

# Biology Keyword / Picture Dictionary - Living Environment

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## abiotic

1. Base your answer to this question on the information given and on your knowledge of biology.  
**Gulf Coast Suffers from Red Tide**

Florida residents have been experiencing the consequences of "red tides" caused by the excessive growth of the algae "Karenia brevis" (*K. brevis*). This species of algae is a single-celled organism that releases brevetoxin, a dangerous nerve toxin that can be fatal to animals. Even though shellfish, which can eat "*K. brevis*", are not affected by this algae, many fish and other marine organisms, such as dolphins and manatees, are paralyzed by the toxin. This toxin prevents the organisms from carrying out the process of cellular respiration.

The red tides usually appear in late summer or early fall. Researchers are not sure what causes red tides. A variety of factors seem to be associated with their occurrence. These factors include warmer ocean temperatures, heavy rainfall, and pollution from fertilizers. The diagram shown represents a typical food web present in Gulf Coast waters. What abiotic factor mentioned in the information given could be causing the red tides in Florida?

- (1) heavy rainfall  
(2) zooplankton  
(3) contaminated sea grass  
(4) shellfish

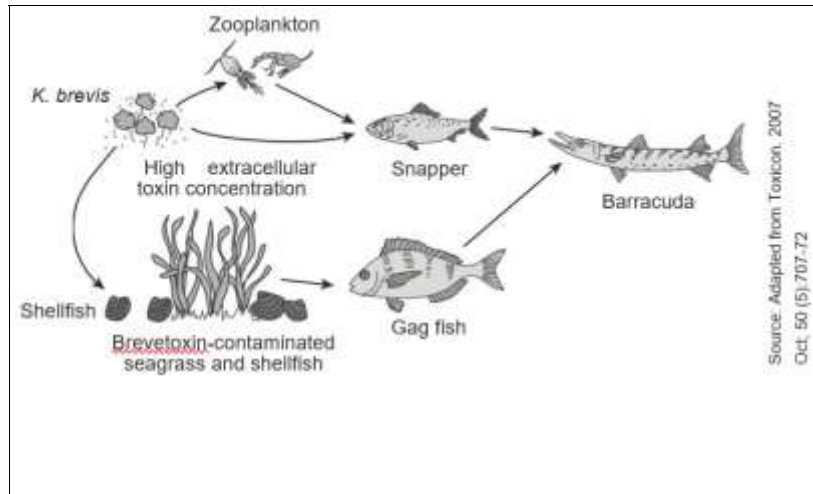
Data Base File Number: 1648

Regents Date Jan2024-65.bmp

Jan2024

65 1/23/2024 S4K6

Answer 1



**abiotic**

2. Study the diagram shown. Use your knowledge of biology and the diagram to answer this question. Identify one abiotic factor that would directly affect the survival of organism A shown in the diagram.

- (1) oxygen level in the water
- (2) bird feeding on the fish
- (3) the plants growing in the water
- (4) the rocks at the bottom of the water

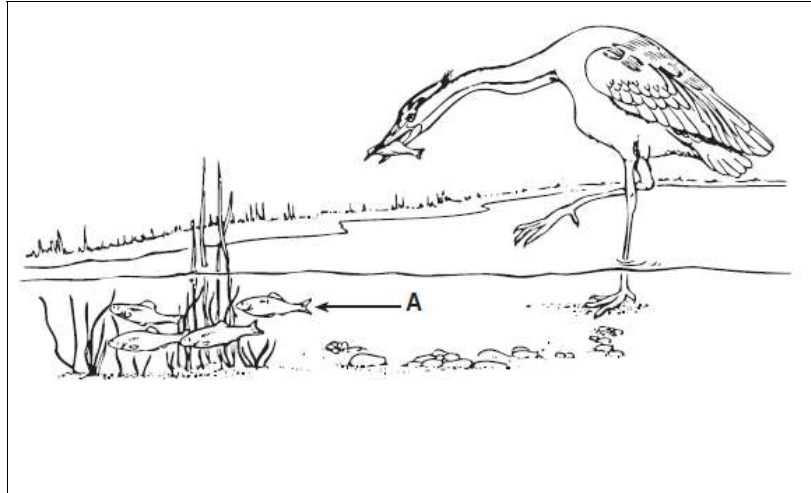
Data Base File Number: 650

Regents Date Jan2004-54.bmp

Jan2004

54 1/29/2004 S4K1

Answer 1



**abiotic**

3. The diagram shown represents a pond ecosystem. Which of the following is an abiotic factor in the diagram shown?

- (1) frog
- (2) water
- (3) fish
- (4) green plant

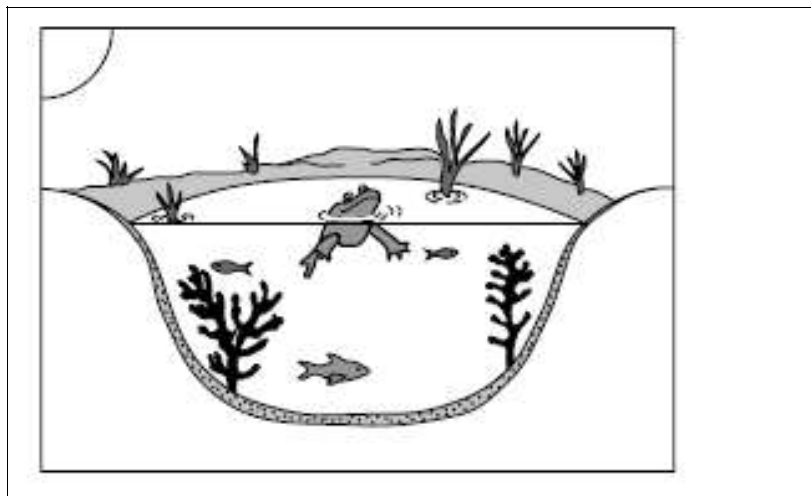
Data Base File Number: 1378

Regents Date Aug2019-55.bmp

Aug2019

55 8/14/2019 S4K6

Answer 2



**abiotic**

4. An Adirondack Mountain ecosystem is represented in the diagram shown. An abiotic factor in this ecosystem is the

- (1) pH of the soil where the trees grow
- (2) number of deer of reproductive age
- (3) different species of grass present
- (4) balance between predators and prey

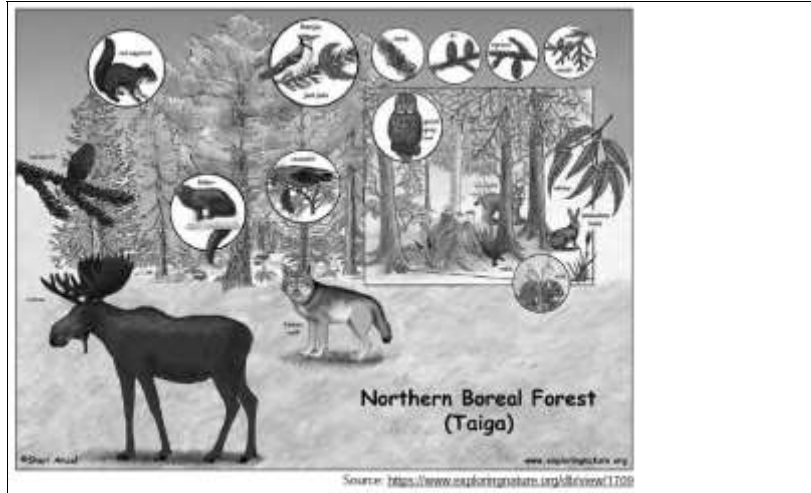
Data Base File Number: 1663

Regents Date June2024-22.bmp

June2024

22 6/14/2024 S4K6

Answer 1



**abiotic**

5. Base your answer to this question on the diagrams given and on your knowledge of biology. The diagrams represent how various populations interact in a forest environment. Which diagram, A or B, most accurately represents interactions between biotic and abiotic factors in a forest environment?

- (1) A
- (2) B
- (3) A and B
- (4) Neither A or B

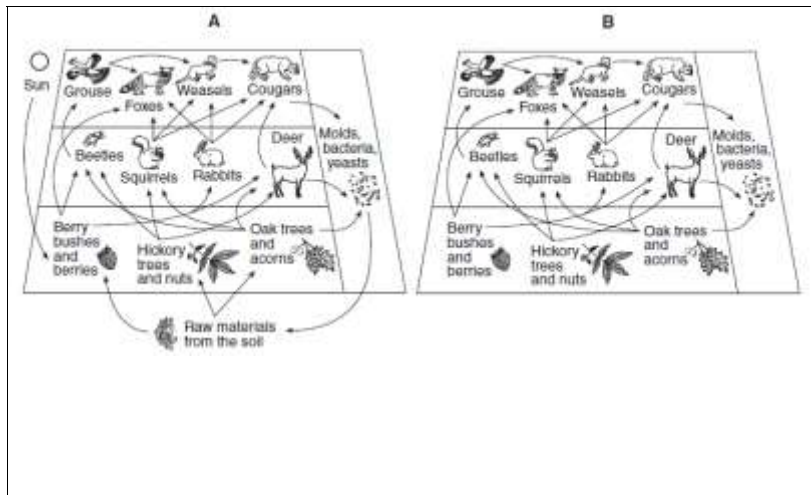
Data Base File Number: 629

Regents Date Jan2013-65.bmp

Jan2013

65 1/23/2013 S4K6

Answer 1



**abiotic**

6. A student set up a small freshwater fish tank. The tank included water, fish, gravel, a snail, and plants, as shown in the diagram. Which statement best describes an activity performed by a student investigating an abiotic factor using this setup?

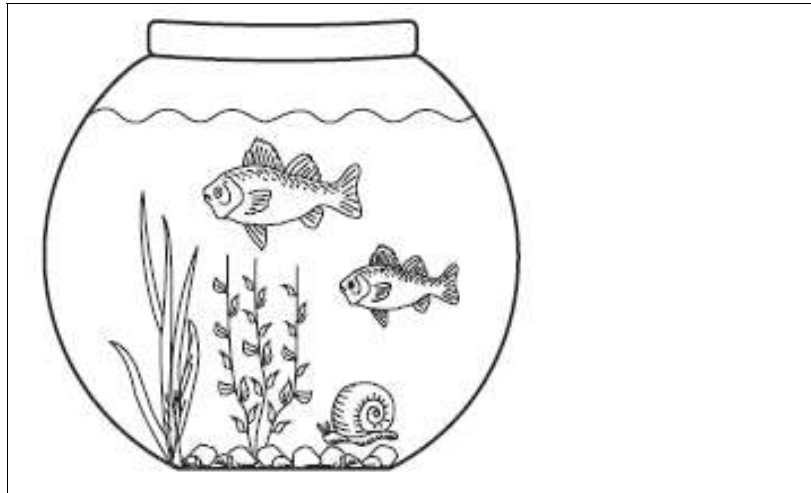
- (1) He records the temperature of the water.
- (2) He feeds the fish 0.5 gram of fish food twice a day.
- (3) He measures the growth of the plants with a metric ruler.
- (4) He observes the snail scrape algae off the gravel.

Data Base File Number: 1072

Regents Date Jan2016-24.bmp

Jan2016  
24 1/27/2016 S4K6

Answer 1





## absorption

7. A glucose-tolerance test was conducted to observe the effect of time on glucose concentration in the blood. An animal was fed 10 milliliters of glucose solution. At five different times after the ingestion of the solution, the blood glucose concentration was determined, and the results were recorded in the data table as shown. The change in glucose concentration in the blood between 0 and 30 minutes was probably due to

- (1) the liver releasing glucose into the small intestine  
(2) glucose being absorbed from the digestive system  
(3) the synthesis of glucose from starch  
(4) glucose being used for cellular respiration

Data Base File Number: 826

Regents Date Jan2002-6.bmp

Jan2002

6 1/23/2002 S4K1

Answer 2

Time After Glucose Ingestion (minutes)	Glucose Concentration in Blood (mg/100 dL)
0	75
30	125
60	110
90	90
120	80
180	70

## acid rain

8. Base your answer to this question on the information below. Acid rain can have a pH between 1.5 and 5.0. The effect of acid rain on the environment depends on the pH of the rain and the characteristics of the environment. It appears that acid rain has a negative effect on plants. The scale shows the pH of normal rain. What is the pH of Normal rain?

- (1) 1.5  
(2) 2.5  
(3) 5.5  
(4) 6.5

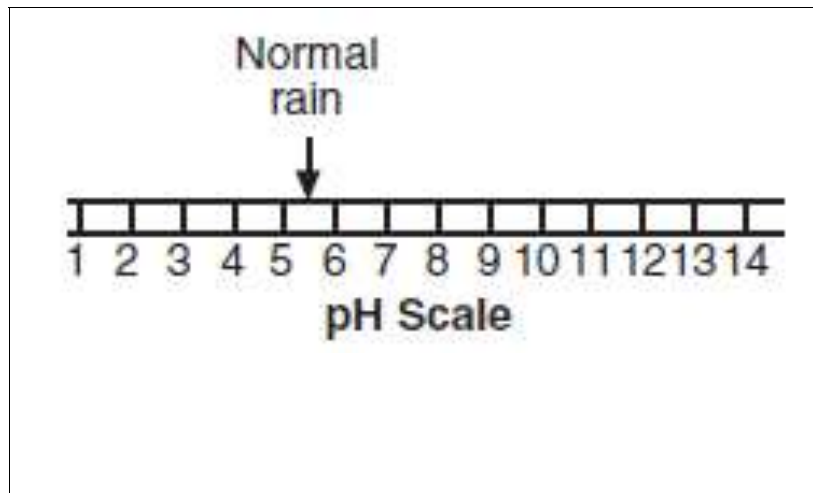
Data Base File Number: 799

Regents Date Aug2002-73.bmp

Aug2002

73 8/13/2002 LABA

Answer 3



**active transport**

9. Which row in the chart best describes the active transport of molecule X through a cell membrane?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 475

Regents Date June2006-3.bmp

June2006

3 6/21/2006 S4K1

Answer 3

Row	Movement of Molecule X	ATP
(1)	high concentration → low concentration	used
(2)	high concentration → low concentration	not used
(3)	low concentration → high concentration	used
(4)	low concentration → high concentration	not used

**active transport**

10. The diagram shown represents two cells viewed using the same magnification with the same microscope. One possible conclusion that can be drawn about the activity of these two cells is that

- (1) more active transport occurs in cell B than in cell A
- (2) more active transport occurs in cell A than in cell B
- (3) cell B uses some of the extra mitochondria to make food
- (4) cell A is a plant cell since it has a cell wall

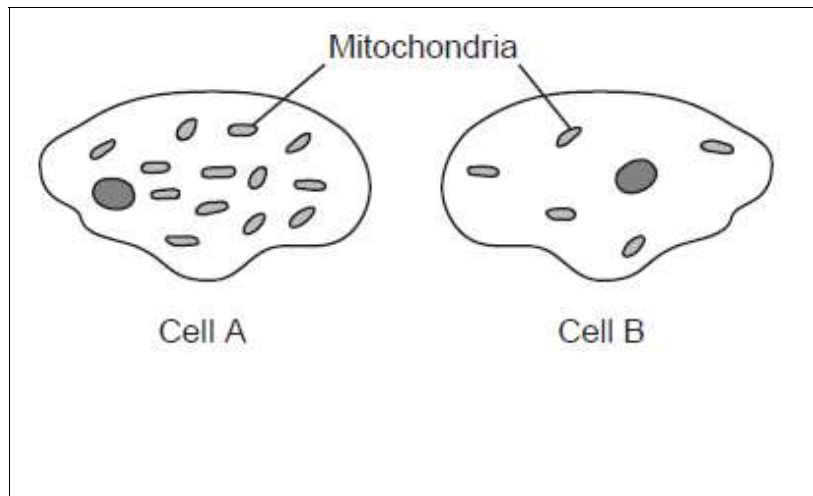
Data Base File Number: 1109

Regents Date June2016-42.bmp

June2016

42 6/15/2016 S4K1

Answer 2



## active transport

11. Base your answer to this questions on the information and diagram given, and on your knowledge of biology. Using a microscope and a wet-mount slide, a student observed a pond water sample containing paramecia, which are single-celled freshwater organisms. He noticed that there was a structure within each living paramecium that contracted regularly about four times each minute. He researched the organism in his science textbook and found that the structure was a contractile vacuole and its function was to remove excess water from the paramecium. In the diagram as shown, a paramecium is represented as seen through a microscope. The function of the contractile vacuole is described. The process used to remove excess water from the paramecium by the contractile vacuole is

- (1) synthesis  
(2) digestion  
(3) active transport  
(4) passive transport

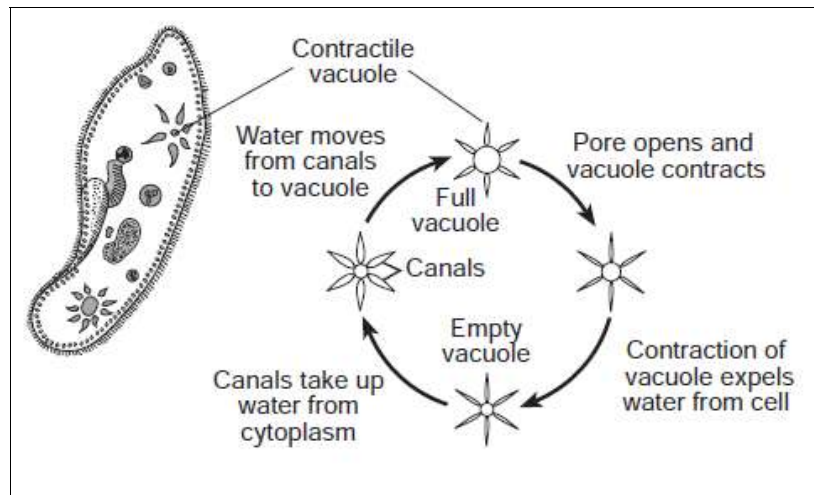
Data Base File Number: 1123

Regents Date June2016-81.bmp

June2016

81 6/15/2016 LAB3

Answer 3



## active transport

12. The diagram shown represents the results of the net movement of a specific kind of molecule across a living cell membrane. The movement of molecules from side A to side B is an example of the process of

- (1) active transport  
(2) chromatography  
(3) cellular respiration  
(4) diffusion

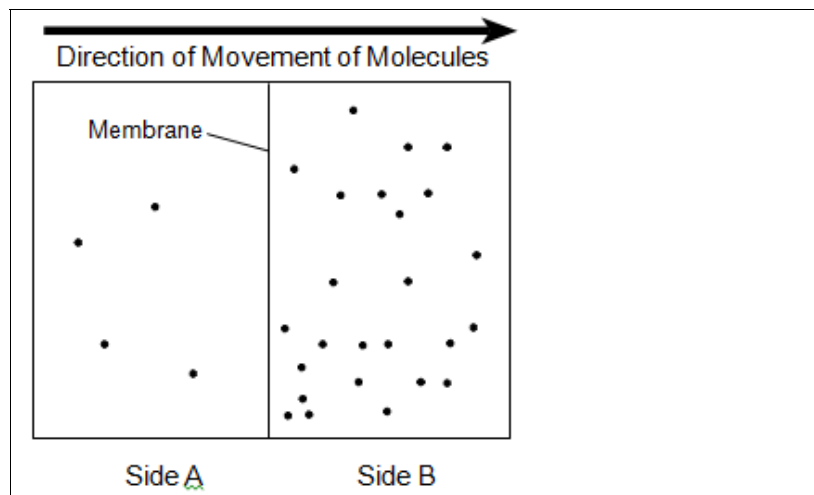
Data Base File Number: 1205

Regents Date Aug2017-24.bmp

Aug2017

24 8/17/2017 S4K1

Answer 1



## active transport

13. The diagram shown represents a portion of a cell membrane. The arrow indicates that the cell membrane is carrying out the process of

- (1) respiration
- (2) cell recognition
- (3) diffusion
- (4) active transport

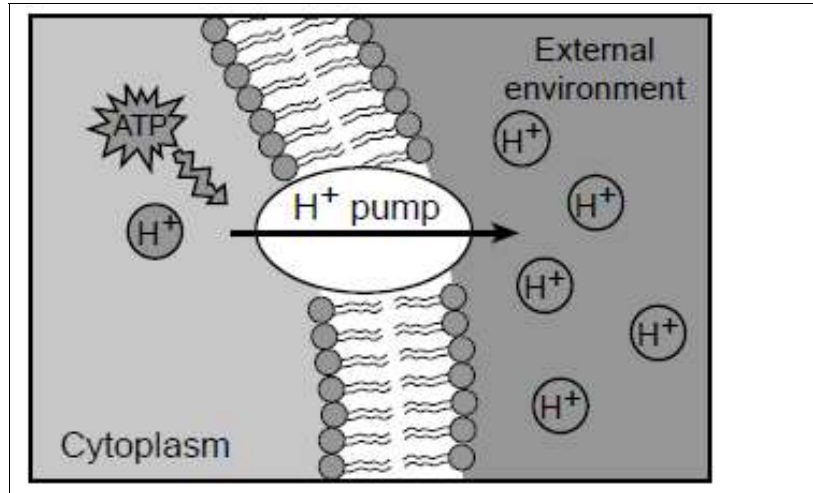
Data Base File Number: 1336

Regents Date June2019-22.bmp

June2019

22 6/18/2019 S4K1

Answer 4



## active transport

14. The graph shows the relative concentrations of different ions inside and outside of an animal cell. Which process is directly responsible for the net movement of  $K^+$  and  $Mg^{++}$  into the animal cell?

- (1) electrophoresis
- (2) diffusion
- (3) active transport
- (4) circulation

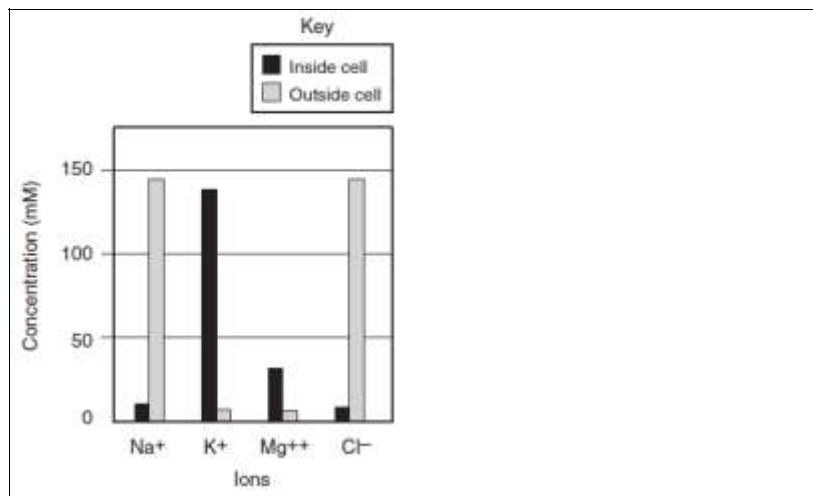
Data Base File Number: 533

Regents Date Jan2005-3.bmp

Jan2005

3 1/28/2005 S1K1

Answer 3



## active transport

15. The diagram shown illustrates the movement of glucose across a cell membrane. Which two processes are most directly represented in this diagram?

- (1) ATP synthesis and the diffusion of water
- (2) molecule transport and energy use
- (3) homeostasis and ATP synthesis
- (4) homeostasis and the diffusion of water

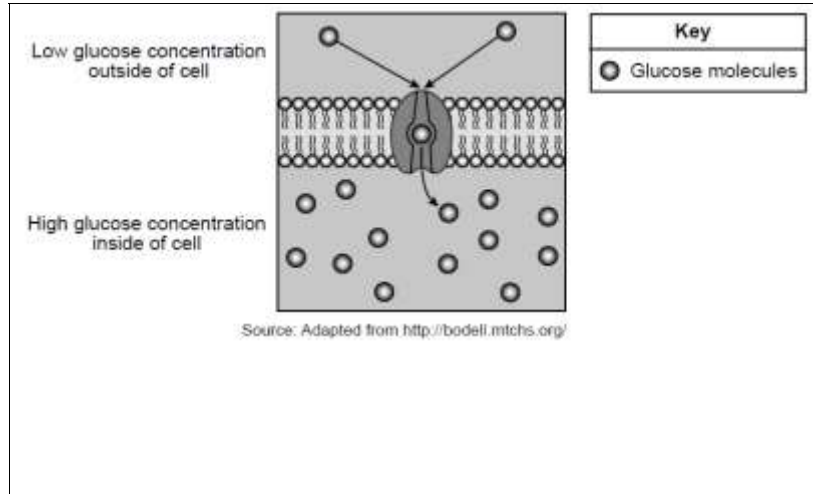
Data Base File Number: 1395

Regents Date Jan2020-27.bmp

Jan2020

27 1/21/2020 S4K1

Answer 2



## active transport

16. Base your answer to this question on the diagram shown, which represents a unicellular organism in a watery environment. The ▲s represent molecules of a specific substance. Arrow A represents active transport. What is one way that active transport is different from diffusion?

- (1) active transport requires the use of energy
- (2) active transport is the same as diffusion
- (3) active transport excretes carbon dioxide
- (4) active transport shows dynamic equilibrium

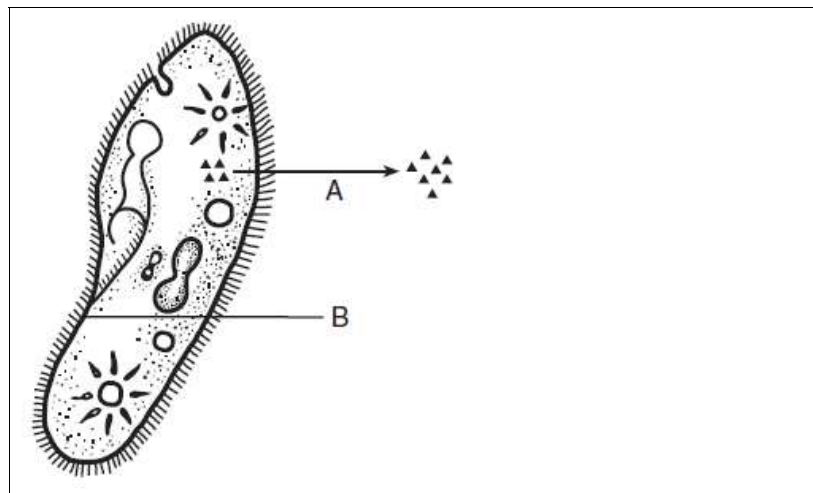
Data Base File Number: 749

Regents Date June2003-55.bmp

June2003

55 6/19/2003 S4K1

Answer 1



**active transport**

17. The diagram shown represents a cell and some molecules in its environment. Which molecule would require the use of energy in order to be brought into the cell?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

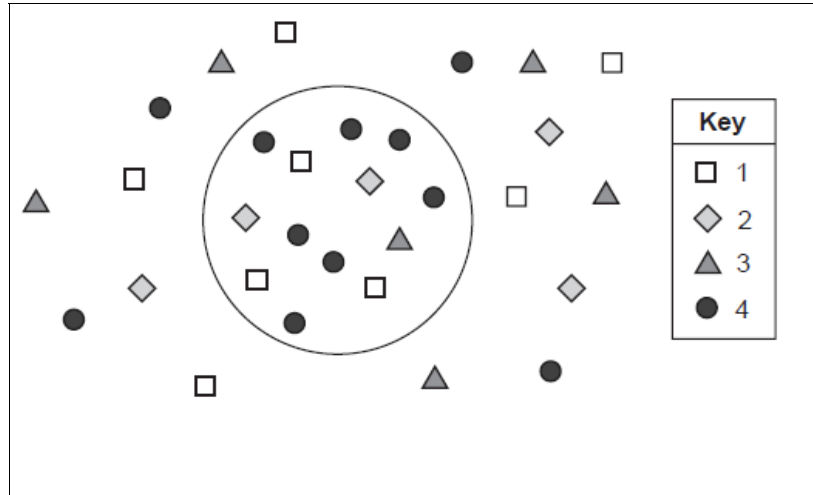
Data Base File Number: 1094

Regents Date June2016--8.bmp

June2016

8 6/15/2016 S4K1

Answer 4



**active transport**

18. A common cycle in biology is represented in the diagram. The ATP molecule shown is commonly used to

- (1) actively transport molecules in an organism
- (2) diffuse water across a membrane
- (3) move molecules from a high to a low concentration
- (4) balance the nutrients in an ecosystem

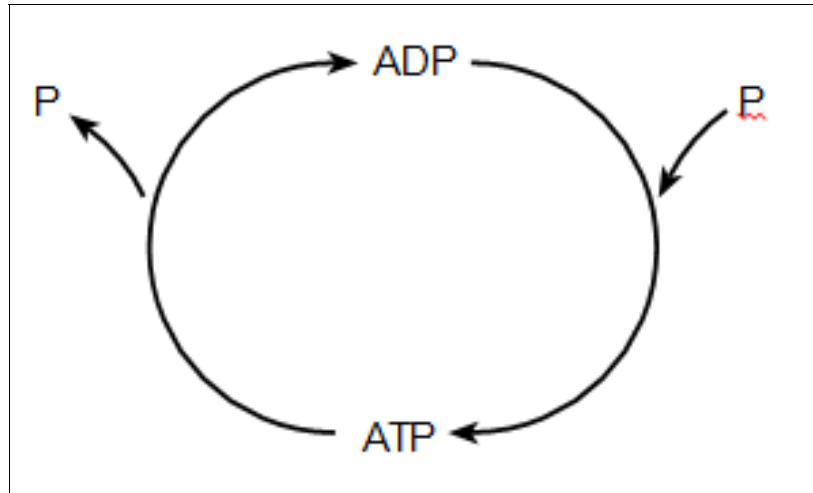
Data Base File Number: 1277

Regents Date Aug2018-16.bmp

Aug2018

16 8/17/2018 S4K1

Answer 1



**active transport**

19. The diagram shown represents movement of a large molecule across a membrane. Which process is best represented in this diagram?

- (1) active transport
- (2) diffusion
- (3) protein building
- (4) gene manipulation

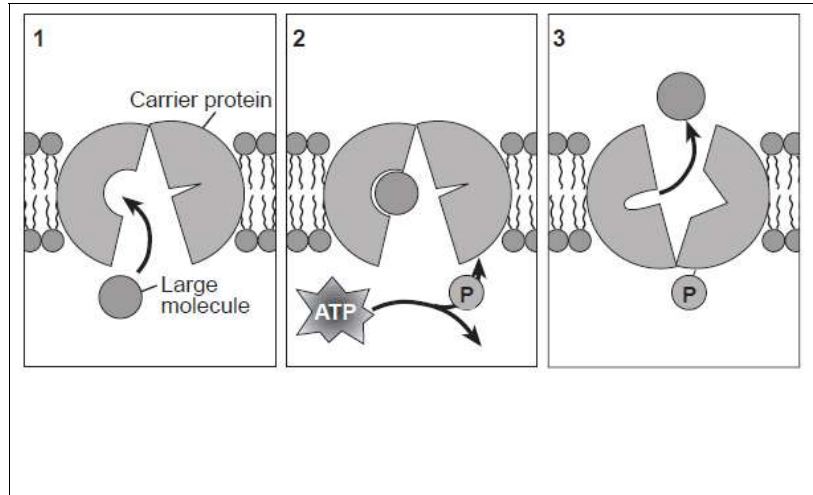
Data Base File Number: 827

Regents Date Jan2002-7.bmp

Jan2002

7 1/23/2002 S4K1

Answer 1



**active transport**

20. The diagram shown represents a cell and several molecules. The number of molecules shown represents the relative concentration of the molecules inside and outside of the cell. Molecule B could enter the cell as a direct result of

- (1) digestion
- (2) diffusion
- (3) active transport
- (4) enzyme production

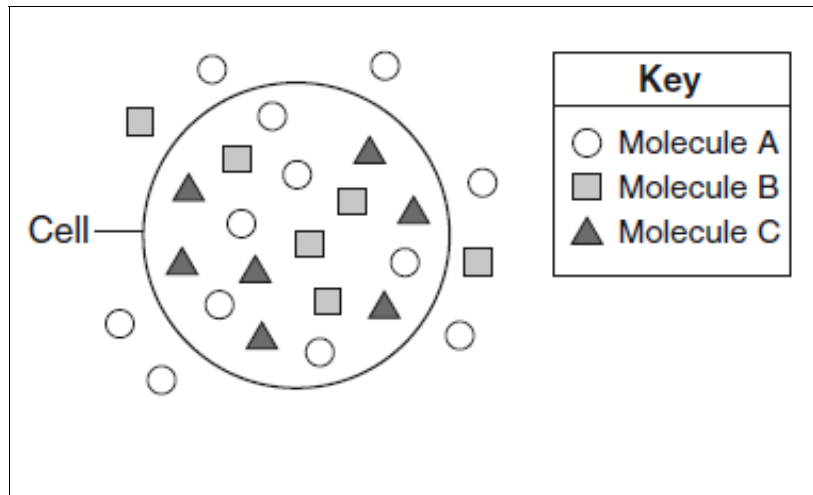
Data Base File Number: 431

Regents Date Aug2012-2.bmp

Aug2012

2 8/17/2012 S4K1

Answer 3





## adaptation

21. Base your answer to this question on the information given and on your knowledge of biology. The existing species of South American bats depend upon a wide variety of food sources, yet they have evolved from a single population of insect eating bats. The diagram shown summarizes the feeding habits of some species of South American bats. The adaptations shown by each species of bat will most likely cause the total number of bats to

- (1) increase due to decreased competition
- (2) decrease due to increased breeding
- (3) increase due to a greater chance of mutation
- (4) decrease due to a decrease in pathogens

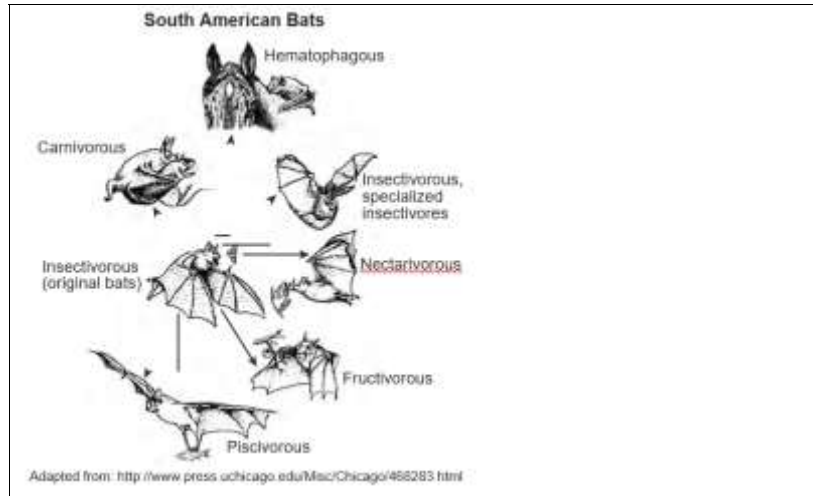
Data Base File Number: 1652

Regents Date Jan2024-76.bmp

Jan2024

76 1/23/2024 LAB3

Answer 1



## adaptation

22. Base your answer to this question on the information given and on your knowledge of biology. Yes, This Big Lizard is Pink. A new study from the University of Rome Tor Vergata shows that a rare strawberry-tinted land iguana [rosada iguana] in the Galapagos Islands is genetically distinct from other iguanas there, having diverged from them more than five million years ago as the archipelago [a group of islands] formed. The rosada iguana, which escaped Darwin's notice, was discovered only recently, largely because it lives on the desolate slopes of an active volcano. Source: Smithsonian, March 2009. Which diagram best represents the evolutionary pathway of the strawberry-tinted iguana?

(1) 1

(3) 3

(2) 2

(4) 4

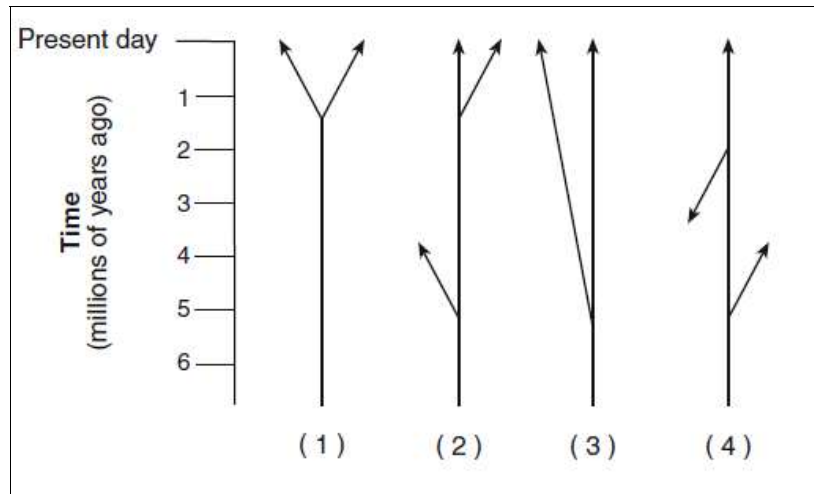
Data Base File Number: 444

Regents Date Aug2012-42.bmp

Aug2012

42 8/17/2012 S4K6

Answer 3



## adaptation

23. The diagram as shown represents a pair of guard cells changing shape, reducing the size of the stomatal opening in a leaf. This is an adaptation that benefits plants by

- (1) increasing the flow of liquid water into leaves, which increases the rate of food and oxygen production
- (2) regulating the flow of water vapor out of leaves, preventing excess water loss by the plant
- (3) increasing the flow of oxygen molecules into the leaves, which increases the rate of photosynthesis
- (4) preventing the flow of carbon dioxide into the leaves, which would reduce the rate of respiration

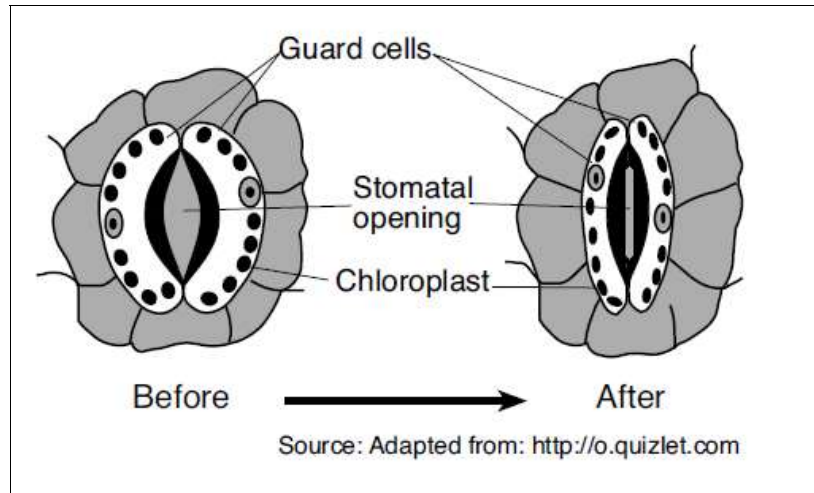
Data Base File Number: 1469

Regents Date June2022-14.bmp

June2022

14 6/15/2022 S4K5

Answer 2



## adaptation

24. The ranges of the African hunting dog and Arctic wolf are represented in the maps as shown. What hypothesis might explain why these two related animals successfully inhabit different areas of Earth

- (1) The environment caused the two animals to mutate for survival.
- (2) The two animals adapted to different environments.
- (3) The two animals were predators.
- (4) The two animals had no enemies.

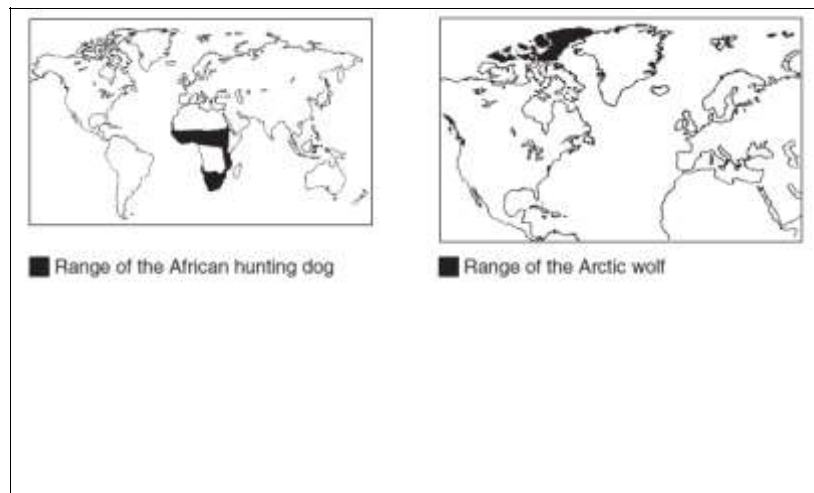
Data Base File Number: 818

Regents Date June2002-43.bmp

June2002

43 6/19/2002 S4K3

Answer 2



## adaptation

25. A photograph of a polar bear in its environment is shown. One possible reason why polar bears might not be able to survive if the environment they live in changes is because. (Photo Source: [http://www.bbc.co.uk/schools/gcsebitesize/science/ocr\\_gateway/environment/3\\_adapt\\_to\\_fit1.shtml](http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/environment/3_adapt_to_fit1.shtml))

- (1) the species will experience decreased competition for mates
- (2) the new environment will cause greater variation in the species
- (3) there will be a larger variety of food sources available
- (4) they are adapted to the specific environment in which they now live

Data Base 919  
File Number:

Regents Date Jan2014-11.bmp

Jan2014

11 1/27/2014 S4K3

Answer 4



## adaptation

26. Researchers discovered four different species of finches on one of the Galapagos Islands. DNA analysis showed that these four species, shown in the illustration, are closely related even though they vary in beak shape and size. It is thought that they share a common ancestor. Which factor most likely influenced these differences in beak size and shape?

- (1) Birds with poorly adapted beaks changed their beaks to get food
- (2) Birds with yellow beaks were able to hide from predators.
- (3) Birds with successful beak adaptations obtained food and survived to have offspring.
- (4) Birds with large, sharp beaks become dominant.

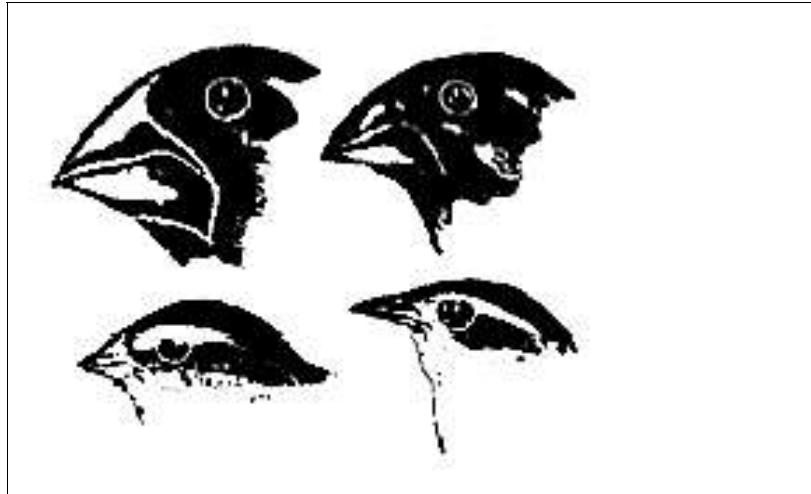
Data Base 83  
File Number:

Regents Date Jan08-66.bmp

Jan2008

66 1/25/2008 LABS

Answer 3



adaptation

27. Note: ROTATE your test paper to the LEFT to properly orient the diagram. QUESTION: Base your answer to this question on the diagram shown and on your knowledge of biology. One possible conclusion that can be drawn regarding ancestral horses A and B is that

- (1) A was better adapted to changes that occurred during the Pliocene Epoch than was B
- (2) the areas that B migrated to contained fewer varieties of producers than did the areas that A migrated to
- (3) competition between A and B led to the extinction of Pliohippus
- (4) the adaptive characteristics present in both A and B were insufficient for survival

Data Base  
File Number:

77

Regents Date

Jan08-39.bmp

Jan2008

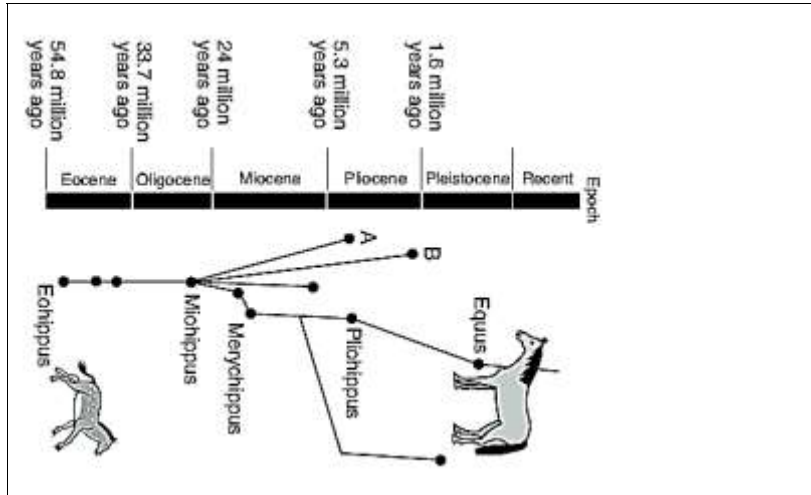
39

1/25/2008

S4K3

Answer

4



## adaptation

28. Base your answer to this question on the information given and the illustration shown, and on your knowledge of biology.

### Some Moths Are Not Easy For Bats to Detect

The cabbage tree emperor moth does not have ears that might alert them to approaching predators, such as bats. Instead, they all have wings with scales and hair-like structures called fur, suited to absorbing the ultrasonic sound frequencies used by bats hunting for food. This absorption reduces the echoes that bounce back to the bats, allowing these moths to avoid detection. Since they are not detected, they don't need to quickly fly away and use more energy. Scientists have observed that other moth species have developed different defense mechanisms. Some moth species have ears and can hear their predators approaching and quickly swerve out of the way. Other moth species fly in a slow zigzag pattern that imitates bees and wasps, which are not desirable prey to bats. What is one advantage of having sound-absorbing fur and scales?

- (1) the bat sounds are absorbed                      (3) the bat sounds are distorted  
(2) the bat sounds are reflected                  (4) the bat sounds are destroyed

Data Base 1649  
File Number:

Regents Date Jan2024-65.bmp

Jan2024

68 1/23/2024 S4K3

Answer 1





**adaptation**

29. The chart shows some characteristics of different species of finches. According to the information in the chart, which finch species is best adapted to feed on insects that live under the bark of trees?

- (1) large ground finch
- (2) small ground finch
- (3) warbler finch
- (4) cactus finch





Data Base File Number: 1651

Regents Date Jan2024-74.bmp

Jan2024

74 1/23/2024 LAB3

Answer 3

Characteristics Chart	
<p>Large Ground Finch</p> <p>Beak: crushing</p>  <p>Food: mainly large seeds</p>	<p>Warbler Finch</p> <p>Beak: probing</p>  <p>Food: 100% animal</p>
<p>Small Ground Finch</p> <p>Beak: crushing</p>  <p>Food: mainly plant</p>	<p>Cactus Finch</p> <p>Beak: probing</p>  <p>Food: cactus</p>

**adaptation**

30. Base your answer to this question on the information given and on your knowledge of biology. The diagrams shown provide information about two separate species of tree frogs found in the United States. The shaded areas represent the habitats of each of the two species. One likely reason that the gray tree frog occupies a larger environmental area than the green tree frog is that the gray tree frog species

- (1) eats only prey found in central areas in the United States
- (2) is adapted to live in any environment in the United States
- (3) has adaptations that enable survival in a wider variety of habitats
- (4) outcompetes the green tree frogs in Florida and any state where they both live

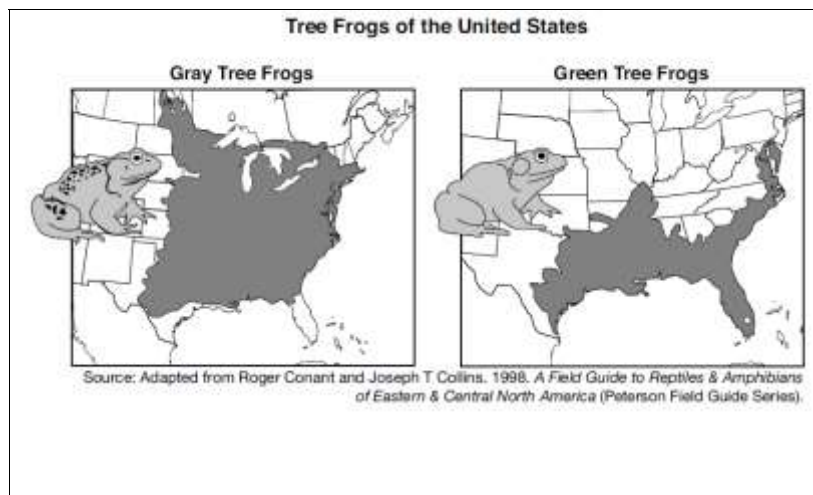
Data Base File Number: 1440

Regents Date June2021-50.bmp

June2021

49 6/22/2021 S4K3

Answer 3



## adaptation

31. The male peacock, as illustrated attracts females (peahens) by fanning out his very long tail feathers in an elaborate display. However, the large fan of colorful feathers makes the males more noticeable to predators and makes it difficult for them to escape. Why do male peacocks continue to have large tail feathers, even though having the feathers may make them more likely to be killed by predators.

- (1) It is a favorable adaptation to attract females, and produce more offspring.
- (2) It is a favorable adaptation to scare off some small predators.
- (3) It is a favorable adaptation for camouflage.
- (4) It is not a favorable adaptation.

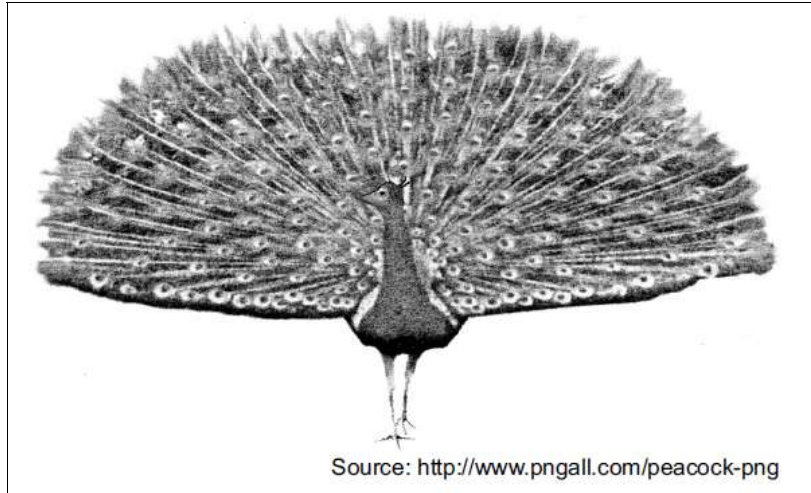
Data Base File Number: 1556

Regents Date Jan2023-52.bmp

Jan2023

52 1/24/2023 S4K3

Answer 1



## adaptation

32. What is the most probable reason for the increase in the percentage of variety A in the population of the species shown in the graph?

- (1) There is no chance for variety A to mate with variety B.
- (2) There is no genetic difference between variety A and variety B.
- (3) Variety A is less fit to survive than variety B is.
- (4) Variety A has some adaptive advantage that variety B does not have.

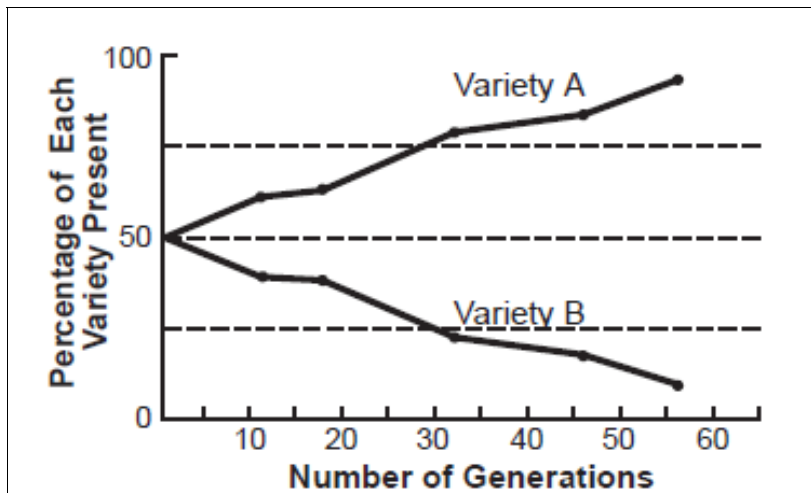
Data Base File Number: 830

Regents Date Jan2002-12.bmp

Jan2002

12 1/23/2002 S4K3

Answer 4



## adaptation

33. The diagrams show the bones in the forelimbs of three different organisms. Differences in the bone arrangements support the hypothesis that these organisms

- (1) are members of the same species
- (2) may have descended from the same ancestor
- (3) have adaptations to survive in different environments
- (4) all contain the same genetic information

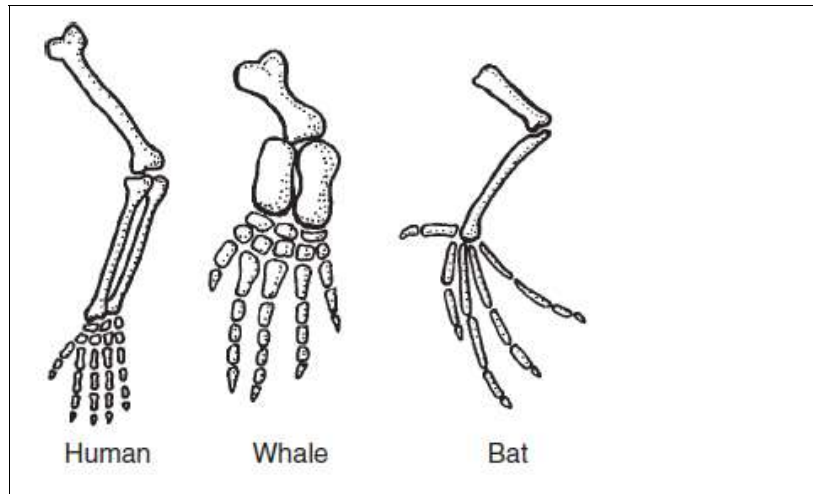
Data Base File Number: 805

Regents Date June2002-15.bmp

June2002

15 6/19/2002 S4K3

Answer 3



## adaptation

34. The ability of sea otters to find food can be reduced because the environment where they search for food is often dark and murky. It has been recently discovered that the surface of otters' paws are able to quickly detect a difference of one-quarter of a millimeter when comparing the size of objects, including food sources. The special characteristics of the otters' paws can be described as

- (1) a variation that eliminates the need for other senses otters normally possess
- (2) a variation that is unlikely to be passed on to offspring because it is not a genetic trait
- (3) an adaptation that could provide an advantage over the other organisms that they compete with for food
- (4) an adaptation that is most likely the result of a mutation in body cells of the ancestors of the otter

Data Base File Number: 1692

Regents Date Aug2024-30.bmp

Aug2024

30 8/20/2024 S4K3

Answer 3



adaptation

35. Base your answer to this question on the information and diagram shown and on your knowledge of biology. Finches on the Galapagos Islands are thought to have originated from South America and to have evolved into new species over the last 10,000 years. Some of this evolution is represented in the diagram shown. The success of the finches on the Galapagos was most likely due to the

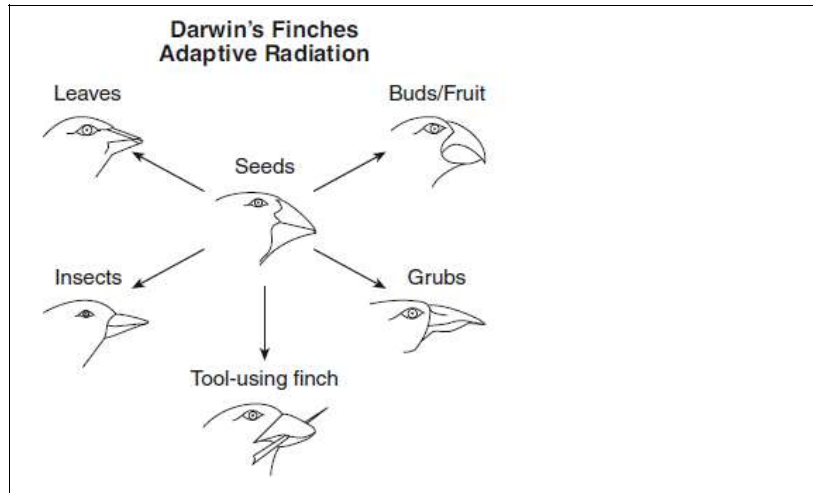
- (1) large numbers of other birds competing for food
- (2) mutations occurring in every offspring
- (3) birds occupying the same island
- (4) birds adapting to different niches

Data Base File Number: 631

Regents Date Jan2013-73.bmp

Jan2013  
73 1/23/2013 LAB3

Answer 4



adaptation

36. The diagram shown illustrates the change that occurred in the physical appearance of a rabbit population over a 10-year period. Which condition would explain this change over time?

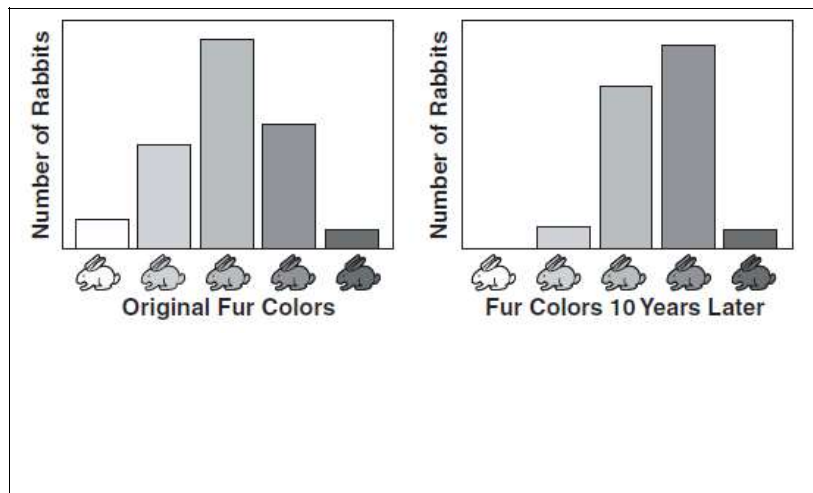
- (1) a decrease in the mutation rate of the rabbits with black fur
- (2) a decrease in the advantage of having white fur
- (3) an increase in the advantage of having white fur
- (4) an increase in the chromosome number of the rabbits with black fur

Data Base File Number: 710

Regents Date Jan2003-16.bmp

Jan2003  
16 1/30/2003 S4K3

Answer 2



adaptation

37. Base your answers to this questions on the information below and on your knowledge of biology. The diagram below represents the relationship between beak structure and food in several species of finches in the Galapagos Islands. Which factor most directly influenced the evolution of the diverse types of beaks of these finches?

- (1) predation by humans
- (2) available food sources
- (3) oceanic storms
- (4) lack of available niches

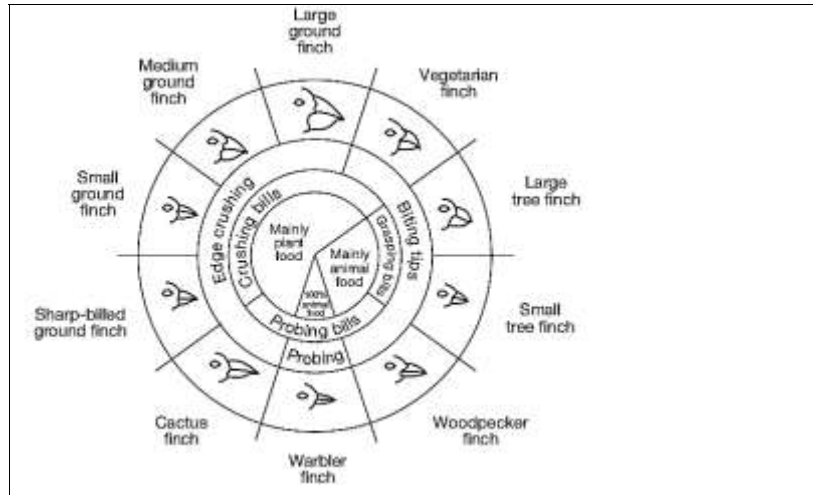
Data Base File Number: 144

Regents Date Aug08-78.bmp

Aug2008

78 8/13/2008 LABS

Answer 2



adaptation

38. Base your answer to this question on the illustration shown and the information given and on your knowledge of biology. The illustration is of a species commonly called the little brown bat. It has 38 teeth and usually lives near bodies of water. The animal is considered beneficial by many people because it eats mosquitoes and many types of garden pests. They feed at night, detecting their prey by echolocation, a form of sonar similar to what is used on ships. They can determine the location and size of their prey by listening to the return echo. The little brown bat eats mainly mosquitoes and night-flying insects. What is one way in which the animal is adapted to prey on these organisms?

- (1) echolation
- (2) daylight feeding
- (3) swimming
- (4) autotrophic nutrition

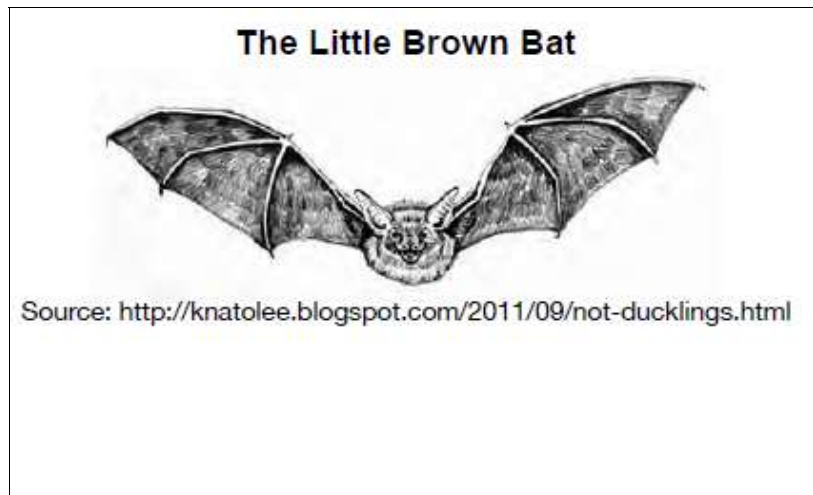
Data Base File Number: 1356

Regents Date June2019-58.bmp

June2019

58 6/18/2019 S4K3

Answer 1



## adaptation

39. Base your answers to this question on the information and photograph given and on your knowledge of biology. The photograph shows a naked mole rat.

### Naked Mole Rats

The unique traits of naked mole rats have made it a focus of research. Found in the hot, dry grasslands of East Africa, they live in underground tunnel systems in social colonies of 20 to 300. They are well-adapted for life underground with protruding teeth for digging, small eyes, and the ability to survive without oxygen for up to 18 minutes. They feed primarily on very large tubers (underground plant stems) and rely on bacteria in their intestine to break down the indigestible plant fibers.

Although most small rodents live only a few years, naked mole rats can live up to 30 years. Unlike most mammals that maintain a constant body temperature despite external conditions, mole rats cannot regulate their body temperature.

Researchers have found that they are resistant to the pain caused by venom injected by aggressive ants that share their burrow systems. Analysis has shown that naked mole rats have variations in the membranes of nerve cells that block the pain signals from the venom. Based on information from the reading, what is one advantage the mole rats have by living in underground tunnels?

- (1) They eat underground stems (tubers) that grow in the tunnels.                      (3) They are able to breathe without oxygen for several hours.
- (2) They can regulate their body temperature.    (4) They have poisonous venom.

Data Base                      1706  
File Number:

Regents Date                      Aug2024-61.bmp

Aug2024

61                      8/20/2024                      S1K1

Answer                      1





## adaptation

40. Base your answer to this question on the information and graph shown and on your knowledge of biology. A population composed of tan snails and black snails inhabits the same sandy beach. A nearby volcano erupted, and black lava particles washed down to the beach. The once tan beach was now black. The graph shows the population of tan snails and black snails before and after the volcanic eruption. Which statement concerning the snails is correct?

- (1) The lava particles turned the tan snails black.
- (2) The tan snails will become extinct.
- (3) The black snails had an adaptive advantage.
- (4) The tan snails preyed on the black snails.

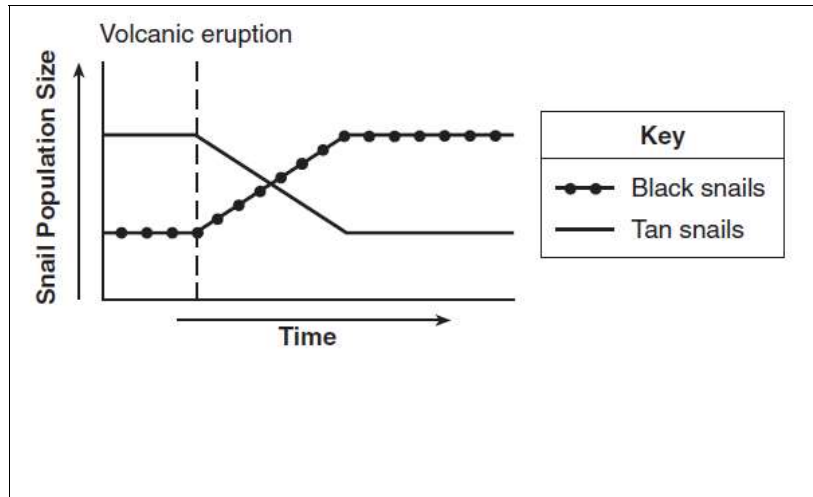
Data Base File Number: 1046

Regents Date August2015-31.b

Aug2015

31 8/12/2015 S4K3

Answer 3





## adaptation

41. **Base your answer to this question on the information given and on your knowledge of biology.** Desert camels have the following characteristics: • large feet ;• nostrils that can be closed; • fat stored in their humps; • a body temperature between 33.9°C and 41.7°C; • thick lips; • brown coat color; • hair lined ears Which statement best describes these camel characteristics?
- (1) Natural selection favored other characteristics over the ones listed.
- (2) The listed characteristics are the result of manipulating genes in female camels.
- (3) These characteristics have adaptive value for the camel.
- (4) Camels have these characteristics because they needed them.

Data Base File Number: 1633

Regents Date Jan2024-35.bmp

Jan2024

35 1/23/2024 S4K3

Answer 3



Source: <https://animals.sandiegozoo.org/animals/camel>

## adaptation

42. The diagram shown represents a remora fish attached to a shark. A remora fish has an adhesive disk or sucker on its head, which it uses to attach itself to larger fishes, such as sharks. This attachment causes the shark no harm. The remora fish eat scraps of food that the sharks drop as they feed. This is an example of
- (1) an adaptation to a specialized niche
- (2) an adaptation of a successful parasite
- (3) competition between two fish species for food
- (4) competition for abiotic resources

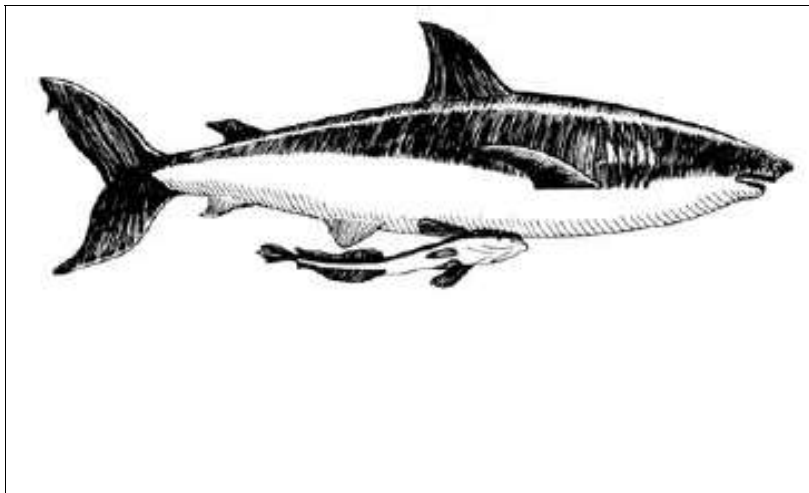
Data Base File Number: 1023

Regents Date June2015-35.bmp

June2015

35 6/16/2015 S4K6

Answer 1



## adaptation

43. The diagram shown represents the bone arrangements in the front limbs of three different species of mammals. The similarities and differences in these limbs suggest that all three species developed from the same ancestor, but

- (1) produced different numbers of offspring
- (2) lived in different time periods
- (3) adapted to different habitats
- (4) migrated to similar habitats

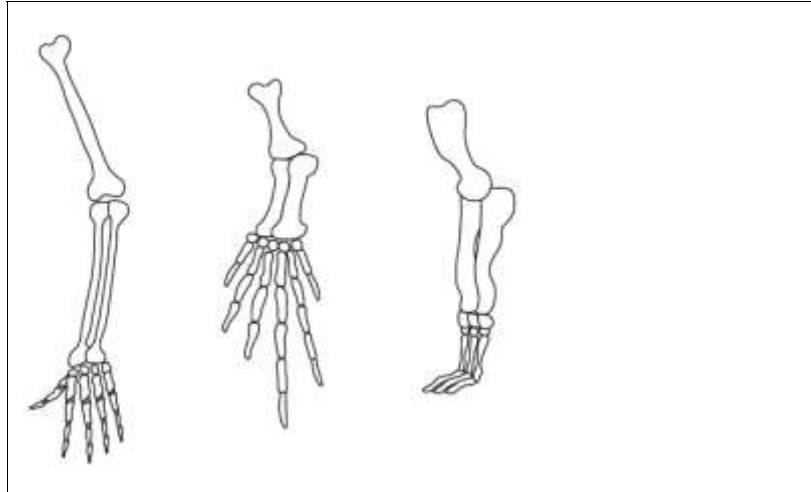
Data Base File Number: 609

Regents Date Jan2013-14.bmp

Jan2013

14 1/23/2013 S4K3

Answer 3



## allergy

44. Human cells have many molecules attached to their surfaces. Some of these molecules are involved in producing the symptoms associated with allergies. Histamine is a chemical produced by some human cells. When histamine binds to molecules on the surface of cells that line the nose and throat, the cells will swell and leak fluid, causing the characteristic itching, sneezing, and congestion associated with allergies. The UPPER part of the diagram shown is a model of this mechanism. Look at the LOWER part of the diagram where four objects are labeled as 1,2,3 and 4. Antihistamines are medications taken to block this reaction. Which of the antihistamine molecules in the LOWER part of the diagram as shown would be the most effective?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

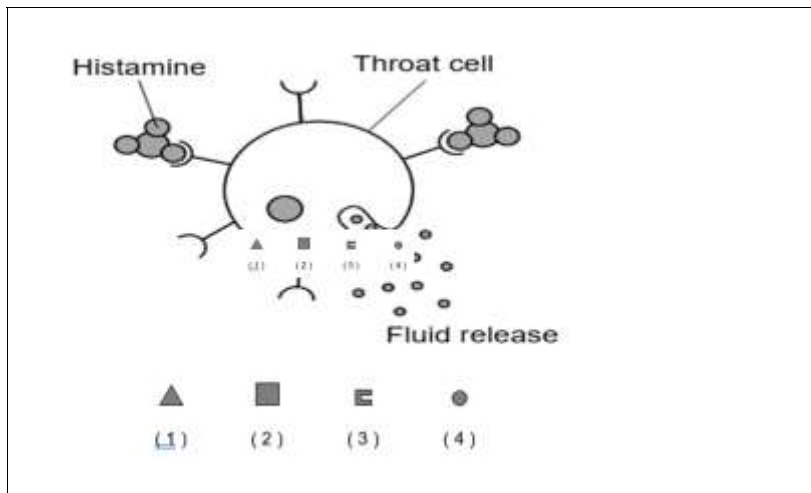
Data Base File Number: 1519

Regents Date Aug2022-43C.bm

Aug2022

43 8/17/2022 S4K1

Answer 4



## allergy

45. Carmine, a compound that comes from the cochineal beetle, shown in the photo, is used as a food coloring. The food coloring is not harmful to most people, but in a small number of individuals, it causes a reaction and affects their ability to breathe. This response to carmine is known as

- (1) a stimulus
- (2) an allergy
- (3) natural selection
- (4) an adaptation

Data Base File Number: 1362

Regents Date Aug2019-13.bmp

Aug2019

13 8/14/2019 S4K5

Answer 2



## amino acid chains

46. Base your answer to this question on the diagram shown and on your knowledge of biology. Identify the type of building block represented by the letters A, B, and C.

- (1) fatty acids
- (2) simple sugars
- (3) amino acids
- (4) purines

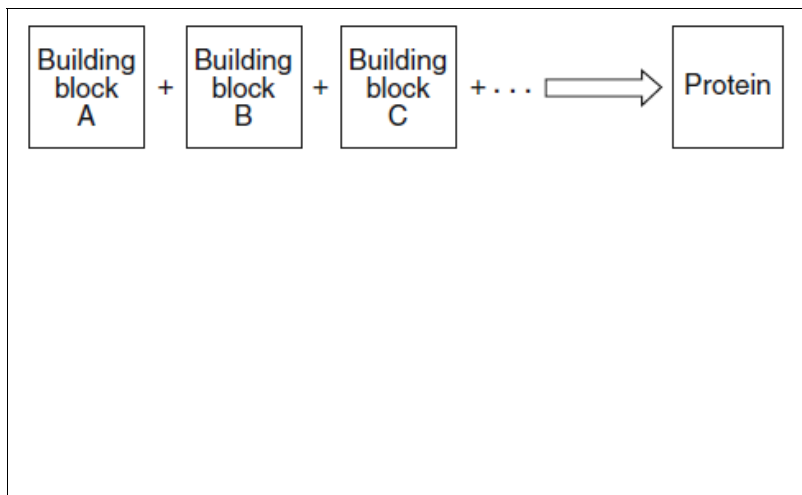
Data Base File Number: 627

Regents Date Jan2013-54.bmp

Jan2013

54 1/23/2013 S4K2

Answer 3



## amino acid sequences

47. The diagram shown provides some information concerning proteins. Which phrase is represented by A?

- (1) sequence of amino acids
- (2) sequence of simple sugars
- (3) sequence of starch molecules
- (4) sequence of ATP molecules

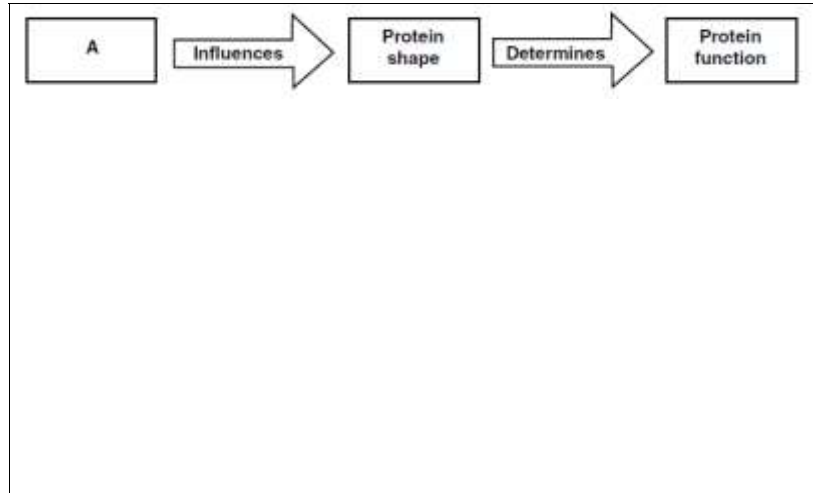
Data Base File Number: 755

Regents Date Aug2003-6.bmp

Aug2003

6 8/13/2003 S4K2

Answer 1



## amino acid sequences

48. The number of amino acid differences in the protein Cytochrome c between chimpanzees and some other animals is shown in the table given. Based on the data shown in the table, which animal is the most closely related to the Chimpanzee?

- (1) Dog
- (2) Dogfish shark
- (3) Rattlesnake
- (4) Rhesus monkey

Data Base File Number: 1081

Regents Date Jan2016-48.bmp

Jan2016

48 1/27/2016 S4K3

Answer 4

Animal	Number of Amino Acid Differences
Chimpanzee	0
Dog	8
Dogfish shark	24
Rattlesnake	12
Rhesus monkey	1

**amino acid sequences**

49. The amino acid sequence of four species, Bc, X, Y, and Z, were compared to determine their evolutionary relationship. Based on the amino acid sequence shown in the diagram, identify the evolutionary tree that best represents the relationship between the species.

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1623

Regents Date Aug2023-74.bmp

Aug2023

74 8/17/2023 LAB1

Answer 2

Species	Amino Acid Sequence
Bc	Val His Leu Thr Pro Glu Glu
X	Val His Leu Ser Pro Val Glu
Y	Val His Leu Ser Pro Val Glu
Z	Val His Leu Thr Pro Glu Glu

(1)

(2)

(3)

(4)

**amino acid sequences**

50. Base your answer to this question on the Universal Genetic Code Chart shown and on your knowledge of biology. When provided with a sequence of bases in one segment of mRNA, the Universal Genetic Code Chart is used to

- (1) directly identify the DNA from an animal cell
- (2) determine the sequence of amino acids in a protein
- (3) change the RNA sequence of a protein into DNA
- (4) identify the specific mutations in the genetic material in a cell

Data Base File Number: 1352

Regents Date June2019-76.bmp

June2019

76 6/18/2019 LAB1

Answer 2

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

## amino acid sequences

51. The amino acid sequences of three species, as shown in the table, were determined in an investigation of evolutionary relationships. Based on these data, which TWO species are most closely related?

(1) A and C

(3) B and C

(2) A and B

(4) C and A

Data Base File Number: 272

Regents Date June2010-65.bmp

June2010

65 6/16/2010 LABS

Answer 2

Species A:	Val	His	Leu	Ser	Pro	Val	Glu
Species B:	Val	His	Leu	Cys	Pro	Val	Glu
Species C:	Val	His	Thr	Ser	Pro	Glu	Glu

## amino acid sequences

52. The chart shown contains amino acid sequences for part of a protein that is found in the feathers on each of these three species of birds. Which species are MOST closely related?

(1) A and B

(3) B and A

(2) A and C

(4) B and C

Data Base File Number: 529

Regents Date Aug2006-63.bmp

Aug2006

63 8/16/2006 LAB1

Answer 2

Species	Amino Acid Sequence
A	Arg-Leu-Glu-Gly-His-His-Pro-Lys-Arg
B	Arg-Gly-Glu-Gly-His-His-Pro-Lys-Arg
C	Arg-Leu-Glu-Gly-His-His-Pro-Lys-Arg

amino acids

53. Base your answer to this question on the information given and on your knowledge of biology. An Enzyme Investigation is being studied. An enzyme was isolated from digestive juices taken from the small intestine. An experiment was set up to test the ability of the enzyme to break down protein. Two test tubes, labeled A and B, were placed in a hot water bath at 37°C, human body temperature. Test tube A contained only protein and test tube B contained protein and the enzyme. The chart shows the set-up. After two hours, the contents of both test tubes were analyzed. Test tube A showed only the presence of protein. Test tube B showed the presence of the end products of protein digestion, indicating the enzyme had successfully broken down the protein. What are the end products of protein digestion that made up the contents of test tube B after the two hours.

- (1) starches
- (2) sugars
- (3) amino acids
- (4) fats

Data Base File Number: 1221

Regents Date Aug2017-60.bmp

Aug2017

60 8/17/2017 S4K1

Answer 3

Test Tube	Contents
A	protein
B	protein, enzyme



## annual rings

54. The rings in the diagram shown represent the annual growth of a tree approximately 20 years old. Tree trunks grow wider each year by continuous growth in a thin layer of cells just beneath the bark. Since one new layer is added each year, the number of rings in a tree can be used to tell its age. The thickness of the rings provides information about the environmental conditions in past years. By observing the annual rings in the diagram, one can infer that

- (1) environmental conditions did not change over the last 20 years
- (2) trees grow faster on the side that faces the Sun
- (3) some years provide better conditions for growth than other years
- (4) tree rings are not reliable because trees must be cut down to see them

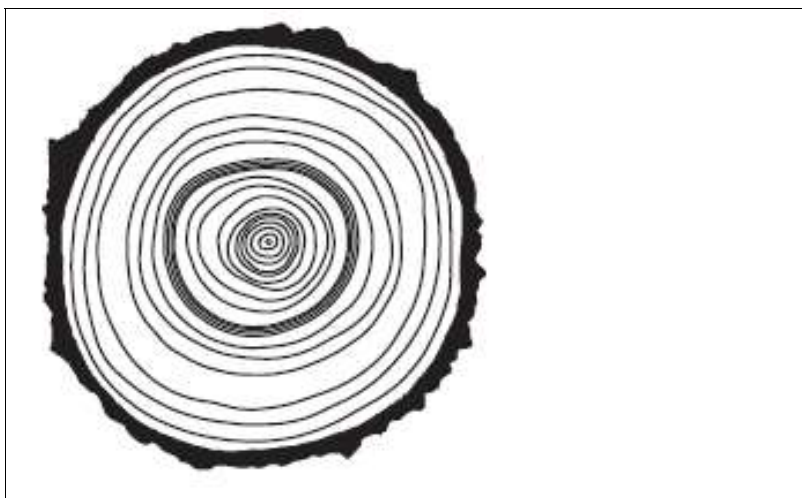
Data Base 1259  
File Number:

Regents Date June2018-37.bmp

June2018

37 6/13/2018 S1K3

Answer 3



## annual rings

55. Bristlecone Pine Trees are some of the oldest trees in the world. The enclosed photo is of a Bristlecone Pine Tree. Some of these trees are 5,000 years old. They grow in a very cold environment such as in Northern California. What would be the best way to determine the age of a Bristlecone Pine Tree without harming it?

- (1) Cut the tree down at its base and count the annual rings.
- (2) Measure the stem length.
- (3) Divide the stem circumference by the stem diameter.
- (4) Take a stem boring and count the annual rings in the extracted bore.

Data Base File Number: 1464

Regents Date BristleconePine.

RBS2021

1 10/8/2021 RBS

Answer 4



antibiotic

56. Base your answer to this question on the graph shown and on your knowledge of biology. Which statement provides the best possible reason for the decrease in number of cases of bacterial pneumonia from 1940 to 1970?

- (1) As a result of genetic engineering, humans became immune to the bacteria.
- (2) Antibiotics were made available for the treatment of bacterial infections.
- (3) The bacteria did not respond to medical treatments.
- (4) As a result of sexual reproduction, the bacteria evolved into a harmless form.

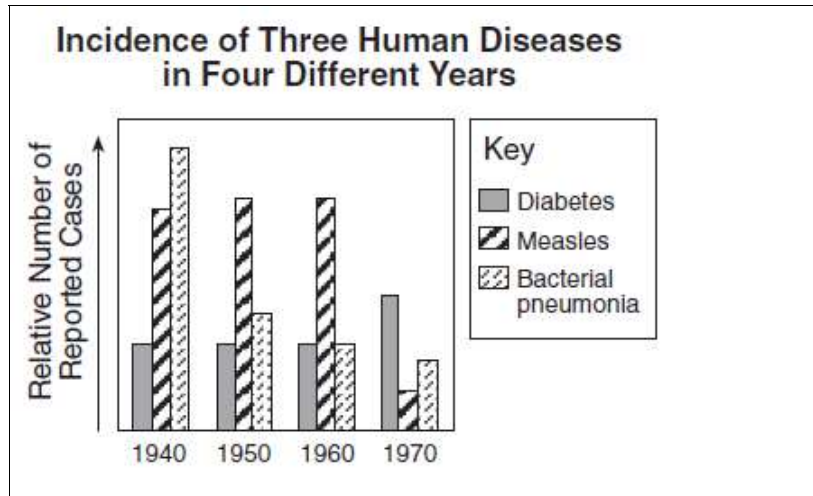
Data Base File Number: 595

Regents Date Aug2005-35.bmp

Aug2005

37 8/16/2005 S4K5

Answer 2



**antibiotic resistance**

57. Base your answer to this question on the scatter-plot graph shown and on your knowledge of biology. The graph shows changes in the percentage of vancomycin-resistant bacteria in a population between the years 1983 and 2001. Why did the percentage of resistant bacteria increase over time?

- (1) The vancomycin caused the resistance.
- (2) The resistant bacteria survived, reproduced, and passed on the gene for resistance.
- (3) The vancomycin caused a gene shift in the bacteria.
- (4) The vancomycin caused a DNA change in the bacteria and this resulted in a resistant mutation.

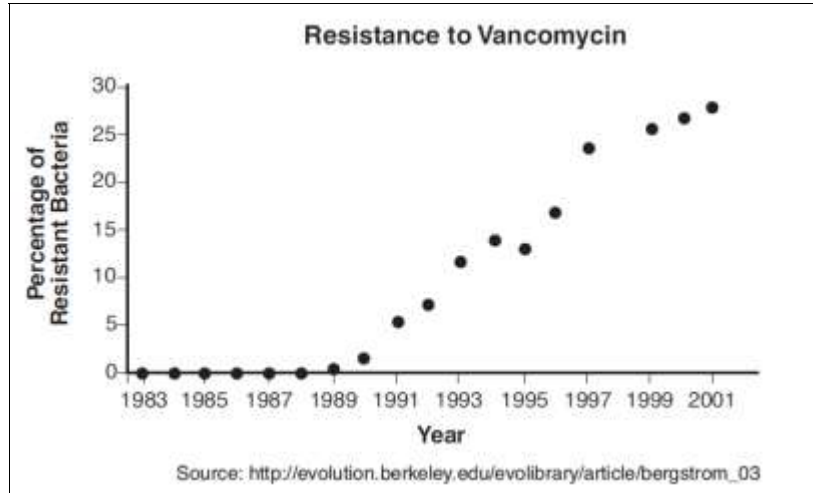
Data Base File Number: 891

Regents Date June2013-54.bmp

June2013

54 6/11/2013 S4K3

Answer 2



**antibiotic resistance**

58. The diagram shown represents some changes that took place in a bacterial population recently exposed to an antibiotic. Which statement would best explain the presence of bacteria on day 4?

- (1) A bacterial population cannot survive exposure to antibiotics.
- (2) This bacterial population cannot survive exposure to this antibiotic.
- (3) Bacteria can change whenever it is necessary to survive antibiotic treatment.
- (4) Some of the bacterial population was resistant to this antibiotic.

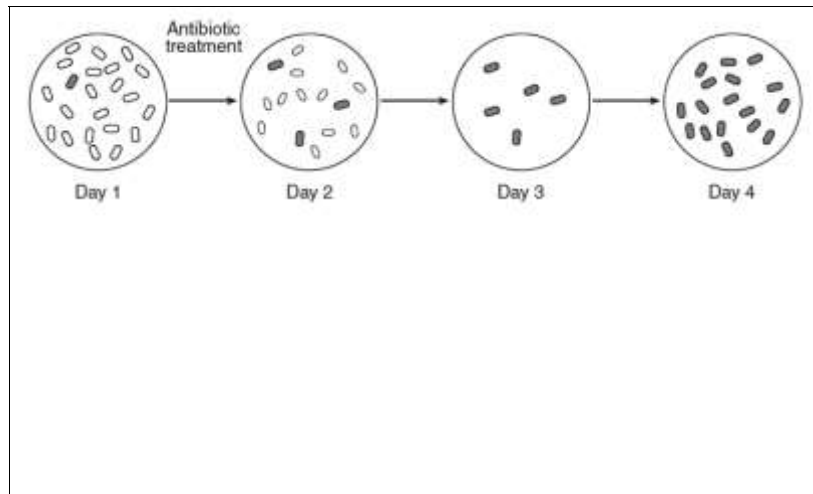
Data Base File Number: 438

Regents Date Aug2012-36.bmp

Aug2012

36 8/17/2012 S4K3

Answer 4



## antibiotic resistance

59. Base your answer to this question on the information and diagram given and on your knowledge of biology. To study how bacteria respond to antibiotics, four paper discs, three treated with different antibiotics and one treated with water, were placed on a nutrient source with bacteria and left for 24 hours. The water and the antibiotics on the discs diffused into the nutrient source. If the antibiotic stopped the bacteria from growing, a circular area of no bacterial growth around the discs could be seen. After 24 hours, the results represented by the diagram demonstrate

- (1) which of these antibiotics most effectively stopped bacterial growth
- (2) the nutrient source that resulted in the most bacterial growth
- (3) whether the bacteria were resistant to most antibiotics or not
- (4) that these bacteria were harmful to antibiotics

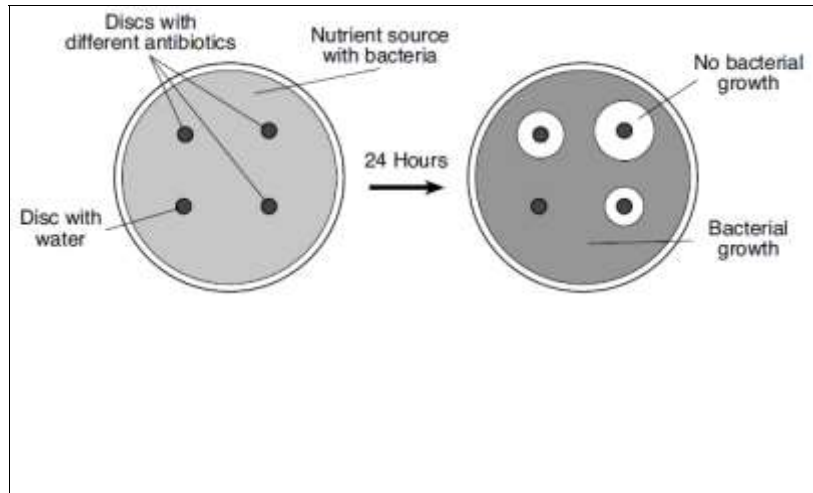
Data Base File Number: 1308

Regents Date Jan2019-34.bmp

Jan2019

34 1/22/2019 S1K3

Answer 1



## antibiotic resistance

60. Base your answer to this question on the information given and on your knowledge of biology. In order to determine the effect of a certain antibiotic on a species of microorganism, an investigation was carried out. A sample of a specific species of microorganism was added to 100 mL of a liquid culture medium. One mL of a solution of the antibiotic was then added to that culture medium. Each day at 10 a.m., 1 mL of the experimental culture medium was removed and the number of microorganisms in the 1-mL sample was determined. The 1 mL of experimental culture medium was replaced by 1 mL of new sterile culture medium to maintain a constant volume. The results are shown in the table. The microorganisms present on day 5 were

- (1) newly added from the sterile culture medium
- (2) offspring of antibiotic-resistant individuals
- (3) organisms that were all present on day 1
- (4) offspring with no resistance to the antibiotic

Data Base File Number: 623

Regents Date Jan2013-44.bmp

Jan2013

44 1/23/2013 LABA

Answer 2

Day	0	1	2	3	4	5	6	7
Number of Microorganisms in Sample	1000	500	100	50	40	200	500	1000

**antibiotic resistance**

61. The diagram shown represents a petri dish containing nutrient agar. A single bacterial colony is growing on the surface of the agar. A mold, represented by the shaded area, is also growing on the agar surface. Which statement best explains why no mold is growing in the white area next to the bacterial colony?
- (1) The mold cannot use the nutrient agar for food.
  - (2) The bacteria may release a substance that prevents mold growth.
  - (3) The mold is causing the bacterial colony to reproduce faster.
  - (4) The bacteria are scavengers of the growing mold.

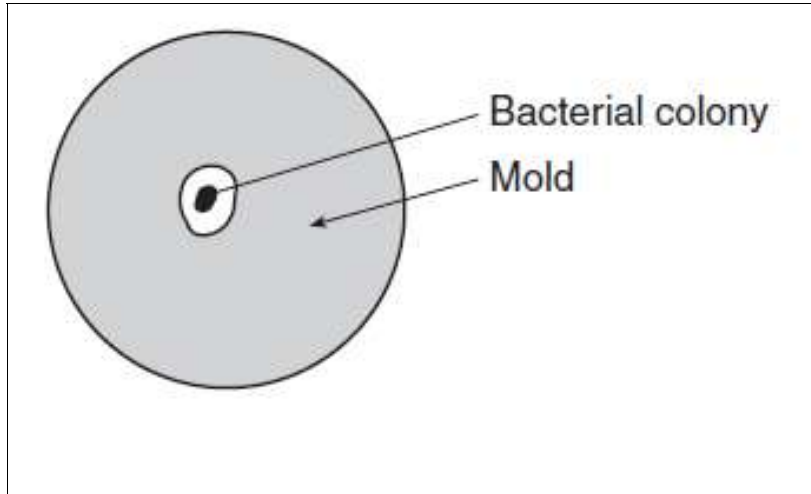
Data Base File Number: 768

Regents Date Aug2003-42.bmp

Aug2003

42 8/13/2003 S1K3

Answer 2



**antibodies**

62. To attend public school in New York State, children need to be vaccinated against various diseases. The list shows some required vaccinations. How do vaccinations protect against diseases?
- (1) they cause sickness
  - (2) they cause antibodies to be produced
  - (3) they cause white cells to be produced
  - (4) they cause mitosis

Data Base File Number: 1296

Regents Date Aug2018-69.bmp

Aug2018

69 8/17/2018 S4K5

Answer 2

Required Vaccinations
Polio
Tetanus
Pertussis
Measles
Mumps
Rubella
Diphtheria

## antigen / antibody

63. An activity that occurs in the human body is shown. This activity helps to

- (1) provide protection against pathogens
- (2) produce antibiotics to control disease
- (3) eliminate harmful gene alterations
- (4) regulate production of ATP by the cell

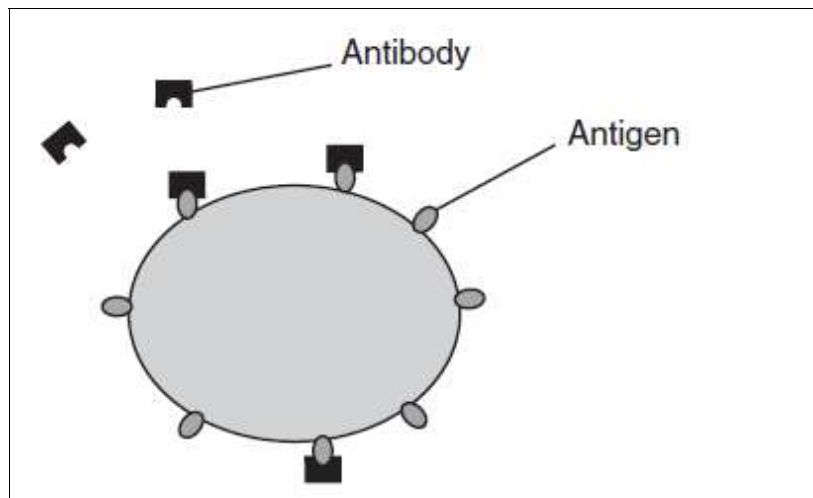
Data Base 365  
File Number:

Regents Date Aug2011-21.bmp

Aug2011

21 8/18/2011 S4K5

Answer 1





## antigen / antibody

64. Base your answer to this question on the illustration and information given and on your knowledge of biology. The illustration is of a Tasmanian devil. The Tasmanian devil is the largest surviving carnivorous marsupial in Australia. It is in danger of extinction due to an unusual type of cancer called Devil Facial Tumor Disease (DFTD). It can be passed from one individual to another through wounds that occur when they fight over food. Tumor cells in the mouth of an infected animal break off and enter the wound on an uninfected animal. The tumor cells multiply in the body of the newly infected devil, forming new tumors that eventually kill the animal. Recent research has shown that the immune system of a Tasmanian devil accepts tumor cells from another devil as if they were cells from its own body. The tumor cells are ignored by the immune system. No immune response develops against them, and the cancerous cells multiply. Scientists predict that DFTD could wipe out all the remaining Tasmanian devils in 25 years, unless a treatment is developed. Why are the tumor cells ignored by the immune system in Tasmanian devils?

- (1) The cancer cells might not have any antibodies on their surface, so antigens will not attack.
- (2) The cancer cells might not have any antigens on their surface, so antibodies will not attack.
- (3) The cancer cells might not have any sugars on their surface, so antibodies will not attack.
- (4) The cancer cells might not have any coagulants on their surface, so antibodies will not attack.

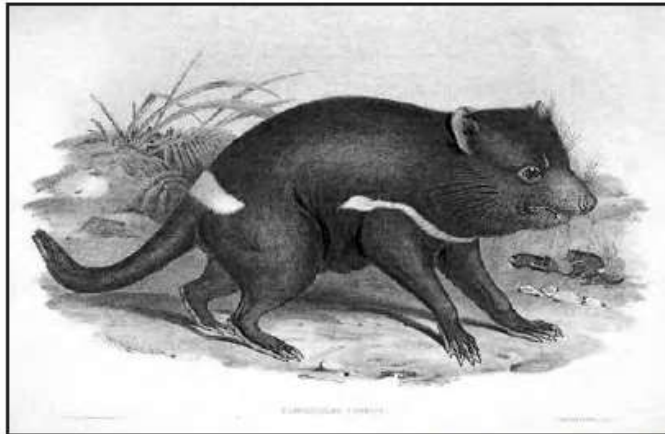
Data Base File Number: 1117

Regents Date June2016-62.bmp

June2016

62 6/15/2016 S4K5

Answer 2



Source: <http://www.statelibrary.tas.gov.au>

**antigens**

65. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram illustrates activities taking place in the body of a human. Which structure normally stimulates an allergic response?

- (1) A, only
- (2) B, only
- (3) C, only
- (4) A, B, and C

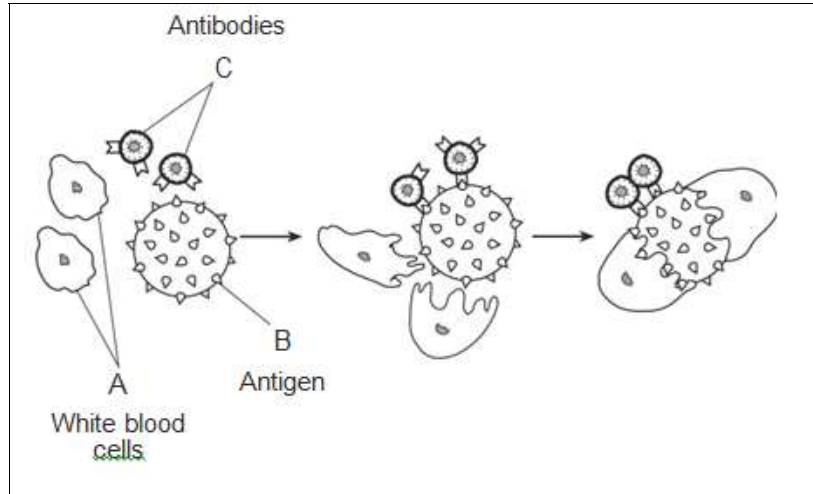
Data Base File Number: 1212

Regents Date Aug2017-38.bmp

Aug2017

39 8/17/2017 S4K5

Answer 2



**asexual**

66. The number in each circle shown in the diagram represents the chromosome number of the cell. Which diagram represents the production of offspring by an asexually reproducing organism?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

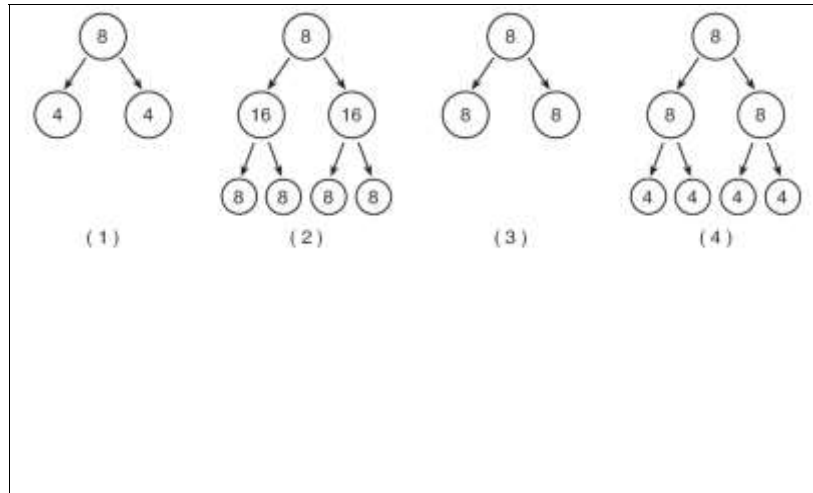
Data Base File Number: 305

Regents Date Jan2011-13.bmp

Jan2011

13 1/25/2011 S4K2

Answer 3



## asexual reproduction

67. Base your answer to this question on the illustration shown and on your knowledge of biology. The illustration shows two methods of reproduction, method A and method B. Which statement regarding these methods of reproduction is correct?
- (1) They are both forms of asexual reproduction.
  - (2) They are both forms of sexual reproduction.
  - (3) Method A is a form of asexual reproduction and method B is a form of sexual reproduction.
  - (4) Method A is a form of sexual reproduction and method B is a form of asexual reproduction.

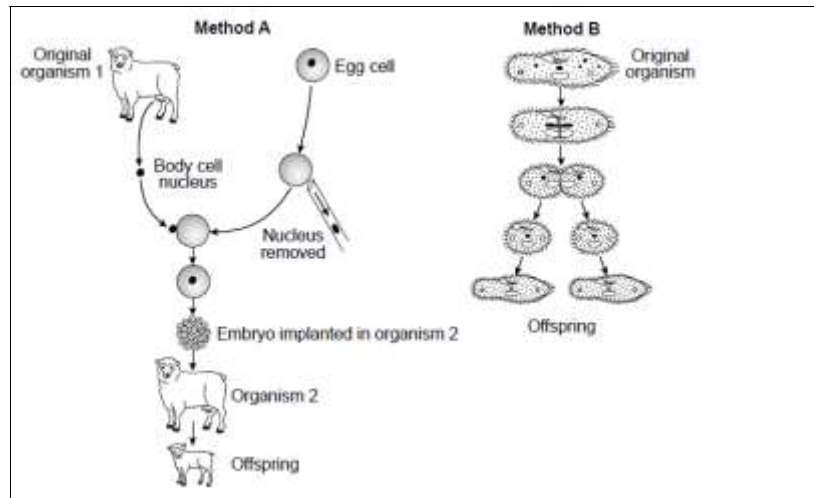
Data Base File Number: 1404

Regents Date Jan2020-42.bmp

Jan2020

42 1/21/2020 S4K4

Answer 1



## asexual reproduction

68. Base your answer to this question on the illustrationshown and on your knowledge of biology. Base your answers to questions 42 and 43 on the illustration below and on your knowledge of biology. The illustration shows two methods of reproduction, method A and method B. Which process takes place in both method A and method B?
- (1) meiosis
  - (2) mitosis
  - (3) fertilization
  - (4) recombination

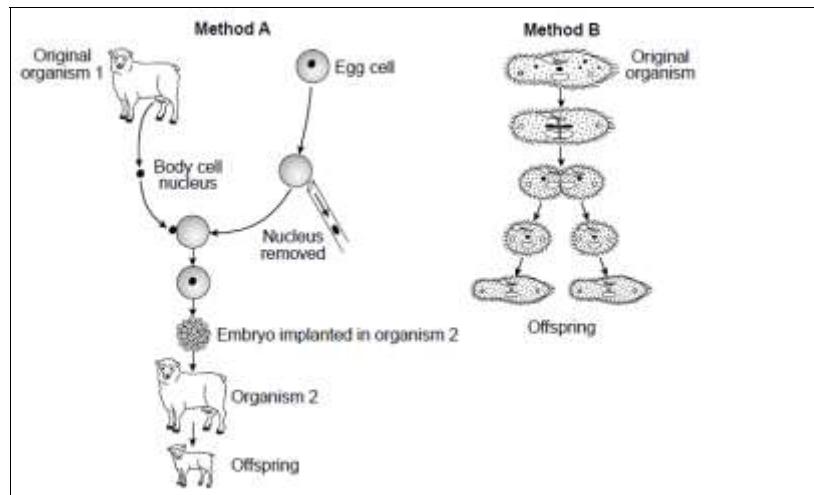
Data Base File Number: 1405

Regents Date Jan2020-42.bmp

Jan2020

43 1/21/2020 S4K4

Answer 2



## asexual reproduction

69. The diagram illustrates asexual reproduction in yeast. Yeast produce offspring that usually have
- (1) genes that are different from those of the parent
  - (2) genes that are identical to those of the parent
  - (3) half of the genetic information of the parent
  - (4) organelles that are not found in the parent

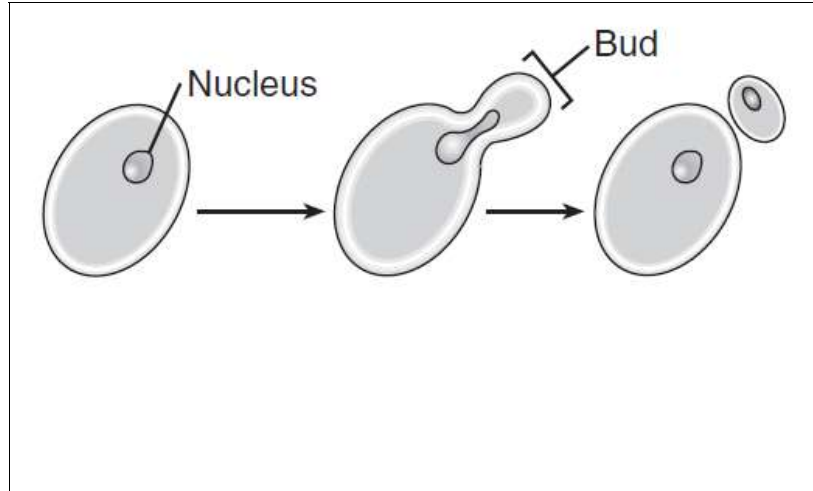
Data Base File Number: 231

Regents Date Jan2010-9.bmp

Jan2010

9 1/26/2010 S4K2

Answer 2



## asexual reproduction

70. A technique used to reproduce plants is shown in the diagram below. This technique is a form of
- (1) sexual reproduction
  - (2) asexual reproduction
  - (3) gamete production
  - (4) gene manipulation

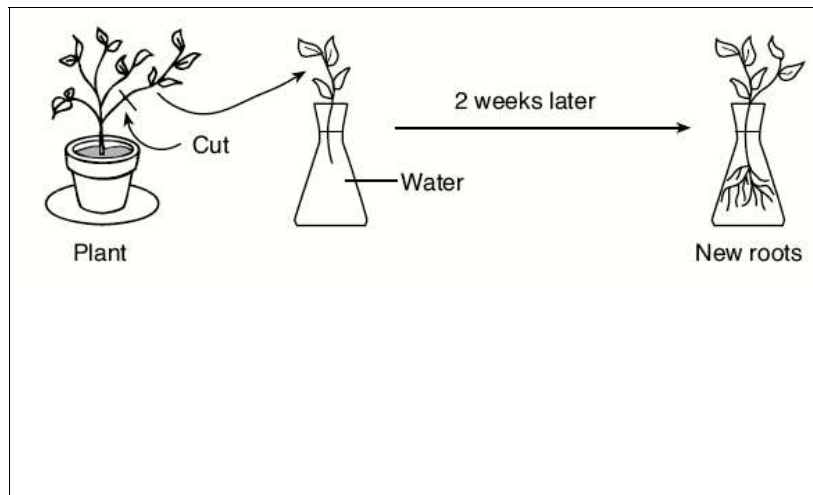
Data Base File Number: 121

Regents Date Aug08-19.bmp

Aug2008

19 8/13/2008 S4K2

Answer 2



## asexual reproduction

71. Base your answer to this question on the diagram shown and on your knowledge of biology. Which process is indicated by letter B?

- (1) natural selection  
 (2) asexual reproduction  
 (3) sexual reproduction  
 (4) gene deletion

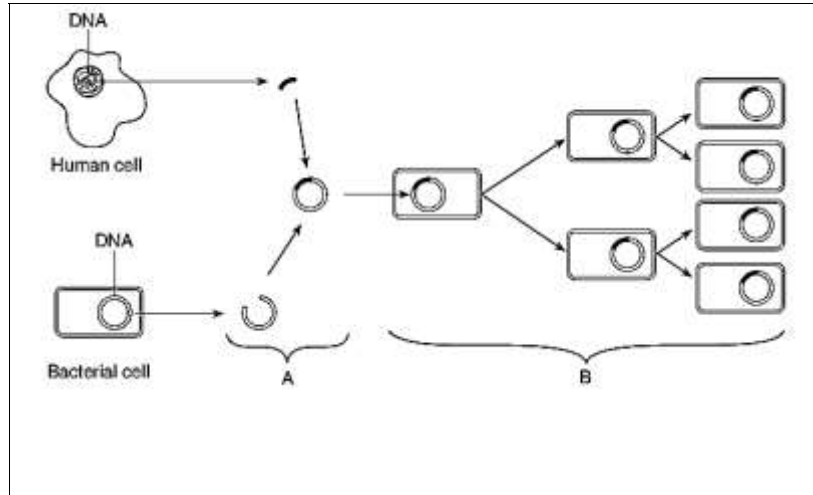
Data Base File Number: 78

Regents Date Jan08-41.bmp

Jan2008

41 1/25/2008 S4K4

Answer 2



## asexual reproduction

72. A student made the drawing shown in DIAGRAM A of a single-celled organism as he observed it with a compound light microscope under the high-power objective. Several minutes later, he drew the diagram shown in DIAGRAM B of the same organism, using the same magnification. These drawings show that the organism is carrying out the process of

- (1) asexual reproduction  
 (2) sexual reproduction  
 (3) embryo formation  
 (4) genetic alteration

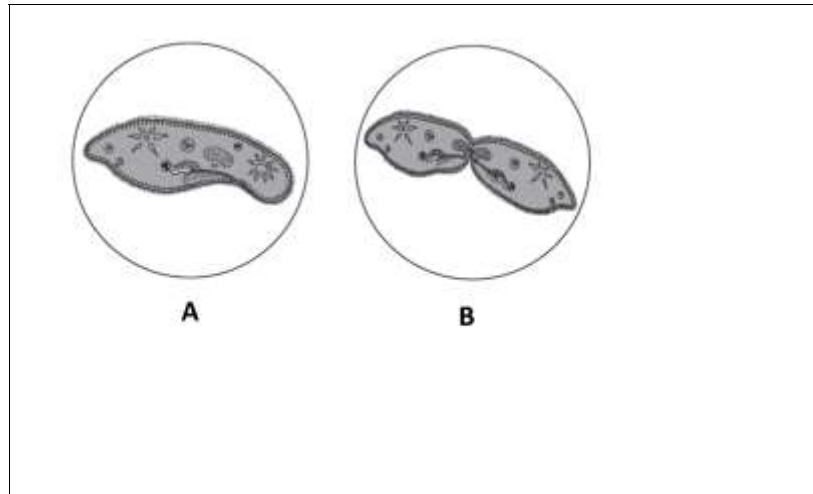
Data Base File Number: 902

Regents Date Aug2013-16C.bm

Aug2013

16 8/14/2013 S4K4

Answer 1



## asexual reproduction

73. The diagram shown represents a form of cellular reproduction. As a result of this process, offspring 1 and offspring 2 will have

- (1) the same number of genes but different traits
- (2) a different number of genes but the same traits
- (3) the same number of genes and the same traits
- (4) a different number of genes and different traits

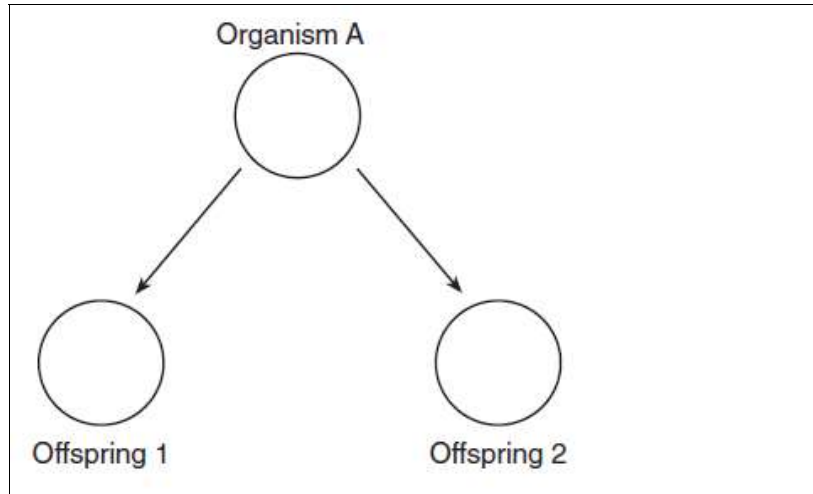
Data Base File Number: 1157

Regents Date Jan2017-20.bmp

Jan2017

20 1/25/2017 S4K2

Answer 3



## asexual reproduction

74. The diagram shown represents division of a cell that produces two daughter cells. Which statement most likely describes the daughter cells produced?

- (1) The daughter cells will pass on only half of the genetic information they received from the original cell
- (2) The daughter cells will each produce offspring that will have the same genetic information as the original cell
- (3) The daughter cells will each undergo the same mutations as the original cell after reproduction has occurred.
- (4) The daughter cells will not pass on any of the genes that they received from the original cell.

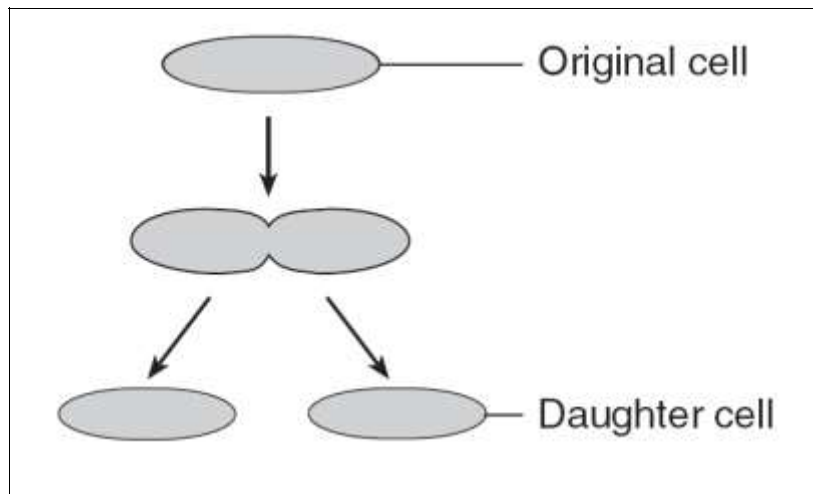
Data Base File Number: 334

Regents Date June2011-11.bmp

June2011

11 6/21/2011 S4K2

Answer 2



## asexual reproduction

75. The bud shown in the diagram was produced by asexual reproduction. Which process is responsible for the formation of the bud?

- (1) fertilization
- (2) recombination
- (3) mitosis
- (4) meiosis

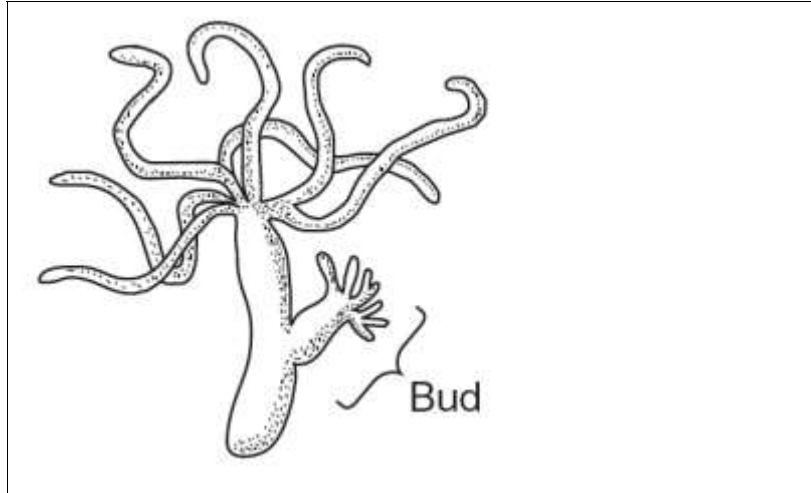
Data Base File Number: 338

Regents Date June2011-21.bmp

June2011

21 6/21/2011 S4K4

Answer 3



## asexual reproduction

76. The diagram shown represents reproduction in a yeast cell. The genes in the bud are identical to the genes in the parent. This type of production of offspring is a form of

- (1) sexual reproduction
- (2) asexual reproduction
- (3) gene manipulation
- (4) genetic engineering

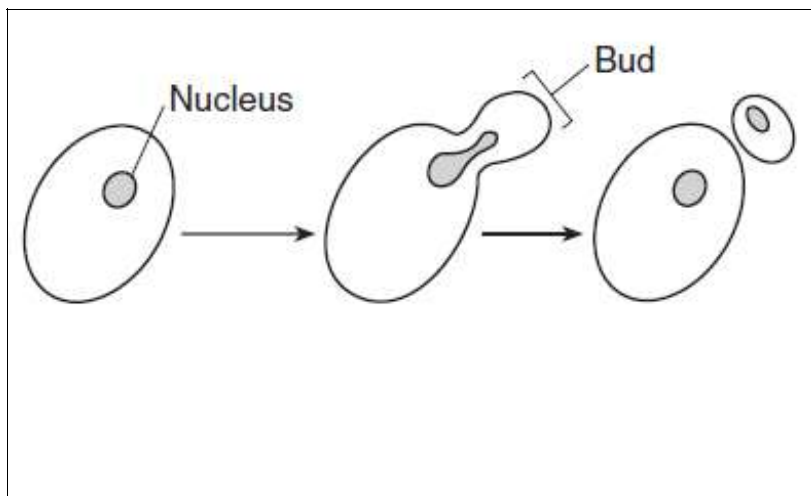
Data Base File Number: 1127

Regents Date August2016-19.b

Aug2016

19 8/18/2016 S4K4

Answer 2



## asexual reproduction

77. A pattern of reproduction and growth in a one-celled organism is shown in the diagram. Which statement best describes this pattern of reproduction?

- (1) All genetic material comes from one parent.
- (2) Only some of the genetic material comes from one parent.
- (3) The size of the parent determines the amount of genetic material.
- (4) The size of the parent determines the source of the genetic material.

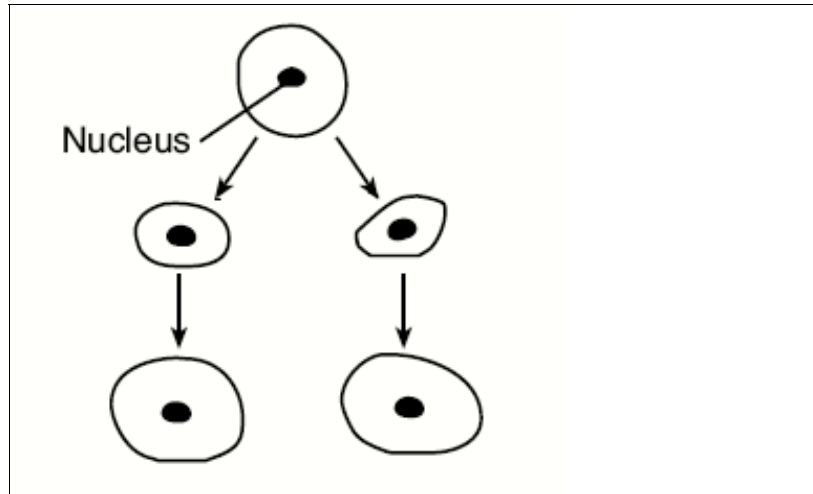
Data Base File Number: 120

Regents Date Aug08-18.bmp

Aug2008

18 8/13/2008 S4K2

Answer 1



## asexual reproduction

78. A student used a microscope to observe a single-celled organism. As he watched, it looked as if the organism split into two cells. He made drawings, as shown, of the organism over a short period of time. Which process did the student record in his drawings?

- (1) genetic engineering
- (2) asexual reproduction
- (3) selective breeding
- (4) gamete formation

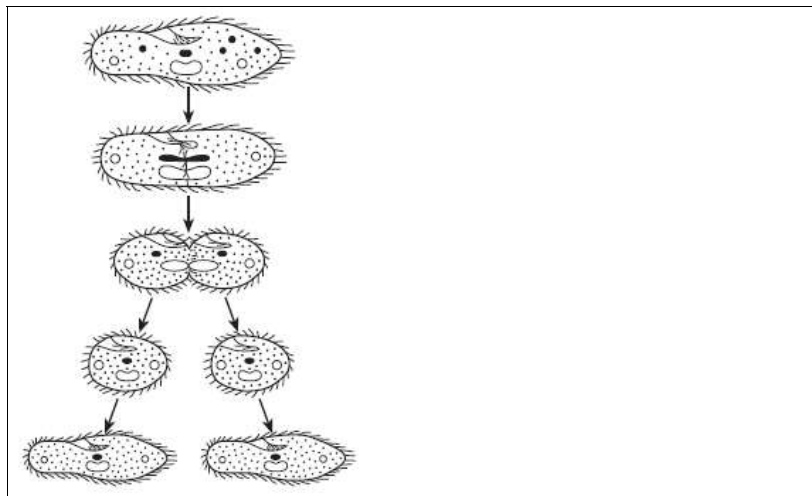
Data Base File Number: 1018

Regents Date June2015-25.bmp

June2015

25 6/16/2015 S4K2

Answer 2





## asexual reproduction

79. Aphids, small insects that feed on the sap of plants, undergo asexual reproduction during the summer months. They produce eggs that are formed without the separation of chromosomes. These eggs do not need to be fertilized, and all of the resulting offspring are female. The best explanation for all of these offspring being female is that

- (1) there is not enough food to support male aphids
- (2) asexual reproduction produces offspring with many mutations
- (3) only the females are able to feed on the sap of the plants
- (4) asexual reproduction produces offspring that are genetically identical to the parent

Data Base File Number: 1068

Regents Date Jan2016-11.bmp

Jan2016

11 1/27/2016 S4K2

Answer 4



Source: [http://www.bbc.co.uk/nature/adaptations/Asexual\\_reproduction](http://www.bbc.co.uk/nature/adaptations/Asexual_reproduction)

## asexual reproduction

80. The diagrams shown illustrate types of asexual reproduction. Which statement correctly describes the offspring?

- (1) They vary genetically from the parent.
- (2) They are produced by the union of gametes.
- (3) They obtain nourishment from a placenta.
- (4) They result without the union of gametes.

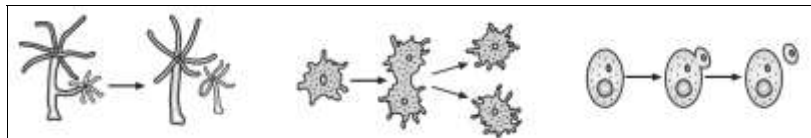
Data Base File Number: 287

Regents Date Aug2010-37.bmp

Aug2010

37 8/18/2010 S4K4

Answer 4



## asexual reproduction

81. Many tiny plants can be seen developing asexually along the edge of the mother-of-thousands plant leaf, as shown in the photo. The tiny plants eventually drop to the ground and grow into new plants of the same species. One way this form of reproduction differs from sexual reproduction is

- (1) more genetic variations are seen in the offspring
- (2) there is a greater chance for mutations to occur
- (3) the offspring and the parents are genetically identical
- (4) the new plants possess the combined genes of both parents

Data Base File Number: 1364

Regents Date Aug2019-16.bmp

Aug2019

16 8/14/2019 S4K4

Answer 3



## asexual reproduction

82. An antibiotic is effective in killing 95% of a population of bacteria that reproduce by the process shown in the diagram. Which statement best describes future generations of these bacteria?

- (1) They will be produced by asexual reproduction and will be more resistant to the antibiotic.
- (2) They will be produced by sexual reproduction and will be more resistant to the antibiotic.
- (3) They will be produced by asexual reproduction and will be just as susceptible to the antibiotic.
- (4) They will be produced by sexual reproduction and will be just as susceptible to the antibiotic.

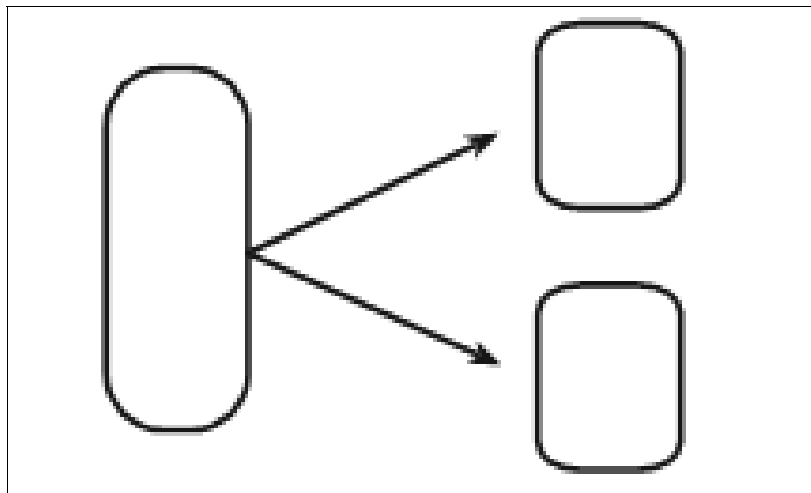
Data Base File Number: 184

Regents Date June09-22.bmp

June2009

22 6/18/2009 S4K2

Answer 1



## asexual reproduction

83. The organism represented in the diagram is multicellular, heterotrophic, and completely aquatic. Which other characteristics could be used to describe this organism?

- (1) carries out photosynthesis and needs oxygen
- (2) deposits cellular wastes on land and decomposes dead organisms
- (3) reproduces asexually and is a consumer
- (4) reproduces in a water habitat and is a producer

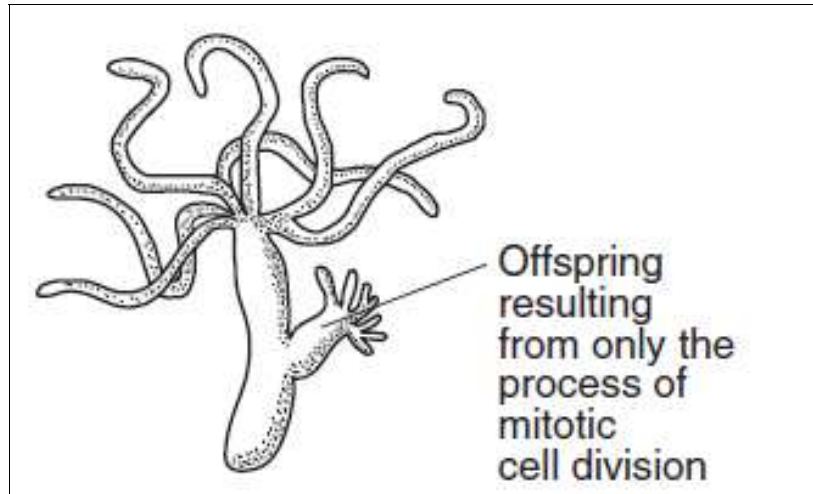
Data Base File Number: 554

Regents Date June2005-15.bmp

June2005

15 6/22/2005 S1K1

Answer 3



## asexual reproduction

84. The diagram shown represents a cell process. Which statement regarding this process is correct?

- (1) Cell B contains the same genetic information that cells A and C contain.
- (2) Cell C has DNA that is only 50% identical to cell B.
- (3) Cell A has DNA that is only 75% identical to cell B.
- (4) Cells A, B, and C contain completely different genetic information.

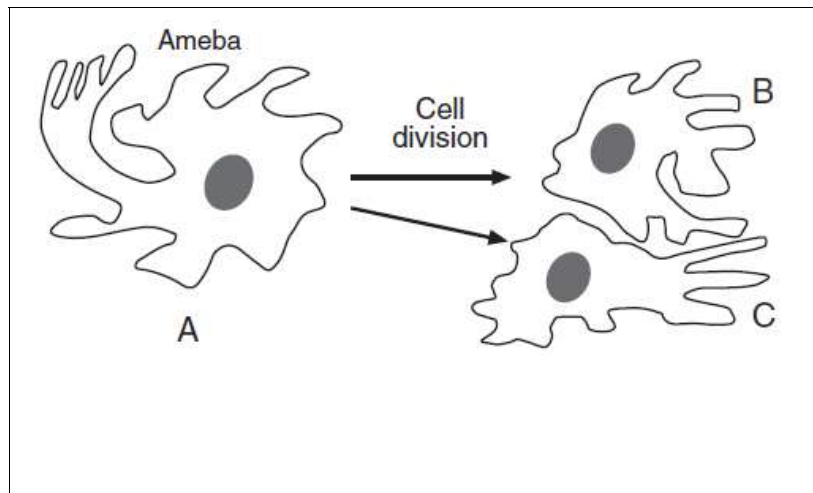
Data Base File Number: 780

Regents Date Aug2002-17.bmp

Aug2002

17 8/13/2002 S4K4

Answer 1



**asexual reproduction**

85. The diagram shown illustrates asexual reproduction in bread mold. Reproductive structures known as spores were released from bread mold A. One of these spores developed into bread mold B. How does the genetic information in bread mold B compares to the genetic information in bread mold A?

- (1) they are identical
- (2) they are not identical
- (3) they are mutations
- (4) they are zygotes

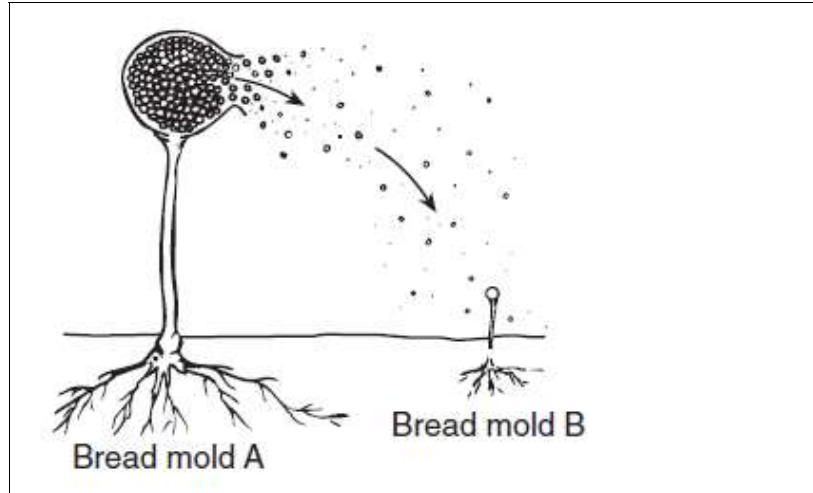
Data Base File Number: 697

Regents Date Aug2004-52.bmp

Aug2004

52 8/17/2004 S4K2

Answer 1



**asexual reproduction**

86. Which row in the chart below best describes asexual reproduction?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 580

Regents Date Aug2005-5.bmp

Aug2005

5 8/16/2005 S4K2

Answer 1

Row	Number of Parents	Comparison of Offspring to Parents
(1)	one	identical
(2)	one	different
(3)	two	identical
(4)	two	different

## asexual reproduction

87. The diagram shown represents a yeast cell that is in the process of budding, a form of asexual reproduction. Which statement describes the outcome of this process?

- (1) The bud will develop into a zygote.
- (2) The two cells that result will each contain half the species number of chromosomes.
- (3) The two cells that result will have identical DNA
- (4) The bud will start to divide by the process of meiotic cell division.

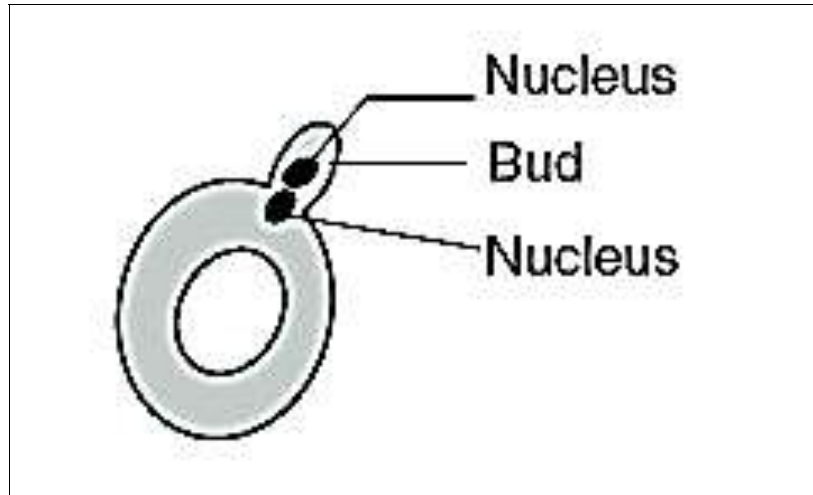
Data Base File Number: 25

Regents Date June07-8.bmp

June2007

8 6/20/2007 S4K2

Answer 3



## asexual reproduction

88. Base your answer to this questions on the diagram shown and on your knowledge of biology. The diagram represents a single-celled organism, such as an ameba, undergoing the changes shown. As a result of these processes, the single-celled organism accomplishes

- (1) gamete production
- (2) energy production
- (3) sexual reproduction
- (4) asexual reproduction

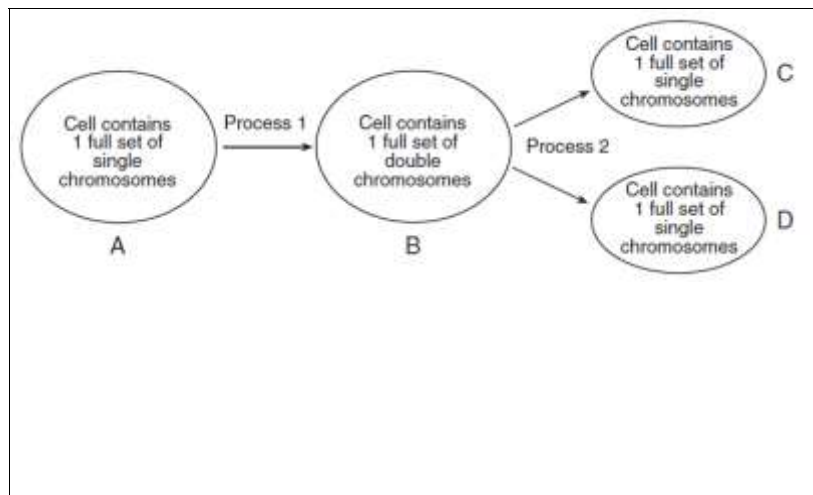
Data Base File Number: 514

Regents Date Aug2006-31.bmp

Aug2006

31 8/16/2006 S4K4

Answer 4



## ATP

89. Substance X directly supplies energy for various life functions, as shown in the diagram. Which substance is represented by X in the diagram?

- (1) ATP
- (2) DNA
- (3) starch
- (4) glucose

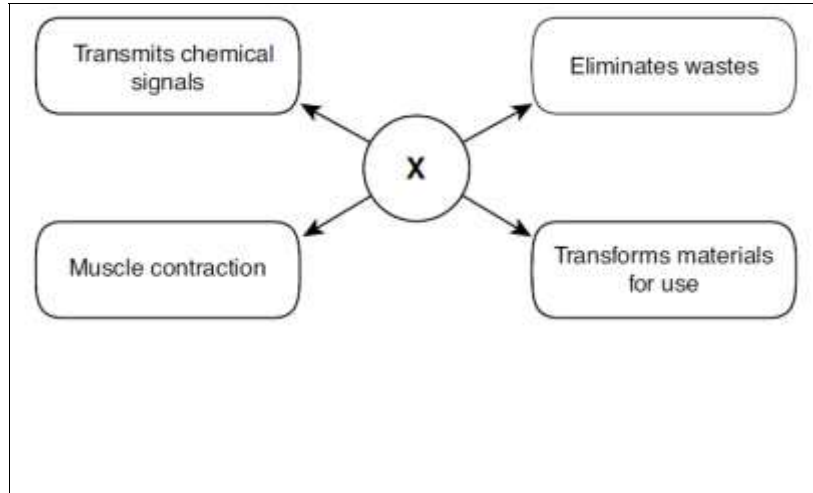
Data Base File Number: 1426

Regents Date June2021-30.bmp

June2021

30 6/22/2021 S4K5

Answer 1



## ATP

90. Information concerning a metabolic activity is shown in the diagram. Substance X is most likely

- (1) DNA
- (2) oxygen
- (3) ATP
- (4) chlorophyll

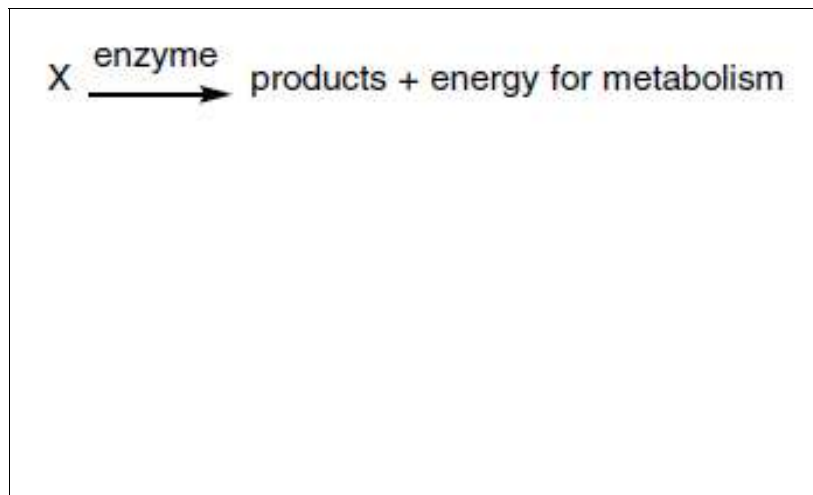
Data Base File Number: 644

Regents Date Jan2004-27.bmp

Jan2004

27 1/29/2004 S4K5

Answer 3



## ATP

91. The diagram shows molecules represented by X both outside and inside of a cell. A process that would result in the movement of these molecules out of the cell requires the use of

- (1) DNA
- (2) ATP
- (3) antigens
- (4) antibodies

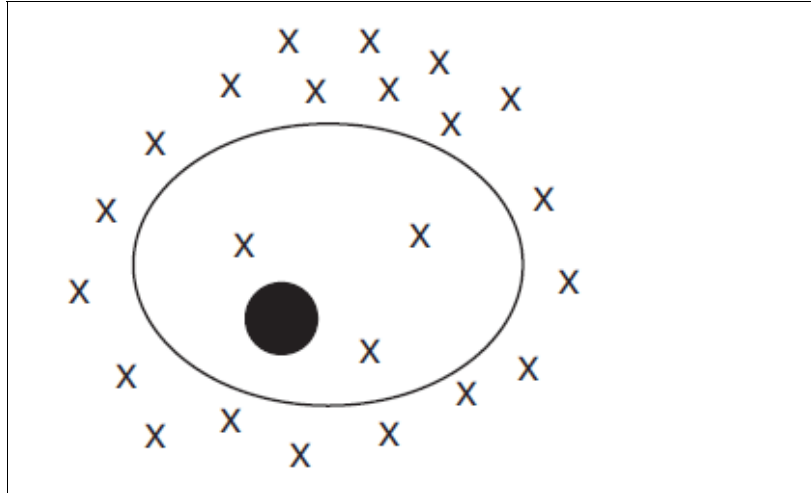
Data Base File Number: 265

Regents Date June2010-38.bmp

June2010

38 6/16/2010 S4K1

Answer 2



## ATP

92. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents three sections of a cell membrane showing three different methods involved in the transport of various molecules across the membrane. Methods A and B are classified as methods of passive transport because they do not require

- (1) ATP
- (2) carbon dioxide
- (3) light
- (4) DNA

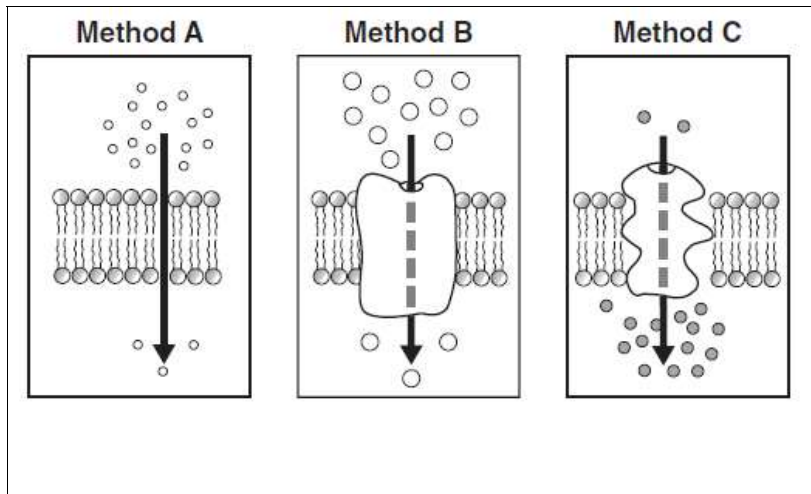
Data Base File Number: 1152

Regents Date August2016-82.b

Aug2016

82 8/18/2016 LAB5

Answer 1



## ATP

93. The diagram shows two different kinds of substances, A and B, entering a cell. ATP is most likely being used for
- (1) substance A to enter the cell
  - (2) substance B to enter the cell
  - (3) both substances to enter the cell
  - (4) neither substance to enter the cell

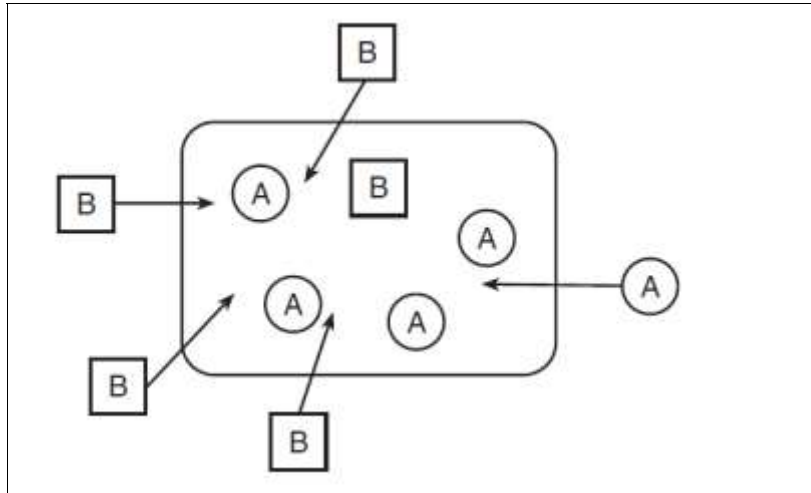
Data Base File Number: 322

Regents Date Jan2011-44.bmp

Jan2011

44 1/25/2011 S4K1

Answer 1



## ATP

94. In the diagram shown, the dark dots indicate small molecules. These molecules are moving out of the cells, as indicated by the arrows. The number of dots inside and outside of the two cells represents the relative concentrations of the molecules inside and outside of the cells. ATP is being used to move the molecules out of the cell by
- (1) cell A, only
  - (2) cell B, only
  - (3) both cell A and cell B
  - (4) neither cell A nor cell B

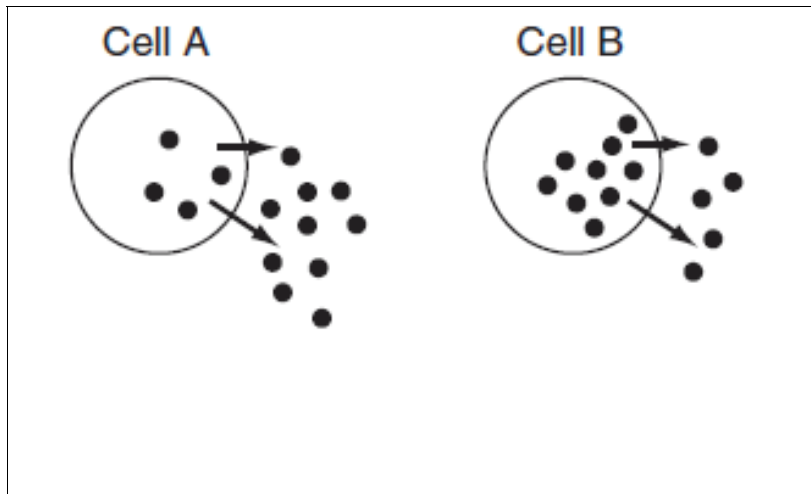
Data Base File Number: 707

Regents Date Jan2003-11.bmp

Jan2003

11 1/30/2003 S4K5

Answer 1





## ATP

95. A single-celled organism is represented in the diagram. An activity is indicated by the arrow. If this activity requires the use of energy, which substance would be the source of this energy?

- (1) DNA
- (2) ATP
- (3) a hormone
- (4) an antibody

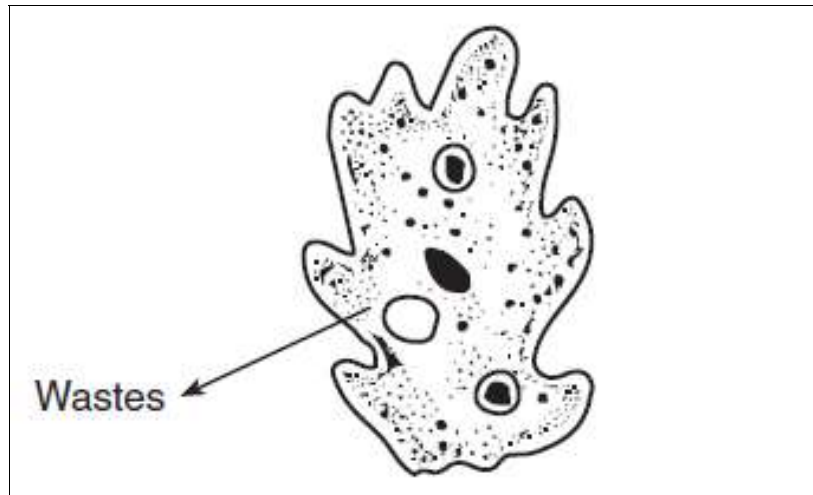
Data Base File Number: 737

Regents Date June2003-25.bmp

June2003

25 6/19/2003 S4K5

Answer 2



## ATP

96. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The setup in the diagram shows four test tubes. Tube 1 contains water only. Tube 2 contains a live snail. Tube 3 contains a live green water plant. Tube 4 contains both a live green water plant and a live snail. Which compound that directly provides energy in living cells is being produced in every tube where cellular respiration is occurring?

- (1) oxygen
- (2) glucose
- (3) DNA
- (4) ATP

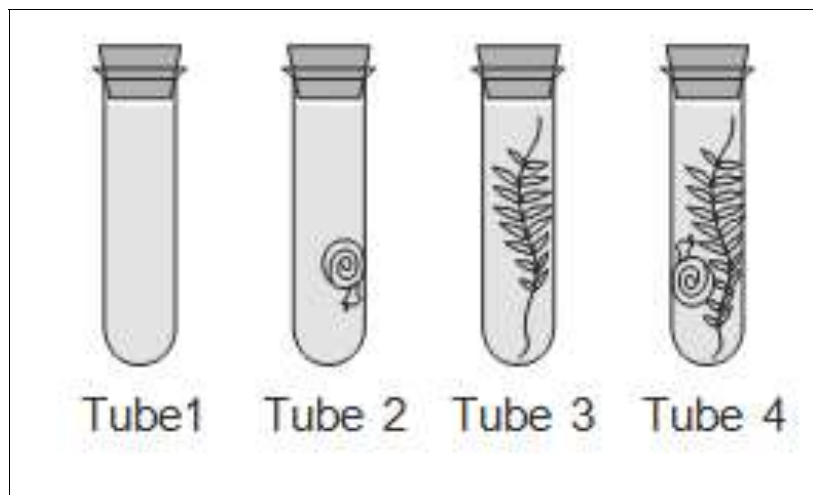
Data Base File Number: 1217

Regents Date Aug2017-42.bmp

Aug2017

43 8/17/2017 S4K5

Answer 4



## ATP

97. The diagram below represents a cell. Which statement concerning ATP and activity within the cell is correct?
- (1) The absorption of ATP occurs at structure A
  - (2) The synthesis of ATP occurs within structure B.
  - (3) ATP is produced most efficiently by structure C.
  - (4) The template for ATP is found in structure D.

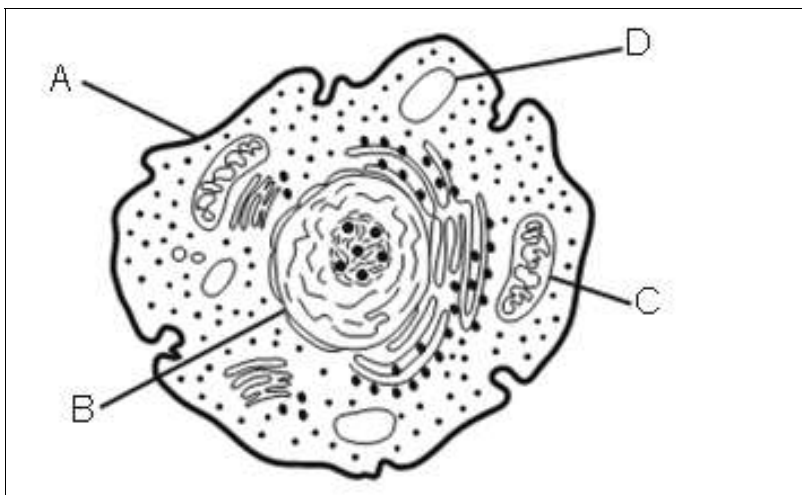
Data Base File Number: 188

Regents Date June09-32.bmp

June2009

32 6/18/2009 S4K5

Answer 3



## ATP

98. The diagram shown represents a series of events that occur in living cells. Which molecule is indicated by X?
- (1) glucose
  - (2) ATP
  - (3) carbon dioxide
  - (4) protein

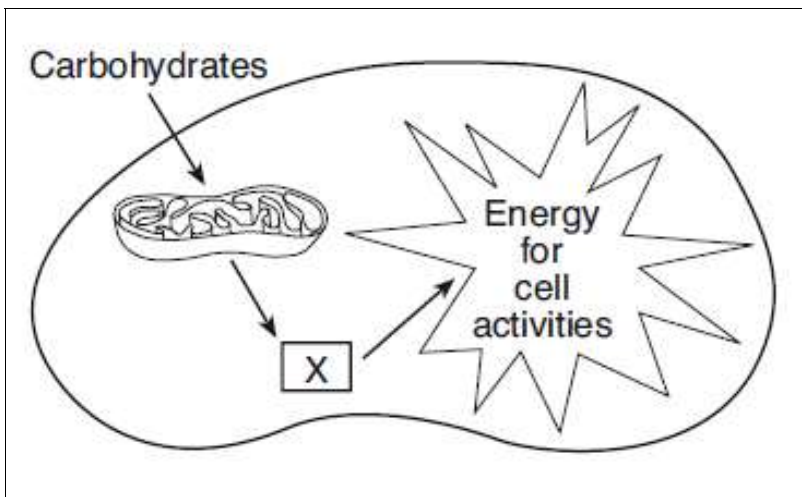
Data Base File Number: 411

Regents Date June2012-33.bmp

June2012

33 6/19/2012 S4K5

Answer 2



## ATP

99. The diagram shows part of the human body with some organs that help to carry out the removal of wastes. The energy necessary to perform this function comes directly from the

- (1) exchange of water and oxygen during respiration
- (2) blood flowing through the organs
- (3) ATP molecules produced during cellular respiration
- (4) water that is eliminated by the organs

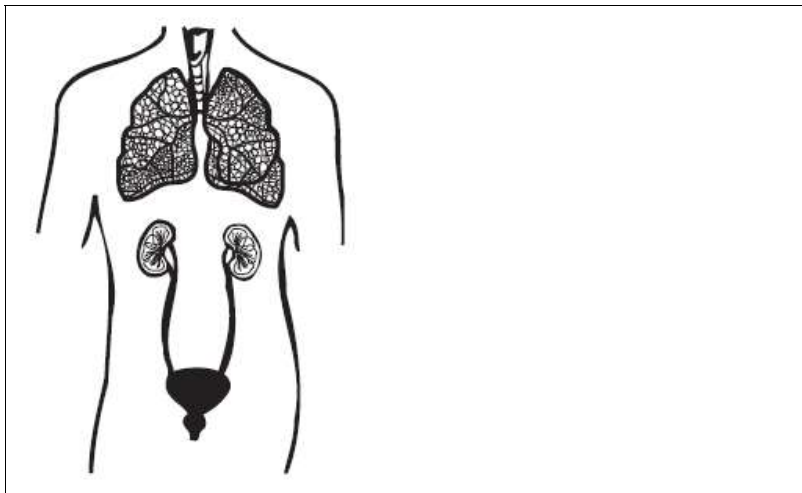
Data Base File Number: 1071

Regents Date Jan2016-20.bmp

Jan2016

20 1/27/2016 S4K5

Answer 3



## ATP

100. The diagram below represents a biochemical process. Which molecule is represented by X?

- (1) DNA
- (2) starch
- (3) protein
- (4) ATP

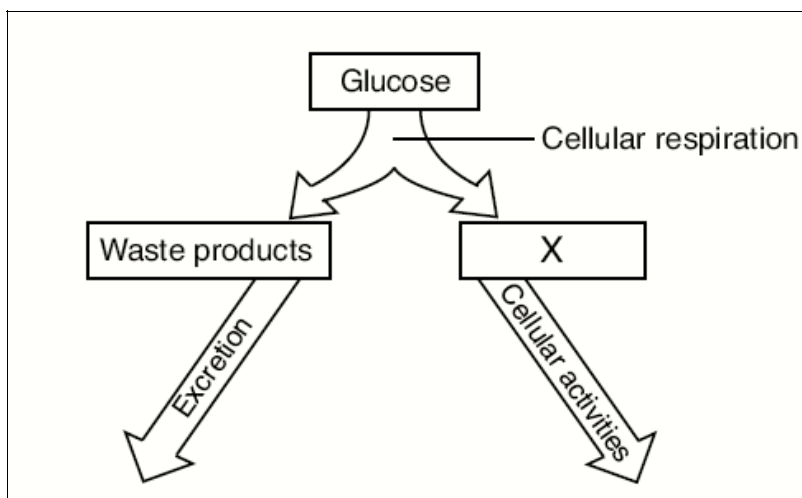
Data Base File Number: 122

Regents Date Aug08-29.bmp

Aug2008

20 8/13/2008 S4K5

Answer 4



**autotroph**

101. The diagram shown represents an autotrophic cell. For the process of autotrophic nutrition, the arrow labeled A would most likely represent the direction of movement of

- (1) carbon dioxide, water, and solar energy
- (2) oxygen, glucose, and solar energy
- (3) carbon dioxide, oxygen, and heat energy
- (4) glucose, water, and heat energy

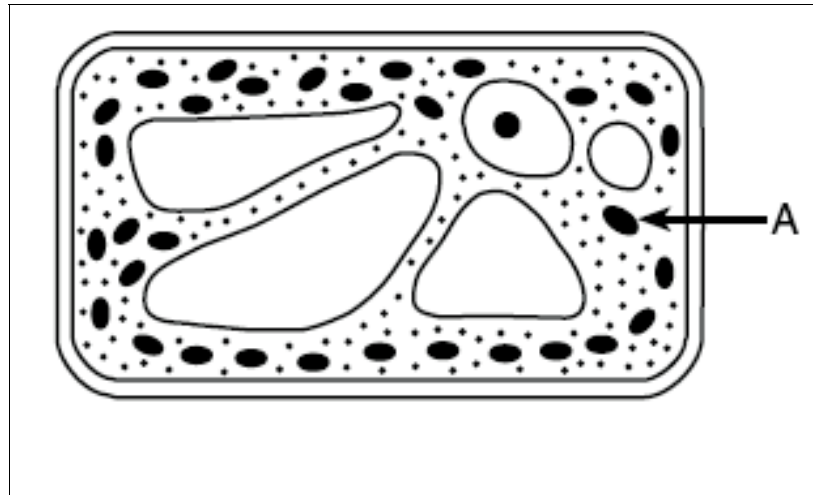
Data Base File Number: 153

Regents Date Jan09-20.bmp

Jan2009

20 1/27/2009 S4K5

Answer 1



**autotroph**

102. Base your answer to this question on the food web represented as shown and on your knowledge of biology. The food web contains some of the organisms found in Glacier National Park. Which group of organisms in this food web would contain the greatest amount of stored energy? Support your answer.

- (1) autotrophs
- (2) carnivores
- (3) secondary consumers
- (4) mice

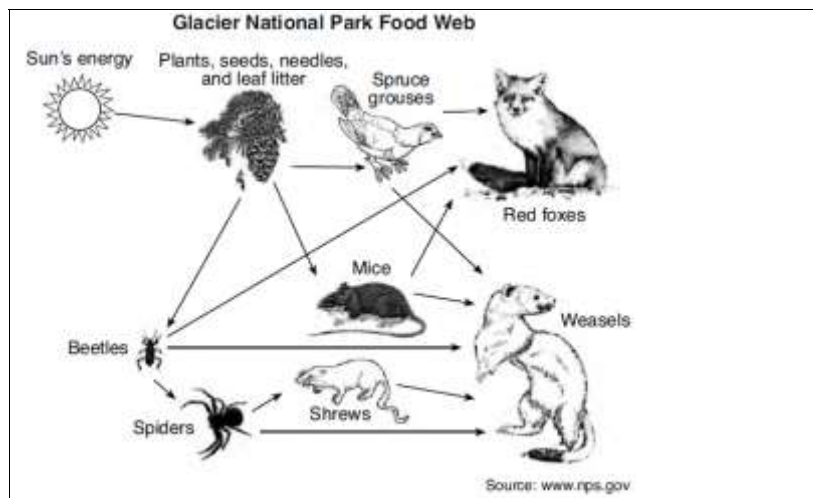
Data Base File Number: 1319

Regents Date Jan2019-56.bmp

Jan2019

56 1/22/2019 S4K6

Answer 1



## autotroph

103. Base your answer to this question on the information and graph given and on your knowledge of biology. The graph shows the amount of oxygen in Earth's atmosphere from 3500 million years ago to present. Scientists can use this information to learn more about the evolution of different species. Identify when during Earth's history autotrophs most likely first appeared.

- (1) 3000 mya  
(2) 2500 mya

- (3) 500 mya  
(4) present time

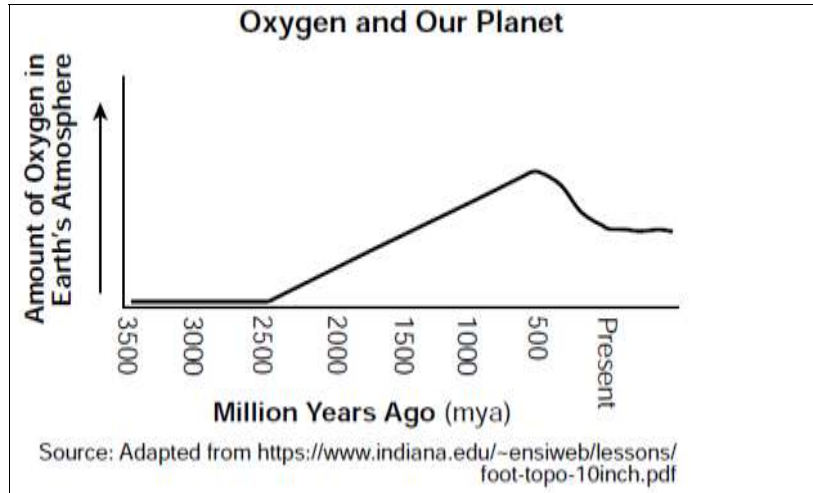
Data Base File Number: 1579

Regents Date June2023-44.bmp

June2023

44 6/14/2023 S4K5

Answer 2



## autotroph

104. Base your answer to this question on the information in the diagram and on your knowledge of biology. In an autotrophic organism, substance B functions as a

- (1) source of energy  
(2) hormone

- (3) vitamin  
(4) biotic resource

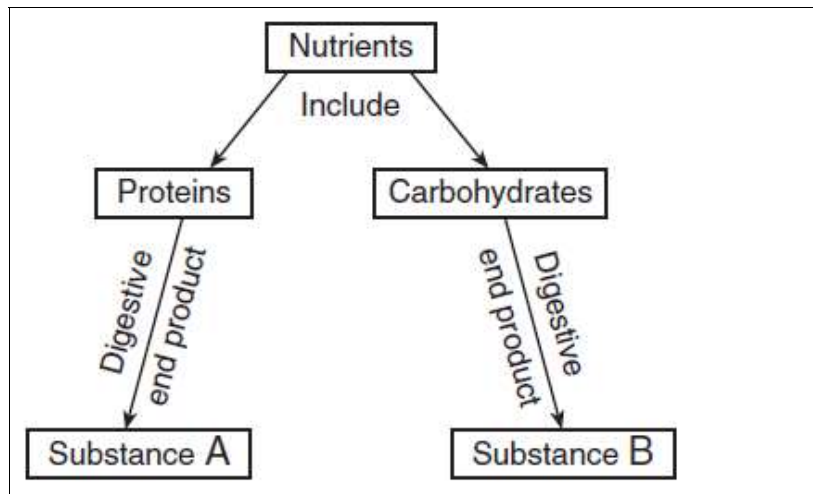
Data Base File Number: 491

Regents Date June2006-36.bmp

June2006

36 6/21/2006 S4K1

Answer 1



autotroph

105. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a pond ecosystem. Energy in this ecosystem passes directly from the Sun to

- (1) herbivores
- (2) consumers
- (3) heterotrophs
- (4) autotrophs

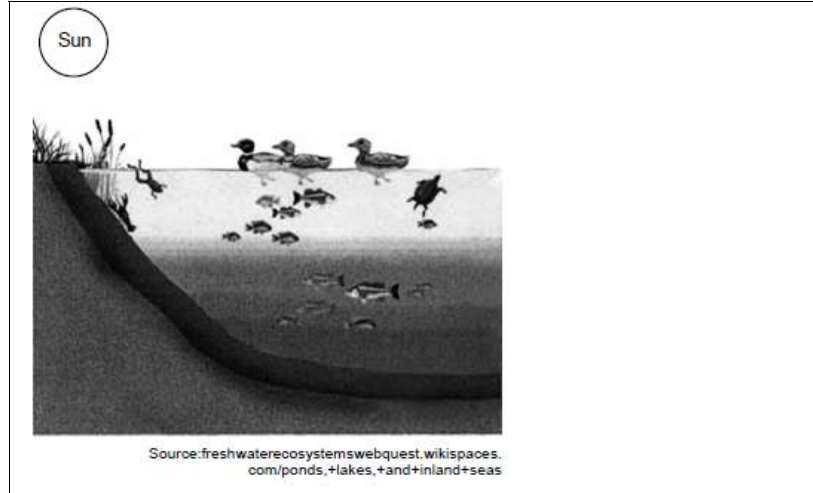
Data Base File Number: 1374

Regents Date Aug2019-41.bmp

Aug2019

41 8/14/2019 S4K6

Answer 4



autotroph

106. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents interactions between organisms in an ecosystem. Which statement correctly identifies a possible role of ONE organism in this ecosystem?

- (1) Species A may carry out autotrophic nutrition.
- (2) Species B may be a producer that synthesizes nutrients.
- (3) Species C carries out heterotrophic nutrition.
- (4) Species D can recycle energy from the Sun.

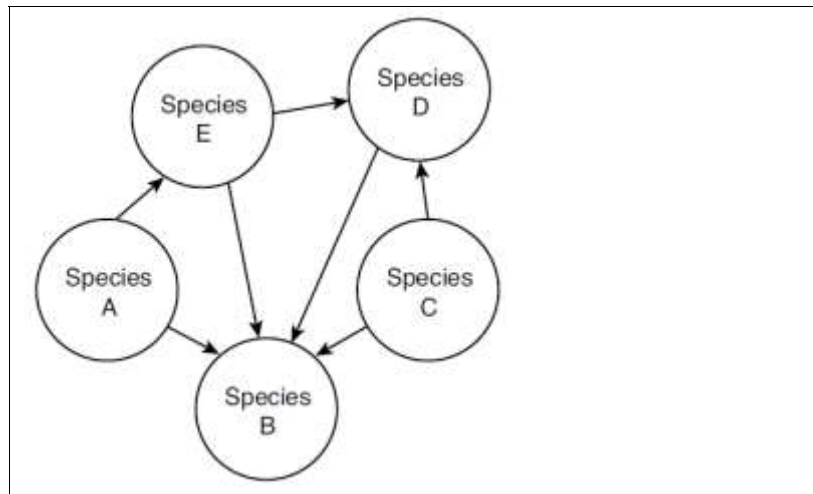
Data Base File Number: 1430

Regents Date June2021-34.bmp

June2021

34 6/22/2021 S4K1

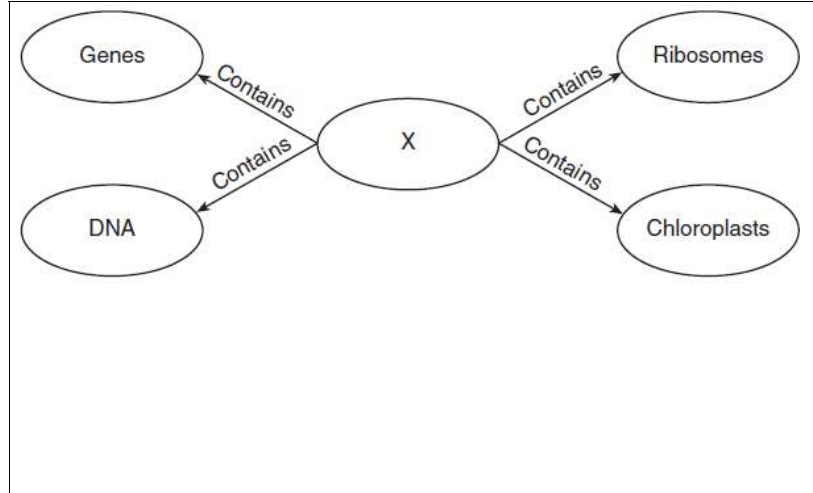
Answer 1



autotroph

107. The diagram shows a concept map. Which label correctly identifies what X represents in the concept map?

- (1) nucleus
- (2) chromosome
- (3) autotrophic cell
- (4) heterotrophic cell



Data Base File Number: 1016

Regents Date June2015-22.bmp

June2015

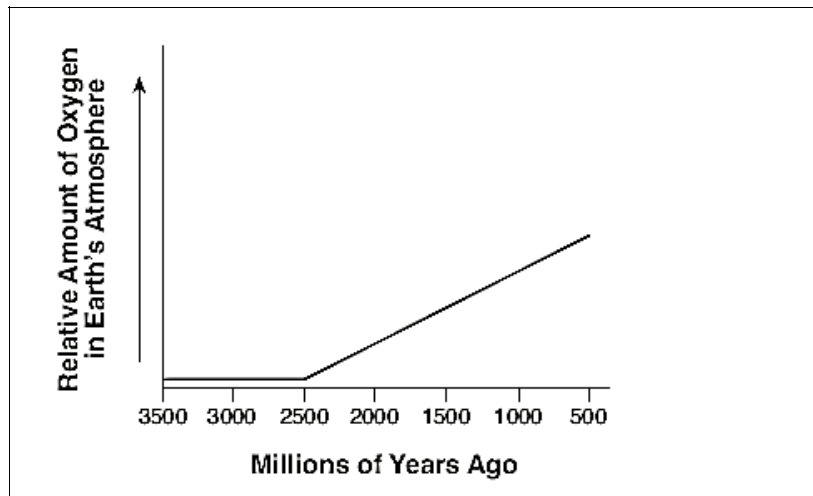
22 6/16/2015 S4K1

Answer 3

autotroph

108. The relative amount of oxygen in the atmosphere of Earth is shown in the graph. At what point in the history of Earth did autotrophs most likely first appear?

- (1) 3500 million years ago
- (2) 2500 million years ago
- (3) 1500 million years ago
- (4) 500 million years ago



Data Base File Number: 75

Regents Date Jan08-37.bmp

Jan2008

37 1/25/2008 S4K3

Answer 2



autotroph

109. Which row in the chart shown correctly pairs a group of organisms with the type of nutrition they carry out?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1498

Regents Date Aug2022-4.bmp

Aug2022

4 8/17/2022 S4K1

Answer 4

Row	Autotrophic Nutrition	Heterotrophic Nutrition
(1)	<u>carnivores</u>	herbivores
(2)	decomposers	carnivores
(3)	herbivores	producers
(4)	<u>producers</u>	decomposers

autotroph

110. Base your answer to this question on the diagram and your knowledge of biology. Which organism carries out autotrophic nutrition?

- (1) hawk
- (2) cricket
- (3) grass
- (4) deer

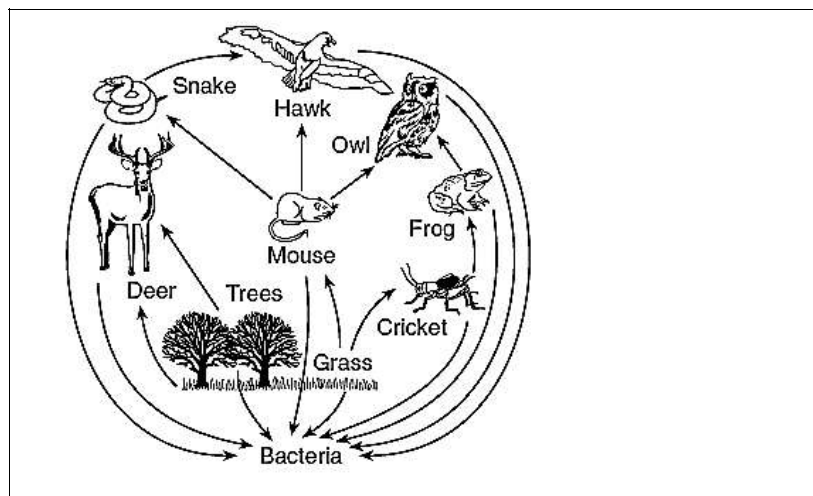
Data Base File Number: 44

Regents Date June07-47.bmp

June2007

47 6/20/2007 S4K1

Answer 3





## bacteria

111. An experiment was carried out to determine which mouthwash was most effective against bacteria commonly found in the mouth. Four paper discs were each dipped into a different brand of mouthwash. The discs were then placed onto the surface of a culture plate that contained food, moisture, and bacteria commonly found in the mouth. The diagram shows the growth of bacteria on the plate after 24 hours.

Which change in procedure would have improved the experiment?

- (1) using a smaller plate with less food and moisture
- (2) using bacteria from many habitats other than the mouth
- (3) using the same size paper discs for each mouthwash
- (4) using the same type of mouthwash on each disc

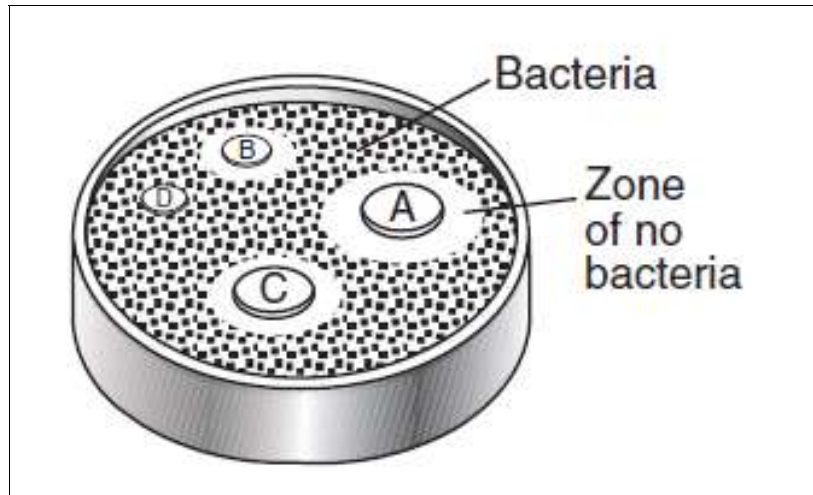
Data Base File Number: 462

Regents Date Jan2006-33.bmp

Jan2006

33 1/27/2006 S1K3

Answer 3



## bacteria

112. Base your answer to this question on the information shown and on your knowledge of biology. Food is often treated to lower the risk of disease and spoilage, as shown in the chart. Name one type of organism that is controlled by these food preservation methods.

- (1) bacteria
- (2) viruses
- (3) antibodies
- (4) chromosomes

Data Base File Number: 166

Regents Date Jan09-60.bmp

Jan2009

60 1/27/2009 S4K5

Answer 1

Food Preservation Methods		
Method	Description of Method	Example of Food Treated With This Method
canning	heating at 115°C for 30 minutes	green beans
freezing	storing between -10°C and -18°C for extended time	meat, fish, poultry
salting	soaking in a salt solution for several days or weeks	pickles, sauerkraut

## bacterial growth cycle

113. A sample of bacteria was added to a culture dish containing a food supply. The dish was kept in an incubator for two weeks, where temperature and other conditions that favored bacterial growth were kept constant. The graph shows changes that occurred in the bacterial population over the two weeks. Which statement provides the best explanation for some of the changes observed?
- (1) The bacteria were unable to reproduce until day 8.
  - (2) The bacteria consumed all of the available food.
  - (3) The culture dish contained an antibiotic for the first five days.
  - (4) The temperature increased and the bacteria died.

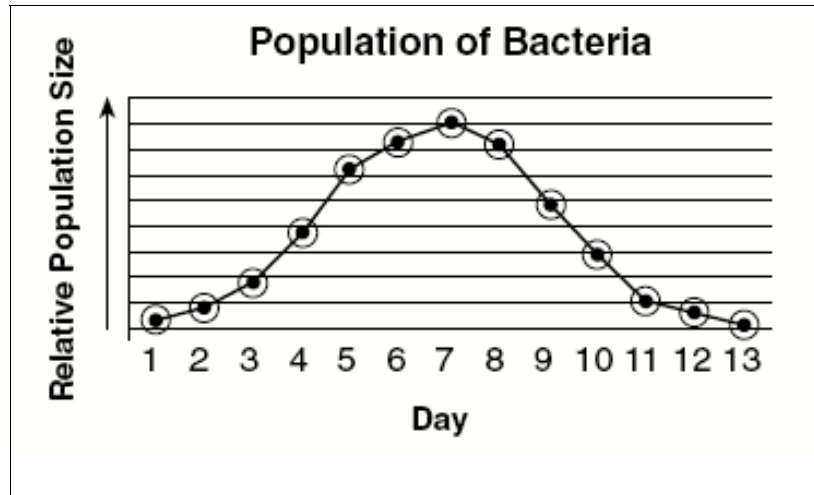
Data Base 160  
File Number:

Regents Date Jan09-40,bmp

Jan2009

40 1/27/2009 S4K6

Answer 2



## bacterial growth cycle

114. The graph shown represents the growth of bacteria cultured at three different temperatures over a period of 24 hours. Which statement concerning the rate of cell division in the bacteria culture is correct?

- (1) Cell division is most rapid at 37°C between 6 and 8 hours after it began.
- (2) Cell division is most rapid at 25°C between 20 and 24 hours after it began.
- (3) Cell division is most rapid at 18°C between 4 and 8 hours after it began.
- (4) Cell division occurs at the same rate no matter what the temperature.

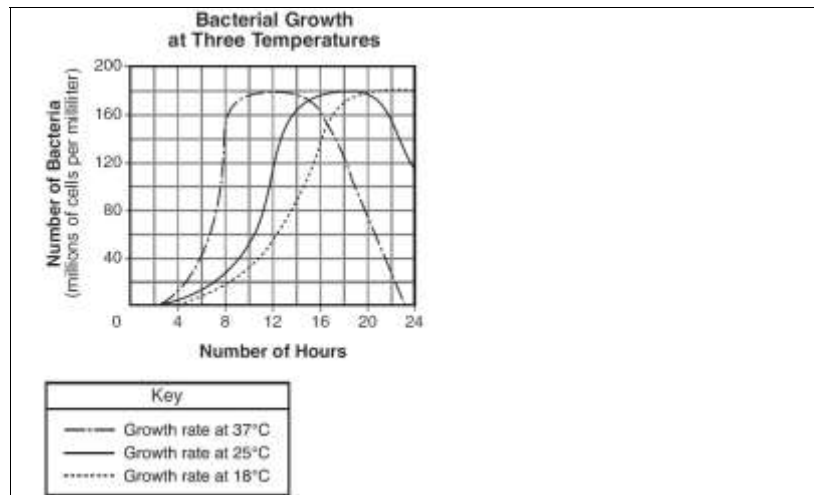
Data Base File Number: 282

Regents Date Aug2010-31.bmp

Aug2010

31 8/18/2010 S1K3

Answer 1



## bacterial reproduction

115. The graph shown provides information about the reproductive rates of four species of bacteria, A, B, C, and D, at different temperatures. Which statement is a valid conclusion based on the information in the graph?

- (1) Changes in temperature cause bacteria to adapt to form new species.
- (2) Increasing temperatures speed up bacterial reproduction.
- (3) Bacteria can survive only at temperatures between 0°C and 100°C.
- (4) Individual species reproduce within a specific range of temperatures.

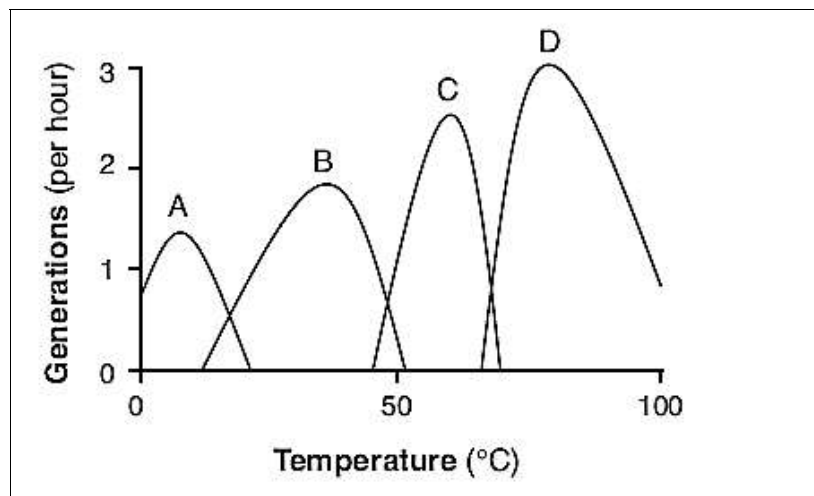
Data Base File Number: 102

Regents Date Jane08-37.bmp

June2008

37 6/24/2008 S4K4

Answer 4



## bar graph

116. The bar graph shows the height of a plant at the end of each week of a five-week growth period. Which statement represents a valid conclusion based on the information in the graph?

- (1) The plant was given water during the first three weeks, only.
- (2) The plant will grow faster during the sixth week than it did during the fifth week.
- (3) The plant grew fastest during the first three weeks, and then it grew slower.
- (4) The plant grew slowest during the first three weeks, and then it grew faster.

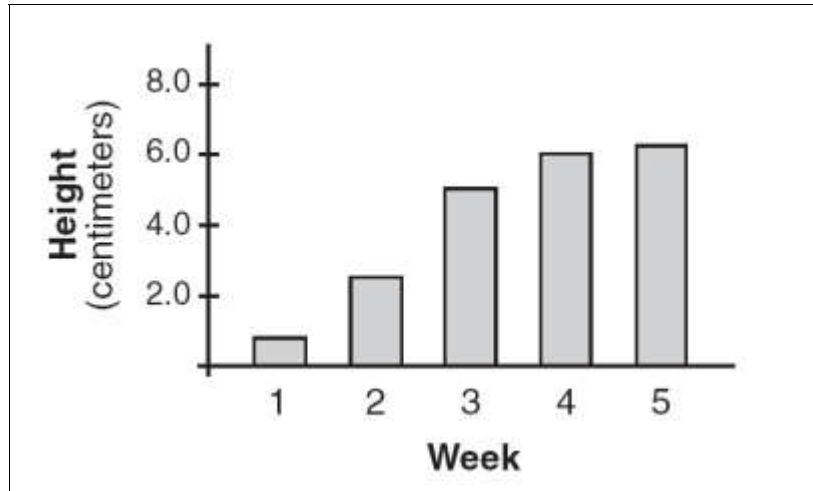
Data Base File Number: 339

Regents Date June2011-31.bmp

June2011

31 6/21/2011 S1K3

Answer 3



## base sequences

117. The diagram shown represents a portion of a molecule found in cells of the human body. Sequences represented by the letters in this molecule enable human cells to

- (1) alter the method of absorption of material
- (2) carry out asexual reproduction by meiosis
- (3) synthesize enzymes from organic molecules
- (4) modify genetic recombination during mitosis

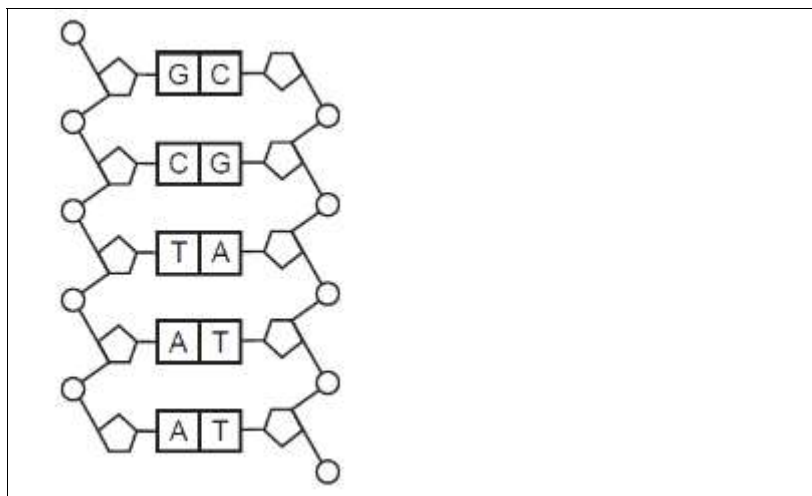
Data Base File Number: 925

Regents Date Jan2014-39.bmp

Jan2014

39 1/27/2014 S4K2

Answer 3



## base sequences

118. A strand of DNA in a skin cell contains the bases shown in the FIRST LINE of the diagram. After the cell is exposed to ultraviolet light, the strand contains the bases as shown in the BOTTOM LINE of the diagram. Which statement describes the result of this exposure?
- (1) A new base has been inserted  
(2) A base has been deleted  
(3) One base has been substituted for another.  
(4) There have been no changes in the bases.

Data Base File Number: 1096

Regents Date June2016-10.bmp

June2016

10 6/15/2016 S4K2

Answer 1

A-T-G-C-C-A-T-C-G-G-T-A

After the cell is exposed to ultraviolet light, the strand contains the bases:

A-T-G-G-C-C-A-T-C-G-G-T-A

## base sequences

119. The diagram shows an alteration that occurred during the replication process of a portion of a gene. The numbers identify the locations of specific bases in the sequence. This alteration is most likely the result of
- (1) a substitution at base 2  
(2) a deletion of base 2  
(3) an insertion of base 3  
(4) a deletion of base 4

Data Base File Number: 940

Regents Date June2014-30.bmp

June2014

30 6/17/2014 S4K2

Answer 4

ATCCGCATCTTAT → ATCGCATCTTAT

1 2 3 4 5 6 7 8 9 10 11 12 13

Replication

## biochemical processes

120. Two biological processes that occur in certain organelles are represented in the diagrams shown. Which statement is correct regarding the types of organisms able to carry out these processes?

- (1) Process X occurs in heterotrophs, but not in autotrophs.
- (2) Process Y occurs in consumers, but not in producers.
- (3) Both processes X and Y occur in all living things.
- (4) Both processes X and Y occur in green plants.

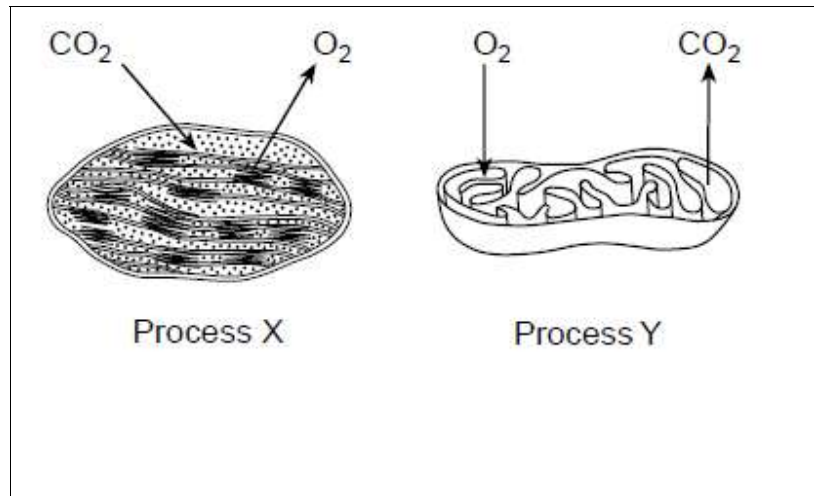
Data Base File Number: 1260

Regents Date June2018-41.bmp

June2018

41 6/13/2018 S4K5

Answer 4



## biodiversity

121. Some data concerning bird species are shown in the chart. Which statement is a valid inference based on information in the chart?

- (1) The different species in northern Alaska can interbreed.
- (2) There are conditions in Costa Rica that account for greater biodiversity there.
- (3) The different species in southwest Texas evolved from those in northern Alaska.
- (4) The greater number of species in Costa Rica is due to a greater number of predators there.

Data Base File Number: 587

Regents Date Aug2005-31.bmp

Aug2005

31 8/16/2005 S4K6

Answer 2

Number of Bird Species	Location
26	northern Alaska
153	southwest Texas
600	Costa Rica

**biodiversity**

122. Which graph best shows the relationship between the amount of biodiversity and the number of different populations in an ecosystem?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

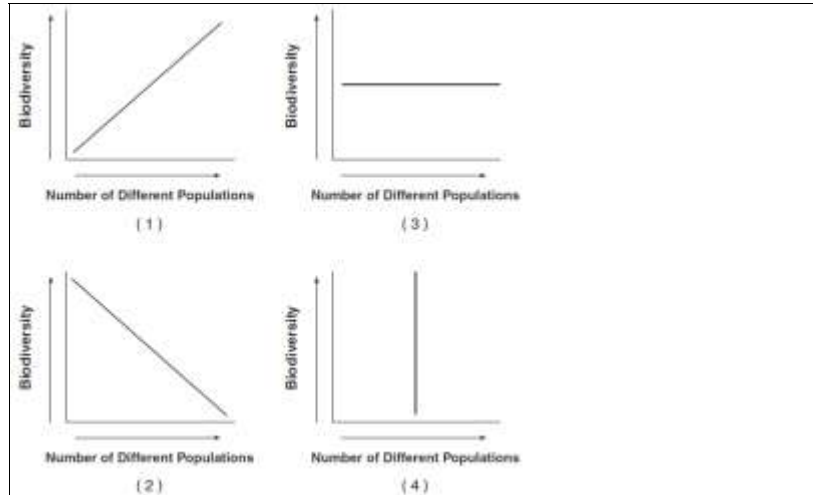
Data Base File Number: 442

Regents Date Aug2012-40.bmp

Aug2012

40 8/17/2012 S4K6

Answer 1



**biodiversity**

123. In the coastal waters off western North America, there is a starfish species that feeds primarily on mussels, another marine organism. In an experimental area, the starfish were removed from the waters. The effect of this removal is shown in the graph. What conclusion can be made regarding the role of the starfish in this ecosystem?

- (1) The biodiversity of this ecosystem increased within ten years as organisms adjusted to the loss of the starfish.
- (2) The starfish is important in maintaining the biodiversity of this ecosystem.
- (3) When the starfish were removed, the ecosystem decreased in stability and increased in biodiversity.
- (4) Biodiversity in this ecosystem is not dependent on the presence of starfish

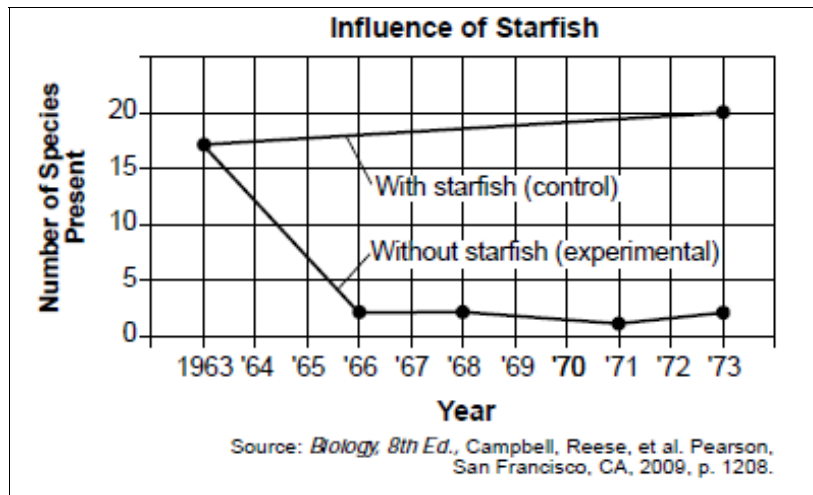
Data Base File Number: 1377

Regents Date Aug2019-49.bmp

Aug2019

49 8/14/2019 S4K6

Answer 2



**biodiversity**

124. An ecologist is studying the biodiversity of beetle species in four different habitats. She counted the number of individuals of each species she observed in each habitat. The results are shown in the data table. Which of these habitats displays the most biodiversity of beetle species?

- (1) Habitat W
- (2) Habitat X
- (3) Habitat Y
- (4) Habitat Z

Data Base File Number: 1698

Regents Date Aug2024-37.bmp

Aug2024

37 8/20/2024 S4K6

Answer 2

Beetle Species	Number of Individuals			
	Habitat W	Habitat X	Habitat Y	Habitat Z
A	0	2	0	40
B	0	6	0	0
C	32	10	120	40
D	54	22	0	0
E	0	8	0	40

**biodiversity**

125. Students were studying the different species of organisms in two different pond ecosystems. Their findings are summarized in the chart as shown. Based on the information in the chart, how does the biodiversity present in pond A compare to the biodiversity present in pond B?

- (1) Pond A has greater biodiversity than pond B because there are more species present.
- (2) Pond B has more biodiversity than pond A because there are more plants present.
- (3) Both ponds have the same levels of biodiversity because there is a variety of species present.
- (4) The biodiversity cannot be determined without also identifying the abiotic factors present.

Data Base File Number: 1534

Regents Date Jan2023-6.bmp

Jan2023

6 1/24/2023 S4k6

Answer 1

	Plant Species	Microorganism Species
Pond A	10	20
Pond B	11	5



## biodiversity

126. The diagram shown represents the varying biodiversity in three ecosystems. The level of biodiversity in ecosystem A is high because it has the

- (1) least variety of energy levels  
 (2) greatest variety of genetic material  
 (3) greatest number of decomposers  
 (4) least number of ecological niches




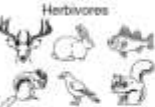

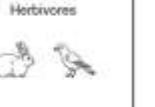



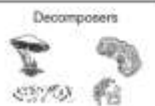


Data Base File Number: 292

Regents Date Aug2010-43.bmp

Aug2010

43 8/18/2010 S4K6

Answer 2

Ecosystem A	Ecosystem B	Ecosystem C
<p>Carnivores</p> 	<p>Carnivores</p> 	<p>Carnivores</p> 
<p>Herbivores</p> 	<p>Herbivores</p> 	<p>Herbivores</p> 
<p>Autotrophs</p> 	<p>Autotrophs</p> 	<p>Autotrophs</p> 
<p>Decomposers</p> 	<p>Decomposers</p> 	<p>Decomposers</p> 

## biological control

127. Mosquitoes are insects whose bite can cause discomfort and disease in humans. In an attempt to control mosquito populations, scientists have used radiation to prevent the males from producing functional sperm. How can the mosquito population be controlled as a result of this procedure.

- (1) Eggs will not be fertilized because sperm are non functional.  
 (2) Eggs can develop without sperm.  
 (3) Radiated males will produce mutant sperm.  
 (4) Mosquitos cannot be controlled using this procedure.

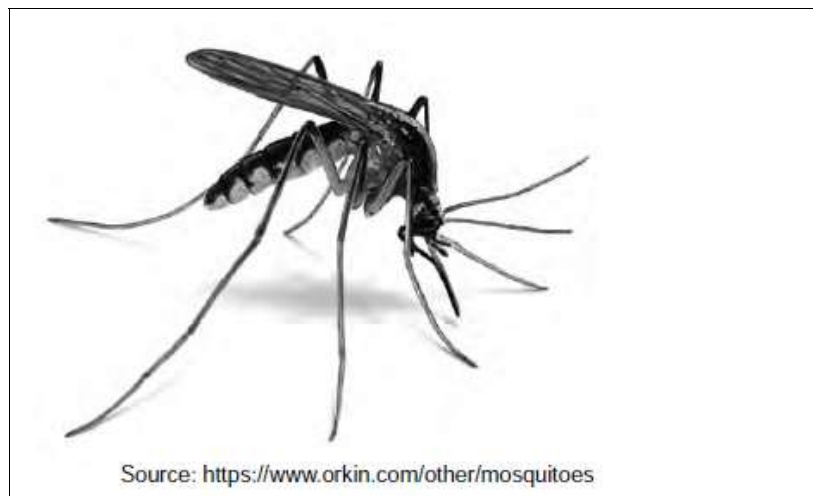
Data Base File Number: 1680

Regents Date June2024-72.bmp

June2024

72 6/14/2024 S4K2

Answer 1



## biological control

128. Base your answer to this question on the photo shown, reading passage as given, and on your knowledge of biology.

### Invasive Water Chestnuts Challenge Environmentalists

Environmental scientists are troubled by the rapid spread of the water chestnut plant. This invasive plant is a freshwater species with leaves that blanket the surface of water. The leaves grow so densely, they stop people from swimming and prevent boats from moving. Invasive water chestnut leaves prevent 95% of the sunlight from reaching the water below. Local animals and insects cannot eat this plant. New York ecosystems infested by the water chestnut are quickly disrupted. Water chestnut seeds can survive more than ten years under water in the sediments. The most effective way to kill the water chestnut is to pull out each plant by hand. This can be done in a small pond, but for rivers and lakes that are blocked by huge numbers of water chestnut plants, other methods are needed. Chemical herbicides kill the leaves, but, after several weeks, the water chestnut plants grow back. Large machines have been used to clear these plants and seeds from the water and sediments of ecosystems, but the machines remove many other organisms too. One possible way to remove the water chestnut is to

- (1) Bring in biological controls, such as introducing a new species of insect to eat the water chestnut leaves and stop its growth.
- (2) Poison every living thing in the water environment and let native species take over the area.
- (3) Drain all the water away from the area.
- (4) Let the water chestnut take over the environment.

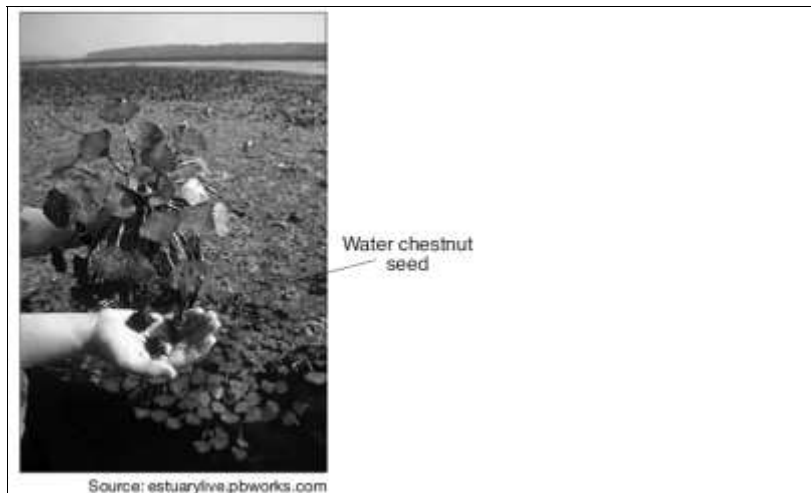
Data Base 1441  
File Number:

Regents Date June2021-59.bmp

June2021

59 6/22/2021 S4K1

Answer 1



## body mass index (BMI)

129. Excess body weight is considered to be a risk factor for diseases such as diabetes and high blood pressure. The Body Mass Index (BMI) chart shown can be used as a guide to determine if a person's body weight puts that person at risk for such diseases. Using the information in the chart provided, the BMI for a person who is 5 feet 9 inches tall and weighs 170 pounds is between

- (1) 24 and 25  
 (2) 25 and 26  
 (3) 27 and 28  
 (4) 29 and 30

Data Base File Number: 913

Regents Date Aug2013-50.bmp

Aug2013

50 8/14/2013 LABA

Answer 2

BMI	Healthy		Overweight				Obese					
	19	24	25	26	27	28	29	30	35	40	45	
Height	Weight in Pounds											
5'0"	97	123	128	130	138	143	148	153	158	185	211	238
5'1"	100	127	132	137	143	148	153	158	164	191	218	246
5'2"	104	131	136	142	147	153	158	169	197	225	254	
5'3"	107	135	141	146	152	158	163	174	204	232	262	
5'4"	110	140	145	151	157	163	169	180	210	240	270	
5'5"	114	144	150	156	162	168	174	186	216	247	278	
5'6"	118	148	155	161	167	173	179	191	223	255	287	
5'7"	121	153	159	166	172	178	185	197	230	262	295	
5'8"	125	158	164	171	177	184	190	203	236	270	304	
5'9"	128	162	169	176	182	189	196	209	243	278	313	
5'10"	132	167	174	181	188	195	202	215	250	286	322	
5'11"	136	172	179	186	193	200	208	221	258	294	331	
6'0"	140	177	184	191	198	206	213	227	265	302	340	
6'1"	144	182	189	197	204	212	219	233	272	311	350	
6'2"	148	186	194	202	210	218	225	240	279	319	359	
6'3"	152	192	200	208	216	224	232					

## body mass index (BMI)

130. Base your answer to this question on the information and the chart shown and on your knowledge of biology. - Body weight is considered to be a risk factor for diseases such as diabetes and high blood pressure. The Body Mass Index (BMI) chart can be used as a guide to determine if a person's body weight puts them at risk for such diseases. A portion of this chart is shown. The BMI for a person who is 5 feet 9 inches tall and weighs 170 pounds is between

- (1) 24 and 25  
 (2) 25 and 26  
 (3) 27 and 28  
 (4) 29 and 30

Data Base File Number: 347

Regents Date June2011-47.bmp

June2011

47 6/21/2011 S1K3

Answer 2

BMI	Healthy		Overweight				Obese				
	19	24	25	26	27	28	29	30	35	40	45
Height	Weight in Pounds										
5'4"	110	140	145	151	157	163	169	174	204	232	262
5'5"	114	144	150	156	162	168	174	180	210	240	270
5'6"	118	148	155	161	167	173	179	186	216	247	278
5'7"	121	153	159	166	172	178	185	191	223	255	287
5'8"	125	158	164	171	177	184	190	197	230	262	295
5'9"	128	162	169	176	182	189	196	203	236	270	304
5'10"	132	167	174	181	188	195	202	209	243	278	313
5'11"	136	172	179	186	193	200	208	215	250	286	322

## camouflage

131. Base your answer to this question on the information given, the data table shown, and on your knowledge of biology. An investigation was carried out over a five-year period to measure the effect of color on the survival of trout in a stream. The stream contained many brightly colored stones and food was plentiful. At the start of the investigation (year 0), 100 bright-colored trout and 100 drab-colored trout were placed into a section of the stream that had been blocked with netting. Investigators monitored the trout populations for five years and recorded the water condition each time a count was done. The data collected are shown in the table. Which of the following best explains how trout survival is related to the color of trout and the environmental condition of the stream.

- (1) Drab-colored trout survive better in cloudy water because they blend in with water.
- (2) Brightly-colored trout survive better in clear water because they blend in with the brightly colored stones.
- (3) Both choice 1 and choice 2 are correct.
- (4) Both choice 1 and choice 2 are incorrect.

Data Base File Number: 294

Regents Date Aug2010-52.bmp

Aug2010

52 8/18/2010 S1K3

Answer 3

Trout Population Over Five Years

Year	Bright-Colored Trout	Drab-Colored Trout	Condition of Water
0	100	100	clear
1	64	36	clear
2	86	25	clear
3	25	77	cloudy
4	14	86	cloudy
5	90	9	clear

## camouflage

132. The illustration shows an insect resting on some green leaves. The size, shape, and green color of this insect are adaptations that would most likely help the insect to

- (1) compete successfully with all birds
- (2) make its own food
- (3) hide from predators
- (4) avoid toxic waste materials

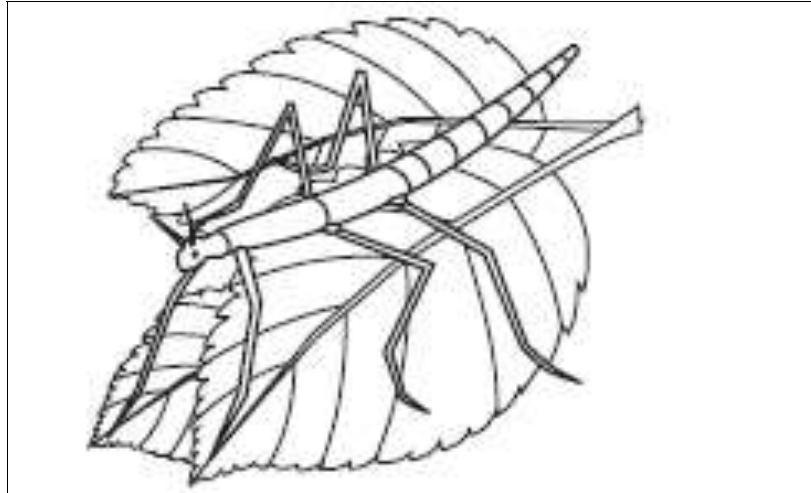
Data Base File Number: 476

Regents Date June2006-10.bmp

June2006

10 6/21/2006 S4K3

Answer 3



## cancer

133. Cells may divide abnormally and produce cells like some of those shown in the photograph. When cells such as the skin cells shown reproduce abnormally, it could be a sign of

- (1) an immune response
- (2) dynamic equilibrium
- (3) cancerous cell growth
- (4) a cellular adaptation

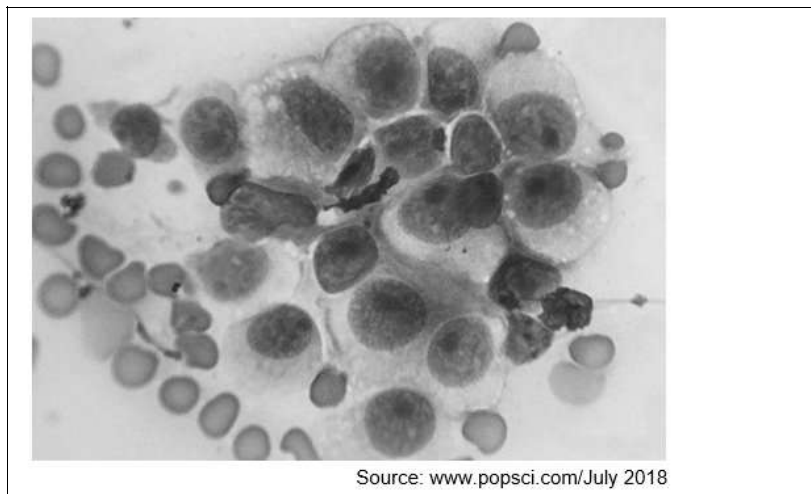
Data Base File Number: 1509

Regents Date Aug2022-30.bmp

Aug2022

30 8/17/2022 S4K5

Answer 3



Source: www.popsci.com/July 2018

**cancer**

134. The diagram shown represents the formation of a cancerous growth. Which statement best explains the events represented in this diagram?

- (1) A gene mutation caused the cells to become muscle cells
- (2) The growth resulted from the introduction of a vaccine.
- (3) A gene mutation caused abnormal mitotic cell division
- (4) The growth resulted from uncontrolled meiotic cell division.

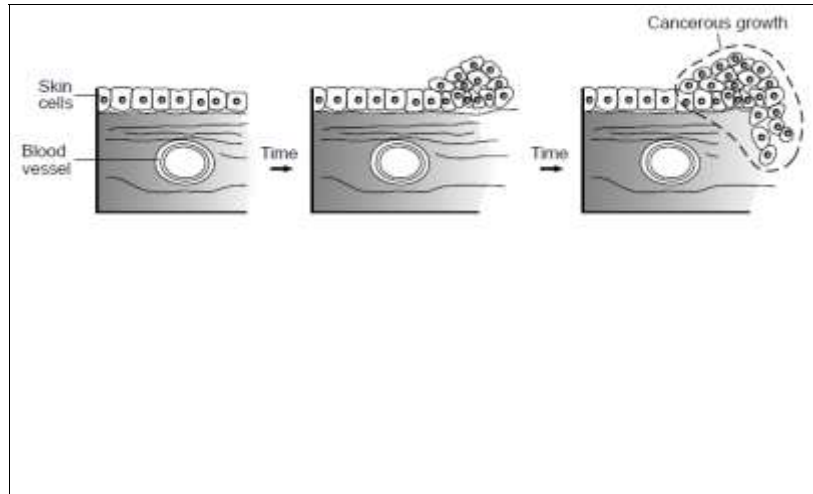
Data Base File Number: 1249

Regents Date June2018-12.bmp

June2018

12 6/13/2018 S4K5

Answer 3



**cancer**

135. The diagram shows the growth pattern of some skin cells in the human body after they have been exposed to ultraviolet radiation. The cells in area X are most likely

- (1) red blood cells
- (2) cancer cells
- (3) white blood cells
- (4) sex cells

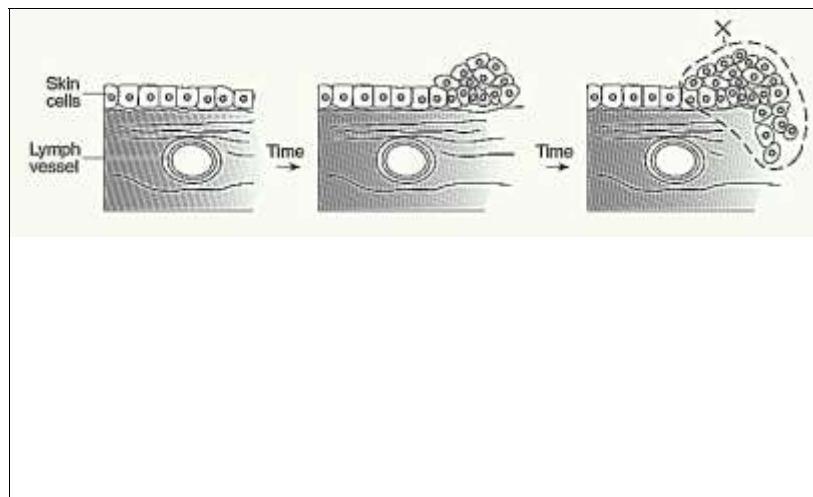
Data Base File Number: 8

Regents Date Aug07-21.bmp

Aug2007

21 8/16/2007 S4K5

Answer 2



**cancer**

136. Which phrase belongs in box X of the flowchart shown?

- (1) Increased chance of cancer
- (2) Increase in the production of functional gametes
- (3) Decrease in genetic variability of offspring
- (4) Decreased number of altered genes

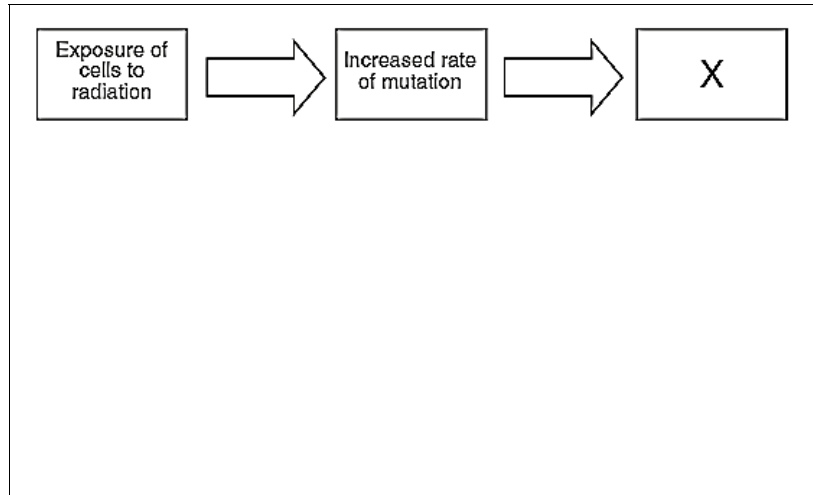
Data Base File Number: 52

Regents Date Jan07-29.bmp

Jan2007

29 1/26/2007 S4K5

Answer 1



**carbon dioxide / oxygen cycle**

137. The diagram shown represents a cycling of materials. Which row in the chart shows the substances represented by X and Y?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

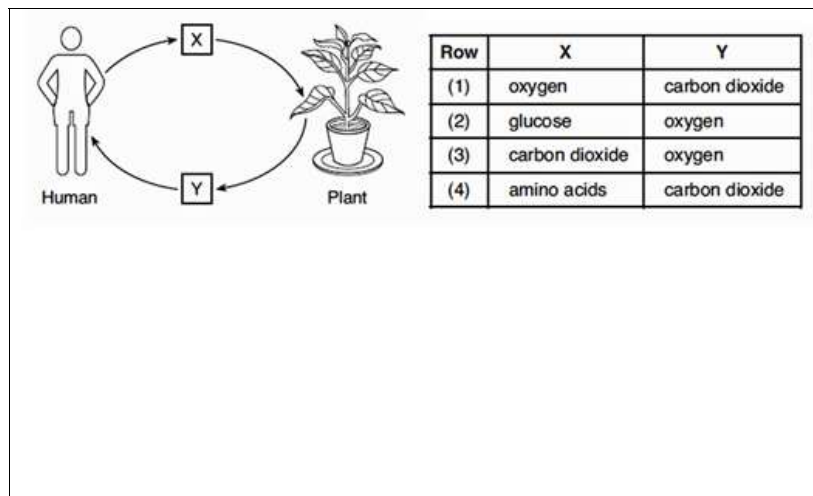
Data Base File Number: 408

Regents Date June2012-25.bmp

June2012

25 6/19/2012 S4K5

Answer 3





## carbon dioxide levels

138. Base your answer to this question on the information and graph shown and on your knowledge of biology. At an observatory in Mauna Loa, Hawaii, scientists have been measuring and collecting data related to changes in the atmosphere since the 1950s. The remote location of the observatory makes it ideal for studying atmospheric conditions that can cause climate change. One specific measurement taken is the amount of atmospheric carbon dioxide. Information for a 7-year period is shown in the graph. Analyze the data shown in the graph. From Jan-95 to Jan-02, what conclusion can be made about Atmospheric Carbon Dioxide in Mauna Loa?

- (1) carbon dioxide levels remained the same  
(2) carbon dioxide levels decreased  
(3) carbon dioxide levels increased  
(4) carbon dioxide levels are erratic

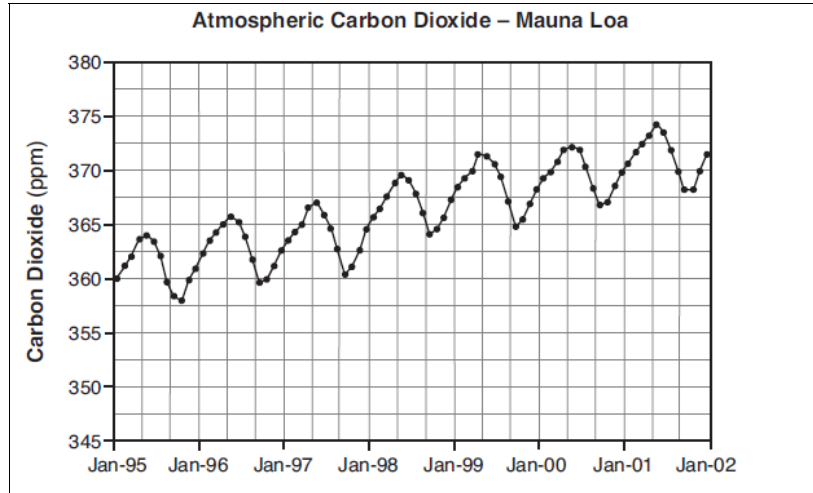
Data Base File Number: 630

Regents Date Jan2013-69.bmp

Jan2013

69 1/23/2013 S4K7

Answer 3





## carbon dioxide levels

139. Base your answer to this question on the information below and on your knowledge of biology. The average level of carbon dioxide in the atmosphere has been measured for the past several decades. The data collected are shown in the table. From 1960 to 2000, what has happened to the levels of carbon dioxide?

- (1) Carbon dioxide is rising.
- (2) Carbon dioxide is falling.
- (3) The data does not show a change in carbon dioxide.
- (4) Carbon dioxide levels have remained constant.

Data Base File Number: 81

Regents Date **Jan08-57.bmp**  
Jan2008

1/25/2008 S1K3

Answer 1

Average CO<sub>2</sub> Levels in the Atmosphere

Year	CO <sub>2</sub> (in parts per million)
1960	320
1970	332
1980	350
1990	361
2000	370

## carnivore

140. Base your answer to this questions on the data table shown and on your knowledge of biology. Based on its preferred food, species B would be classified as a

- (1) decomposer
- (2) procucer
- (3) carnivore
- (4) parasite

Data Base File Number: 112

Regents Date **June08-74.bmp**  
June2008

74 6/24/2008 LABS

Answer 3

Dietary Preferences of Finches

Species of Finch	Preferred Foods
A	nuts and seeds
B	worms and insects
C	fruits and seeds
D	insects and seeds
E	nuts and seeds

**carnivore**

141. Which ecological term best describes the polar bears in the cartoon?

- (1) herbivores
- (2) parasites
- (3) carnivores
- (4) producers

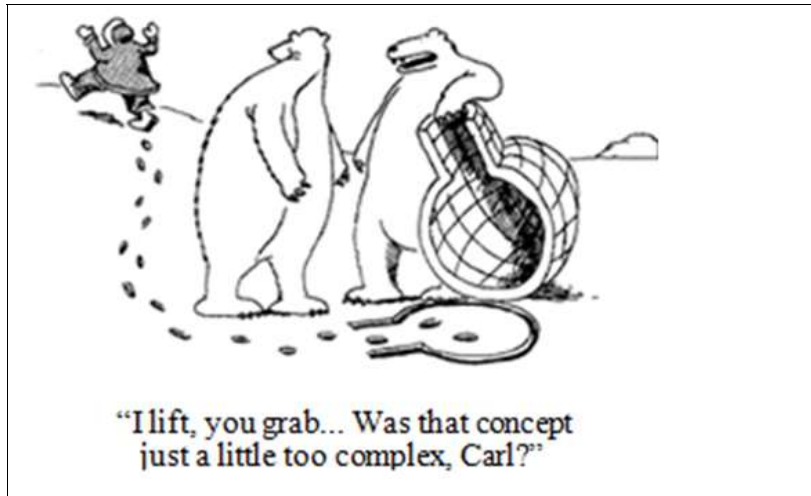
Data Base 738  
File Number:

Regents Date June2003-29B.b

June2003

29 6/19/2003 S4K6

Answer 3



**carnivore**

142. Which group contains terms that are all directly associated with one of the organisms shown in the diagram below?

- (1) herbivore, prey, autotroph, host
- (2) predator, scavenger, decomposer, consumer
- (3) carnivore, predator, heterotroph, multicellular
- (4) producer, parasite, fungus, fish

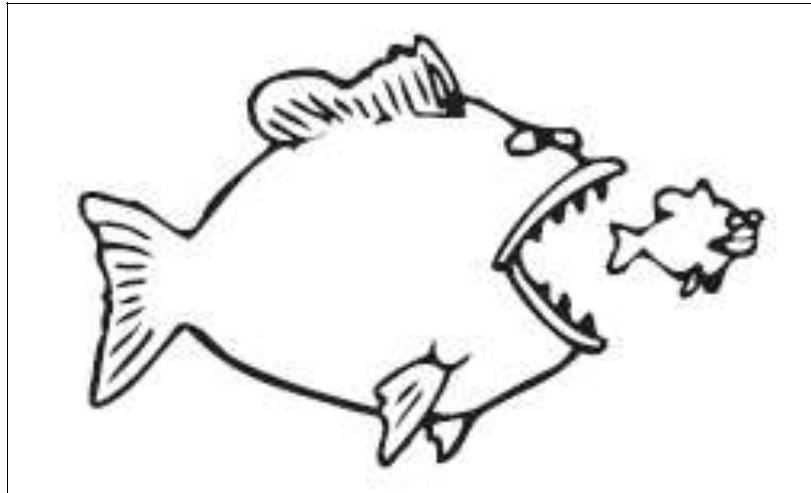
Data Base 763  
File Number:

Regents Date Aug2003-32.bmp

Aug2003

32 8/13/2003 S4K6

Answer 3



## carrying capacity

143. The dotted line on the graph shown represents the potential size of a population based on its reproductive capacity. The solid line on this graph represents the actual size of the population. Which statement best explains why the actual population growth is less than the potential population growth?

- (1) Resources in the environment are limited.
- (2) More organisms migrated into the population than out of the population.
- (3) The birthrate gradually became greater than the death rate.
- (4) The final population size is greater than the carrying capacity.

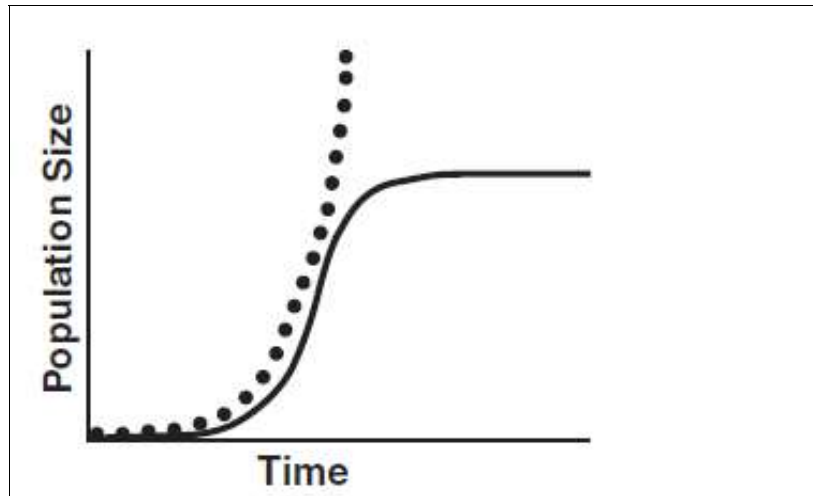
Data Base File Number: 811

Regents Date June2002-32.bmp

June2002

32 6/19/2002 S4K7

Answer 1



## carrying capacity

144. The growth of a population is shown in the graph. Which letter indicates the carrying capacity of the environment for this population?

- (1) A
- (2) B
- (3) C
- (4) D

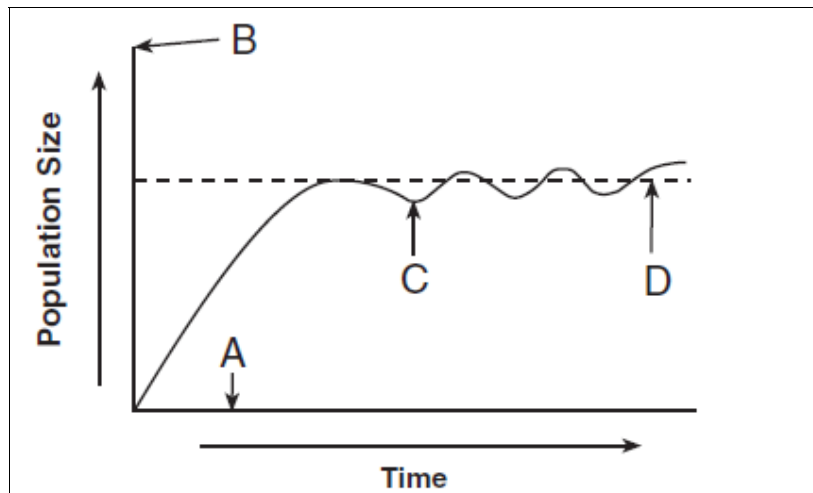
Data Base File Number: 484

Regents Date June2006-25.bmp

June2006

25 6/21/2006 S4K6

Answer 4



## carrying capacity

145. Base your answer to this questions on the information and data table given and on your knowledge of biology.

### Yellowstone Park Wolf Update

For the first time in nearly 70 years, the howl of the wolf is being echoed throughout Yellowstone National Park. "Canis lupus", the gray wolf, one of the largest and most complex of the canine species, has been successfully reintroduced into the Yellowstone ecosystem.

In mid-January 1995, 14 wolves from many separate packs were captured in Canada and then transported into Yellowstone Park and placed into three one acre pens.

Source: <http://www.yellowstone-bearman.com/w-update.html>

After the wolves were given time to establish a new pack structure, the packs were released into the wild. The number of wolf pups was counted each year for four years. The data are shown in the table. The number of wolves that can be supported in this environment for a long period of time is known as

- (1) ecosystem stability  
(2) carrying capacity  
(3) ecological succession  
(4) biological evolution

Data Base 911  
File Number:

Regents Date Aug2013-44.bmp

Aug2013

47 8/14/2013 S4K6

Answer 2

### Number of Wolf Pups Observed

Year	Number of Pups
1996	11
1997	64
1998	42
1999	61

## carrying capacity

146. Four environmental factors are shown in the diagram. Which factors limit environmental carrying capacity in a land ecosystem?

- (1) A, only
- (2) B, C, and D, only
- (3) A, C, and D, only
- (4) A, B, C, and D

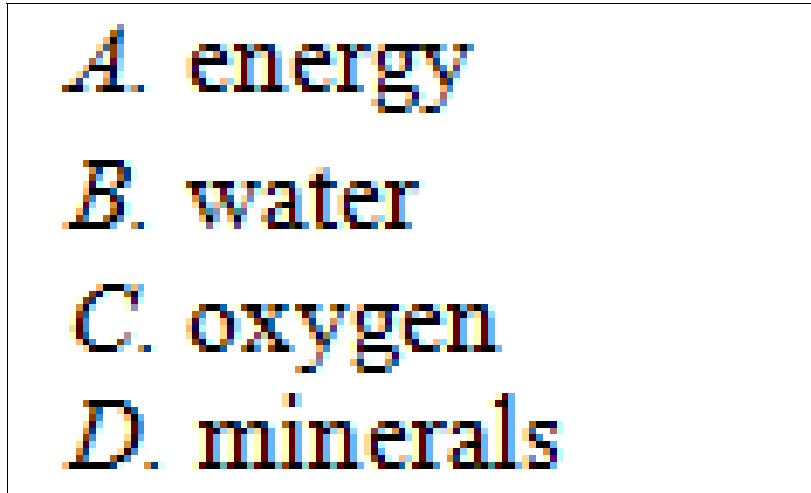
Data Base 513  
File Number:

Regents Date Aug2006-29.bmp

Aug2006

29 8/16/2006 S4K6

Answer 4



## carrying capacity

147. Base your answer to this question on the information and photograph given and on your knowledge of biology. Wild horses called mustangs roam acres of federally owned land in the western United States. These horses have overgrazed the local vegetation to the extent that plants and soils are being lost entirely. When the number of mustangs that roam the land exceeds the number of horses that the land can sustain, the government organizes helicopter-driven roundups. The horses are guided into a roped-off area and then are sold to the public or brought to pastures in the Midwest. About one percent of the horses captured die from injuries or accidents that occur during roundups. The risk to the horses during the roundups compared to the entire loss of plants and soils is considered

- (1) selective breeding
- (2) a technological fix
- (3) direct harvesting
- (4) a trade-off

Data Base 1375  
File Number:

Regents Date Aug2019-42.bmp

Aug2019

42 8/14/2019 S4K7

Answer 4



## carrying capacity

148. The graph shows the size of a population of foxes over a period of years. If the line did not stay around the carrying capacity, but continued to rise, which concept would this graph best illustrate?

- (1) environmental stability
- (2) genetic variety
- (3) behavioral change
- (4) overproduction

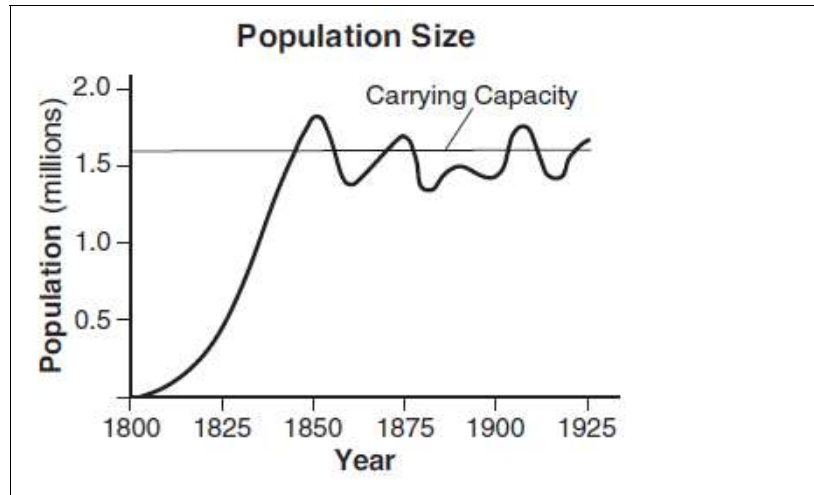
Data Base File Number: 1020

Regents Date June2015-31.bmp

June2015

31 6/16/2015 S4K3

Answer 4



## carrying capacity

149. The graph shown provides information about the population of deer in a given area between 1900 and 1945. Which statement identifies the most likely reason that the carrying capacity of the area to support deer decreased between 1925 and 1930?

- (1) The deer population decreased in 1926.
- (2) The number of predators increased between 1915 and 1925.
- (3) The deer population became too large.
- (4) An unusually cold winter occurred in 1918.

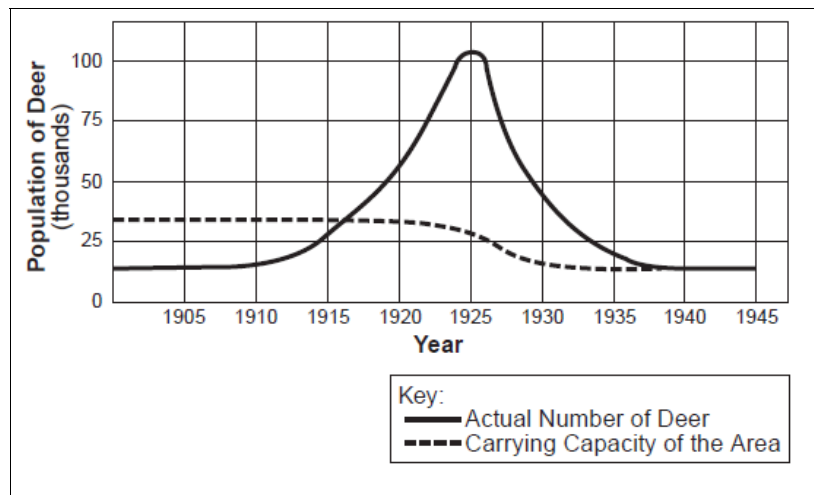
Data Base File Number: 849

Regents Date June2001-28.bmp

June2001

28 6/15/2001 S4K6

Answer 3



## carrying capacity

150. A population of chipmunks migrated to an environment where they had little competition. Their population quickly increased but eventually stabilized as shown in the graph. Which statement best explains why the population stabilized?

- (1) Interbreeding between members of the population increased the mutation rate.
- (2) The population size became limited due to factors such as availability of food.
- (3) An increase in the chipmunk population caused an increase in the producer population.
- (4) A predator species came to the area and occupied the same niche as the chipmunks.

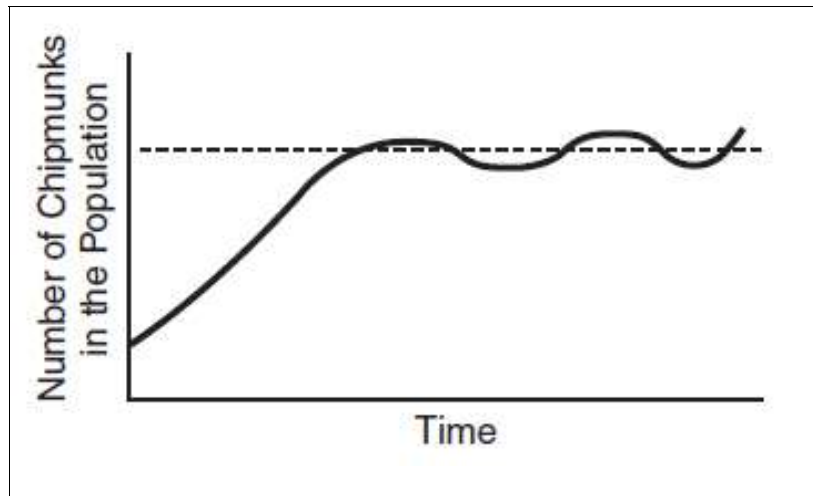
Data Base File Number: 667

Regents Date June2004-26.bmp

June2004

26 6/18/2004 S4K6

Answer 2



## carrying capacity

151. Base your answer to this question on the information and graph given and on your knowledge of biology. The graph shows the number of animals in a population throughout the course of a year. The population migrated into the area at the beginning of 2011. The graph can best be used to illustrate

- (1) a food chain
- (2) ecological succession
- (3) natural selection
- (4) carrying capacity

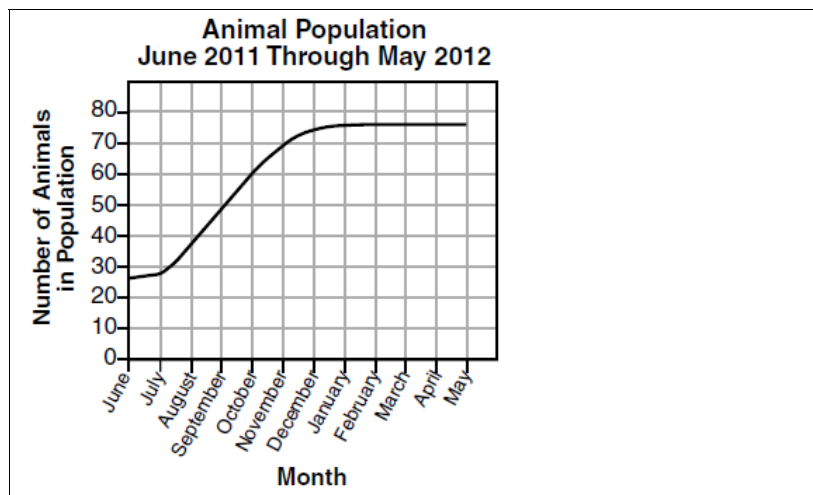
Data Base File Number: 1283

Regents Date Aug2018-33.bmp

Aug2018

33 8/17/2018 S4K6

Answer 4



## carrying capacity

152. Base your answer to this question on the data table, which shows the estimated population of wolves in Minnesota from 1995 through 2002. The most likely explanation for the size of the wolf population for the 2000-2002 period is that the population

- (1) reached the carrying capacity of the environment
- (2) stabilized due to global warming
- (3) began reproducing at a faster rate
- (4) was affected by a new pathogen

Data Base File Number: 929

Regents Date Jan2014-44.bmp

Jan2014

47 1/27/2014 S4K6

Answer 1

Minnesota Wolf Population

Year	Estimated Population
1995	2000
1996	2200
1997	2300
1998	2450
1999	2500
2000	2600
2001	2600
2002	2600

## carrying capacity

153. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the size of a population over time. Which term best identifies line B in the graph?

- (1) niche of the species in the environment
- (2) biodiversity in the environment
- (3) carrying capacity of the environment
- (4) number of populations in the environment

Data Base File Number: 886

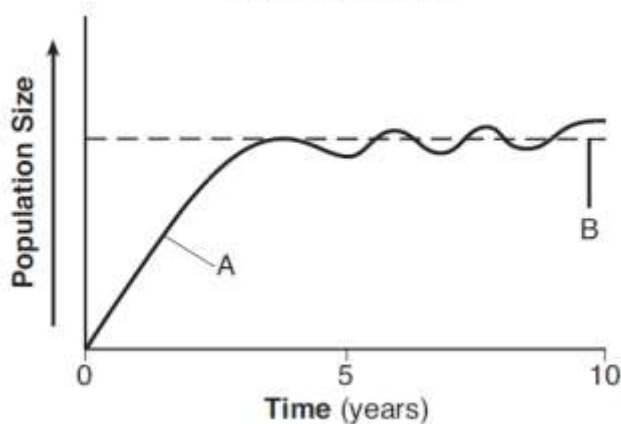
Regents Date June2013-48.bmp

June2013

49 6/11/2013 S4K6

Answer 3

Population Size





## carrying capacity

154. Which statement best describes the fruit fly population in the part of the curve labeled X in the graph shown?

- (1) The fruit fly population has reached the number of organisms the habitat can support.
- (2) The fruit fly population can no longer mate and produce fertile offspring.
- (3) The fruit fly population has an average life span of 36 days.
- (4) The fruit fly population is no longer able to adapt to the changing environmental conditions.

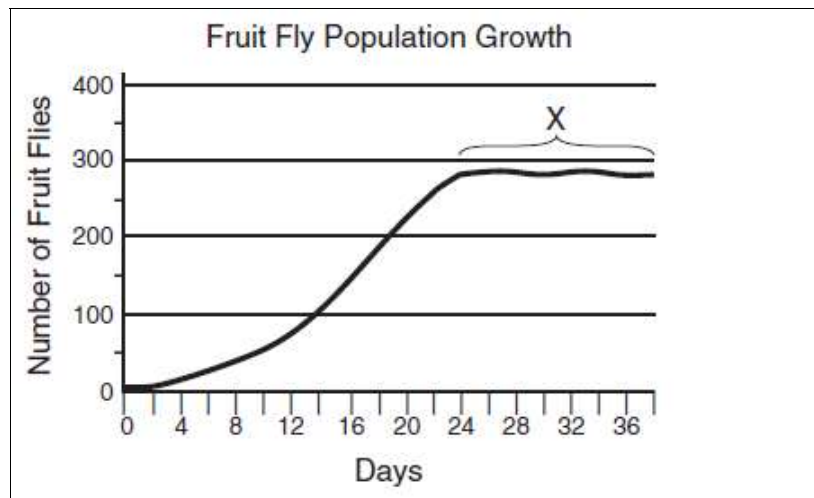
Data Base 560  
File Number:

Regents Date June2005-25.bmp

June2005

25 6/22/2005 S4K6

Answer 1



## catalyst / enzymes

155. Base your answer to this question the information given and on your knowledge of biology. Some students tested two samples of a mixture of starch and water with two different indicators. The results of these tests are shown in Table 1 as shown .Next, a specific protein was added to two new samples of the starch and water mixture. After waiting 30 minutes, the students tested these samples with the same two indicator solutions. The results are shown in Table 2 as shown. Based on these results, it can be concluded that the specific protein that was added to the samples was

- (1) a salt solution
- (2) a new indicator
- (3) a pancreatic hormone
- (4) a biological catalyst

Data Base File Number: 1324

Regents Date Jan2019-74.bmp

Jan2019

74 1/22/2019 LAB5

Answer 4

Table 1: Results of Testing a Starch-Water Solution with Indicators.			
Indicator Used	Color of Indicator Alone	Sample Being Tested	Color of Sample After Indicator Was Added
starch indicator	amber	starch and water	black
glucose indicator + heat	blue	starch and water	blue

Next, a specific protein was added to two new samples of the starch and water mixture. After waiting 30 minutes, the students tested these samples with the same two indicator solutions. The results are shown in Table 2 below.

Table 2: Results of Testing a Starch-Water Solution with Indicators 30 Minutes After Adding a Certain Protein			
Indicator Used	Color of Indicator Alone	Sample Being Tested	Color of Sample After Indicator Was Added
starch indicator	amber	starch and water	amber
glucose indicator + heat	blue	starch and water	brick red

## catalyst / enzymes

156. To capture their prey, spiders have fangs, which pierce the body wall of insects and inject venom. Spider venoms usually contain specific proteins that attack the cell membranes of the prey. The membranes and most of the contents of the insect's body turn into a liquid that the spider then ingests for food. These specific venom proteins are most likely

- (1) ATP molecules
- (2) DNA molecules
- (3) biological catalysts
- (4) biological catalysts

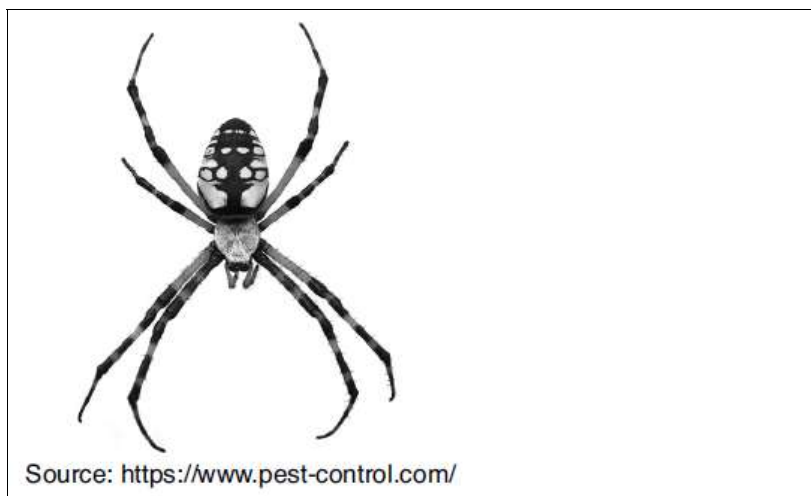
Data Base File Number: 1435

Regents Date June2021-41.bmp

June2021

41 6/22/2021 S4K5

Answer 3



## cell division

157. The diagram shown illustrates the process of cell division. What is the significance of anaphase in this process?

- (1) Anaphase usually ensures that each daughter cell has the same number of chromosomes as the parent cell.
- (2) Anaphase usually ensures that each daughter cell has twice as many chromosomes as the parent cell.
- (3) In anaphase, the cell splits in half.
- (4) In anaphase, the DNA is being replicated

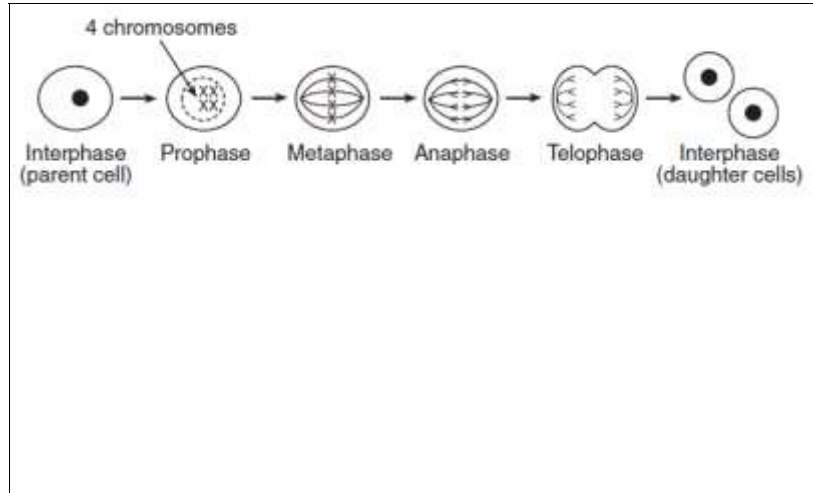
Data Base File Number: 570

Regents Date June2005-38.bmp

June2005

38 6/22/2005 S4K4

Answer 1



## cell division

158. A student viewed a slide of an onion root tip with a compound light microscope. The photograph shown represents what he saw. In order to observe whether or not this root tip was growing, the student should

- (1) switch to a higher magnification and look for evidence of cell division
- (2) switch to a lower magnification and look for evidence of cell division
- (3) switch to a lower magnification and add a stain to the onion root tip cells
- (4) switch to a higher magnification and add salt solution to the onion root tip cells

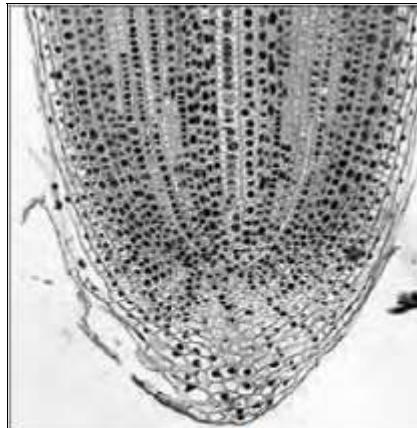
Data Base File Number: 1578

Regents Date June2023-41.bmp

June2023

41 6/14/2023 LABA

Answer 1



Source: <http://slideplayer.com/slide/760969/2/images/77/Onion+root+tip.jpg>

## cell genetics

159. Several structures are labeled in the diagram of a puppy as shown. Every cell in each of these structures contains

- (1) equal amounts of ATP
- (2) identical genetic information
- (3) proteins that are all identical
- (4) organelles for the synthesis of glucose

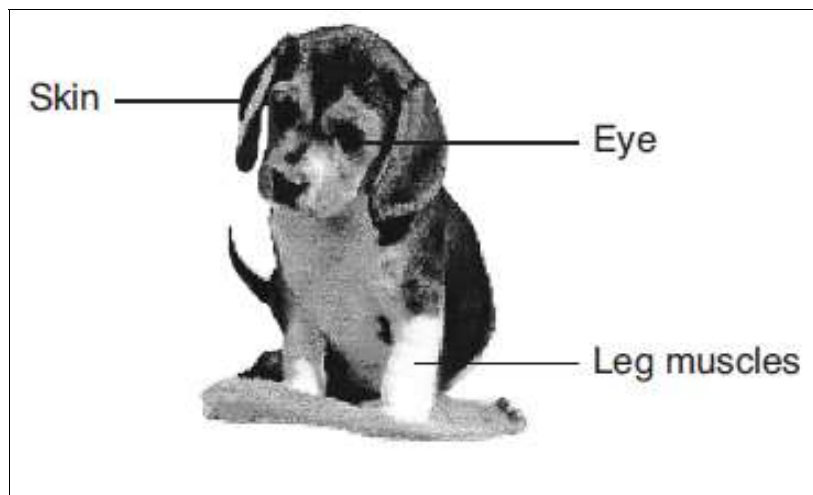
Data Base File Number: 254

Regents Date June2010-9.bmp

June2010

9 6/16/2010 S4K2

Answer 2



## cell membrane

160. The diagram below represents two cells, X and Y. Which statement is correct concerning the structure labeled A?

- (1) It aids in the removal of metabolic wastes in both cell X and cell Y.
- (2) It is involved in cell communication in cell X, but not in cell Y.
- (3) It prevents the absorption of CO<sub>2</sub> in cell X and O<sub>2</sub> in cell Y.
- (4) It represents the cell wall in cell X and the cell membrane in cell Y.

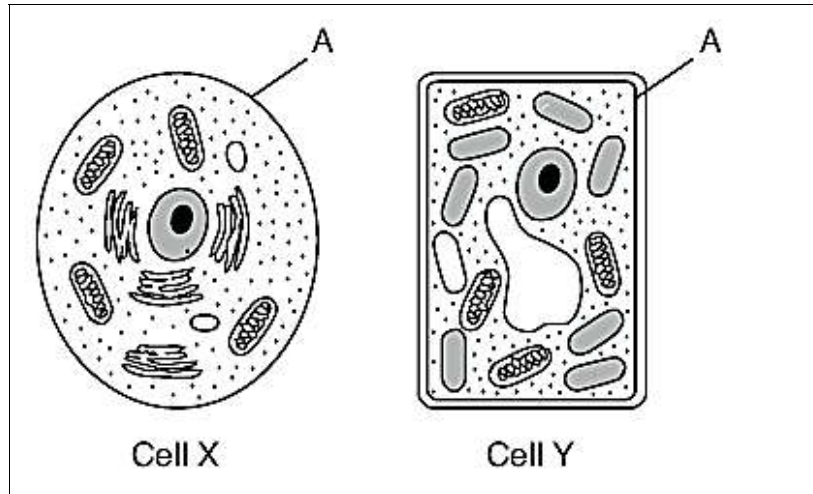
Data Base File Number: 101

Regents Date June08-36.bmp

June2008

36 6/24/2008 S4K1

Answer 1



## cell membrane

161. The ameba represented in the diagram shown is a single-celled organism. Which two processes are most closely associated with structure A?

- (1) insertion and deletion
- (2) nervous regulation and circulation
- (3) active transport and diffusion
- (4) replication and photosynthesis

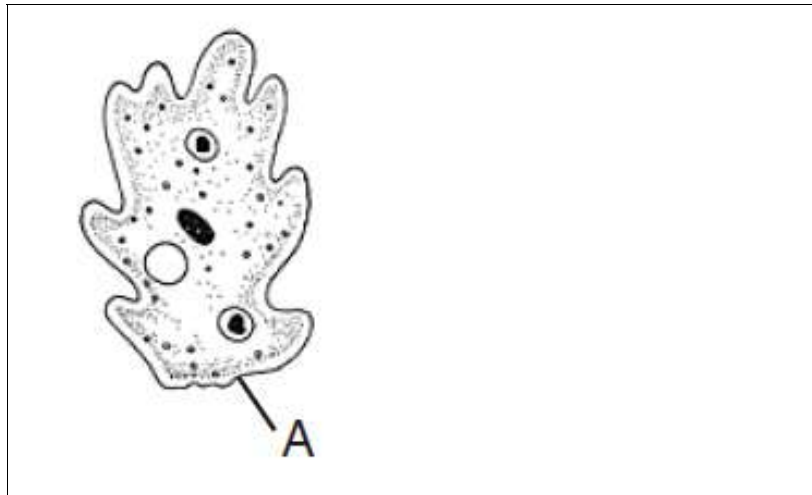
Data Base File Number: 230

Regents Date Jan2010-3.bmp

Jan2010

3 1/26/2010 S4K1

Answer 3



**cell membrane**

162. Some human structures and their functions are shown. In a single-celled organism such as an ameba, all these functions can be performed by the

- (1) nucleus
- (2) ribosomes
- (3) mitochondria
- (4) cell membrane

Data Base File Number: 361

Regents Date Aug2011-8.bmp

Aug2011

8 8/18/2011 S4K1

Answer 4

Human Structures	Functions
alveoli	absorption of oxygen, excretion of carbon dioxide
kidney	excretion of salts and nitrogenous wastes
large intestine	absorption of water

**cell membrane**

163. In the diagram shown, which structure performs a function similar to a function of the human lungs?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

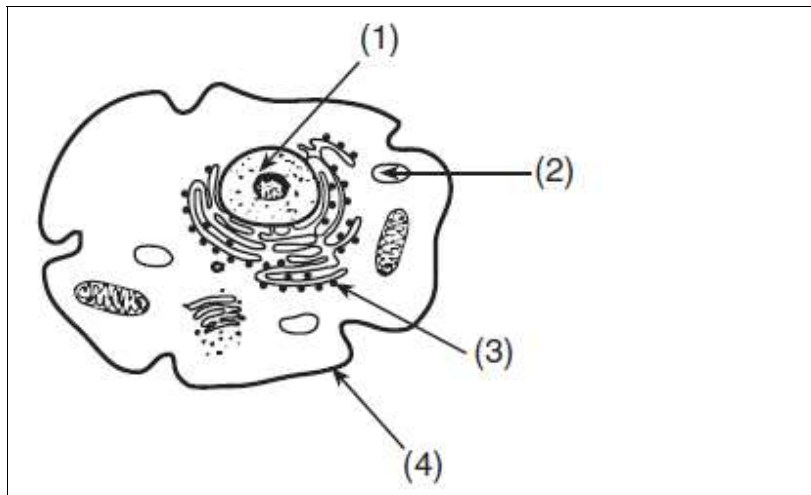
Data Base File Number: 588

Regents Date Aug2005-32.bmp

Aug2005

32 8/16/2005 S4K1

Answer 4



## cell membrane

164. The diagram shown represents a portion of a cell membrane. Which structure may function in the recognition of chemical signals?

(1) A

(3) C

(2) B

(4) D

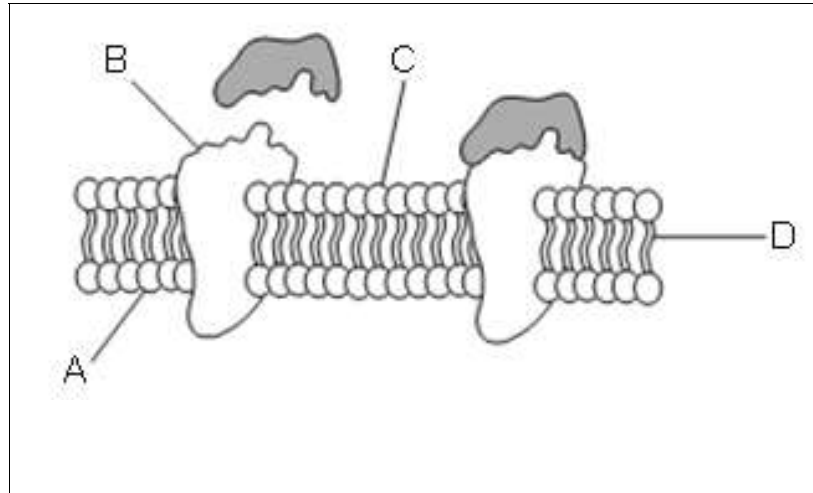
Data Base File Number: 191

Regents Date June09-35.bmp

June2009

35 6/18/2009 S4K1

Answer 2



## cell membrane

165. The diagram shown illustrates the release of chemical A from a human cell in response to a specific stimulus. Which cell structure plays a direct role in the release of this chemical from the cell?

(1) nucleus

(3) chloroplast

(2) ribosome

(4) cell membrane

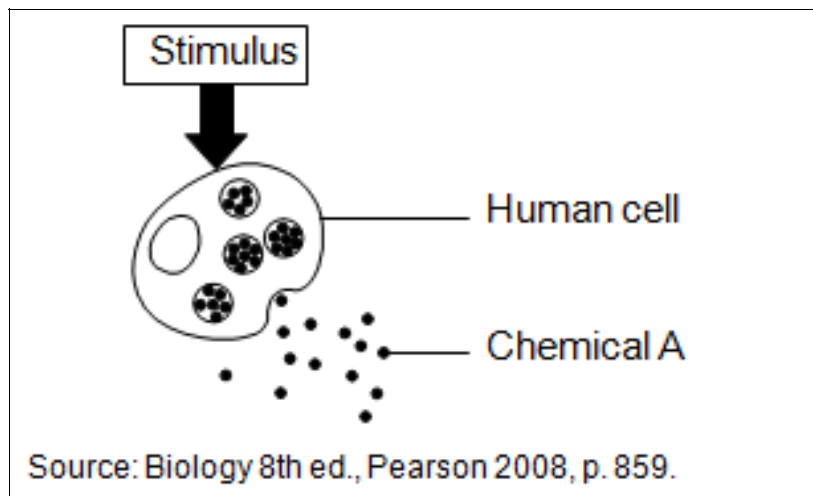
Data Base File Number: 1303

Regents Date Jan2019-15.bmp

Jan2019

15 1/22/2019 S4K1

Answer 4



## cell membrane

166. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents a cell. Which structure is responsible for the passage of materials into and out of the cell?

(1) A

(3) C

(2) B

(4) D

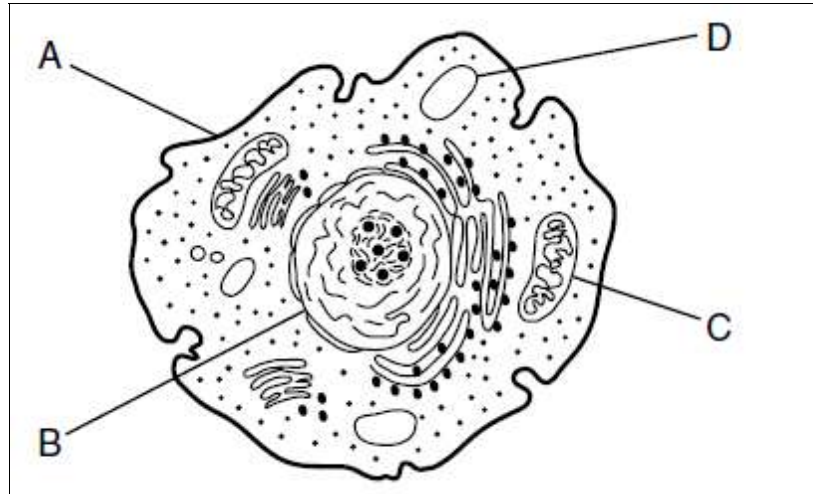
Data Base File Number: 1165

Regents Date Jan2017-42.bmp

Jan2017

42 1/25/2017 S4K1

Answer 1



## cell membrane

167. Which letter indicates a cell structure that directly controls the movement of molecules into and out of the cell?

(1) A

(3) C

(2) B

(4) D

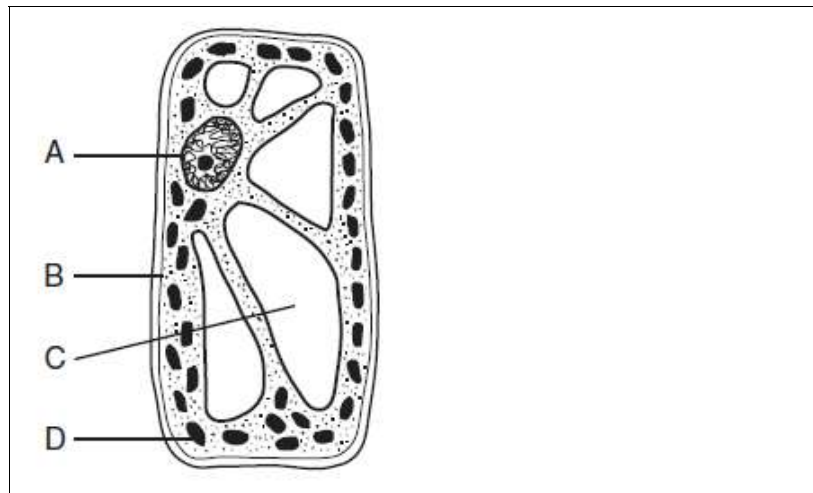
Data Base File Number: 728

Regents Date June2003-3.bmp

June2003

3 6/19/2003 S4K1

Answer 2





**cell membrane**

168. Base your answer to this question on the information given and on your knowledge of biology. The diagram represents a model cell with a semi-permeable membrane. The contents of the model cell and beaker are labeled. One reason for the color change in the model cell represented in the final state diagram is

- (1) The starch indicator diffused INTO the cell and reacted with the starch to produce a black color.
- (2) The starch diffused out of the cell.
- (3) The glucose diffused out of the cell.
- (4) Osmosis of the water molecules occurred.

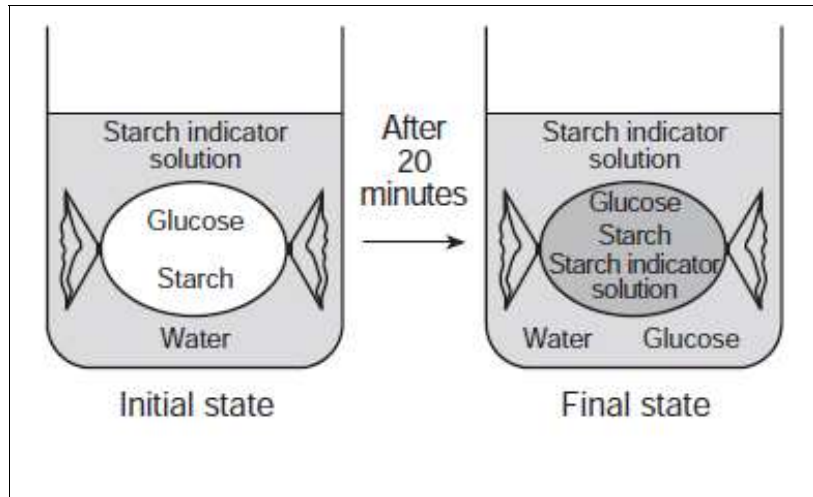
Data Base File Number: 1713

Regents Date Aug2024-77.bmp

Aug2024

77 8/20/2024 LAB5

Answer 1



**cell membrane**

169. In the cell shown in the diagram, which lettered structure is responsible for the excretion of most cellular wastes?

- (1) A
- (2) B
- (3) C
- (4) D

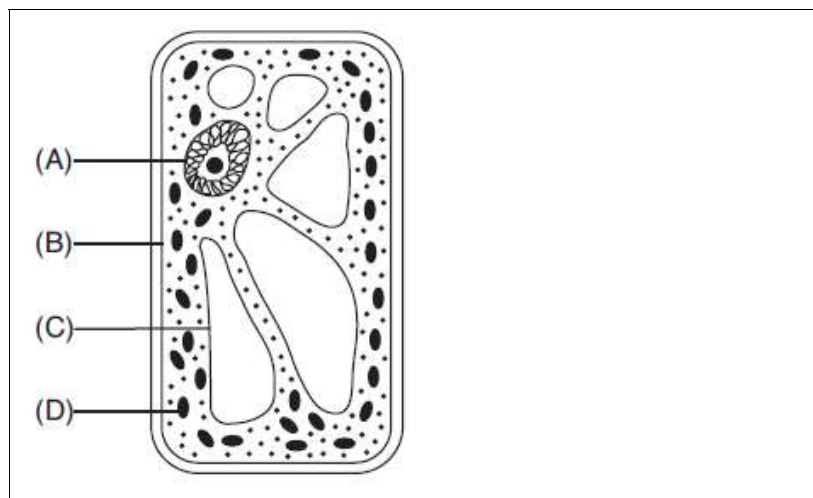
Data Base File Number: 253

Regents Date June2010-5.bmp

June2010

5 6/16/2010 S4K1

Answer 2



## cell membrane

170. A single-celled organism is represented in the diagram. Structure X carries out a function most similar to which structure in a human?

- (1) lung
- (2) brain
- (3) ovary
- (4) heart

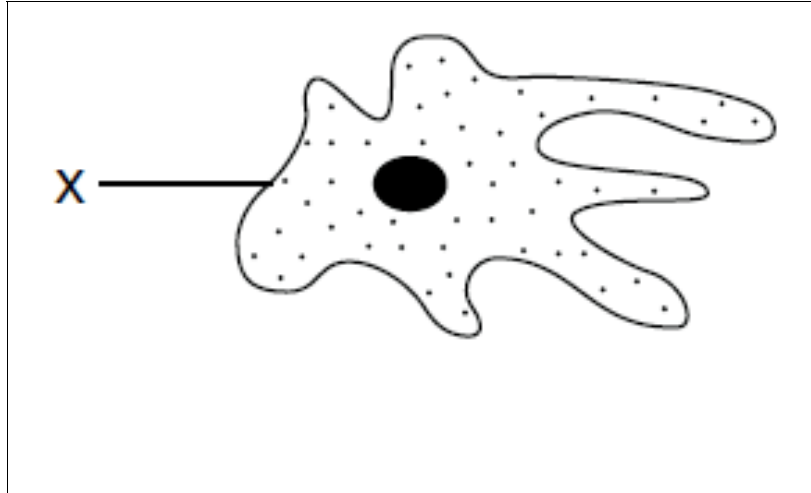
Data Base File Number: 401

Regents Date June2012-5.bmp

June2012

5 6/19/2012 S4K1

Answer 1



## cell membrane

171. The diagram shown represents the distribution of some molecules inside and outside of a cell over time. Which factor prevented the protein molecules from moving out of the cell?

- (1) temperature
- (2) pH
- (3) molecule size
- (4) molecule concentration

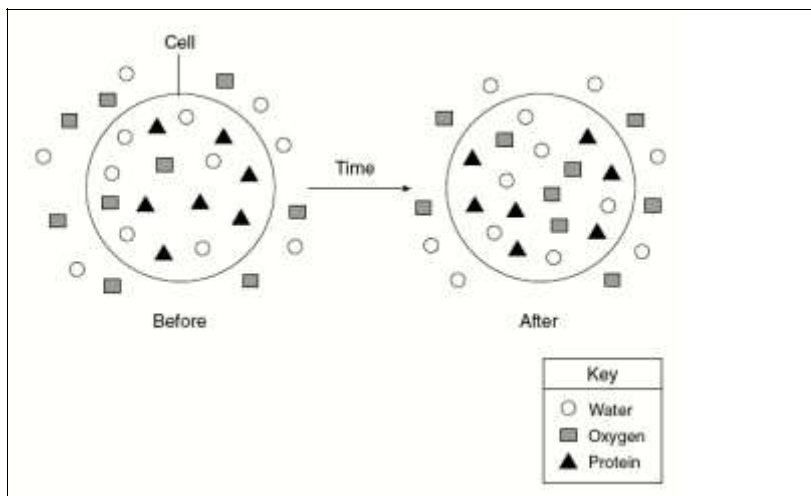
Data Base File Number: 173

Regents Date Jan09-80.bmp

Jan2009

80 1/27/2009 LABS

Answer 3



## cell membrane

172. The cell represented in the diagram produces oxygen. Which structure allows the passage of this oxygen to the environment?

(1) A

(3) C

(2) B

(4) D

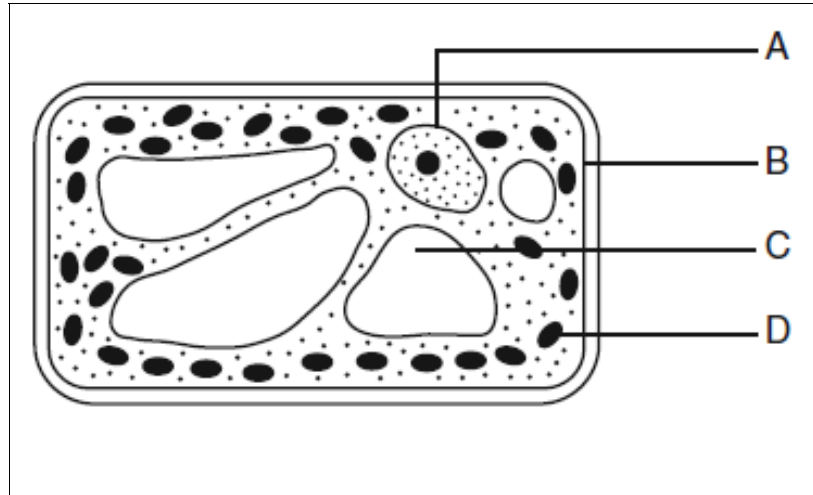
Data Base File Number: 430

Regents Date Aug2012-1.bmp

Aug2012

1 8/17/2012 S4K1

Answer 2



## cell membrane

173. In the diagram shown, which letter indicates the part of the cell that carries out a function most similar to a function of the human excretory system?

(1) A

(3) C

(2) B

(4) D

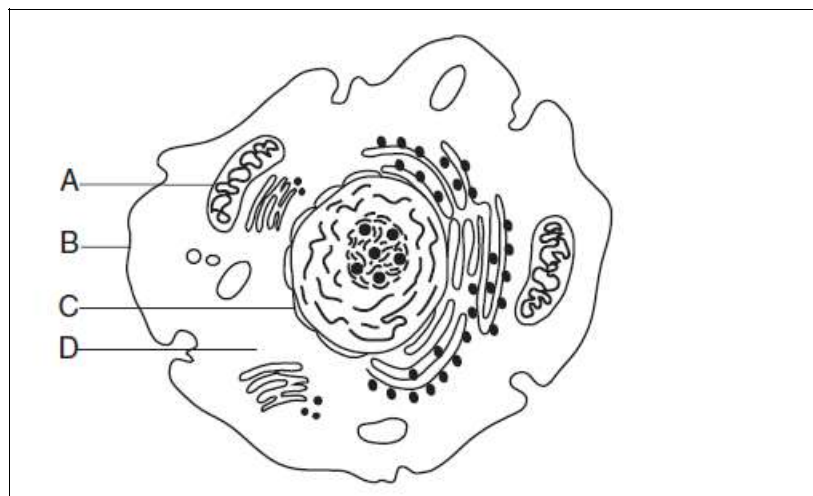
Data Base File Number: 387

Regents Date Jan2012-37.bmp

Jan2012

37 1/25/2012 S4K1

Answer 2



## cell membrane

174. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram illustrates the movement of molecules across an artificial membrane in a U-shaped glass tube. A 1% starch solution was poured into the left side of the tube, and distilled water was placed in the right side of the tube.

If a 1% salt solution were substituted for the starch solution in this setup, the results would be

- (1) different, because all of the molecules would move to the right side of the tube
- (2) similar, because the salt would block the movement of molecules across the membrane
- (3) the same, because the movement of molecules in a tube always goes from right to left
- (4) similar, because water molecules will still move across the membrane in a similar manner

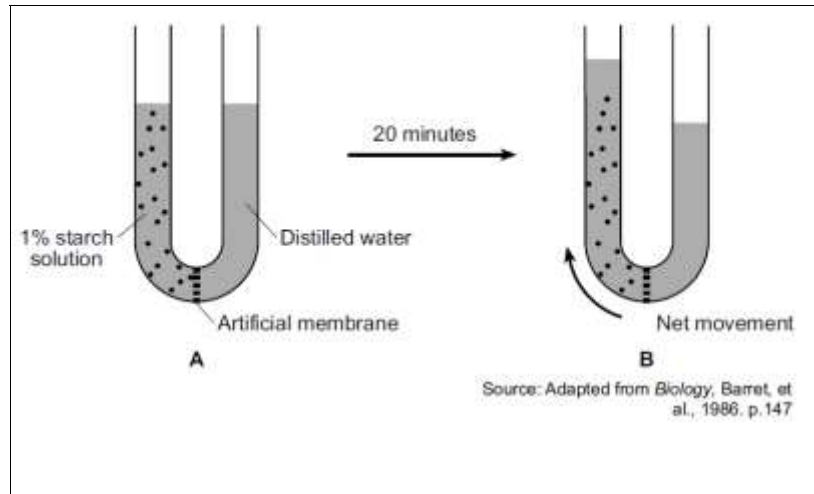
Data Base File Number: 1561

Regents Date Jan2023-80.bmp

Jan2023

81 1/24/2023 LAB5

Answer 4



## cell organization

175. Which diagram best illustrates the relationship between the number of cells, tissues, and organs in a complex multicellular organism?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

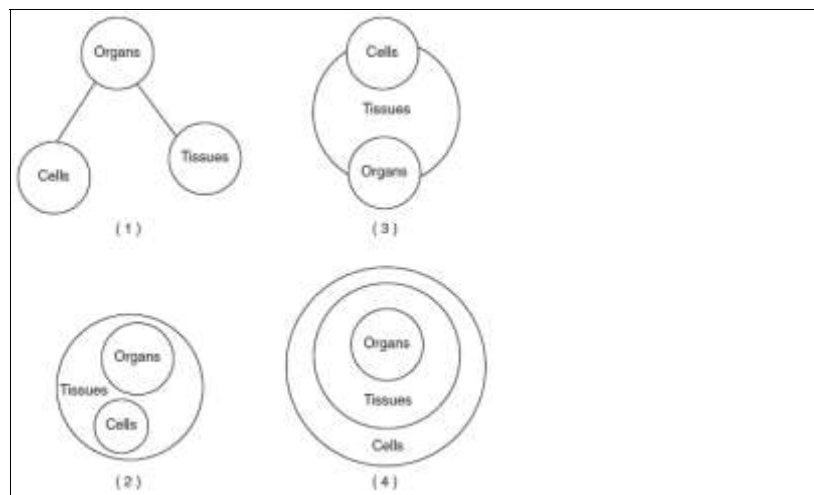
Data Base File Number: 1028

Regents Date June2015-41.bmp

June2015

41 6/16/2015 S4K1

Answer 4



## cell organization

176. The diagram shown represents levels of organization within a cell of a multicellular organism. The level represented by X is composed of

- (1) four types of base subunits
- (2) folded chains of glucose molecules
- (3) twenty different kinds of amino acids
- (4) complex, energy-rich inorganic molecules

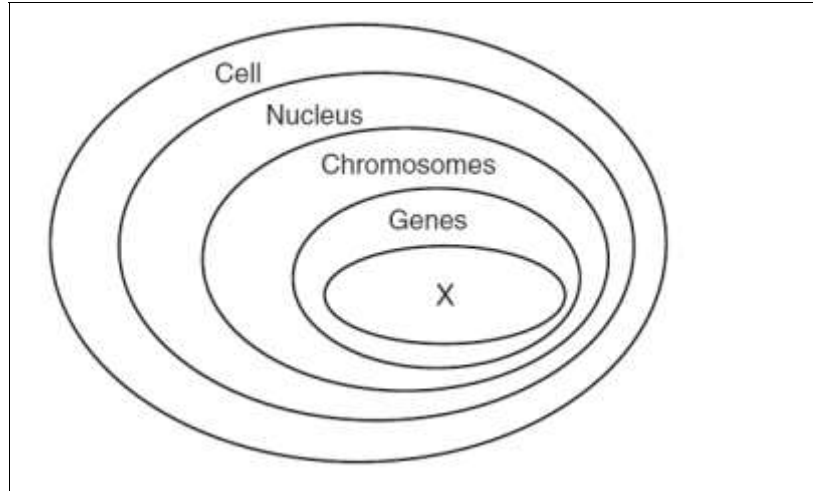
Data Base File Number: 279

Regents Date Aug2010-12.bmp

Aug2010

12 8/18/2010 S4K2

Answer 1



## cell structure

177. In the cell as shown, identify both the number and name of the structure in the cell that produces proteins

- (1) 1 - ribosome
- (2) 2 - vacuole
- (3) 3 - mitochondrion
- (4) 4 - cell membrane

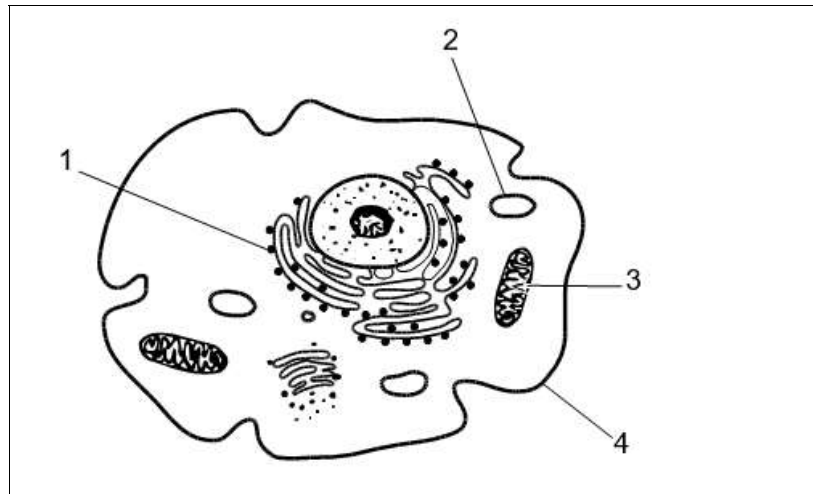
Data Base File Number: 1526

Regents Date Aug2022-55.bmp

Aug2022

55 8/17/2022 S4K6

Answer 1



**cell structure**

178. Which model best represents the relationship between a cell, a nucleus, a gene, and a chromosome?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

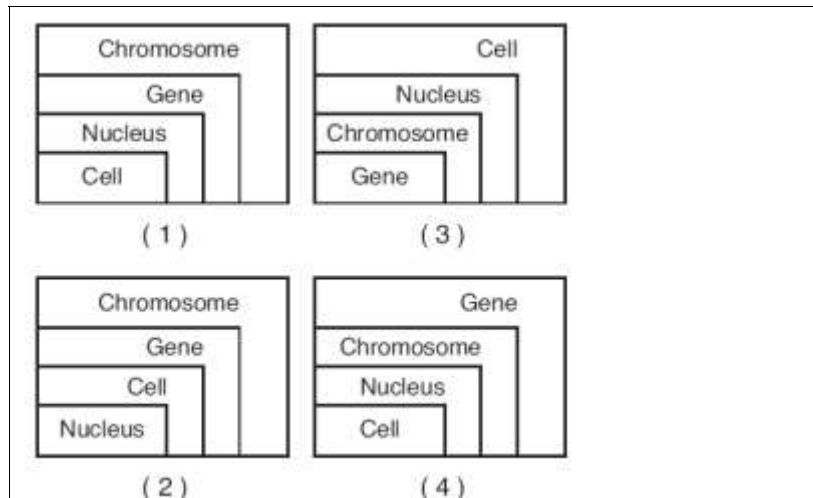
Data Base File Number: 216

Regents Date August2009--34.b

Aug2009

34 8/13/2009 S4K2

Answer 3



**cell structure**

179. Base your answer to this question the diagram shown of a cell associated with coordination and on your knowledge of biology. Structure X would be involved in the

- (1) storage of digestive enzymes
- (2) absorption of energy from the Sun
- (3) development of pathogens
- (4) synthesis of proteins

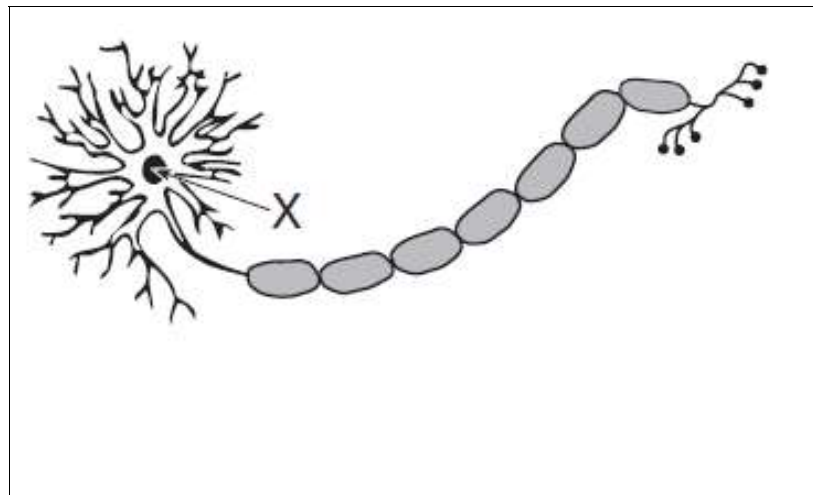
Data Base File Number: 592

Regents Date Aug2005-38.bmp

Aug2005

38 8/16/2005 S4K1

Answer 4



**cell structure**

180. The series of circles shown represent cell structure. The letter assignments are as follows: A=chromosome. B=Nucleus. C=Cell. D=Gene. Which diagram best represents the relative locations of the structures as assigned by the letters?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

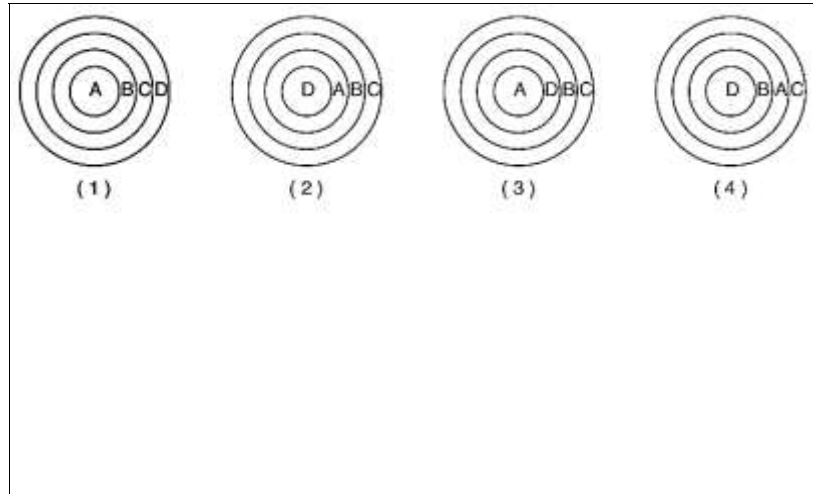
Data Base File Number: 91

Regents Date June08-9.bmp

June2008

10 6/24/2008 S4K2

Answer 2



**cell structure**

181. Base your answer to this question on the diagrams of the two cells shown, and on your knowledge of biology. Which letter ( A, B, and C) correctly identifies the cell part in BOTH diagrams?

- (1) A, cell membrane
- (2) B, chloroplast
- (3) C, vacuole
- (4) B, nucleolus

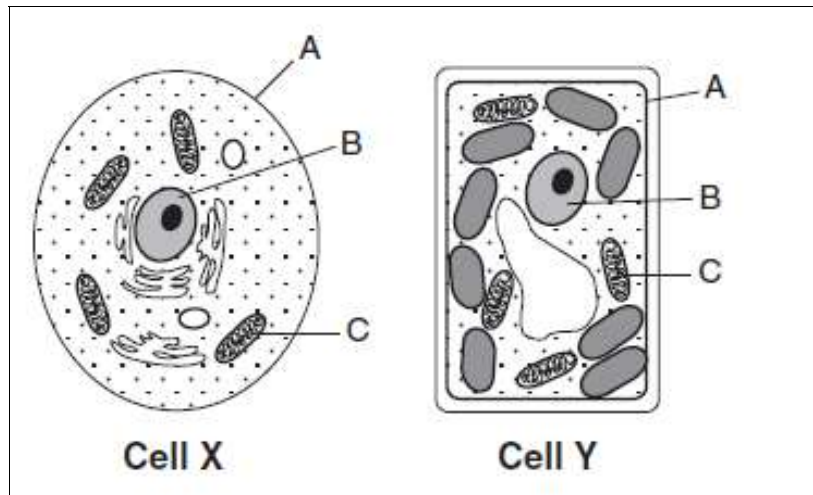
Data Base File Number: 547

Regents Date Jan2005-43.bmp

Jan2005

43 1/28/2005 S4K1

Answer 1



## cell structure

182. Which graph shown, best represents the relationship between the relative number of nuclei, genes, and chromosomes in a typical human cell?

- (1) 1 (3) 3  
 (2) 2 (4) 4

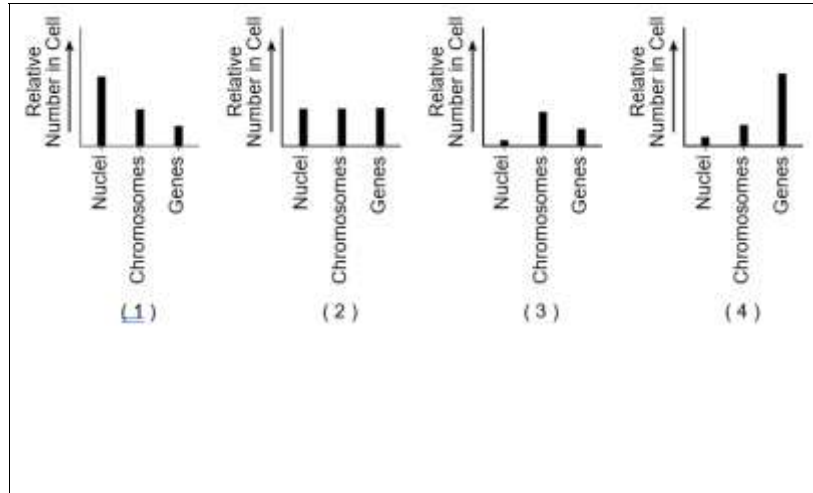
Data Base File Number: 1507

Regents Date Aug2022-28.bmp

Aug2022

28 8/17/2022 S4K2

Answer 4



## cell structure

183. Base your answer to this question on the diagram shown, which shows some of the specialized organelles in a single-celled organism, and on your knowledge of biology. What are the names of the organelles, which are labelled, IN ORDER as A, B, C, and D?

- (1) cell membrane, nucleus, contractile vacuole, and food vacuole (3) contractile vacuole, nucleus, food vacuole and cell membrane  
 (2) food vacuole, contractile vacuole, nucleus and cell membrane (4) cell membrane, contractile vacuole, receptor sites, and DNA

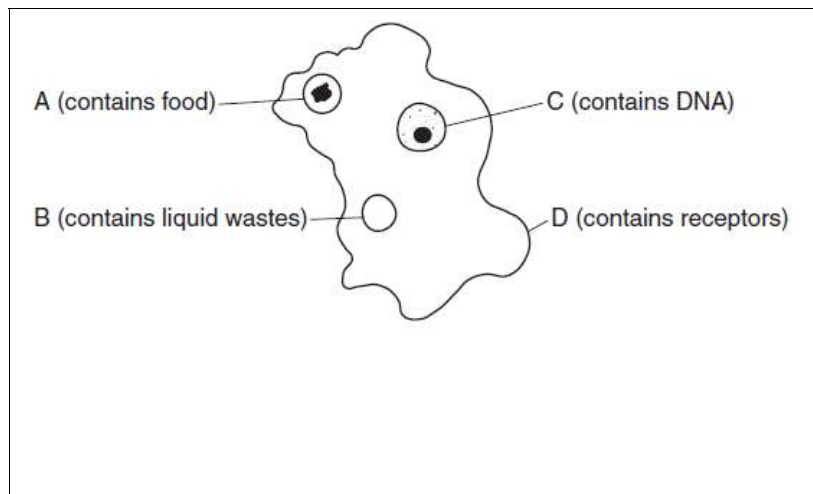
Data Base File Number: 867

Regents Date Aug2001-36.bmp

Aug2001

36 8/16/2001 S4K1

Answer 2





cell structure

184. Which diagram represents the relative sizes of the gene, cell, chromosome and nucleus? Hint: The SMALLEST structure should start in the CENTER of each diagram.

- (1) 1
- (2) 2
- (3) 3
- (4) 4

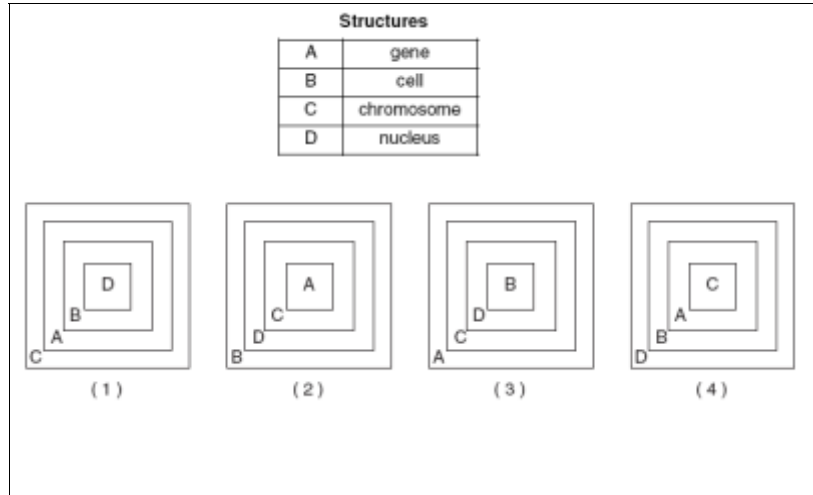
Data Base File Number: 157

Regents Date Jan09-32.bmp

Jan2009

32 1/27/2009 S4K2

Answer 2



cell structure

185. The letters in the diagram below indicate some parts of a cell. The function of which cell part is most similar to that of the human excretory system?

- (1) A
- (2) B
- (3) C
- (4) D

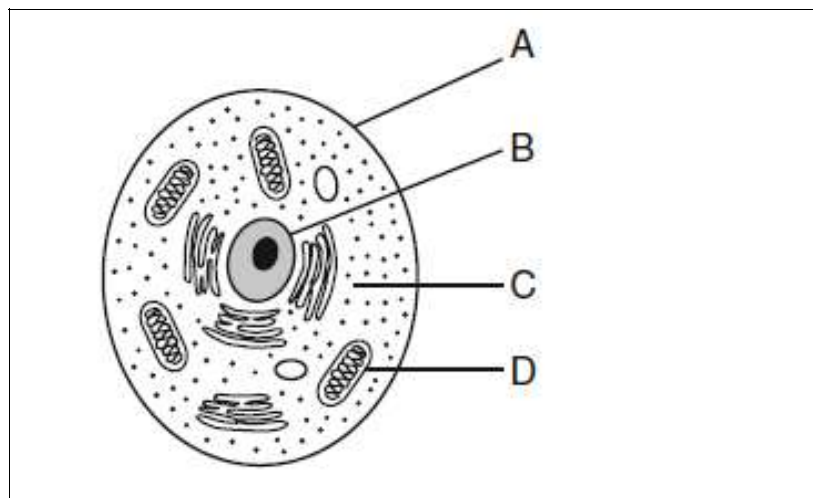
Data Base File Number: 605

Regents Date Jan2013-5.bmp

Jan2013

5 1/23/2013 S4K1

Answer 1



cell structure

186. Examine the diagram shown. Which cell structure contains information needed for protein synthesis?

- (1) 1
- (2) 2

- (3) 3
- (4) 4

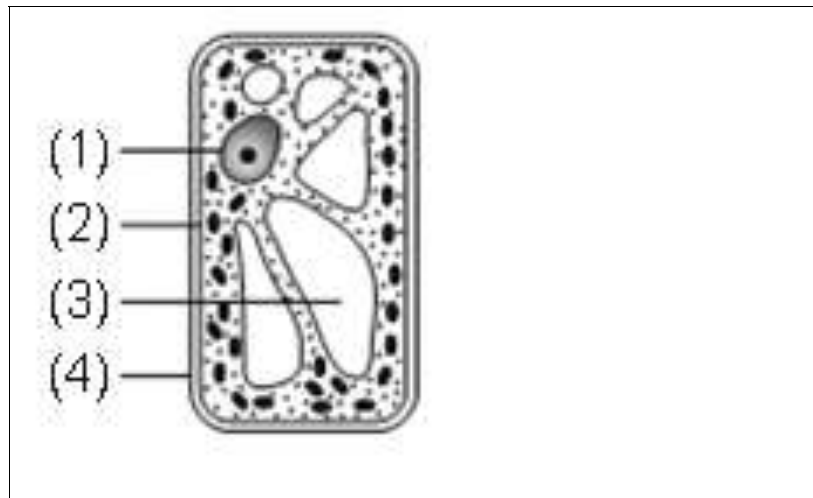
Data Base File Number: 178

Regents Date June09-3.bmp

June2009

3 6/18/2009 S4K1

Answer 1



cell structure

187. Which row in the chart below contains a cell structure paired with its primary function?

- (1) 1
- (2) 2

- (3) 3
- (4) 4

Data Base File Number: 333

Regents Date June2011-9.bmp

June2011

10 6/21/2011 S4K1

Answer 1

Row	Cell Structure	Function
(1)	ribosome	protein synthesis
(2)	vacuole	production of genetic information
(3)	nucleus	carbohydrate synthesis
(4)	mitochondrion	waste disposal

**cell structure**

188. Structures in an animal cell are represented in the diagram as shown. Which row in the chart correctly identifies the functions of structures A, B, and C?

- (1) 1
- (2) 2
- (3) 3
- (4) 4


Data Base File Number: 1098

Regents Date June2016-29.bmp

June2016

29 6/15/2016 S4K1

Answer 1



Which row in the chart correctly identifies the functions of structures A, B, and C?

Row	Structure A	Structure B	Structure C
(1)	waste removal	extract energy from nutrients	protein synthesis
(2)	information storage	transport of materials	storage of liquids
(3)	protein synthesis	storage of wastes	reproduction
(4)	cell communication	transport of materials	waste removal

**cell structure**

189. Base your answer to this question on the diagram and your knowledge of biology. The diagrams represent two different cells and some of their parts. The diagrams are not drawn to scale. Which statement best describes these cells?

- (1) Cell B lacks vacuoles while cell A has them.
- (2) DNA would not be found in either cell A or cell B.
- (3) Both cell A and cell B use energy released from ATP.
- (4) Both cell A and cell B produce antibiotics.

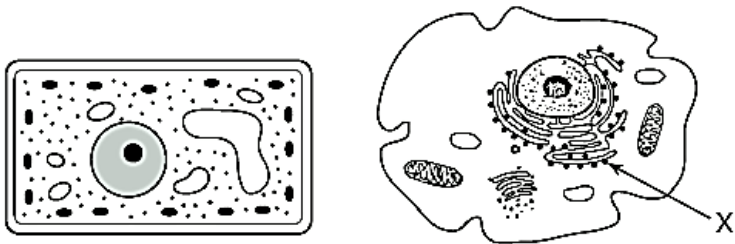
Data Base File Number: 43

Regents Date June07-45.bmp

June2007

45 6/20/2007 S4K1

Answer 3



Cell A

Cell B

cells

190. Which diagram best represents the levels of organization in the human body?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

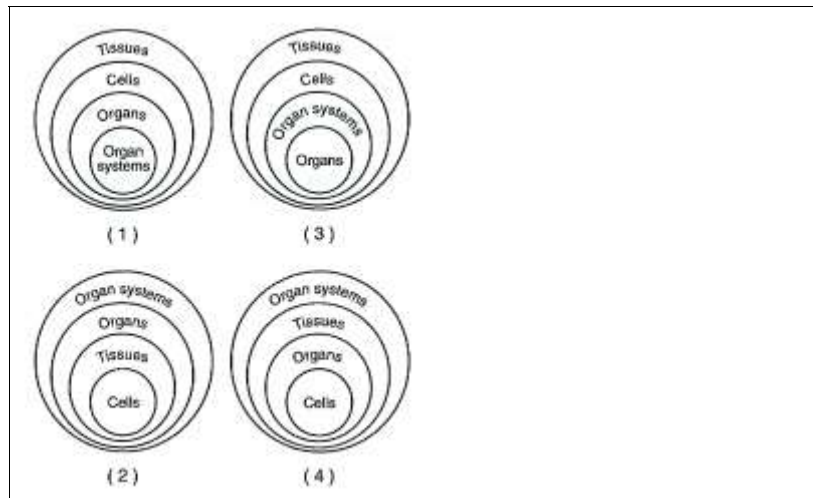
Data Base File Number: 22

Regents Date June07-2.bmp

June2007

2 6/20/2007 S4K1

Answer 2



cellular communication

191. Base your answer to this question on the diagram shown illustrating one type of cellular communication and on your knowledge of biology. In region F, there is a space between nerve cells C and D. Cell D is usually stimulated to respond by

- (1) a chemical produced by cell C moving to cell D
- (2) the movement of a virus from cell C to cell D
- (3) the flow of blood out of cell C to cell D
- (4) the movement of material through a blood vessel that forms between cell C and cell D

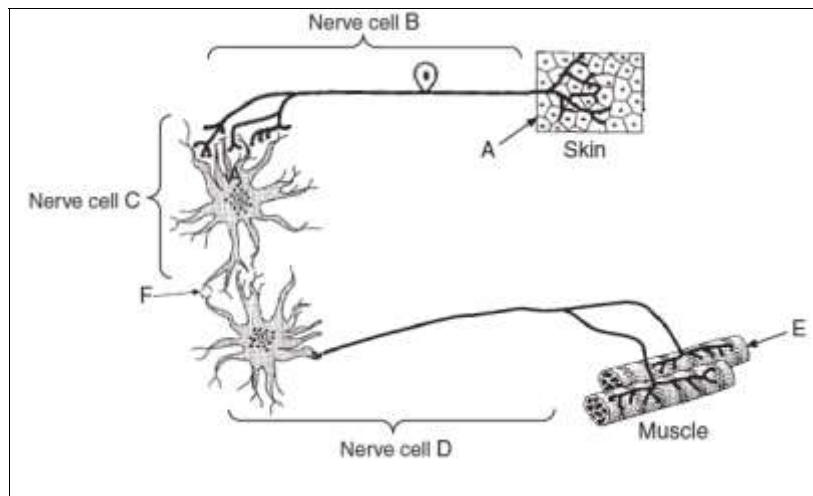
Data Base File Number: 822

Regents Date June2002-56.bmp

June2002

56 6/19/2002 S4K1

Answer 1



## cellular communication

192. Base your answer to this question on the diagram shown and on your knowledge of biology. The process represented in the diagram best illustrates

- (1) cellular communication
- (2) muscle contraction
- (3) extraction of energy from nutrients
- (4) waste disposal

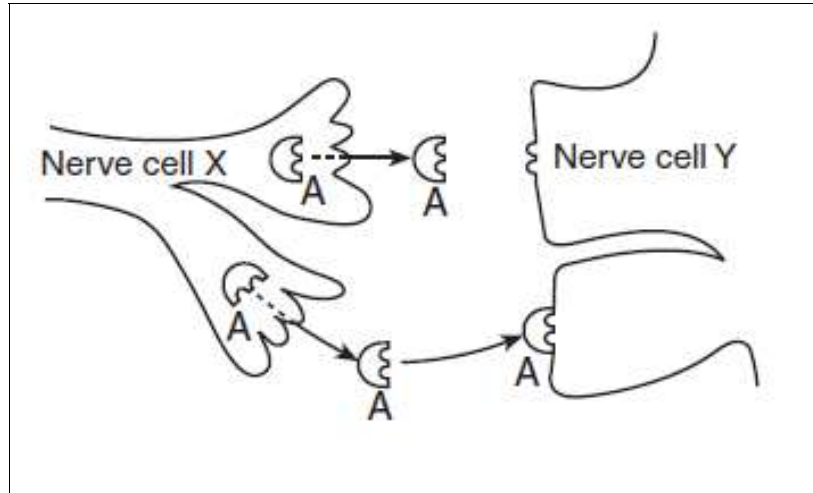
Data Base File Number: 669

Regents Date June2004-34.bmp

June2004

35 6/18/2004 S4K1

Answer 1



## cellular communication

193. Base your answer to this question the diagram shown of a cell associated with coordination and on your knowledge of biology. Which statement best describes a function of the entire structure shown in the diagram?

- (1) It unites with an egg cell during fertilization.
- (2) It synthesizes a hormone involved in the control of blood sugar level.
- (3) It releases chemicals involved in cellular communication.
- (4) It controls the replication of genetic material

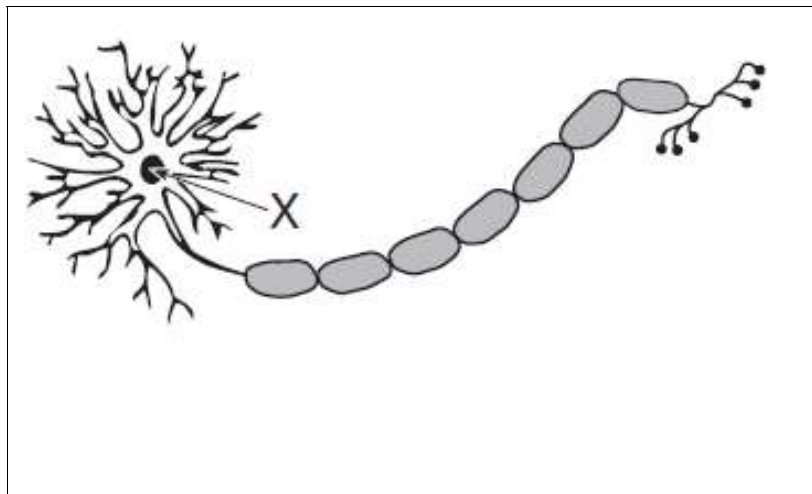
Data Base File Number: 593

Regents Date Aug2005-38.bmp

Aug2005

39 8/16/2005 S4K1

Answer 3



**cellular communication**

194. Two human nerve cells are represented in the diagram shown. The process represented in the diagram indicates that

- (1) cell A is providing food to cell B
- (2) a chemical from cell B is communicating with cell A
- (3) cells A and B are attaching to each other
- (4) cell A is communicating with cell B

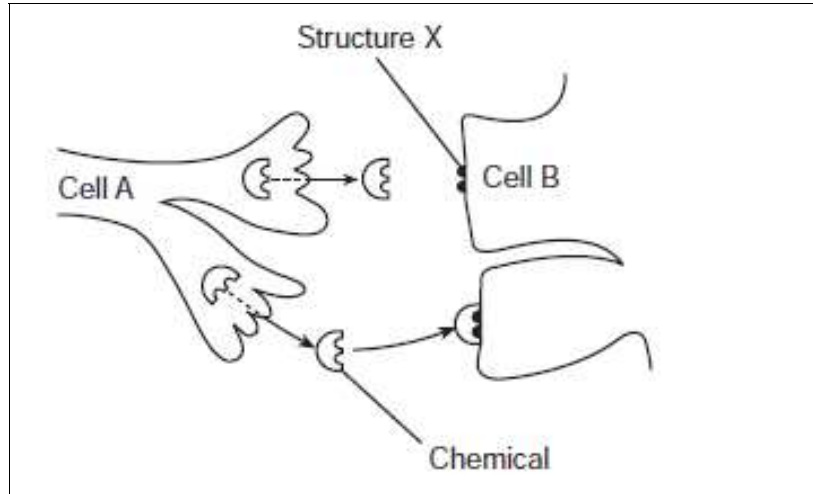
Data Base File Number: 1616

Regents Date Aug2023-42.bmp

Aug2023

42 8/17/2023 S4K1

Answer 4



**cellular communication**

195. Two types of human cells are shown in the diagram. Cell A causes the cells at B to contract. This activity would be most useful for

- (1) lifting a book from a bookshelf
- (2) coordinating the functions of organelles
- (3) digesting food in the small intestine
- (4) carrying out the process of protein synthesis

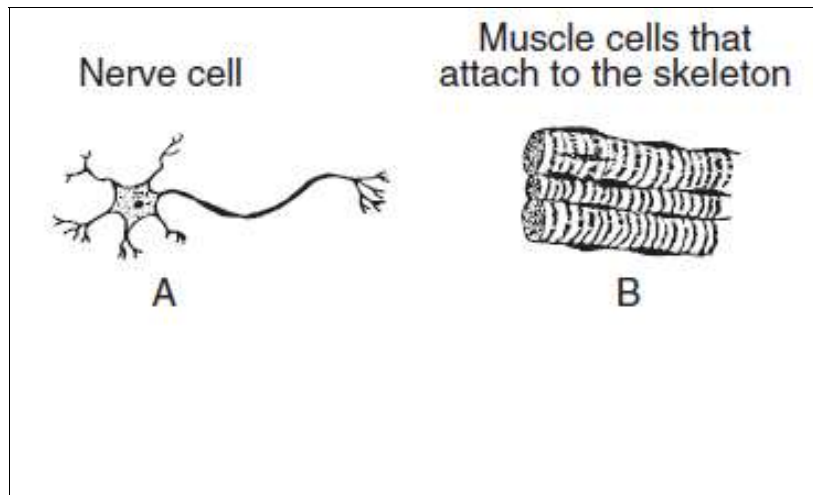
Data Base File Number: 751

Regents Date Aug2003-2.bmp

Aug2003

2 8/13/2003 S4K1

Answer 1



## cellular communication

196. Cellular communication is illustrated in the diagram shown. Information can be sent from

- (1) cell A to cell B because cell B is able to recognize signal 1
- (2) cell A to cell B because cell A is able to recognize signal 2
- (3) cell B to cell A because cell A is able to recognize signal 1
- (4) cell B to cell A because cell B is able to recognize signal 2

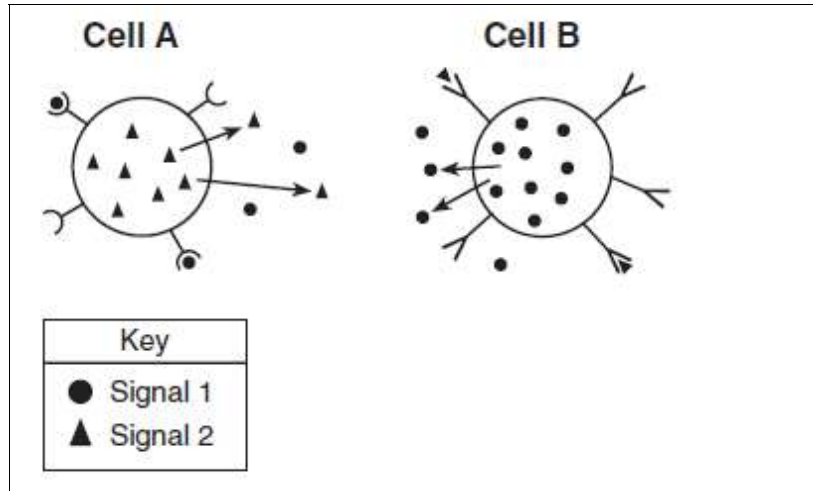
Data Base File Number: 489

Regents Date June2006-34.bmp

June2006

34 6/21/2006 S4K1

Answer 3



## centimeter measurement

197. What is the approximate length of the earthworm shown in the diagram?

- (1) 9 mm
- (2) 90 mm
- (3) 10.6 cm
- (4) 106 cm

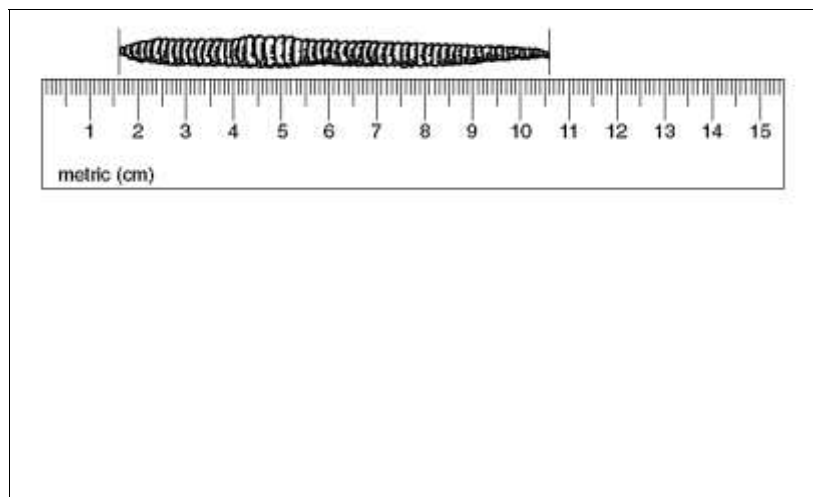
Data Base File Number: 32

Regents Date June07-31.bmp

June2007

31 6/20/2007 LABS

Answer 2





## chemical bonds

198. The two diagrams shown represent a sugar molecule and a fat molecule that are used by living organisms. Which statement best describes these two molecules?

- (1) Sugar molecules are inorganic and fat molecules are organic.
- (2) Sugar molecules are organic and fat molecules are inorganic.
- (3) Energy for life processes can be stored within the chemical bonds of both molecules.
- (4) Energy for life processes can be stored within the chemical bonds of sugar molecules, only.

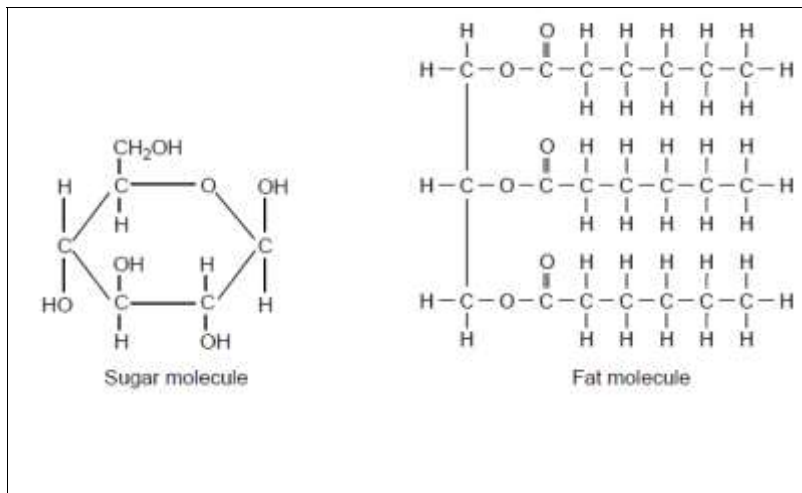
Data Base File Number: 1339

Regents Date June2019-30.bmp

June2019

30 6/18/2019 S4K5

Answer 3



## chemical bonds

199. During cellular respiration, what is the direct source of the energy used in the cells of consumers in the ecosystem represented by the diagram shown?

- (1) the Sun
- (2) enzymes
- (3) the atoms making up inorganic molecules
- (4) the chemical bonds in organic molecules

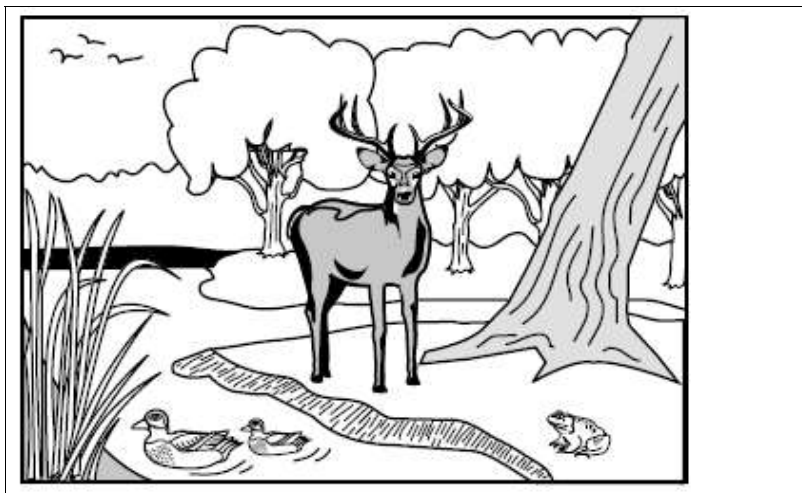
Data Base File Number: 1232

Regents Date Jan2018-27.bmp

Jan2018

27 1/22/2018 S4K5

Answer 4





## chemical message

200. Unlike telephone messages that pass over the telephone wires, messages between parts of the body are carried by a series of nerve cells that are not in direct contact with each other. Communication between two nerve cells is represented in the diagram as shown. Which statement best explains how the message is delivered, even though these cells are NOT physically connected with each other?

- (1) The cells communicate with the use of chemical messengers between them.
- (2) The cells send messages by direct contact with other types of cells.
- (3) Nutrients are the primary means of communication between cells.
- (4) Ribosomes move out of one nerve cell into the other.

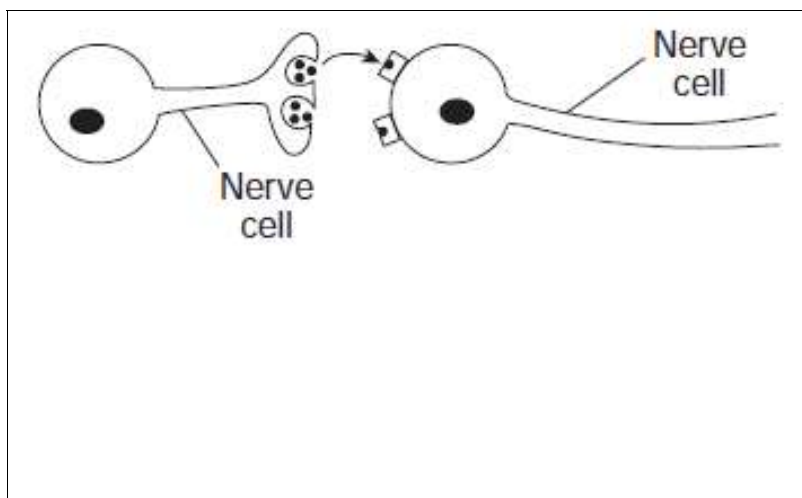
Data Base File Number: 1644

Regents Date Jan2024-14.bmp

Jan2024

14 1/23/2024 S4K1

Answer 1



## chemical message

201. Base your answer to this question on the diagram shown and on your knowledge of biology. Structure X most likely functions in the

- (1) transport of chemical messenger molecules into the cell nucleus
- (2) extraction of energy from nutrients
- (3) separation of cell contents from the outside environment
- (4) digestion of large molecules

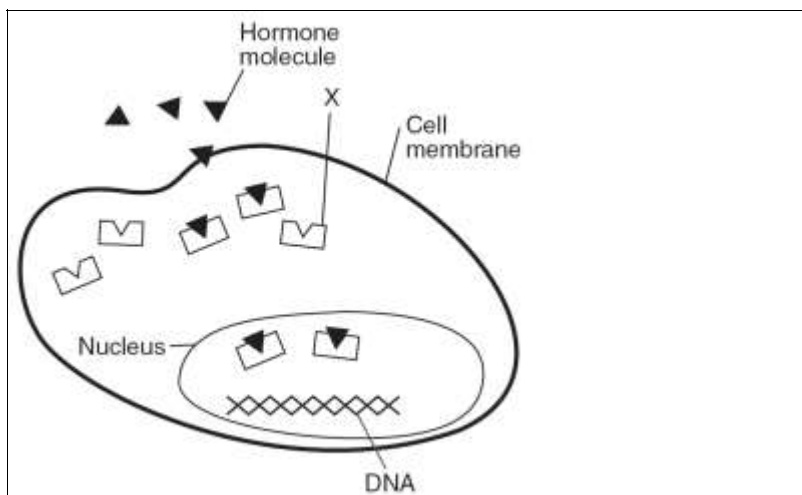
Data Base File Number: 341

Regents Date June2011-34.bmp

June2011

34 6/21/2011 S4K1

Answer 1



## chemical message

202. The diagram shows how a chemical message produced by one cell is received by other cells. If these chemical messages are destroyed, the target cells will

- (1) produce their own chemical messages
- (2) not respond with appropriate actions
- (3) develop different receptors
- (4) no longer be produced in the organism

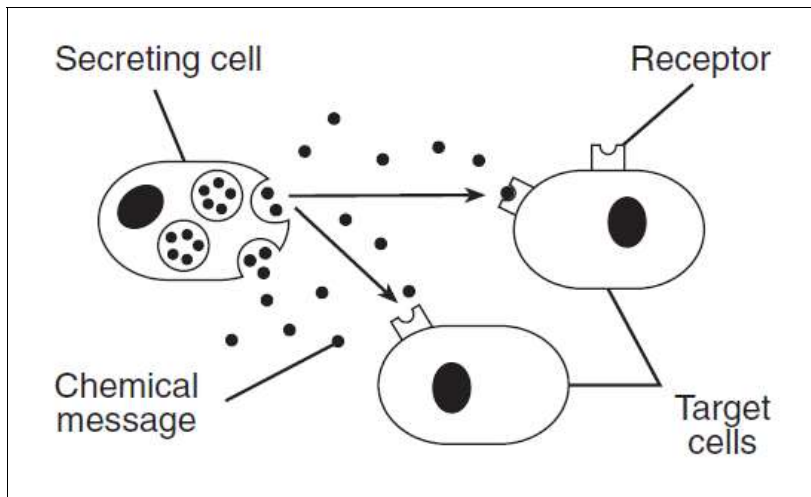
Data Base File Number: 302

Regents Date Jan2011-4.bmp

Jan2011

4 1/25/2011 S4K1

Answer 2



## chemical structure

203. The structural formulas shown below represent parts of two different complex carbohydrate molecules composed of glucose subunits. Molecules 1 and 2 differ in their overall structure. Due to the differences in structure, each of these molecules most likely

- (1) is composed of different molecular bases
- (2) forms a different protein
- (3) contains different elements
- (4) performs a different function

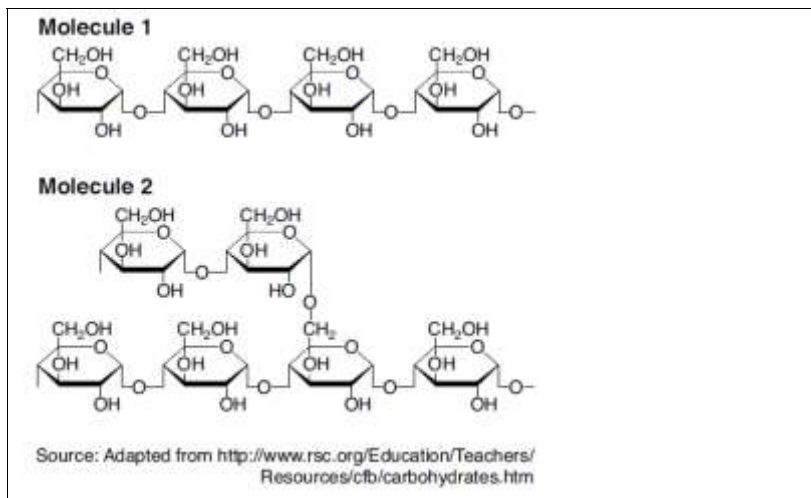
Data Base File Number: 1434

Regents Date June2021-40.bmp

June2021

40 6/22/2021 S4K5

Answer 4



## chloroplast

204. Base your answer to this question on the information and diagram shown and on your knowledge of biology. An investigation was conducted to compare two different types of plants. A student used a microscope to observe the cells in a cross section of a lilac leaf (diagram A) and a cell from the leaf of a freshwater plant (diagram B).

What is the structure labeled Y in both diagrams.

- (1) mitochondrion
- (2) nucleus
- (3) chloroplast
- (4) ribosome

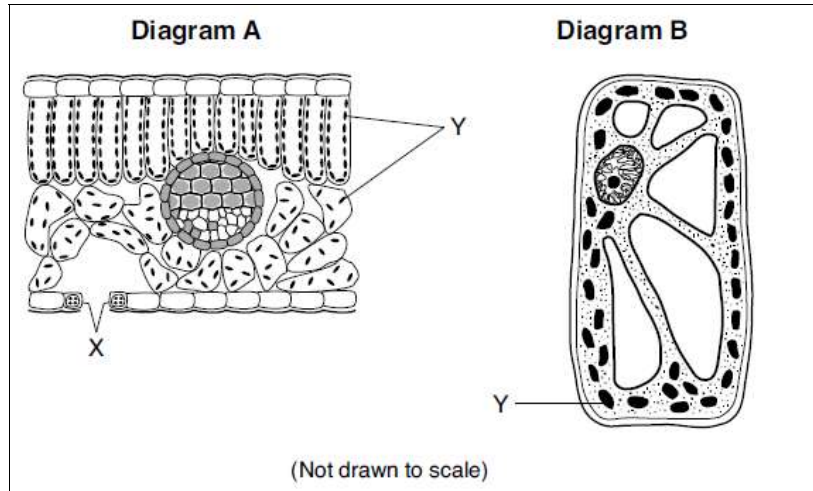
Data Base 1316  
File Number:

Regents Date Jan2019-49.bmp

Jan2019

49 1/22/2019 S4K5

Answer 3



## chloroplast

205. Base your answer to this question on the diagram shown and information given and on your knowledge of biology. The diagram represents a germinating bean seed that has been split open. When water is available and growth begins, the plant embryo inside the seed secretes enzymes to digest the starch stored in the seed. Plants are able to continue to grow and develop once the starch supply in the seed is gone, because they

- (1) develop roots to absorb starch from the environment
- (2) grow leaves, which use light energy for cell respiration
- (3) have chloroplasts and use light energy to make more food
- (4) produce more seeds, which contain additional food reserves

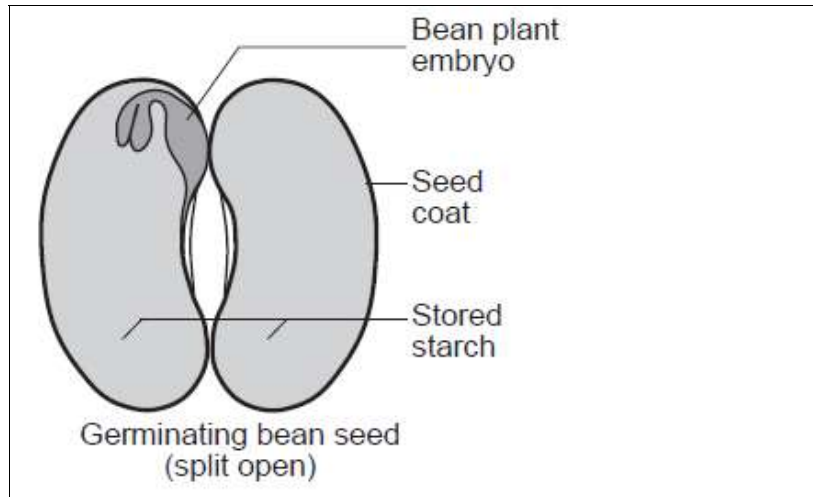
Data Base File Number: 1078

Regents Date Jan2016-37.bmp

Jan2016

38 1/27/2016 S4K5

Answer 3



## chloroplast

206. The diagram shown illustrates the movement of materials involved in a process that is vital for the energy needs of organisms. The process illustrated occurs within

- (1) chloroplasts
- (2) mitochondria
- (3) ribosomes
- (4) vacuoles

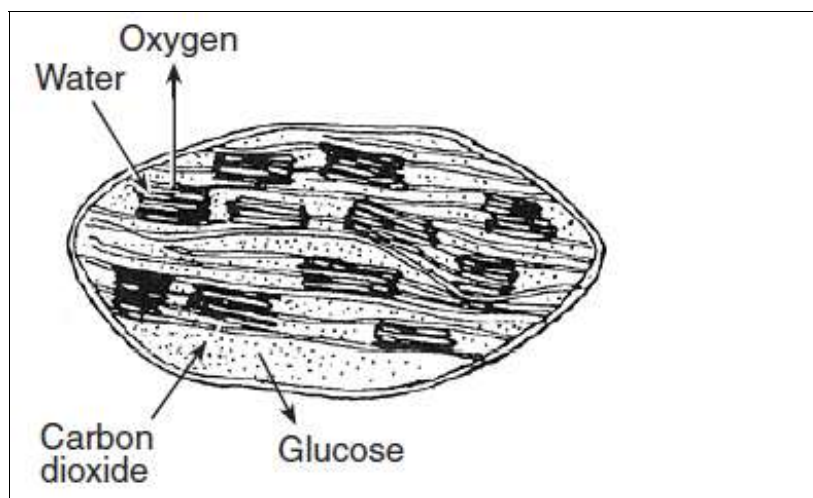
Data Base File Number: 583

Regents Date Aug2005-21.bmp

Aug2005

21 8/16/2005 S4K5

Answer 1



## chloroplast

207. COLEUS is a type of plant that has many variations in its leaves. Many coleus plants have chloroplast-rich areas on the edge of the leaf. Other areas in the middle lack chloroplasts. A student exposed the coleus leaf to sunlight. Later, starch indicator was added to the entire leaf. The diagram shows the result of the experiment. Which statement is a valid claim, supported by evidence from this experiment?

- (1) Chloroplasts are necessary for the production of starch indicator.
- (2) Starch indicator causes leaves to produce oxygen.
- (3) Chloroplasts are necessary for the production of starch.
- (4) Water is necessary for the production of starch.

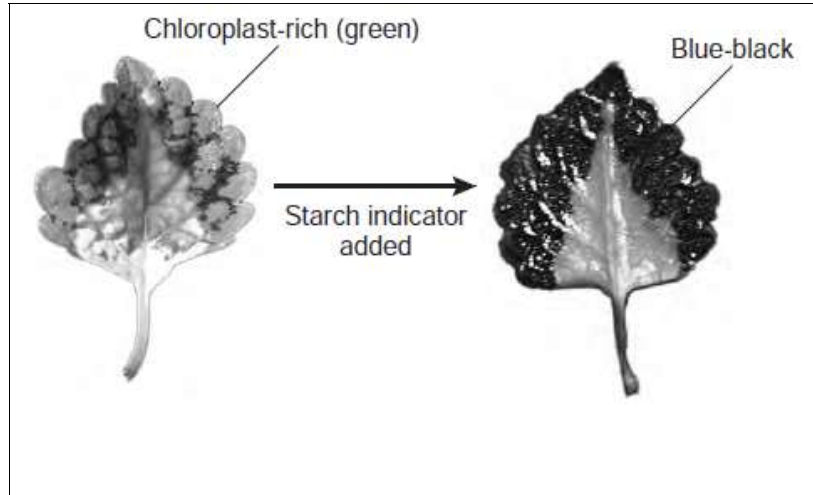
Data Base 1695  
File Number:

Regents Date Aug2024-33.bmp

Aug2024

33 8/20/2024 S4K5

Answer 3



## chloroplast

208. Base your answer to this question on the information given, and the photograph shown, and on your knowledge of biology. The photograph shows an oriental hornet. Oriental hornets are unique insects. A yellow pigment in the body of the insect converts solar energy to electrical energy. Plants also convert energy from the Sun. Identify the organelle present in plants where this conversion takes place.

(1) nucleus

(3) mitochondrion

(2) chloroplast

(4) ribosome

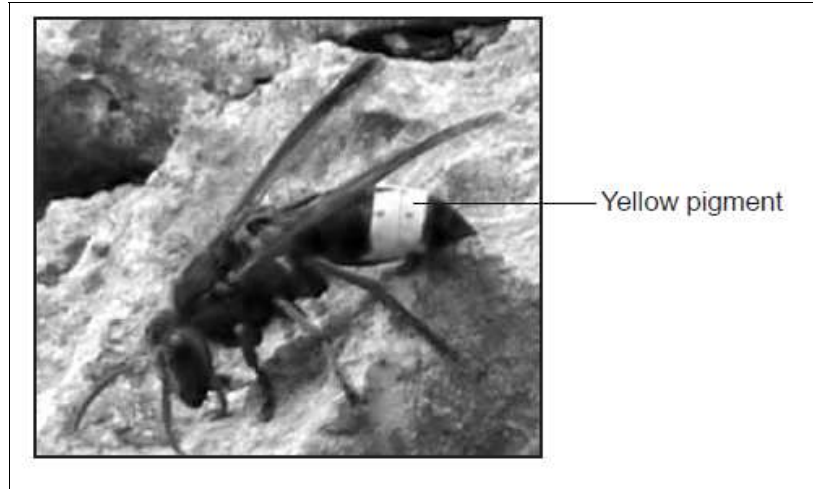
Data Base File Number: 1114

Regents Date June2016-51.bmp

June2016

51 6/15/2016 S4K5

Answer 2



## chloroplast

209. The diagram shown represents a cell of a green plant. Solar energy is used to produce energy-rich compounds in structure

(1) A

(3) C

(2) B

(4) D

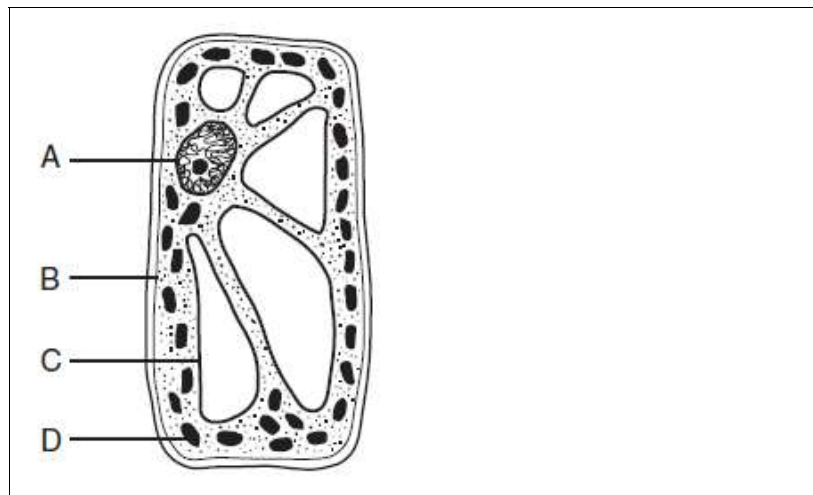
Data Base File Number: 367

Regents Date Aug2011-38.bmp

Aug2011

38 8/18/2011 S4K5

Answer 4



## chromatography

210. A chromatography setup is shown in the diagram. One error in the setup is

- (1) the stopper should have a hole in it
- (2) the pigment spot is below the surface of the solvent
- (3) the pigment is not properly placed on the paper
- (4) the solvent is not identified

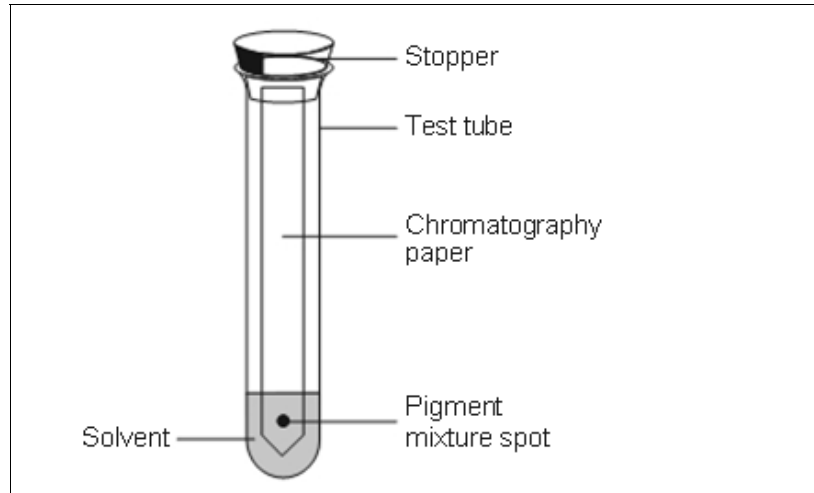
Data Base File Number: 206

Regents Date June09-63.bmp

June2009

63 6/18/2009 LABS

Answer 2



## chromatography

211. Base your answer to this question on the results of an experiment using plant pigments represented as shown in the diagram and on your knowledge of biology. Which phrase could be used to describe this technique?

- (1) the use of chromatography to separate molecules in a mixture
- (2) the use of cut leaves to observe certain colors
- (3) using indicators to determine pH
- (4) using dichotomous keys to identify plants

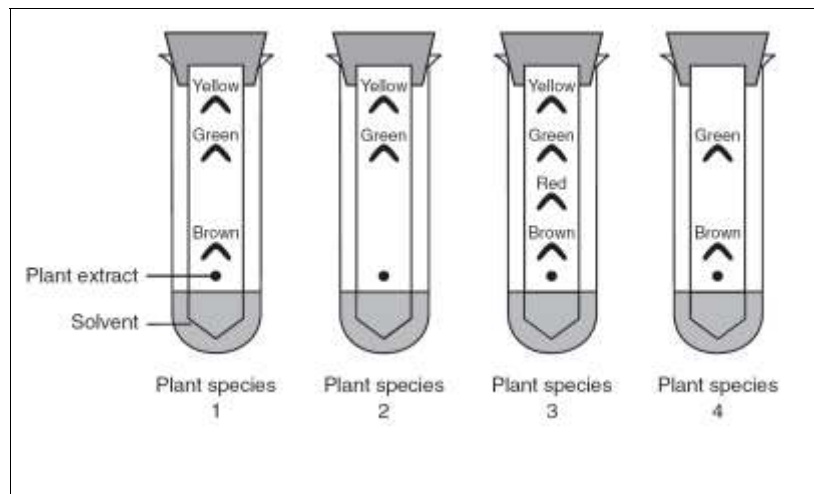
Data Base File Number: 356

Regents Date June2011-82.bmp

June2011

82 6/21/2011 LAB1

Answer 1





## chromatography

212. A laboratory setup that can be used to provide information about relationships between four plant species is represented in the diagram. This setup is part of the technique known as

- (1) electrophoresis  
 (2) biological staining  
 (3) dissection  
 (4) chromatography

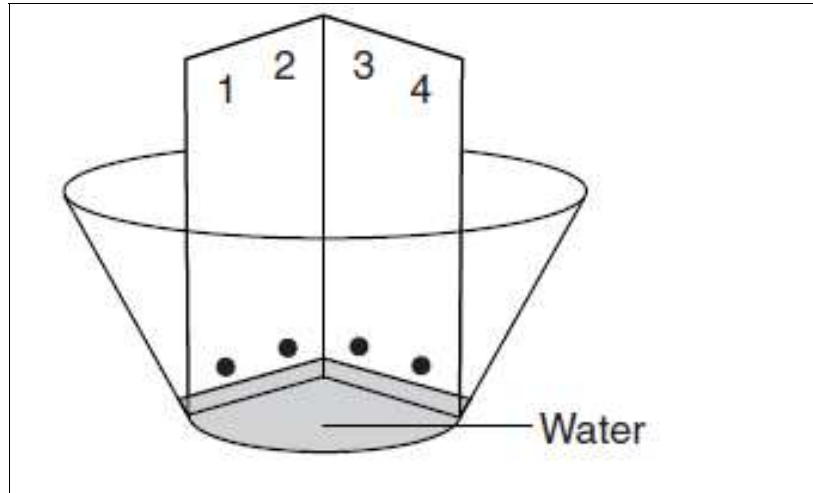
Data Base File Number: 1004

Regents Date Jan2015-73.bmp

Jan2015

73 2/26/2015 LAB1

Answer 4



## chromosome

213. The diagram shown represents a male and female frog with a model of their chromosomes and their tadpole offspring. Identify the pattern of chromosomes possible in the tadpole offspring from these parent frogs.

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

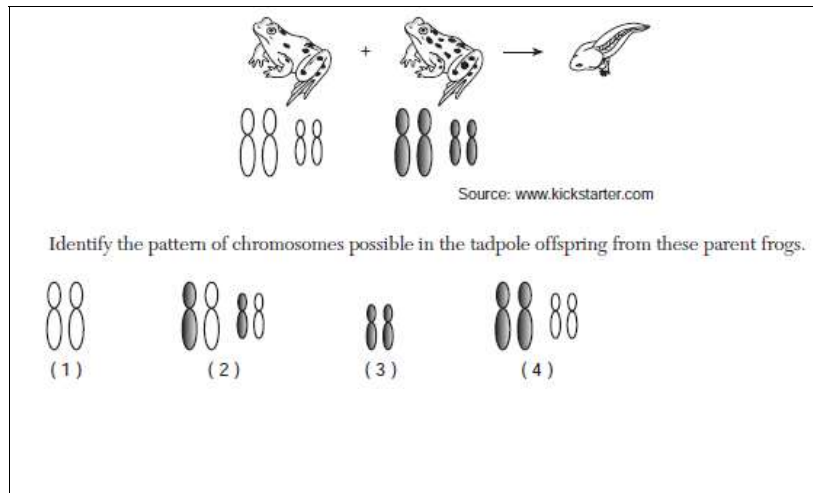
Data Base File Number: 1614

Regents Date Aug2023-40.bmp

Aug2023

40 8/17/2023 S4K4

Answer 2





## chromosome

214. The diagram as shown represents part of a biological process that begins with a chromosome containing a specific human gene being removed from a human cell. The overall process is important because it

- (1) may be used to make human DNA identical to that of other organisms
- (2) helps scientists understand how amino acids are grouped together to form a genetic code
- (3) results in the production of carbohydrates that cannot mutate and cause disease
- (4) may be used to produce chemicals that can be used to treat certain human disorders

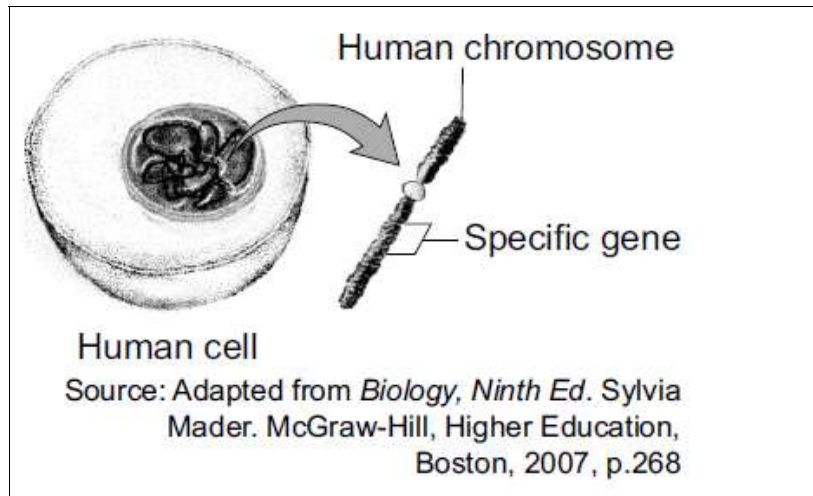
Data Base File Number: 1545

Regents Date Jan2023-30.bmp

Jan2023

30 1/24/2023 S4K5

Answer 4



## chromosome / crossing over

215. The diagram shows a process that can occur during meiosis. The most likely result of this process is

- (1) a new combination of inheritable traits that can appear in the offspring
- (2) an inability to pass either of these chromosomes on to offspring
- (3) a loss of genetic information that will produce a genetic disorder in the offspring
- (4) an increase in the chromosome number of the organism in which this process occurs

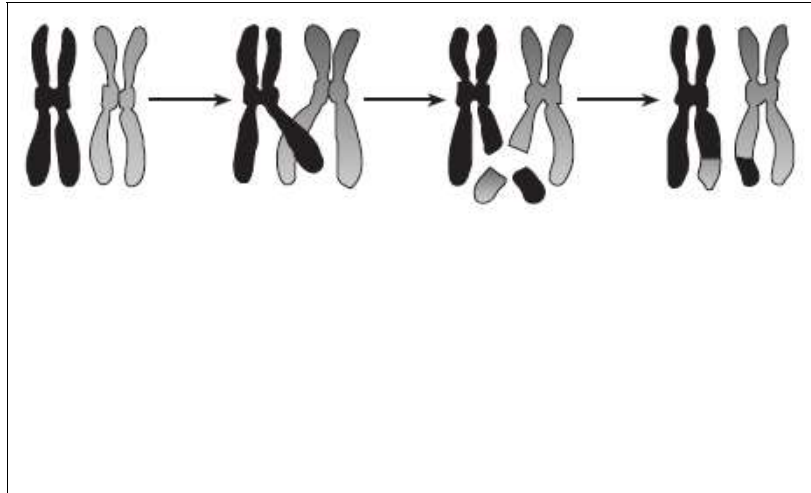
Data Base File Number: 732

Regents Date June2003-15.bmp

June2003

15 6/19/2003 S4K3

Answer 1



## chromosome / crossing over

216. The diagram shows a process that affects chromosomes during meiosis. This process can be used to explain

- (1) why some offspring are genetically identical to their parents
- (2) the process of differentiation in offspring
- (3) why some offspring physically resemble their parents
- (4) the origin of new combinations of traits in offspring

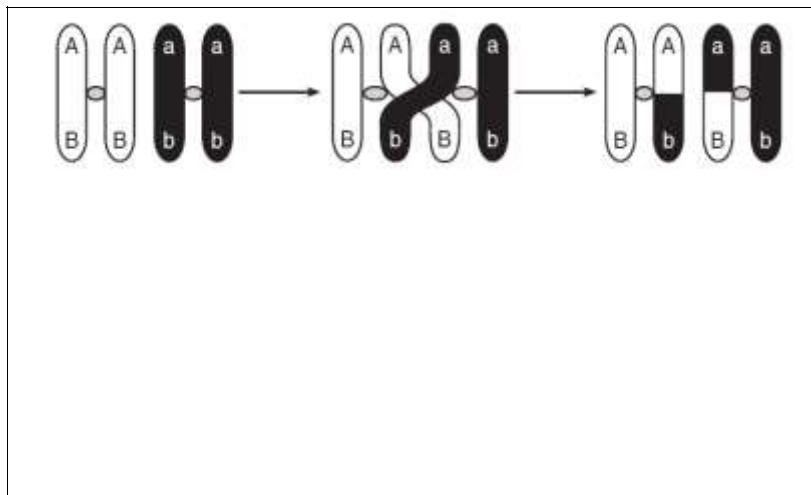
Data Base File Number: 277

Regents Date Aug2010-10.bmp

Aug2010

10 8/18/2010 S4K3

Answer 4



**chromosome / number**

217. Base your answer to this question on the diagram shown and on your knowledge of biology. Why is "Process 2" necessary in sexual reproduction?

- (1) It creates the "n" number of chromosomes in the embryo.
- (2) It permits the formation of the zygote by meiosis.
- (3) It restores the normal species number of chromosomes.
- (4) It permits the formation of the zygote by mitosis.

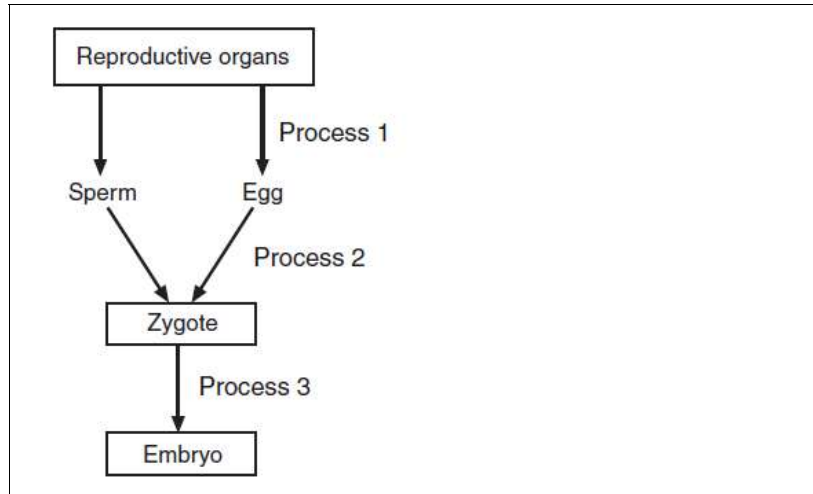
Data Base File Number: 719

Regents Date Jan2003-46.bmp

Jan2003

46 1/30/2003 S4K4

Answer 3



**chromosome / number**

218. Base your answer to this question on the information given and your knowledge of biology. Examine the diagram shown. The diagram is a photograph of chromosomes in a human with a genetic defect. What is most likely the genetic defect? (Photo Credit KATERYNA KON / SCIENCE PHOTO LIBRARY)

- (1) Down syndrome
- (2) sickle cell anemia
- (3) cancer
- (4) hemophilia

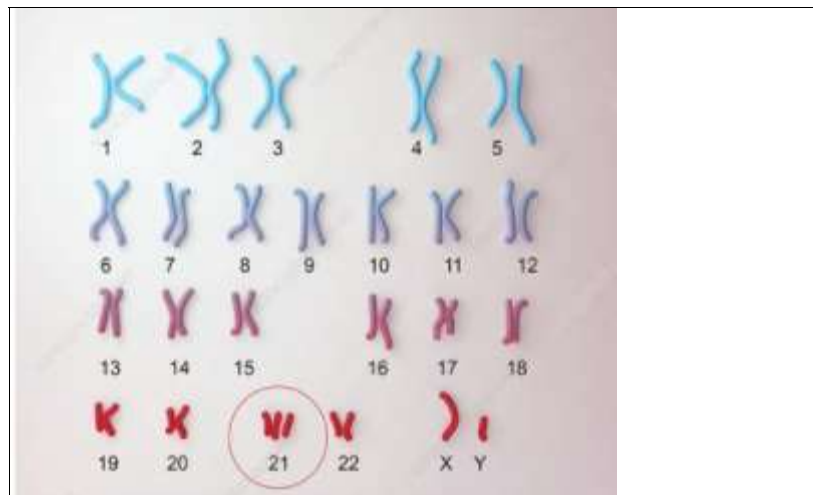
Data Base File Number: 1453

Regents Date KaryotypeDown.

RBS2021

1 8/26/2021 RBS

Answer 1



chromosome / number

219. Base your answer to this question on the information given and your knowledge of biology. A domestic horse ("Equus caballus") can be crossed with a donkey ("Equus asinus") to produce a mule as shown in the diagram. A horse normally has a diploid (2n) chromosome number of 64. A donkey normally has a diploid (2n) chromosome number of 62. What is the normal diploid (2n) chromosome number of the mule produced by the cross?

- (1) 62
- (2) 63
- (3) 64
- (4) 65

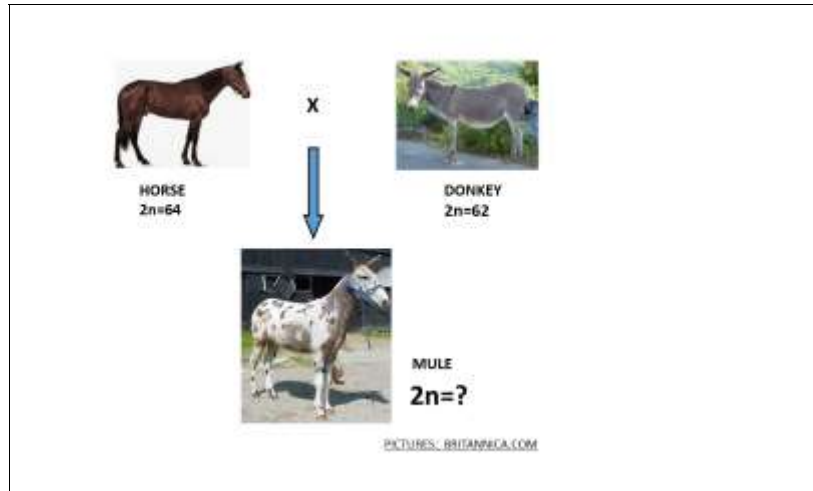
Data Base File Number: 1452

Regents Date MULE.bmp

RBS2021

1 8/20/2021 RBS

Answer 2



chromosome / number

220. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a single-celled organism, such as an ameba, undergoing the changes shown. The genetic content of C is usually identical to the genetic content of

- (1) B but not D
- (2) both B and D
- (3) D but not A
- (4) both A and D

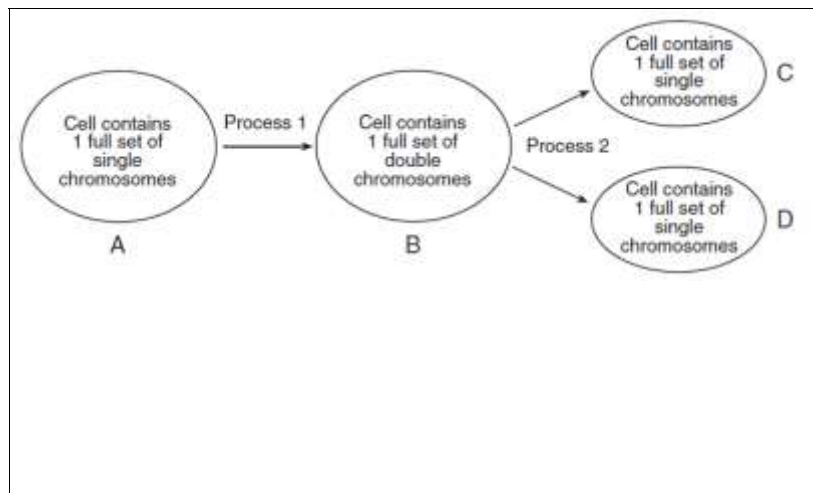
Data Base File Number: 517

Regents Date Aug2006-31.bmp

Aug2006

34 8/16/2006 S4K2

Answer 4



## chromosome / number

221. A female giraffe has 62 chromosomes in each of her skin cells. How many chromosomes will be in the skin cells of her offspring?

(1) 124

(3) 31

(2) 62

(4) 30

Data Base File Number: 1423

Regents Date June2021-14.bmp

June2021

14 6/22/2021 S4K2

Answer 2



## chromosome bands

222. The diagram shown represents the banding pattern for human chromosome 11, with some of the bands labeled. The bands represent

(1) proteins

(3) starches

(2) genes

(4) enzymes

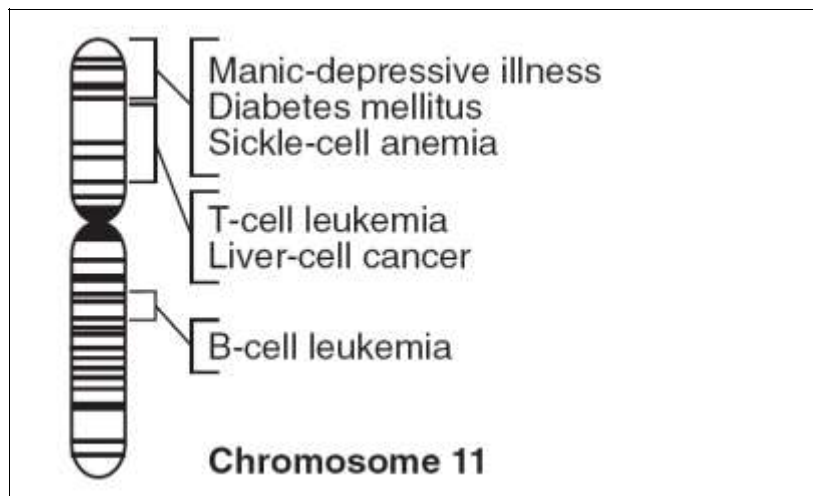
Data Base File Number: 332

Regents Date June2011-6.bmp

June2011

6 6/21/2011 S4K2

Answer 2



## chromosome bands

223. A student used a microscope to examine some cells. He observed strands located in the nuclei of these cells. See the photo of the cells. These strands are responsible for coding different proteins and are known as

- (1) chromosomes
- (2) chromosomes
- (3) ribosomes
- (4) chloroplasts

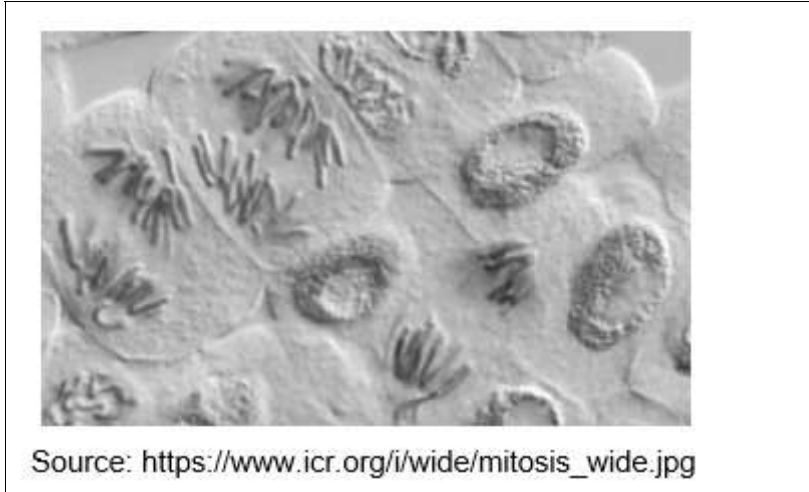
Data Base File Number: 1500

Regents Date Aug2022-10.bmp

Aug2022

10 8/17/2022 S4K1

Answer 1



## chromosome bands

224. The Y-chromosome carries the SRY gene that codes for the production of testosterone in humans. Occasionally a mutation occurs resulting in the SRY gene being lost from the Y-chromosome and added to the X-chromosome, as shown in the diagram. Based on the diagram, which statement is correct?

- (1) The production of testosterone influences the development of male characteristics.
- (2) Reproductive technology has had an important influence on human development.
- (3) Normal female characteristics develop from a single X-chromosome.
- (4) Male characteristics only develop in the absence of X-chromosomes.

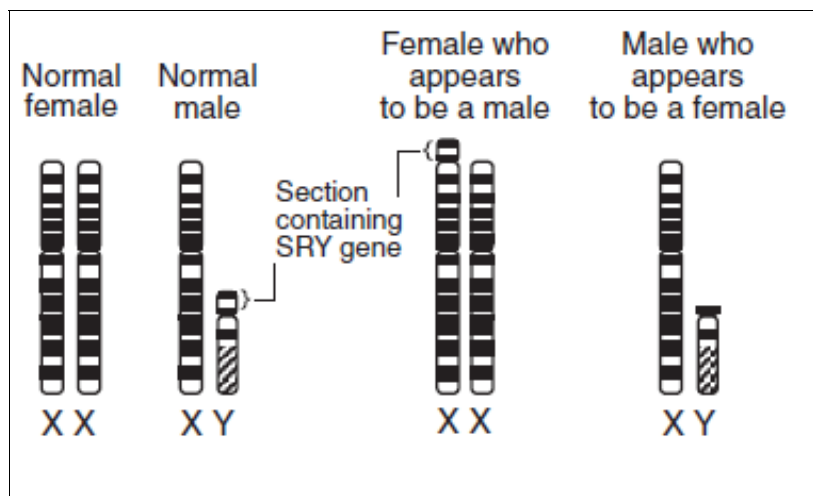
Data Base File Number: 589

Regents Date Aug2005-34.bmp

Aug2005

34 8/16/2005 S4K2

Answer 1



**chromosome number / diploid**

225. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the reproductive cycle of a squirrel species with 40 chromosomes in each zygote. A liver cell in this species of squirrel would have

- (1) 20 chromosomes
- (2) 40 chromosomes
- (3) 60 chromosomes
- (4) 80 chromosomes

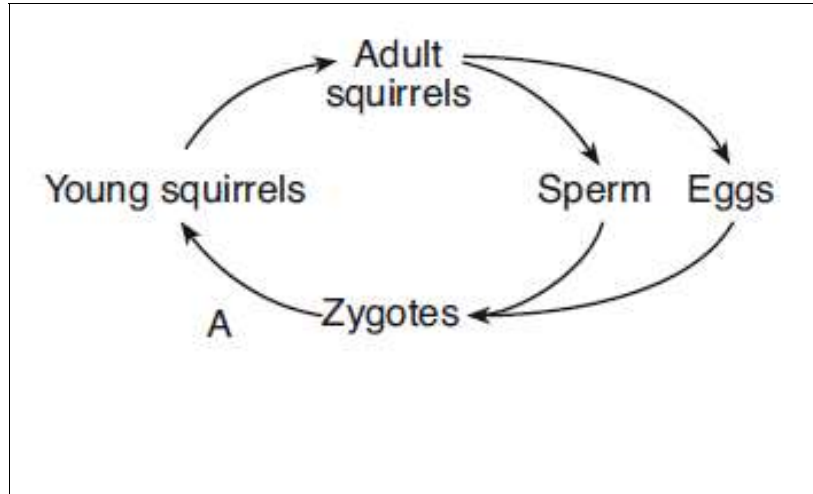
Data Base File Number: 416

Regents Date June2012-38.bmp

June2012

39 6/19/2012 S4K4

Answer 2



**circulatory**

226. Which of the systems in the chart shown work together to take in and move oxygenated blood to the muscles for use.

- (1) Row 1
- (2) Row2
- (3) Row 3
- (4) ALL the rows

Data Base File Number: 1386

Regents Date Aug2019-84.bmp

Aug2019

84 8/14/2019 LAB2

Answer 1

	System	System	System
Row 1	Respiratory	Circulatory	Muscular
Row 2	Muscular	Circulatory	Excretory
Row 3	Digestive	Circulatory	Muscular

**circulatory**

227. Lymphatic capillaries are found throughout the body. Both the lymphatic and circulatory systems transport substances between the bloodstream and body tissues. These two systems are also involved in fighting infections. The arrows shown in the diagram that go from the blood capillaries to the interstitial fluid most likely represent the

- (1) release of red blood cells, so that they can diffuse into body cells and fight bacteria
- (2) movement of materials from the circulatory system that will eventually enter lymphatic capillaries
- (3) transport of digestive enzymes from the blood to help with the digestion of glucose in muscle cells
- (4) transport of glucose molecules from the blood to be used by cells to attack proteins and fats

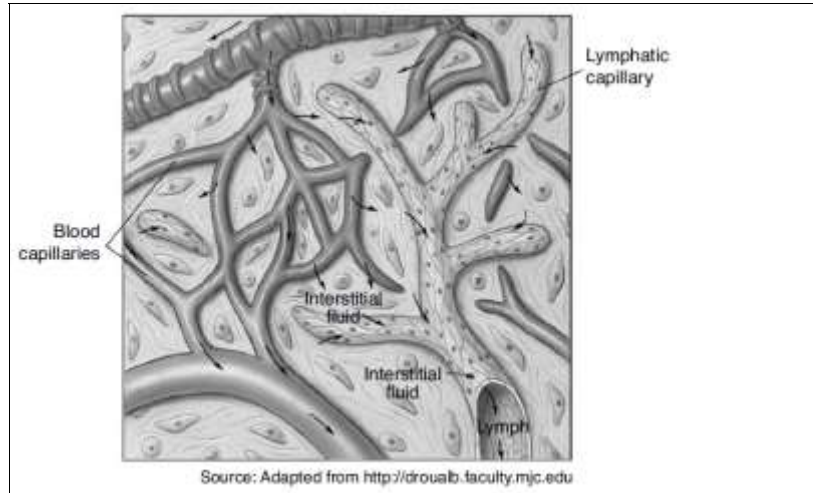
Data Base File Number: 1436

Regents Date June2021-42.bmp

June2021

42 6/22/2021 S4K5

Answer 2



**circulatory**

228. Base your answers to this question on the data table shown and on your knowledge of biology. A group of students obtained the data as shown in the data table. The activity of which body system was measured to obtain these data?

- (1) excretory
- (2) circulatory
- (3) skeletal
- (4) digestive

Data Base File Number: 471

Regents Date Jan2006-67.bmp

Jan2006

67 1/27/2006 LAB5

Answer 2

Student Tested	Pulse Rate at Rest	Pulse Rate After Exercising
1	70	97
2	75	106
3	84	120
4	60	91
5	78	122



**classification**

229. Base your answer to this question on the information provided and on your knowledge of biology. A student observed the physical characteristics of seven organisms and prepared the data table as shown. One of the student's classmates sorted the seven organisms into two groups. GROUP 1 included the fly and parrot. GROUP 2 contained all the other organisms. Which characteristic from the data table did the student use to GROUP the organisms?

- (1) presence or absence of legs
- (2) presence or absence of fur
- (3) presence or absence of wings
- (4) presence or absence of an internal skeleton

Data Base File Number: 701

Regents Date Aug2004-65.bmp

Aug2004  
65 8/17/2004 LAB1

Answer 3

Organism	Internal Skeleton Present	Legs Present	Wings Present	Fur Present	Moist Body Covering Present
Earthworm	no	no	no	no	yes
Fish	yes	no	no	no	yes
Fly	no	yes	yes	no	no
Gorilla	yes	yes	no	yes	no
Jellyfish	no	no	no	no	yes
Parrot	yes	yes	yes	no	no
Snake	yes	no	no	no	no

**classification**

230. The chart shown contains characteristics that can be used to classify organisms A, B, and C. What is one reason why organism A and organism C might be placed into two different classification groups, even though they are both single celled?

- (1) A and C are both single celled
- (2) B is autotrophic
- (3) A is an autotroph and C is a heterotroph
- (4) ribosomes are present in A, B and C

Data Base File Number: 446

Regents Date Aug2012-46.bmp

Aug2012  
46 8/17/2012 S4K3

Answer 3

Characteristics	Organism A	Organism B	Organism C
Number of Cells	single celled	multicellular	single celled
Type of Nutrition	autotrophic	autotrophic	heterotrophic
Nuclear Membrane	absent	present	absent
Ribosomes	present	present	present

## classification

231. The chart shown contains a number of characteristics for three different organisms. The characteristics can be used in classifying these organisms. Which TWO organisms would be expected to have the most similar genetic material? Base your answer on information from the chart.

- (1) A and B  
 (2) A and C  
 (3) B and C  
 (4) C and B

Data Base File Number: 545

Regents Date Jan2005-38.bmp

Jan2005

38 1/28/2005 S4K3

Answer 2

Characteristics	Organism A	Organism B	Organism C
Number of cells	unicellular	multicellular	unicellular
Type of nutrition	autotrophic	autotrophic	heterotrophic
Nuclear membrane	absent	present	absent
DNA	present	present	present

## clone

232. A technique used to produce new plants is represented in the diagram. Which statement is best supported by the information in the diagram?

- (1) The one leaf cell removed formed a zygote that developed into a new plant by mitotic division.  
 (2) This procedure is used to produce new tomato plants that are clones of the original tomato plant.  
 (3) The cell taken from the leaf produced eight cells, each having one-half of the genetic information of the original leaf cell.  
 (4) The new tomato plant will not be able to reproduce sexually because it was produced by mitotic cell division.

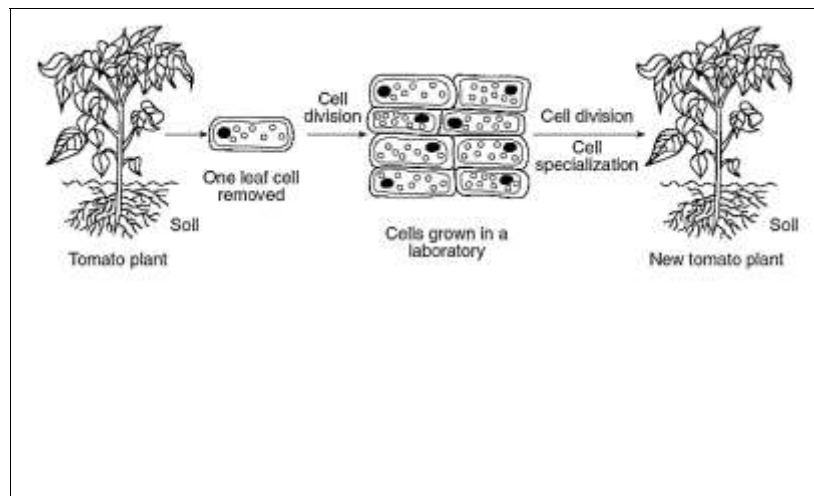
Data Base File Number: 17

Regents Date Aug07-39.bmp

Aug2007

39 8/16/2007 S4K4

Answer 2



clone

233. Scientists have been investigating a way to recreate extinct species such as the saber-toothed cat illustrated in the diagram shown. Which technique would use DNA from an extinct species to recreate an organism of the species?

- (1) natural selection
- (2) differentiation
- (3) cloning
- (4) selective breeding

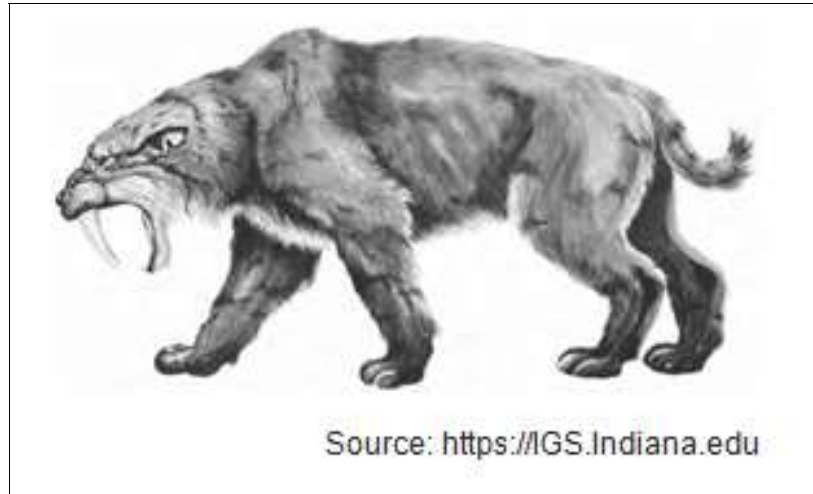
Data Base File Number: 1175

Regents Date June2017-20.bmp

June2017

20 6/14/2017 S4K2

Answer 3



clone

234. The diagram shown represents the cloning of a carrot plant. Compared to each cell of the original carrot plant, each cell of the new plant will have

- (1) the same number of chromosomes and the same types of genes
- (2) the same number of chromosomes, but different types of genes
- (3) half the number of chromosomes and the same types of genes
- (4) half the number of chromosomes, but different types of genes

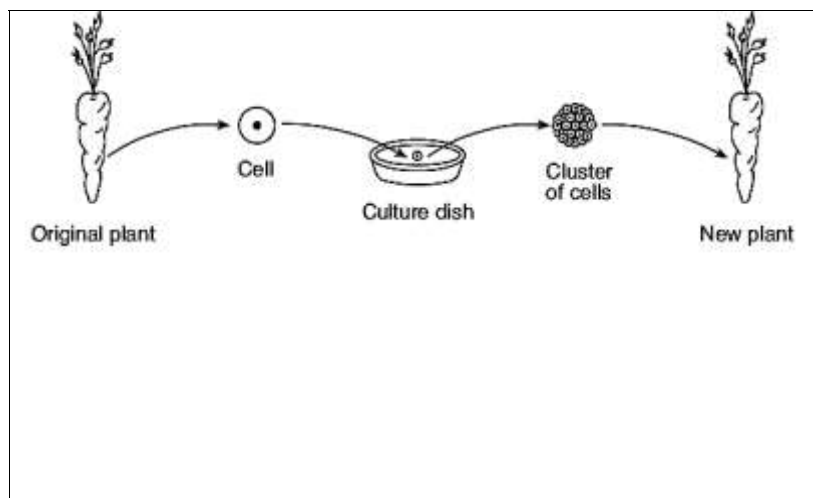
Data Base File Number: 94

Regents Date June08-21.bmp

June2008

21 6/24/2008 S4K4

Answer 1



clone

235. Potatoes are an example of a crop that can be reproduced asexually. One potato will produce a number of "eyes," which are sprouts that can grow into new plants. A potato with four eyes can be cut into four pieces, and each piece can be used to produce an individual potato plant. A gardener could produce a small crop of potatoes by planting the eyes from a single potato in her garden. Some of the potatoes grown in this way could be used to obtain eyes for the next season's crop. One likely **DISADVANTAGE** of growing potatoes cloned in this way, year after year, would be that

- (1) after a few years, the potatoes would stop producing eyes altogether, so no potatoes could be grown in the garden
- (2) the potatoes produced each succeeding year would get larger and larger, eventually being too big for use as food
- (3) the cost for growing your own potatoes in the garden would be greatly reduced
- (4) a potato plant could become infected with a disease, and it could easily spread to the entire crop, killing all of the plants

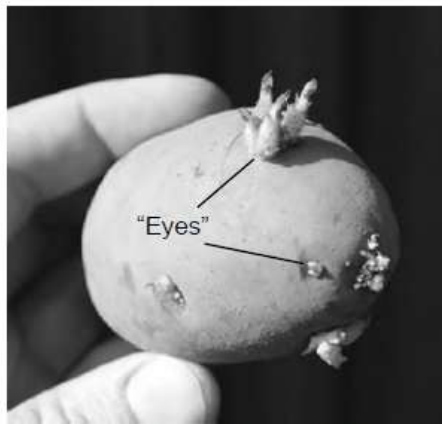
Data Base 1334  
File Number:

Regents Date June2019-14.bmp

June2019

14 6/18/2019 S4K7

Answer 4



Source: <https://www.quickcrop.ie/blog/2014/02/growing-potatoes/>

clone

236. Equine cloning can be used to produce performance horses. Although the horses are clones of each other, they may still exhibit slight differences in appearance. The differences in the physical characteristics of the cloned horses are most likely the result of

- (1) environmental influences
- (2) natural selection
- (3) sexual reproduction
- (4) changes in gametes

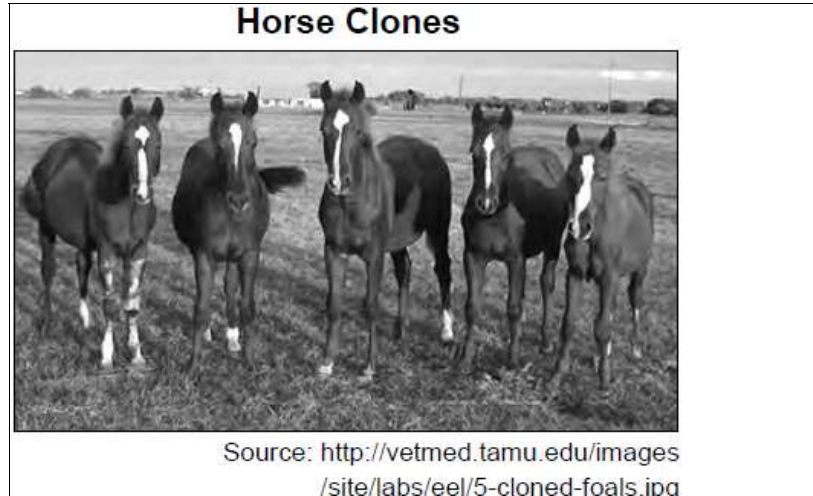
Data Base File Number: 1563

Regents Date June2023-3.bmp

June2023

3 6/14/2023 S4K3

Answer 1



clone

237. A standard laboratory technique used to produce a new plant is represented in the diagram as shown. This technique is best identified as

- (1) gene alteration
- (2) selective breeding
- (3) replication
- (4) cloning

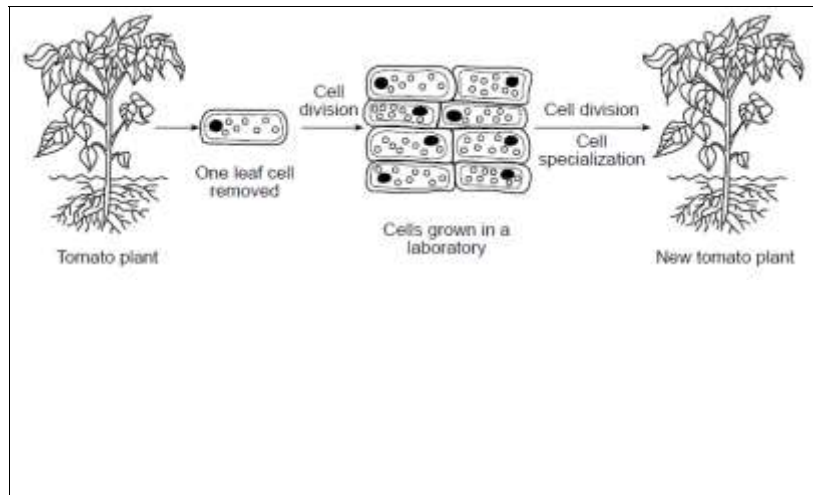
Data Base File Number: 1250

Regents Date June2018-13.bmp

June2018

13 6/13/2018 S4K4

Answer 4



## codons

238. Base your answer to this question on the information given and your knowledge of biology. Refer to the CODON CHART as shown. The universal codes shown are: U=Uracil; C=Cytosine; A=Adenine and G=Guanine. Why is the nitrogen base Thymine(T) not shown on the chart?

- (1) There is no Thymine in RNA. (3) Thymine is not in any nucleic acid.  
 (2) Thymine is not a nitrogen base. (4) Thymine is a vitamin.

Data Base File Number: 1461

Regents Date CodonChart.bmp

June2021

1 9/8/2021 RBS

Answer 1

		Second Base				
		U	C	A	G	
First Base	U	Phenylalanine	Serine	Tyrosine	Cysteine	U
		Phenylalanine	Serine	Tyrosine	Cysteine	C
		Leucine	Serine	Stop	Stop	A
		Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Proline	Histidine	Arginine	U
		Proline	Proline	Histidine	Arginine	C
		Proline	Proline	Glutamine	Arginine	A
		Proline	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Threonine	Asparagine	Serine	U
		Threonine	Threonine	Asparagine	Serine	C
		Threonine	Threonine	Lysine	Arginine	A
		Threonine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Alanine	Aspartic acid	Glycine	U
		Alanine	Alanine	Aspartic acid	Glycine	C
		Alanine	Alanine	Glutamic acid	Glycine	A
		Alanine	Alanine	Glutamic acid	Glycine	G

## codons

239. Base your answer to this question on the information given and your knowledge of biology. There are only two amino acids encoded by a single codon. Use the codon chart as shown. Which two amino acids have only one codon?

- (1) Arginine and Serine (3) Glycine and Aspartic Acid  
 (2) Threonine and Proline (4) Methionine and Tryptophan

Data Base File Number: 1456

Regents Date CodonChart.bmp

RBS2021

1 8/28/2021 RBS

Answer 4

		Second Base				
		U	C	A	G	
First Base	U	Phenylalanine	Serine	Tyrosine	Cysteine	U
		Phenylalanine	Serine	Tyrosine	Cysteine	C
		Leucine	Serine	Stop	Stop	A
		Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Proline	Histidine	Arginine	U
		Proline	Proline	Histidine	Arginine	C
		Proline	Proline	Glutamine	Arginine	A
		Proline	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Threonine	Asparagine	Serine	U
		Threonine	Threonine	Asparagine	Serine	C
		Threonine	Threonine	Lysine	Arginine	A
		Threonine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Alanine	Aspartic acid	Glycine	U
		Alanine	Alanine	Aspartic acid	Glycine	C
		Alanine	Alanine	Glutamic acid	Glycine	A
		Alanine	Alanine	Glutamic acid	Glycine	G



**codons**

240. Base your answer to this question on the information given and your knowledge of biology. Methionine is an amino acid. The methionine codon is the the most common START codon. A "START" codon is a message for a ribosome that signals the initiation of protein translation. Refer to the Codon Chart, as shown. What is the codon for methionine?

- (1) ACG
- (2) AUA
- (3) AUG
- (4) AGG

Data Base File Number: 1455

Regents Date CodonChart.bmp

RBS2021

1 8/28/2021 RBS

Answer 3

		Second Base				
		U	C	A	G	
First Base	U	Phenylalanine	Serine	Tyrosine	Cysteine	U C A G
		Phenylalanine	Serine	Tyrosine	Cysteine	
		Leucine	Serine	Stop	Stop	
		Leucine	Serine	Stop	Tryptophan	
	C	Leucine	Proline	Histidine	Arginine	U C A G
		Leucine	Proline	Histidine	Arginine	
		Leucine	Proline	Glutamine	Arginine	
		Leucine	Proline	Glutamine	Arginine	
	A	Isoleucine	Threonine	Asparagine	Serine	U C A G
		Isoleucine	Threonine	Asparagine	Serine	
		Isoleucine	Threonine	Lysine	Arginine	
		Methionine	Threonine	Lysine	Arginine	
G	Valine	Alanine	Aspartic acid	Glycine	U C A G	
	Valine	Alanine	Aspartic acid	Glycine		
	Valine	Alanine	Glutamic acid	Glycine		
	Valine	Alanine	Glutamic acid	Glycine		

**codons**

241. Base your answer to this question on the chart shown and your knowledge of biology. Which three codons would code for a different amino acid sequence from that coded for by the mRNA base sequence AGU-UCA-CCA?

- (1) AGU-UCU-CCU
- (2) AGU-UCC-CCG
- (3) AGC-UCA-CUU
- (4) AGU-UCG-CCC

Data Base File Number: 229

Regents Date August2009-69-b

Aug2009

69 8/13/2009 LABS

Answer 3

Universal Genetic Code Chart  
Messenger RNA Codons and the Amino Acids for Which They Code

		Second Base				
		U	C	A	G	
First Base	U	UUU } PHE	UCU } SER	UAU } TYR	UGU } CYS	U C A G
		UUC } PHE	UCC } SER	UAC } TYR	UGC } CYS	
		UUA } LEU	UCA } SER	UAA } STOP	UGA } STOP	
		UUG } LEU	UCG } SER	UAG } STOP	UGG } TRP	
	C	CUU } LEU	CCU } PRO	CAU } HIS	GUU } ARG	U C A G
		CUC } LEU	CCC } PRO	CAC } HIS	GUC } ARG	
		CUA } LEU	CCA } PRO	CAA } GLN	GCA } ARG	
		CUG } LEU	CCG } PRO	CAG } GLN	GCG } ARG	
	A	AUU } ILE	ACU } THR	AAU } ASN	AGU } SER	U C A G
		AUC } ILE	ACC } THR	AAC } ASN	AGC } SER	
		AAA } MET or START	ACA } THR	AAA } LYS	AGA } ARG	
		AUG } MET or START	ACG } THR	AAG } LYS	AGG } ARG	
G	GUU } VAL	GCU } ALA	GAU } ASP	GGU } GLY	U C A G	
	GUC } VAL	GCC } ALA	GAC } ASP	GGC } GLY		
	GUA } VAL	GCA } ALA	GAA } ASP	GGA } GLY		
	GUG } VAL	GCG } ALA	GAG } ASP	GGG } GLY		

codons

242. The chart given shows the molecular comparison between several species. Which species is likely to be more closely related to "Botana curus".

- (1) W
- (2) X
- (3) Y
- (4) Z

Data Base File Number: 1273

Regents Date June2018-80.bmp

June2018

80 6/13/2018 LAB1

Answer 4

Botana curus	DNA	GTG	GAC	TGA	GGA	CTC
	mRNA	CAC	CUG	ACU	CCU	GAG
	Amino acid	His	Leu	Thr	Pro	Glu
Species X	DNA	GTG	GAC	AGA	GGA	CAC
	mRNA	CAC	CUG	UCU	CCU	GUG
	Amino acid	His	Leu	Ser	Pro	Val
Species Y	DNA	GTG	GAC	AGA	GGA	CAC
	mRNA	CAC	CUG	UCU	CCU	GUG
	Amino acid	His	Leu	Ser	Pro	Val
Species Z	DNA	GTA	GAC	TGA	GGA	CTC
	mRNA	CAU	CUG	ACU	CCU	GAG
	Amino acid	His	Leu	Thr	Pro	Glu

codons

243. Base your answer to this question on the information given and on your knowledge of biology. Using the Universal Genetic Code Chart, how many messenger RNA codons code for the amino acid leucine (LEU)? NOTE -- IF YOU NEED A LARGER COPY OF THE CODE CHART, YOUR TEACHER WILL SUPPLY ONE TO YOU !

- (1) 6
- (2) 2
- (3) 8
- (4) 4

Data Base File Number: 1594

Regents Date June2023-81.bmp

June2023

81 6/14/2023 LAB1

Answer 1

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAG } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	THIRD BASE U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	



**codons**

244. Base your answer to this question on the information given and your knowledge of biology. Use the Codon Chart shown. What do the codons UAG UAA and UGA have in common?

- (1) These codons are start codons and they begin a polypeptide chain during translation.
- (2) These codons signal the end of the polypeptide chain during translation and they do not code for an amino acid.
- (3) These codons code for the amino acid Tyrosine.
- (4) These codons code for the amino acid Cysteine.

Data Base File Number: 1454

Regents Date CodonChart.bmp

RBS2021

1 6/22/2021 RBS

Answer 2

		Second Base				
		U	C	A	G	
First Base	U	Phenylalanine	Serine	Tyrosine	Cysteine	U
		Phenylalanine	Serine	Tyrosine	Cysteine	C
		Leucine	Serine	Stop	Stop	A
		Leucine	Serine	Stop	Tryptophan	G
	C	Leucine	Proline	Histidine	Arginine	U
		Leucine	Proline	Histidine	Arginine	C
		Leucine	Proline	Glutamine	Arginine	A
		Leucine	Proline	Glutamine	Arginine	G
	A	Isoleucine	Threonine	Asparagine	Serine	U
		Isoleucine	Threonine	Asparagine	Serine	C
		Isoleucine	Threonine	Lysine	Arginine	A
		Methionine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U	
	Valine	Alanine	Aspartic acid	Glycine	C	
	Valine	Alanine	Glutamic acid	Glycine	A	
	Valine	Alanine	Glutamic acid	Glycine	G	

**common ancestor**

245. Base your answer to this question on the information given and on your knowledge of biology. ----- Antler Growth ----- As part of their natural life cycle, deer produce antlers every year. Scientists have noted that fallow deer antlers can grow to 50 inches in length and 20 pounds in weight in a single season. That would require the antlers to grow almost an inch per day in summer. Some of the processes involved in antler growth are similar to bone growth in humans. In fact, two genes in one species of deer that are primarily responsible for rapid antler growth are also found in humans. How is it possible that two organisms as different as humans and deer could have two identical genes.

- (1) deer and humans are mammals and have some genes in common
- (2) deer and humans have similar mutations
- (3) deer and humans have modified DNA
- (4) deer and humans are affected by food web modifications

Data Base 1622  
File Number:

Regents Date Aug2023-71.bmp

Aug2023

71 8/17/2023 S4K3

Answer 1



Source: biologydictionary.net/fallow-deer/

**common ancestor**

246. The illustrations as shown are of an organism called Archeopteryx, which lived approximately 150 million years ago. Archeopteryx had teeth and claws like a dinosaur and wings with feathers like a bird. Such fossils allow scientists to conclude that

- (1) dinosaurs and birds all ate the same foods
- (2) sexual reproduction in birds resulted in dinosaurs
- (3) dinosaurs and birds share a common ancestor
- (4) dinosaurs and birds belong to the same species

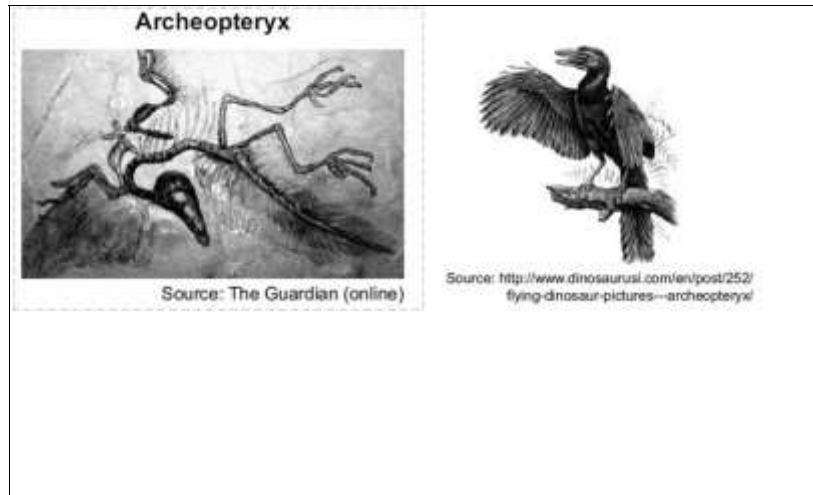
Data Base File Number: 1538

Regents Date Jan2023-23.bmp

Jan2023

23 1/24/2023 S4K3

Answer 3



**common ancestor**

247. Today's whales and alligators both have pelvic and hind leg bones, yet these bones only function in alligators. This similarity between whales and alligators supports the idea that

- (1) whales evolved from alligators
- (2) alligators evolved from whales
- (3) alligators and whales share a common ancestor
- (4) alligators and whales share the same genetic mutations

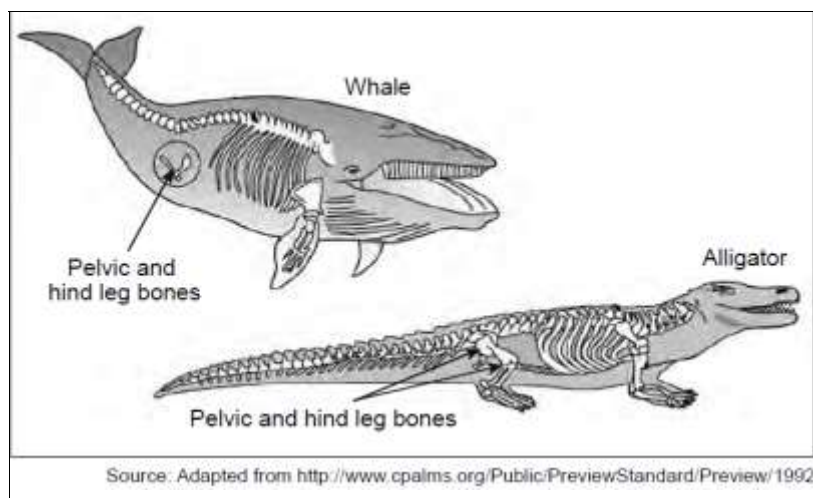
Data Base File Number: 1571

Regents Date June2023-30.bmp

June2023

30 6/14/2023 S4K3

Answer 3



common ancestor

248. Base your answer to this question on the information given and photographs as shown and on your knowledge of biology. Genetic evidence indicates that land and marine iguana species on the Galapagos Islands have a common ancestor that came from South America millions of years ago. There are three species of land iguanas and one species of marine iguana. The marine iguana is an excellent swimmer and is the world's only sea-going lizard. It feeds on algae (seaweed) attached to underwater rocks and is widely distributed on all Galapagos rocky shorelines. The photos and the information shown compare the pink land iguana and the Galapagos land iguanas. One reason why the Galapagos and pink land iguanas can coexist on Wolf Volcano on northern Isabela Island is

- (1) The two iguana species occupy different niches.
- (2) The two iguana species occupy the same niche.
- (3) The two iguana species compete for food.
- (4) The two iguana species have the same food requirements.

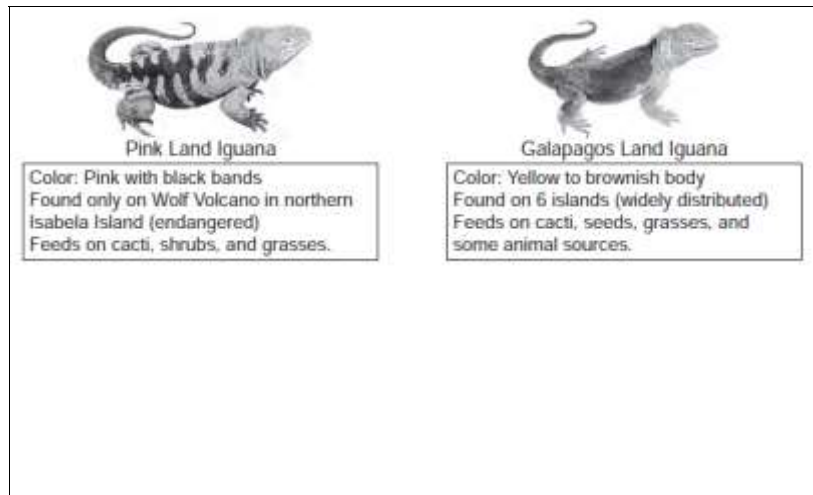
Data Base 1714  
File Number:

Regents Date Aug2024-79.bmp

Aug2024

79 8/20/2024 LAB3

Answer 1



**common ancestor**

249. The diagram shown represents possible evolutionary relationships between groups of organisms. Which statement is a valid conclusion that can be drawn from the diagram?

- (1) Snails appeared on Earth before corals.
- (2) Sponges were the last new species to appear on Earth.
- (3) Earthworms and sea stars have a common ancestor.
- (4) Insects are more complex than mammals

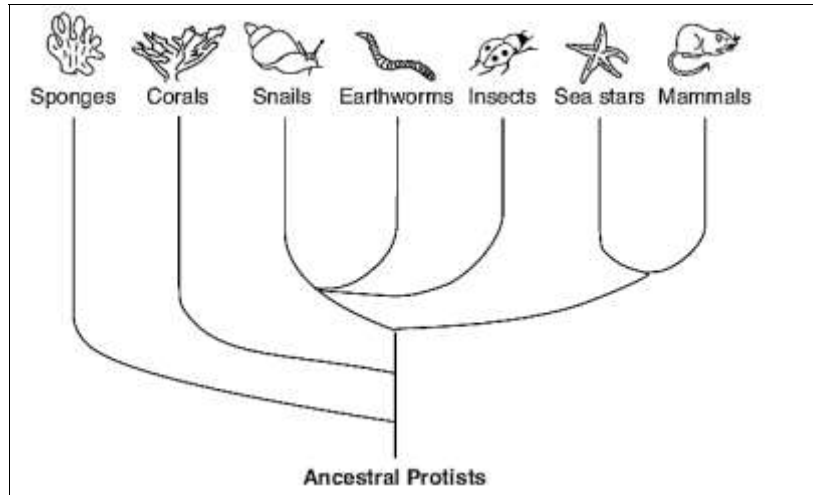
Data Base File Number: 106

Regents Date June08-41.bmp

June2008

41 6/24/2008 S4K3

Answer 3



**common ancestor**

250. Base your answer to this question on the information and diagram shown and on your knowledge of biology. Finches on the Galapagos Islands are thought to have originated from South America and to have evolved into new species over the last 10,000 years. Some of this evolution is represented in the diagram shown. The seed-eating finch was most likely the

- (1) largest finch
- (2) common ancestor
- (3) parent of other finches
- (4) most successful

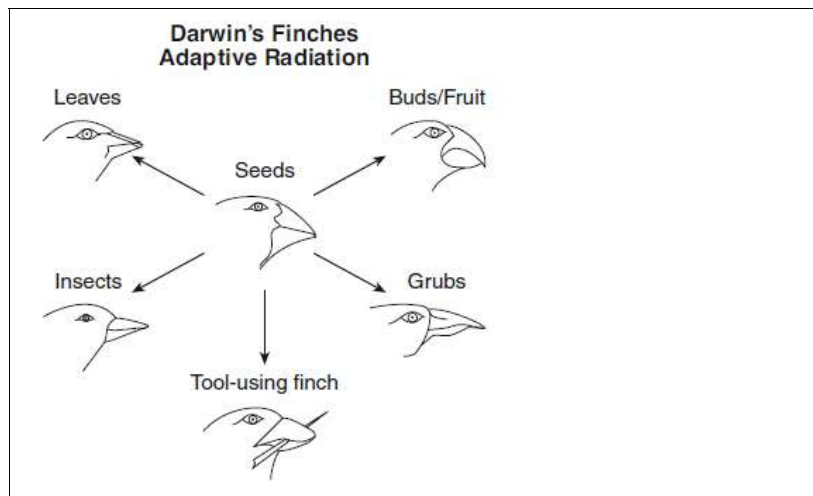
Data Base File Number: 632

Regents Date Jan2013-73.bmp

Jan2013

74 1/23/2013 LAB3

Answer 2



## common ancestor

251. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents evolutionary relationships among some primates. Which statement best describes a relationship between the common ancestor and the other organisms in the diagram?

- (1) The common ancestor most likely has segments of its DNA that will match each of the other organisms'.
- (2) The common ancestor is more closely related to macaques than to gibbons.
- (3) Orangutans and gorillas have exactly the same DNA as the common ancestor.
- (4) Chimps and baboons were the first organisms to evolve from the common ancestor.

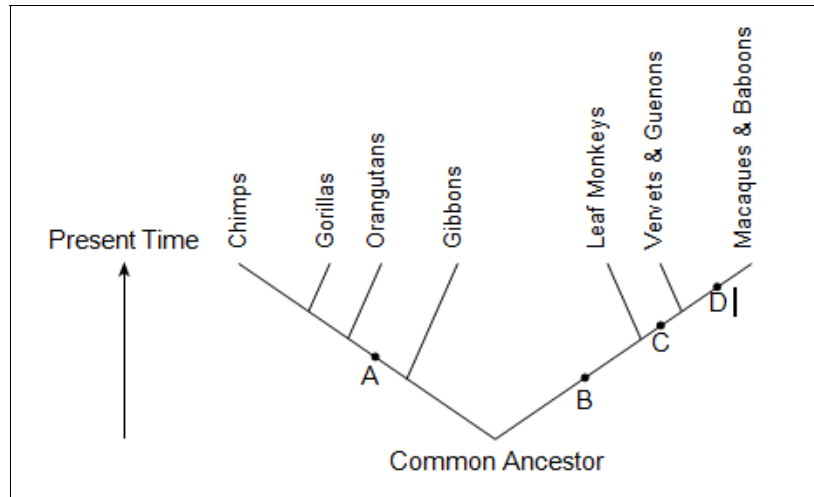
Data Base File Number: 953

Regents Date June2014-73.bmp

June2014

73 6/17/2014 LAB1

Answer 1



community

252. Base your answer to this question on the information given, the table shown, and on your knowledge of biology. The variety of organisms known as plankton contributes to the unique nutritional relationships in an ocean ecosystem. Phytoplankton include algae and other floating organisms that perform photosynthesis. Plankton that cannot produce food are known as zooplankton. Some nutritional relationships involving these organisms and several others are shown in the table. According to the table, which organism can be classified as both an herbivore and a carnivore?

- (1) codfish
- (2) sharks
- (3) small fish
- (4) squid

Data Base File Number: 572

Regents Date June2005-43.bmp

June2005

44 6/22/2005 S4K6

Answer 3

Animals in Community	Food Eaten by Animals in Community				
	Codfish	Phytoplankton	Small Fish	Squid	Zooplankton
codfish			X		
sharks	X			X	
small fish		X			X
squid	X		X		
zooplankton		X			

community

253. Some interactions in a desert community are shown in the diagram. Which statement is a valid inference based on the diagram?

- (1) Certain organisms may compete for vital resources.
- (2) All these organisms rely on energy from decomposers.
- (3) Organisms synthesize energy.
- (4) All organisms occupy the same niche.

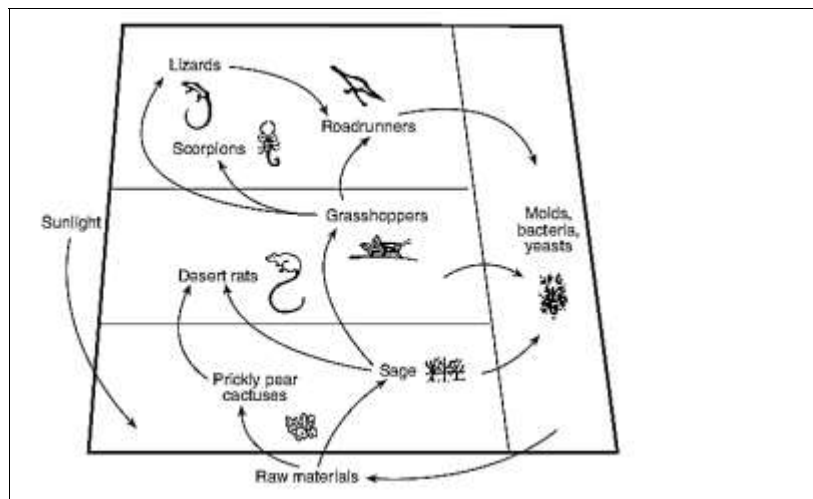
Data Base File Number: 63

Regents Date Jan08-9.bmp

Jan2008

9 1/25/2008 S4K1

Answer 1



## competition

254. The graph shows the growth of two populations of paramecia grown in the same culture dish for 14 days. Which ecological concept is best represented by the graph?

- (1) recycling
- (2) equilibrium
- (3) competition
- (4) decomposition

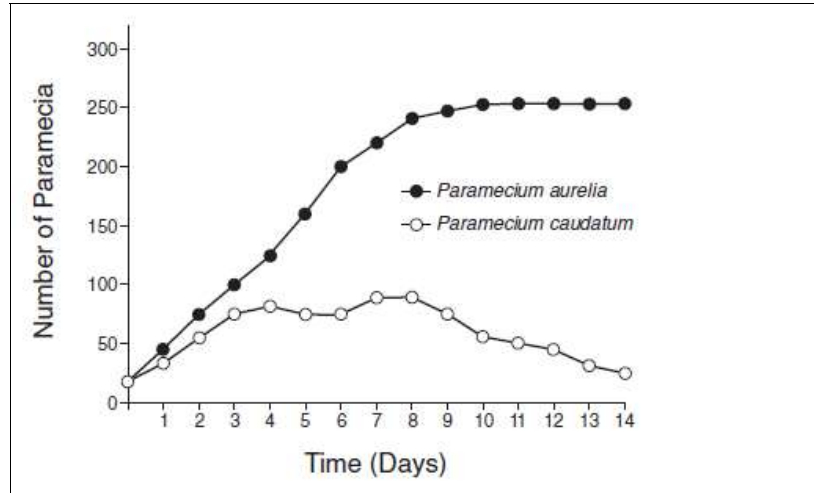
Data Base File Number: 744

Regents Date June2003-45.bmp

June2003

45 6/19/2003 S4K6

Answer 3



## competition

255. The northern snakehead is a type of Asian fish that eats smaller fish and is adapted to a freshwater habitat. The presence of these fish in American waters is of concern because it might offer too much competition to native

- (1) herbivores
- (2) predators
- (3) decomposers
- (4) producers

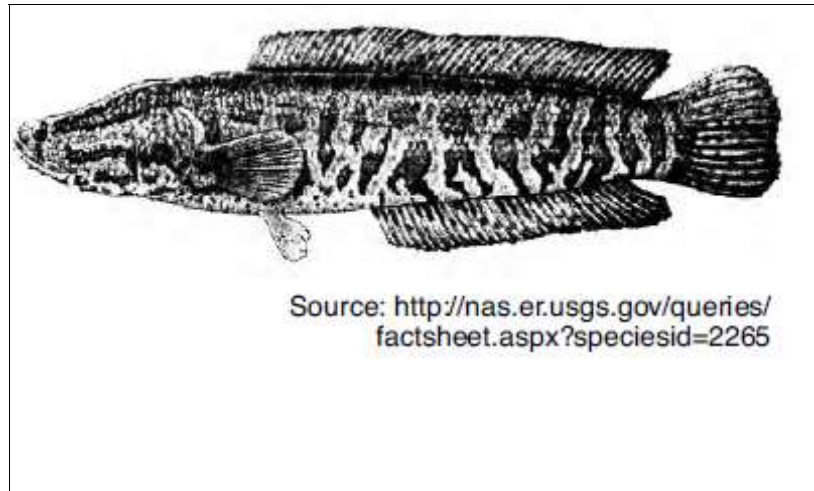
Data Base File Number: 1302

Regents Date Jan2019-6.bmp

Jan2019

6 1/22/2019 S4K1

Answer 2





## competition

256. Two different species of single-celled organisms that eat the same food were placed in the same container. A constant food supply was provided starting on day 2, and the populations were monitored daily. The graph shown represents the growth of the two populations. The most likely reason for the observed changes in the populations over the 18-day period is

- (1) *P. caudatum* outcompeted *P. aurelia*
- (2) *P. aurelia* outcompeted *P. caudatum*
- (3) the two species shared available resources
- (4) *P. caudatum* became a predator for *P. aurelia*

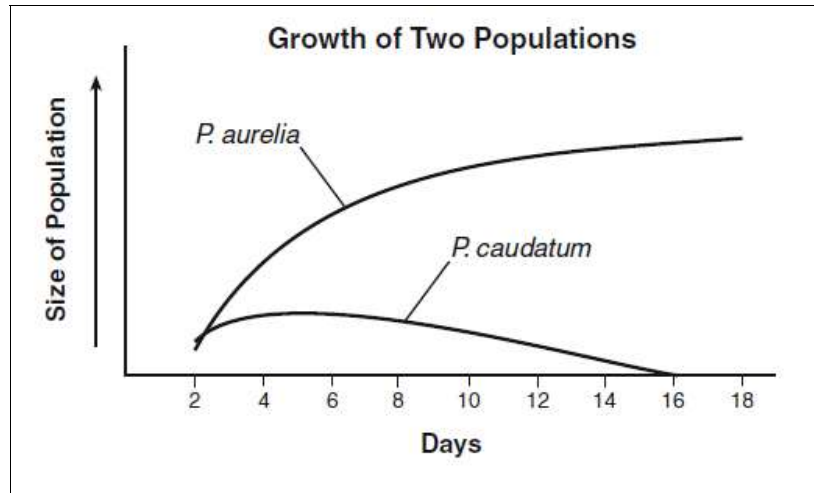
Data Base File Number: 439

Regents Date Aug2012-37.bmp

Aug2012

37 8/17/2012 S4K1

Answer 2



## competition

257. The feeding niches of three bird species are shown in the diagram. What is the advantage of these different feeding niches for the birds?

- (1) less competition for food
- (2) fewer abiotic resources for each bird species
- (3) fewer biotic resources for each bird species
- (4) less energy available as the birds feed higher in the tree

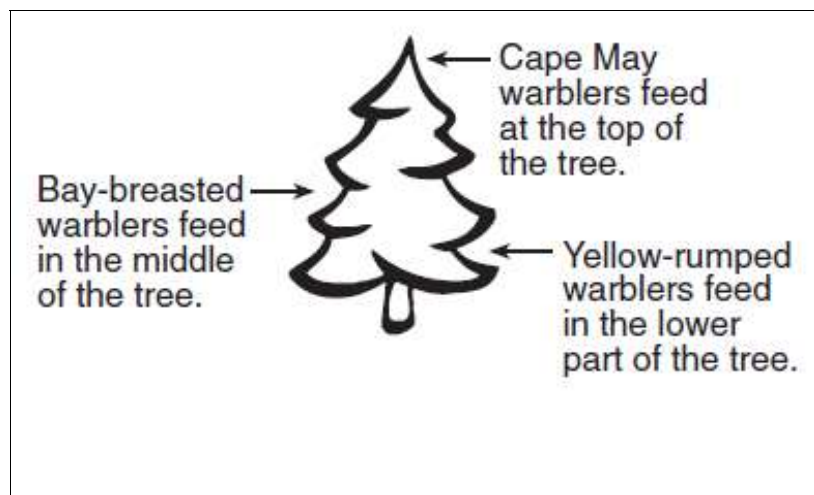
Data Base File Number: 585

Regents Date Aug2005-25.bmp

Aug2005

25 8/16/2005 S4K6

Answer 1



## competition

258. Base your answer to this question on the information and photo shown and on your knowledge of biology. The photo shows an adult female weasel. Weasels Are Built for the Hunt Weasels are fierce and quick-witted carnivores that must compete for food with larger predators. Their slender, elongated body plan allows them to pursue prey in tight spaces that other carnivores can't enter, a key factor in controlling rodent and rabbit populations. This body plan is important to the success of weasels. Female weasels have evolved to give birth to fetuses that have not fully completed development. The fetuses complete their development externally. In this way, there is no baby bump to limit the mother's access to tight feeding locations. A high energy level is key to the weasel's success in capturing prey, but it comes at a price. To survive, weasels need to eat a third of their body weight per day. This need can make them unpopular with poultry farmers, because they can enter through the smallest opening and consume large numbers of chickens. If the weasels are so successful, why do they not completely overpopulate the areas where they live?

- (1) Predators kill large numbers of weasels.
- (2) They require very large numbers of prey for food, which may limit weasel expansion in an area.
- (3) Humans trap large numbers of weasels for their fur, therefore limiting the number of weasels in an area.
- (4) Disease kills large numbers of weasels.

Data Base File Number: 1442

Regents Date June2021-64.bmp

June2021

64 6/22/2021 S4K6

Answer 2



Source: NY Times 6/13/16

## competition

259. Base your answer to this question on the data table shown and on your knowledge of biology. Which two species would most likely be able to live in the same habitat without competing with each other for food?

(1) A and C

(3) B and D

(2) B and C

(4) C and E

Data Base 113  
File Number:

Regents Date June08-74.bmp

June2008

75 6/24/2008 LABS

Answer 2

**Dietary Preferences of Finches**

Species of Finch	Preferred Foods
A	nuts and seeds
B	worms and insects
C	fruits and seeds
D	insects and seeds
E	nuts and seeds

## competition

260. Base your answer to this question on the information given and on your knowledge of biology. -- Research indicates that many plants prevent the growth of other plants in their habitat by releasing natural herbicides (chemicals that kill plants). These substances are known as allelochemicals and include substances such as quinine, caffeine, and digitalis. Experiments have confirmed that chemicals in the bark and roots of black walnut trees are toxic, and when released into the soil they limit the growth of crop plants such as tomatoes, potatoes, and apples. Allelochemicals can alter growth and enzyme action, injure the outer cover of a seed so the seed dies, or stimulate seed growth at inappropriate times of the year. Studies on allelochemical effects help explain the observation that almost nothing grows under a black walnut tree even though light and moisture levels are adequate for growth. Which phrase best predicts the relative numbers of different plant species in regions A, B, and C in the diagram shown?

- (1) greater in C than B  
(2) greater in A than C  
(3) greater in A than B  
(4) greater in B than C

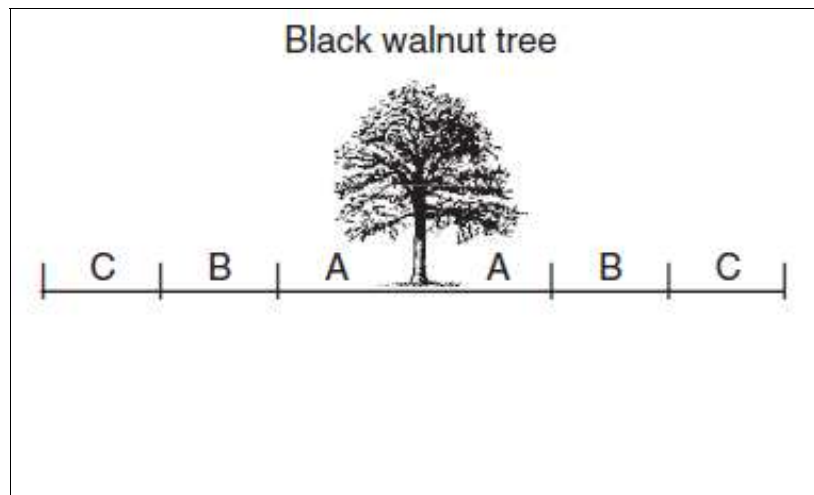
Data Base 574  
File Number:

Regents Date June2005-51.bmp

June2005

51 6/22/2005 S4K1

Answer 1



## competition

261. Base your answer to this question on the information given and on your knowledge of biology. A student set up an experiment to test the effect of the number of seedlings planted in one pot on the rate of growth. All conditions in the experiment were the same, except for the number of plants in each pot. The results are shown in the graph. According to the graph, which statement is true concerning the growth of the plants?

- (1) The plants in the pot with only 5 plants grew to be an average of 40 cm tall in 30 days.
- (2) The plants in the pot with only 10 plants grew to be an average of 30 cm tall in 20 days.
- (3) The plants in the pot with 15 plants grew an average of 20 cm taller after a period of 10 days.
- (4) The plants in the pot with 20 plants grew an average of 20 cm taller after a period of 40 days.

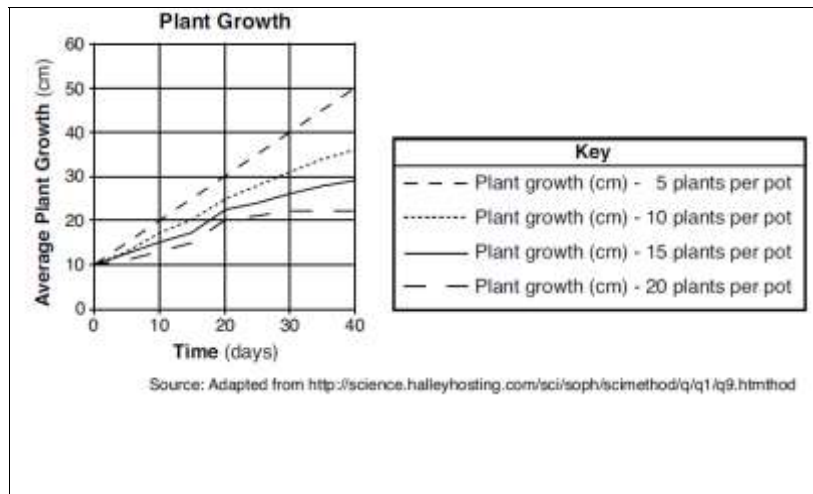
Data Base File Number: 1428

Regents Date June2021-31.bmp

June2021

32 6/22/2021 LABA

Answer 1



competition

262. Base your answer to this question on the information given and on your knowledge of biology. A student set up an experiment to test the effect of the number of seedlings planted in one pot on the rate of growth. All conditions in the experiment were the same, except for the number of plants in each pot. The results are shown in the graph. The most likely reason for the differences in plant growth in the different pots was

- (1) cyclic changes in the plants' ecosystems
- (2) ecological succession over time
- (3) the amount of light available for each setup
- (4) competition for resources in each setup

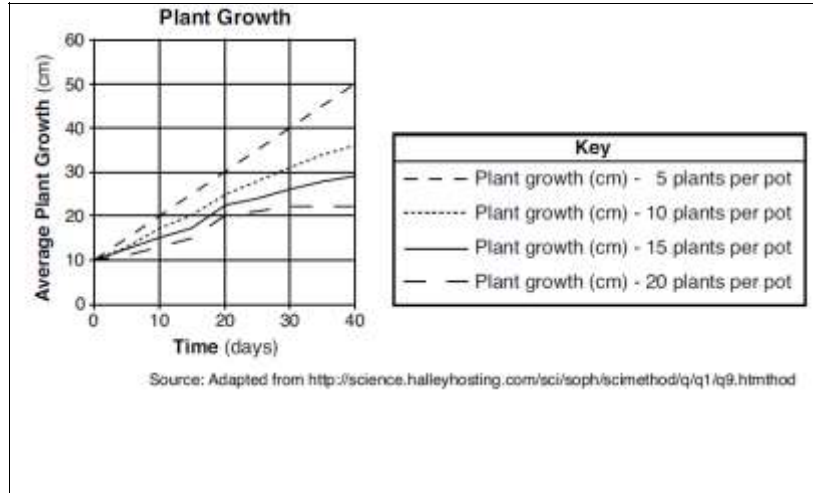
Data Base File Number: 1427

Regents Date June2021-31.bmp

June2021

31 6/22/2021 LABA

Answer 4



## competition

263. The diagram shows four species of birds that evolved from an ancestral species that had a small, pointed beak. Today, all four species inhabit the same island. Which statement best explains the variation in the beaks of these four species?

- (1) Over time, an abundance of seeds for food led to increased similarities between the species.
- (2) Over time, an abundance of seeds for food led to increased differences between the species.
- (3) Competition for limited food resources led to selection for similar traits.
- (4) Competition for limited food resources led to selection for different traits.

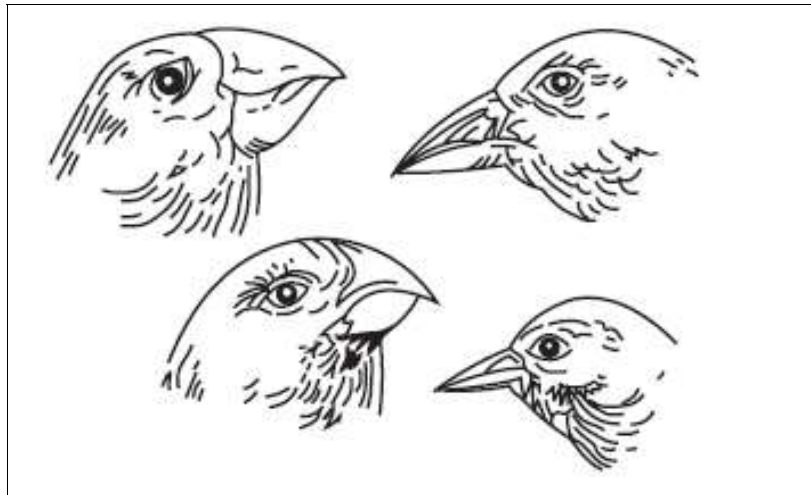
Data Base File Number: 249

Regents Date Jan2010-74.bmp

Jan2010

74 1/26/2010 LABS

Answer 4



## competition

264. The three graphs show the population changes in two species of single-celled organisms that have been grown separately and together in identical environments. Which term is the most closely associated with the changes in relative population size shown in graph C?

- (1) mutation
- (2) artificial selection
- (3) genetic engineering
- (4) competition

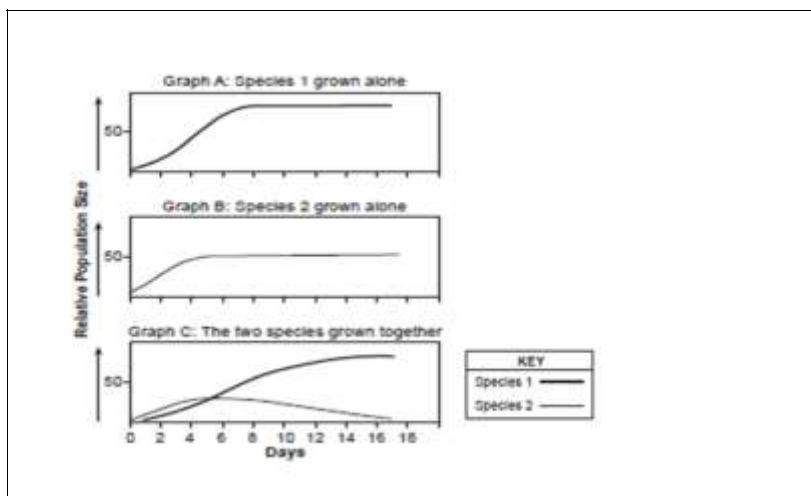
Data Base File Number: 1076

Regents Date Jan2016-36.bmp

Jan2016

36 1/27/2016 S4K1

Answer 4



## competition

265. The graph shows the changes in the size of a population over a period of time. Which environmental condition could have caused the change in the population size at A?
- (1) an increase in competition                      (3) a decrease in the size of its predators  
(2) a constant availability of shelter              (4) an unlimited supply of its food

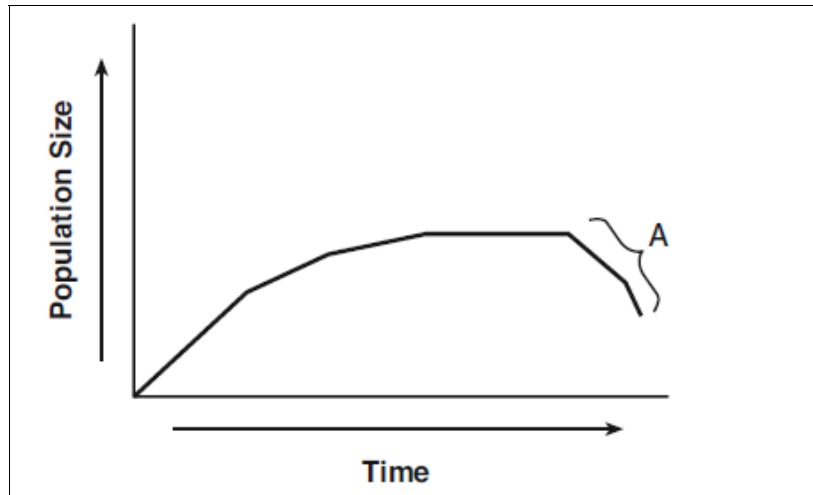
Data Base            622  
File Number:

Regents Date    Jan2013-43.bmp

Jan2013

43            1/23/2013        S4K6

Answer            1



## complex molecules

266. The diagram shown represents two types of carbohydrate molecules, glucose and sucrose. Why is the glucose molecule more likely than a sucrose molecule to diffuse through an artificial membrane.
- (1) glucose is a smaller molecule                      (3) sucrose has more energy  
(2) glucose is a larger molecule                      (4) glucose has more energy

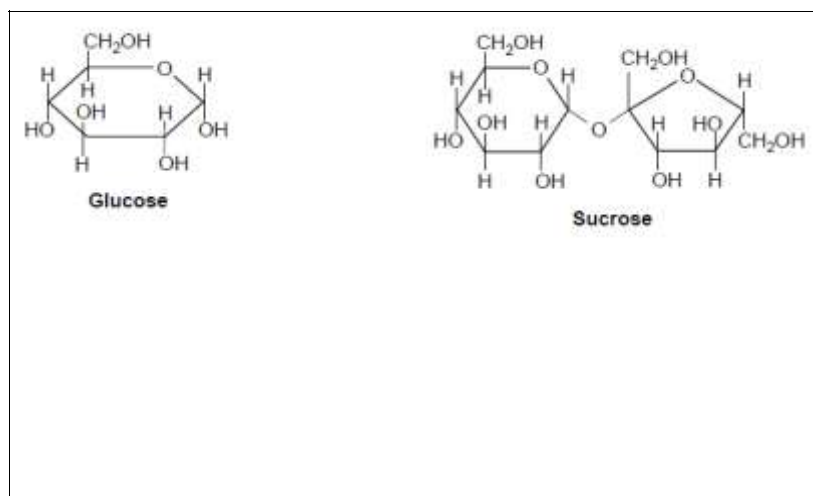
Data Base            1353  
File Number:

Regents Date    June2019-79.bmp

June2019

79            6/18/2019        LAB5

Answer            1





consumer

267. Base your answer to this question on the information given and on your knowledge of biology. Analysis of a sample taken from a pond showed variety in both number and type of organisms present. The data collected are shown in the table. If the frogs feed on insect larvae, what is the role of the frogs in this pond ecosystem?

- (1) herbivore
- (2) parasite
- (3) consumer
- (4) host

Data Base File Number: 463

Regents Date Jan2006-34.bmp

Jan2006

34 1/27/2006 S4K1

Answer 3

**Data Table**

Type of Organisms	Number Present
bass	two
frogs	forty
phytoplankton	thousands
insect larvae	hundreds

consumer

268. Base your answer to this questions on the diagram shown, which represents an ameba engulfing bacteria, and on your knowledge of biology. This ameba would most likely be classified as a

- (1) decomposer
- (2) producer
- (3) consumer
- (4) pathogen

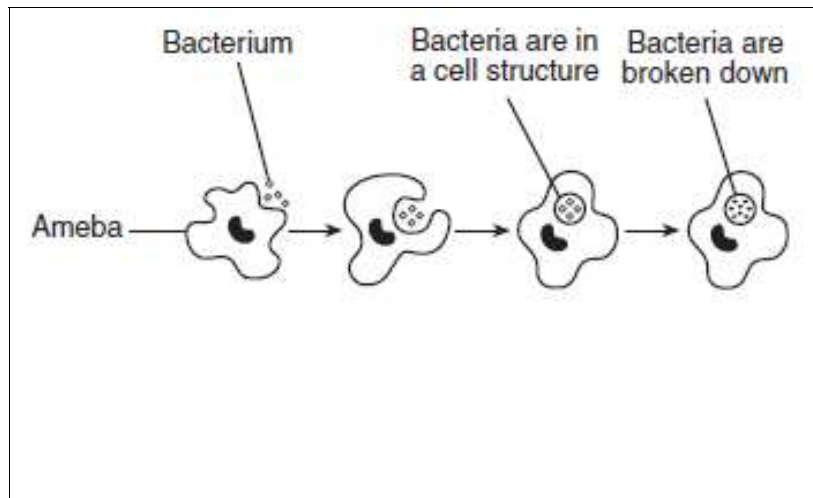
Data Base File Number: 1029

Regents Date June2015-42.bmp

June2015

42 6/16/2015 S4K1

Answer 3



consumer

269. The diagram shown represents an energy pyramid. Which type of organism could occupy levels B, C, and D of this energy pyramid?

- (1) consumer
- (2) producer
- (3) autotroph
- (4) carnivore

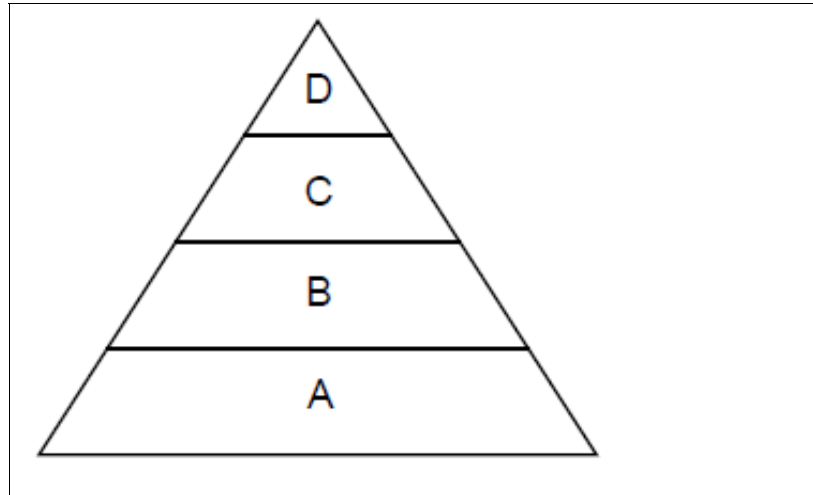
Data Base File Number: 1256

Regents Date June2018-30.bmp

June2018

30 6/13/2018 S4K6

Answer 1



consumer / producer

270. "Euglena" are unique single-celled organisms. Depending on the physical conditions present in their aquatic environment, "Euglena" can act as either producers or consumers. "Euglena" will most likely act as consumers when placed in an environment that has

- (1) an acidic pH
- (2) a low oxygen level
- (3) little or no light present
- (4) many predators

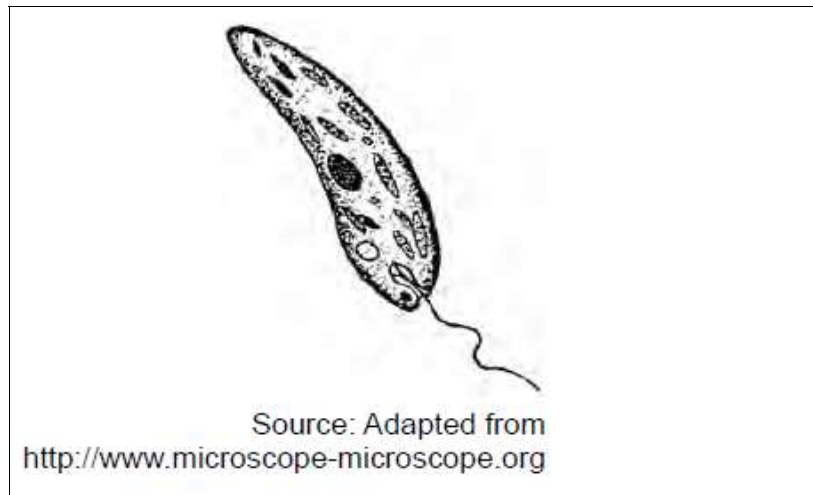
Data Base File Number: 1394

Regents Date Jan2020-26.bmp

Jan2020

26 1/21/2020 S4K6

Answer 3



control

271. Base your answer to this question on the information given and on your knowledge of biology.

**A Study of Antibacterial Cleansers**

An experiment was designed to test the effectiveness of three antibacterial hand-cleansing solutions against bacteria present on hands. Swabs were used to take one sample each from the unwashed hands of ten test subjects. Each swab was then rubbed across the surface of bacterial growth medium in a separate petri dish. The dishes were placed in an incubator to allow bacterial colonies to develop. Ten other test subjects treated their hands with an antibacterial hand-cleansing solution, then had their hands swabbed, and ten more petri dishes were set up and incubated in the same way as the first set of dishes. The process was repeated again with ten more test subjects for a second hand cleanser, and again for a third group with a third hand cleanser. The results from the incubated petri dishes were averaged. The averages are shown in the data table. What was the purpose of testing unwashed hands?

- (1) unwashed hands acted as a control
- (2) unwashed hands acted as an hypothesis
- (3) unwashed hands acted as a theory
- (4) unwashed hands had no useful scientific purpose

Data Base 931  
File Number:

Regents Date Jan2014-60.bmp

Jan2014

61 1/27/2014 LABA

Answer 1

Treatment Before Swabbing	Average Number of Bacterial Colonies
none	30
antibacterial hand-cleansing solution 1	12
antibacterial hand-cleansing solution 2	13
antibacterial hand-cleansing solution 3	11

control

272. The diagram shown illustrates the result of growing a garlic bulb in a cup of distilled water over five days. What is the control in this experiment?

- (1) The light.
- (2) The garlic bulb grown in distilled water.
- (3) The dark.
- (4) The fertilizer used.

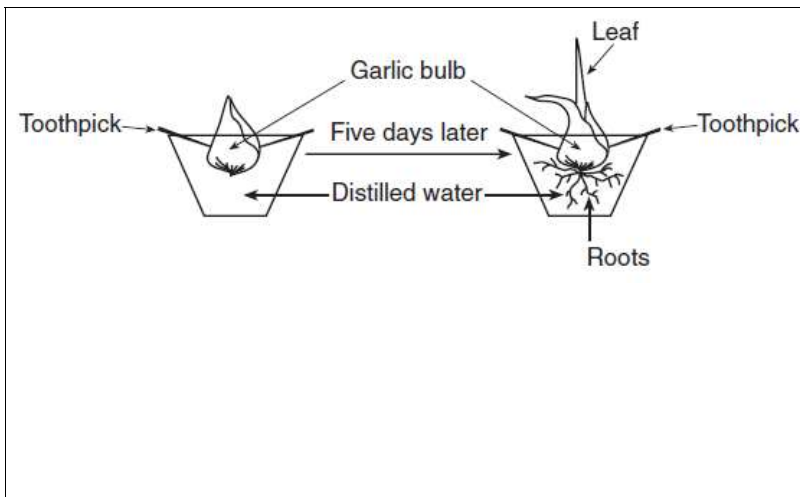
Data Base File Number: 575

Regents Date June2005-57.bmp

June2005

57 6/22/2005 LABA

Answer 2



control

273. Base your answer to this question on the information and diagram given and on your knowledge of biology. To study how bacteria respond to antibiotics, four paper discs, three treated with different antibiotics and one treated with water, were placed on a nutrient source with bacteria and left for 24 hours. The water and the antibiotics on the discs diffused into the nutrient source. If the antibiotic stopped the bacteria from growing, a circular area of no bacterial growth around the discs could be seen. In this experiment, the purpose of using a disc treated with water is that it

- (1) serves as the conclusion for the experiment
- (2) is needed to provide additional moisture
- (3) serves as a control for the experiment
- (4) is needed as a standard safety procedure

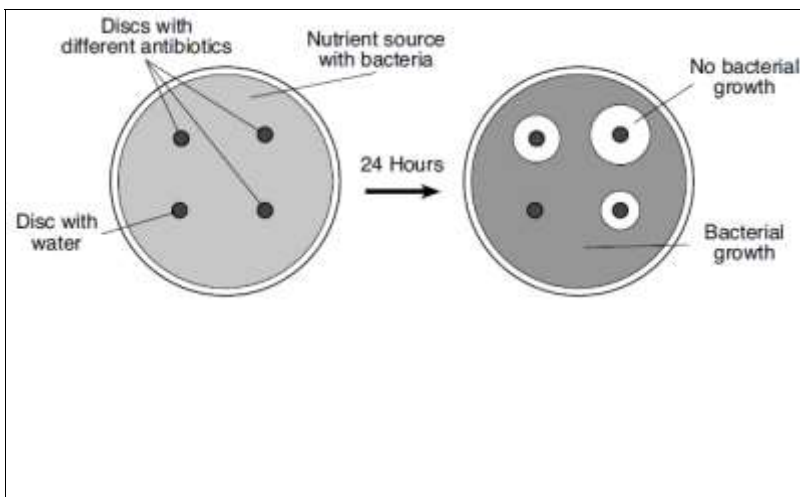
Data Base File Number: 1309

Regents Date Jan2019-35.bmp

Jan2019

35 1/22/2019 S1K3

Answer 3



**controlled experiment**

274. Base your answer to this question on the information, diagram, and data table shown and on your knowledge of biology. A student conducted an investigation to determine the effect of various environmental factors on the rate of transpiration (water loss through the leaves) in plants. The student prepared 4 groups of plants. Each group contained 10 plants of the same species and leaf area. Each group was exposed to different environmental factors. The apparatus shown in the diagram was constructed to measure water loss by the plants over time in 10-minute intervals for 30 minutes. The results are shown in the data table. What was the control group of plants in this experiment?

- (1) Classroom Conditions
- (2) Classroom Conditions + Floodlight
- (3) Classroom Conditions + Fan
- (4) Classroom Conditions + Mist

Data Base File Number:

722

Regents Date

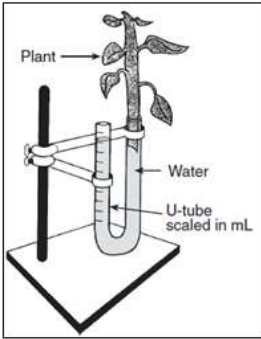
Jan2003-54C.bm

Jan2003

54

1/30/2003

S1K3



Environmental Factors	Average Total Water Loss in mL Over Time			
	0 min	10 min	20 min	30 min
Classroom Conditions	0.0	2.2	4.6	6.6
Classroom Conditions + Floodlight	0.0	4.2	7.6	11.7
Classroom Conditions + Fan	0.0	4.5	7.6	11.0
Classroom Conditions + Mist	0.0	1.3	2.4	3.7

Answer

1

## controlled experiment

275. In an experiment to test the effect of light on plant growth, a student used two marigold plants of the same age. The plants were grown in separate pots. One pot was exposed to sunlight, the other to artificial light. All other conditions were kept the same. The height of each plant was measured at the start and at the end of the experiment. The student's data are shown in the table. The student concluded that all plants grow more rapidly in sunlight than in artificial light. Is this conclusion valid?

- (1) yes, because this is a well designed controlled experiment.
- (2) no, because only two plants of the same species were used and the 1 centimeter difference in height is not significant.
- (3) yes and no, because data is not conclusive.
- (4) yes because sunlight is always better for plant growth than artificial light.

Data Base File Number: 726

Regents Date Jan2003-65.bmp

Jan2003

65 1/30/2003 S1K3

Answer 2

Data Table

Plant Grown In	Increase in Plant Height (cm)
Sunlight	9
Artificial light	8

## daphnia

276. The daphnia shown in the diagram has produced three egg cells, eats live single-celled organisms, lives in freshwater, and is caught and eaten by animals known as hydra. Which terms would most likely be used in a description of this organism?

- (1) asexual reproduction, herbivore, prey, aquatic, heterotrophic
- (2) sexual reproduction, predator, aquatic, heterotrophic, prey
- (3) asexual reproduction, autotrophic, predator, terrestrial, scavenger
- (4) sexual reproduction, carnivore, aquatic, autotrophic, prey

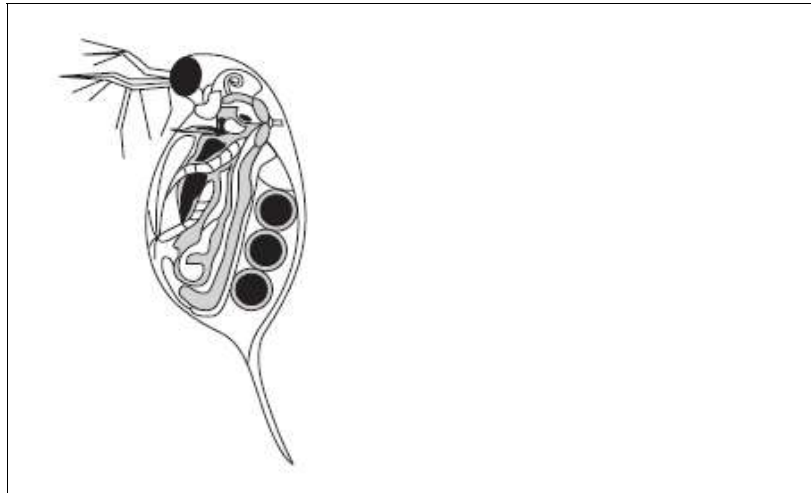
Data Base File Number: 318

Regents Date Jan2011-39.bmp

Jan2011

39 1/25/2011 S4K6

Answer 2



**data analysis**

277. Base your answer to this question on the information given and on your knowledge of biology. **Kaolin as a Spray to Control a Bean Pest.** Spraying kaolin, a clay-like material, on the leaves of plants has been effective in reducing insect damage to plants that grow in temperate regions, but has not been tried in tropical areas. Researchers in the tropical Andean region of South America have recently conducted experiments to see if kaolin can be used there to control the greenhouse whitefly, a significant pest of the region's bean crops. In the study, four groups of bean plants were used with the following treatments: (See the data chart shown). Based on the results of groups 3 and 4, which kaolin treatment would be best for bean plants grown in areas where low rainfall is a common occurrence?

- (1) Group 1 (control)
- (2) Group 2
- (3) Group 3
- (4) Group 4\*

Data Base  
File Number:

1357

Regents Date

June2019-61.bmp

June2019

63

6/18/2019

S1K3

Answer

4

Group	Treatment	Whiteflies Killed (%)
1 (control)	No insecticide or other substance applied to the plants	0
2	Synthetic chemical insecticide applied to leaves	90
3	Leaves treated with 2.5% concentration of kaolin spray	80
4*	Leaves treated with 5% concentration of kaolin spray	80

\* Note: In group 4 the plants lost 40% less water and showed a 45% increase in chlorophyll content in the leaves.



## data analysis

278. Base your answer to this questions on the information given, the graph shown, and on your knowledge of biology. In an investigation, 28 students in a class determined their pulse rates after performing each of three different activities. Each activity was performed three times during equal time intervals. The average results are shown in the graph. Before constructing the graph it would have been most helpful to organize the results of the investigation in

- (1) a research plan
- (2) an equation
- (3) a data table
- (4) a generalization

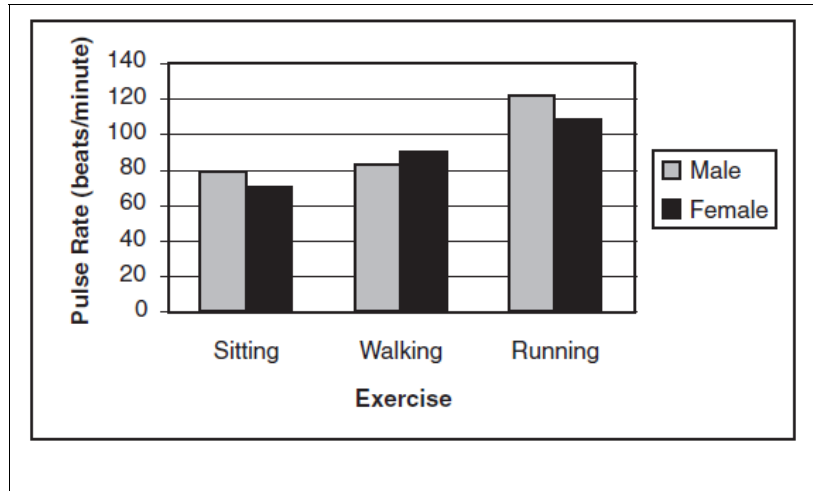
Data Base 602  
File Number:

Regents Date Aug2005-68.bmp

Aug2005

68 8/16/2005 LAB2

Answer 3



## data analysis

279. Stable predator-prey relationships are necessary to maintain a healthy ecosystem. The removal of a predator species from an area caused the deer population to sharply increase from 1910 to 1925. Changes in the deer population and carrying capacity of the area are represented in the graph as shown. Based on the information provided, why did the population increase from 1910 to 1925 result in the decrease in the carrying capacity after 1925?

- (1) In 1925, the deer ate too much food, lowering the amount of food available in future years.
- (2) In 1925, the deer ate too little food, lowering the amount of food available in future years.
- (3) In 1925, the deer died of disease, lowering the amount of food available in future years.
- (4) In 1925, the deer died of disease, increasing the amount of food available in future years.

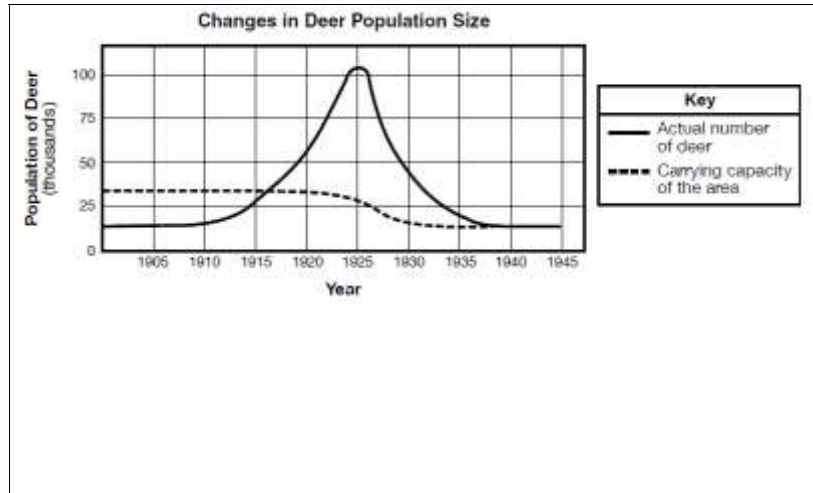
Data Base File Number: 1266

Regents Date June2018-52.nmp

June2018

52 6/13/2018 S4K6

Answer 1



**data analysis**

280. Base your answer to this question on the information and data table shown and on your knowledge of biology. Moose habitat is determined by temperature. Moose prefer areas where the average summer temperature is around 15°C and does not exceed 27°C for too long. The reason for this temperature dependency: Moose cannot sweat. Besides the cooling effect of water, which moose are almost always near, aquatic environments provide them with a good supply of food, and in the past, have protected them against biting insects. However, the North American moose population is facing a new threat: a parasite called the winter tick. These ticks lodge themselves in the animal’s fur and hold on through the winter, sucking the animal’s blood. Many infected moose end up dying of exhaustion and weakness as a result of the large number of ticks feeding on them. Ticks are most active during dry days in the fall. Adult ticks that drop off moose in the spring and land on snow cover have a poorer survival rate. Climate change can be predicted to improve conditions for winter ticks due to longer and warmer falls, and earlier snowmelt in the spring. Surveys of the moose population in Northeastern Minnesota have recorded the change shown in the data table between 2005 and 2013. What has happened to the moose population from 2005-2013 according to the data shown?

- (1) The moose population is lower.
- (2) The moose population is higher.
- (3) The moose population varies up and down.
- (4) The moose population is unchanged.

Data Base 1263  
 File Number:

Regents Date **June2018-44.bmp**

June2018  
 44 6/13/2018 LABA

Answer 1

Survey Year	Estimated Moose Population
2005	8160
2006	8840
2007	6860
2008	7890
2009	7840
2010	5700
2011	4900
2012	4230
2013	2760

## data analysis

281. Base your answer to this question on the information and data table shown and on your knowledge of biology. A student grew two separate cultures of single-celled organisms. One culture contained "Paramecium caudatum" and the other contained "Paramecium aurelia". The cultures were grown under the same conditions and the number of paramecia (per drop) in each culture was estimated every 2 days for a period of 16 days. The results are shown in "Data Table 1". What change occurred in the two populations of paramecia between days 0 and 8?

- (1) both populations increased in number                      (3) both populations stayed the same  
(2) both populations decreased in number                      (4) one population increased while the other decreased

Data Base File Number: 546

Regents Date Jan2005-39.bmp

Jan2005

39 1/28/2005 S1K3

Answer 1

Days	Number of <i>Paramecium caudatum</i> (per drop)	Number of <i>Paramecium aurelia</i> (per drop)
0	4	4
2	10	10
4	30	46
6	48	66
8	58	70
10	62	69
12	60	71
14	61	71
16	60	71

## data analysis

282. Base your answer to this question on the information and diagram shown and on your knowledge of biology. An experiment was carried out to determine the effect of exposure to ultraviolet (UV) light on the growth of bacteria. Equal quantities of bacterial cells were spread on Petri dishes that are used to grow colonies of bacteria. Half of each dish was shielded from the UV light with a UV screen. The other half was exposed to UV light for various amounts of time. After the UV treatment, the bacteria were grown in an incubator for 24 hours and the number of colonies was counted. The table shown contains the data collected at different exposure times by counting the number of bacterial colonies on both the screen-covered side and unscreened side. What happened to the number of bacterial colonies as UV light exposure increased?

- (1) the colony count decreased  
(2) the colony count increased  
(3) the colony count remained the same  
(4) UV light did not affect colony count

Data Base File Number: 1268

Regents Date June2018-59B.b

June2018

59 6/13/2018 LABA

Answer 1

Exposure Time to UV Light (min)	Colonies on Screened Side	Colonies on Unscreened Side
0 (No exposure)	20	22
0.5	21	19
1.0	23	16
2.0	22	10
5.0	24	5
10.0	23	1

## data analysis

283. Base your answer to this question on the information and data table shown and on your knowledge of biology. You are the head of the research division of the Leafy Lettuce Company. Your company is experimenting with hydroponic technology. Hydroponic technology involves growing plants in containers of growth solution in a greenhouse. No soil is used. Your first experiment used five groups of five plants of the same size and species. Each group was grown in a different growth solution for the same period of time. The results of the experiment are shown in the data table. Based on the data as shown, what would be the best growth solution to use for hydroponic lettuce growth?

(1) Group 2

(3) Group 4

(2) Group 3

(4) Group 5

Data Base File Number: 843

Regents Date Jan2002-69.bmp

Jan2002

69 1/23/2002 S1K3

Answer 4

Group	Growth Solution	Average Growth in Height (cm)	Average Surface Area of Leaves (cm <sup>2</sup> )	Key N = Nitrogen P = Phosphorus Mg = Magnesium K = Potassium
1	H <sub>2</sub> O	4.4	7.6	
2	H <sub>2</sub> O + N	5.1	10.0	
3	H <sub>2</sub> O + N + P	11.5	37.5	
4	H <sub>2</sub> O + N + P + Mg	13.0	125.0	
5	H <sub>2</sub> O + N + P + Mg + K	20.3	306.5	

## data analysis

284. Base your answer to this question on the information and data table shown and on your knowledge of biology. A biology student performed an experiment to determine which of two species of single celled organisms would survive best when cultured together in a certain environment. The student placed 10 organisms of each species into a large test tube. Throughout the experiment, the test tube was maintained at 30°C. After the test tube was set up, the population of each species was determined each day for 5 days. The data collected are shown in the table. Based on the daily counts, on which day did it first become evident that one species was better adapted than the other species for survival in the environment provided?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 788

Regents Date Aug2002-42.bmp

Aug2002

45 8/13/2002 S1K3

Answer 4

Day	Population	
	Species A	Species B
1	10	10
2	16	16
3	32	32
4	48	12
5	60	4

**data analysis**

285. Base your answer to this question on the information given and on your knowledge of biology. A student squeezes and releases a clothespin as often as possible for 2 minutes and then takes his pulse for 20 seconds. After a 2-minute rest, he repeats the procedure. This pattern is repeated one more time. The student's 20-second pulse counts were 23, 26, and 21 and are recorded in the data table as shown. What is the "Average Pulse/Min" to be recorded in the data table in the LOWER RIGHT CORNER?

(1) 69

(3) 63

(2) 78

(4) 70

Data Base File Number: 500

Regents Date June2006-67.bmp

June2006

67 6/21/2006 LAB2

Answer 4

Trial	20-Second Pulse Counts	Pulse/Min
1	23	
2	26	
3	21	
Average		



## data analysis

286. A student squeezed a clothespin as many times as possible in a 30-second time period. The student repeated this procedure nine more times in quick succession. The data obtained are in the chart shown. What is one hypothesis that this data would support concerning the relationship between the number of trials and number of squeezes in 30 seconds?

- (1) The number of squeezes in 30 seconds will increase with each consecutive trial.
- (2) The number of squeezes in 30 seconds will remain the same with each consecutive trial.
- (3) The number of squeezes in 30 seconds will decrease with each consecutive trial.
- (4) The number of squeezes in 30 seconds will accelerate with each consecutive trial.

Data Base File Number: 552

Regents Date Jan2005-70.bmp

Jan2005

70 1/28/2005 LAB2

Answer 3

Trial	Number of Squeezes in 30 Seconds
1	32
2	29
3	28
4	27
5	26
6	25
7	23
8	21
9	19
10	17

## data analysis

287. Base your answer to this question on the information given and on your knowledge of biology. An investigation was performed to determine the resistance of two species of *Anopheles* mosquito to the insecticides malathion and dieldrin. In May, two groups of 10,000 insects of each species were sprayed with insecticide. One group was sprayed with malathion, the second group with dieldrin. The number of surviving insects was recorded after the first spraying. The surviving insects were then allowed to reproduce. Several generations of new offspring were produced over the following three months. On the first day of each month they were sprayed, and the number of survivors was recorded in the table as shown. One valid conclusion that can be drawn from these data is

- (1) *Anopheles culifacies* is the dominant insect.
- (2) *Anopheles stephensi* is more resistant to malathion than to dieldrin.
- (3) *Anopheles stephensi* is more resistant to dieldrin than to malathion.
- (4) No valid conclusion can be made.

Data Base File Number: 842

Regents Date Jan2002-59.bmp

Jan2002

59 1/23/2002 LABA

Answer 3

Species	Insecticide	Number Before First Spraying	Number of Survivors			
			May	June	July	Aug
<i>Anopheles culifacies</i>	malathion	10,000	31	129	1,654	4,055
	dieldrin	10,000	78	339	1,982	3,106
<i>Anopheles stephensi</i>	malathion	10,000	28	56	1,207	1,744
	dieldrin	10,000	30	71	1,321	2,388

## data analysis

288. Base your answer to this question on the data table and information below and on your knowledge of biology. The data table shows water temperatures at various depths in an ocean. The approximate water temperature at a depth of 125 meters, in degrees C., would be closest to

(1) 15

(3) 8

(2) 13

(4) 3

Data Base File Number: 819

Regents Date June2002-44.bmp

June2002

47 6/19/2002 S1K3

Answer 3

Water Temperatures  
at Various Depths

Water Depth (meters)	Temperature (°C)
50	18
75	15
100	12
150	5
200	4

## data analysis

289. Base your answer to this question on the information and graph given and on your knowledge of biology. Dr. Liz Hadly studied the ecology of Yellowstone National Park for 30 years, specifically the amphibians inhabiting the park for 20 of those years. Dr. Hadly studied 46 ponds in 1992-1993. Of these, 43 supported amphibians. From 2006-2008, only 38 of the original 46 ponds contained water. The graph shown represents population data for four amphibian species collected by Dr. Hadly during 1992-1993 and 2006-2008. What was the trend in the amphibian populations over the course of the study based on the graphs shown?

- (1) The population size of three of the four species decreased.
- (2) The population size of three of the four species increased.
- (3) The population size of three of the four species stayed the same.
- (4) The population size of all of the species decreased.

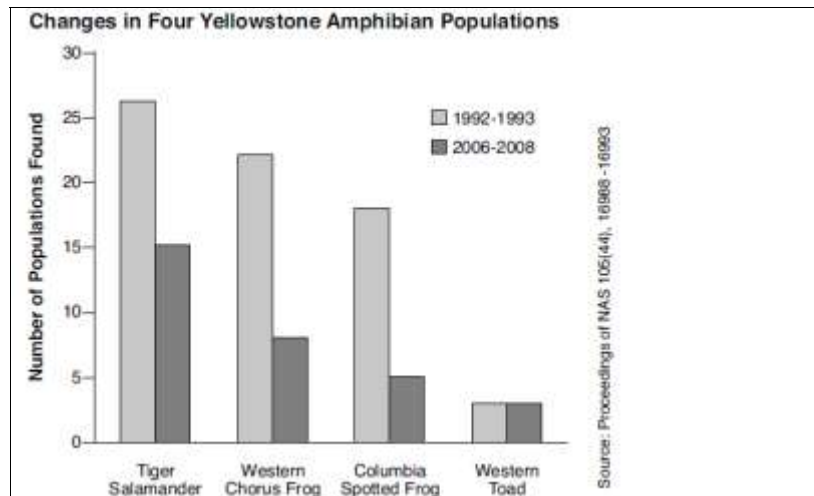
Data Base File Number: 1322

Regents Date Jan2019-62.bmp

Jan2019

63 1/22/2019 S4K3

Answer 1



## data analysis

290. Base your answer to this question on the data table given and your knowledge of biology. A number of bean seeds planted at the same time produced plants that were later divided into two groups, A and B. Each plant in group A was treated with the same concentration of gibberellic acid (a plant hormone). The plants in group B were not treated with gibberellic acid. All other growth conditions were kept constant. The height of each plant was measured on 5 consecutive days, and the average height of each group was recorded in the data table shown. What valid conclusion can be drawn concerning the effect of gibberellic acid on bean plant growth?

- (1) No valid conclusion can be drawn from the data given.                      (3) Bean plants given gibberellic grew taller than those that were not treated.
- (2) The height of Group A plants was smaller.                      (4) The height of Group B plants was taller.

Data Base File Number: 524

Regents Date Aug2006-46.bmp

Aug2006

46 8/16/2006 S1K3

Answer 3

	Average Plant Height (cm)				
	Day 1	Day 2	Day 3	Day 4	Day 5
Group A	5	7	10	13	15
Group B	5	6	6.5	7	7.5

**data analysis**

291. A student designed an investigation to determine the effect of temperature on the rate of seed germination. The student placed moist filter paper in each of four culture dishes. Ten bean seeds were placed on the filter paper in each dish. The four dishes were numbered and placed in the dark at different temperatures as follows: Dish 1: 10°C, Dish 2: 15°C, Dish 3: 20°C, Dish 4: 25°C. The total number of germinated seeds in each culture dish was counted each day for two weeks. Which data table is best for recording the results of this investigation?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 838

Regents Date Jan2002-50.bmp

Jan2002

50 1/23/2002 S1K3

Answer 4

Petri Dish	Day	Temperature	Amount of Light
1			
2			
3			
4			

(1)

Day	Temperature			
	Dish 1	Dish 2	Dish 3	Dish 4

(3)

Petri Dish	Amount of Water	Number of Germinated Seeds	Amount of Light
1			
2			
3			
4			

(2)

Day	Number of Germinated Seeds			
	10°C	15°C	20°C	25°C

(4)

## data analysis

292. Base your answer to this question on the information given and on your knowledge of biology. During a lab activity, a 14-year-old student took his resting pulse rate. He counted 20 beats in 20 seconds. He calculated his pulse rate for a minute and compared the result to the data shown in the table. According to the data table, does the student's pulse rate fall within the normal range? Answer yes or no and and the appropriate reason for the answer.

- (1) No - His rate of 60 beats per minute puts him in the adult range.
- (2) No - His rate of 60 beats per minute puts him in the children's range.
- (3) Yes - His rate of 60 beats per minute puts him in the children's range.
- (4) No - His rate of 60 beats per minute puts him in the children's range.

Data Base File Number: 1272

Regents Date June2018-78.bmp

June2018

78 6/13/2018 LAB2

Answer 1

Age Group	Resting Heart Rate (beats per minute)
Children (ages 6-15)	70 – 100
Adults (ages 18 and over)	60 – 100

## data analysis

293. When living organisms obtain water and food from their environment, they may also take in toxic pesticides. Low concentrations of some pesticides may not kill animals, but they may damage reproductive organs and cause sterility. The data table shows concentrations of a pesticide in tissues of organisms at different levels of a food chain. How does pesticide concentration vary between all the organisms?

- (1) Producers have the highest pesticide concentration.
- (2) Herbivores have the highest pesticide concentration.
- (3) Carnivores have the highest concentration.
- (4) Data is insufficient to draw a conclusion.

Data Base File Number: 599

Regents Date Aug2005-57.bmp

Aug2005

57 8/16/2005 S4K7

Answer 3

Concentration of Pesticide in Tissues	
Organisms	Pesticide Concentration (parts per million)
producers	0.01–0.03
herbivores	0.25–1.50
carnivores	4.10–313.80



## data analysis

294. Base your answer to this question on the information and graph given and on your knowledge of biology. A species of bird lives on an island. Beak thickness varies within the population. The birds feed mainly on seeds. Birds with smaller beaks can eat only small seeds. Only birds with larger beaks are able to crush and eat large seeds. During years with more rain, small seeds are abundant. During dry years, there are very few small seeds, but there are many large seeds. One specific advantage for this bird species to have members of this population with beaks that range from approximately 9.4 mm to 9.9 mm in thickness is:

- (1) The bird species would be able to obtain more food.
- (2) The bird species would be able to obtain less food.
- (3) Beak size is not important in obtaining food.
- (4) The birds can find other sources of food so beak size is not important.

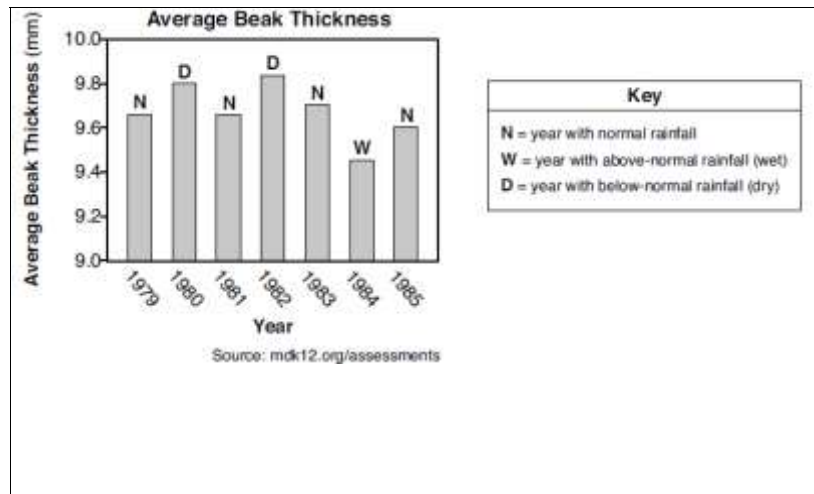
Data Base File Number: 1326

Regents Date Jan2019-77.bmp

Jan2019

78 1/22/2019 LAB3

Answer 1



## data analysis

295. A student completed two trials of the "Beaks of Finches" lab, each time picking up eleven seeds, as shown in the table.. If the student needs to collect an average of thirteen seeds to survive, how many seeds must he pick up in TRIAL NUMBER 3?

- (1) 11 (3) 15  
(2) 13 (4) 17

Data Base File Number: 1355

Regents Date June2019-85.bmp

June2019

85 6/18/2019 LAB3

Answer 4

Trial Number	Seeds Picked Up
1	11
2	11
3	_____
Average	13

## data analysis

296. Insecticides are used by farmers to destroy crop-eating insects. Recently, scientists tested several insecticides to see if they caused damage to chromosomes. Six groups of about 200 cells each were examined to determine the extent of chromosome damage after each group was exposed to a different concentration of one of two insecticides. The results are shown in the data table. Which insecticide has a more damaging effect on chromosomes?

- (1) methyl parathion (3) methyl malathion  
(2) malathion (4) parathion malathion

Data Base File Number: 597

Regents Date Aug2005-44.bmp

Aug2005

47 8/16/2005 S1K4

Answer 1

Insecticide	Insecticide Concentration (ppm)	Number of Cells with Damaged Chromosomes
Methyl parathion	0.01	7
	0.10	15
	0.20	30
Malathion	0.01	3
	0.10	4
	0.20	11

## data analysis

297. Base your answer to this question on the data table shown and on your knowledge of biology. The table labeled "A" indicates the amount of oxygen present at various water temperatures in a pond. An aquatic ecosystem experiences an increase in temperature. Which row in chart "B" shows the effect of this increased temperature on the available oxygen and ecosystem ?

- (1) 1 (3) 3  
 (2) 2 (4) 4

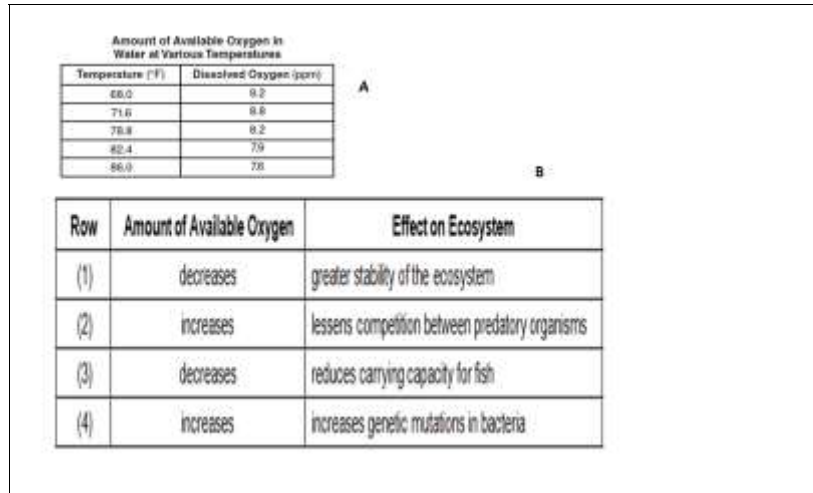
Data Base File Number: 1343

Regents Date June2019-C.bmp

June2019

34 6/18/2019 S4K6

Answer 3



## data analysis

298. NOTE - Rotate your paper to the LEFT to properly view the diagram. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the relative concentrations of different ions inside and outside of an animal cell. Which ion is closest to equilibrium inside and outside of the cell?

- (1) Sodium (3) Calcium  
 (2) Potassium (4) Chloride

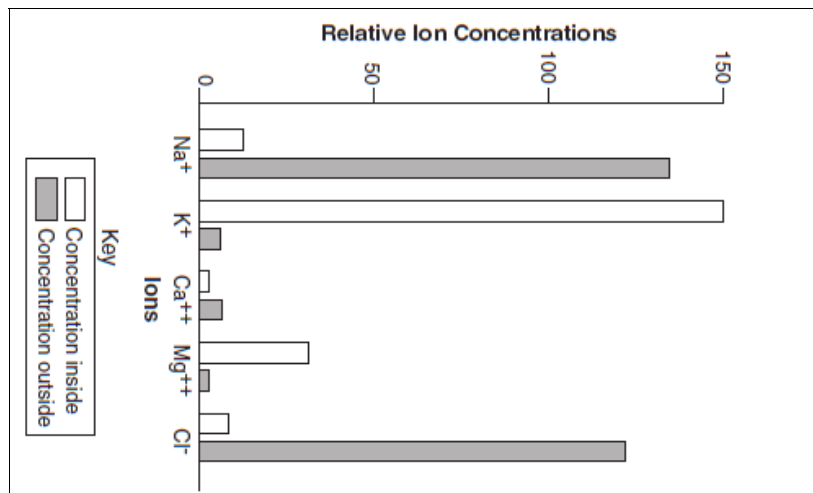
Data Base File Number: 791

Regents Date Aug2002-52.bmp

Aug2002

52 8/13/2002 S4K1

Answer 3



**data analysis**

299. Base your answer to this question on the information and graph below and on your knowledge of biology. Pulse-rate data were collected from some students during their lunch time for a lab activity. The data are represented in the histogram shown. The histogram includes data from a total of how many students?

(1) 6

(3) 10

(2) 7

(4) 27

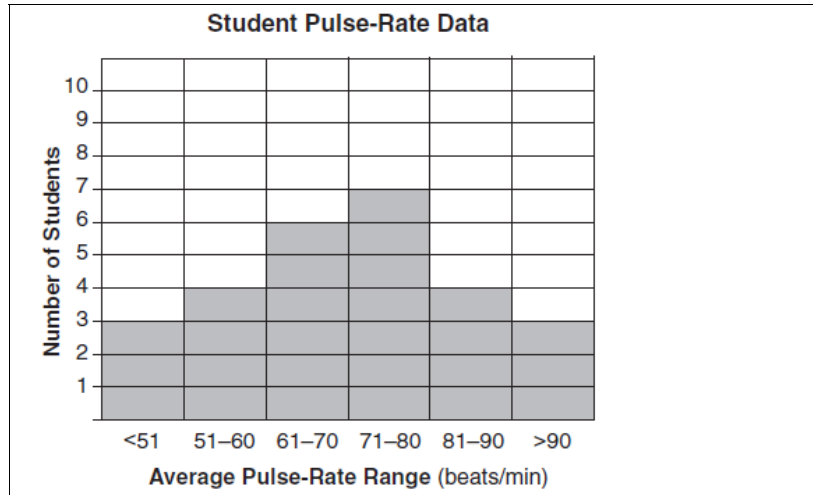
Data Base File Number: 530

Regents Date Aug2006-65.bmp

Aug2006

65 8/16/2006 LAB2

Answer 4



## data analysis

300. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the amount of oxygen that will dissolve in freshwater and seawater at different temperatures. The amount of oxygen is expressed in parts per million (ppm). What is the oxygen-holding ability of freshwater as compared to the oxygen-holding ability of seawater in the temperature range shown?

- (1) The oxygen holding content of fresh water is greater than the oxygen holding content of saltwater.
- (2) The oxygen holding content of fresh water and salt water are the same.
- (3) The data is insufficient to determine the oxygen holding capacity of fresh water and saltwater at a given temperature.
- (4) Oxygen holding capacity depends on mineral content of the water.

Data Base File Number: 840

Regents Date Jan2002-55.bmp

Jan2002

55 1/23/2002 S1K3

Answer 1

Temperature (°C)	Freshwater Oxygen Content (ppm)	Seawater Oxygen Content (ppm)
1	14.24	11.15
10	11.29	9.00
15	10.10	8.09
20	9.11	7.36
25	8.27	6.75
30	7.56	6.19

**data analysis**

301. Base your answer to this question on the information given, the data table shown, and on your knowledge of biology. A group of students obtained the data shown while trying to determine the effect of exercise on pulse rate. Which statement is an example of an observation the students could have made?

- (1) Pulse rates in beats per minute decrease for all people after exercise.
- (2) Student A most likely exercises regularly
- (3) The pulse rate of student C was dangerously low.
- (4) The pulse rate of student F increased by 30 beats per minute.

Data Base File Number: 1038

Regents Date June2015-75.bmp

June2015  
75 6/16/2015 LAB2

Answer 4

Student	Resting Pulse Rate (beats per minute)	Pulse Rate After Exercising (beats per minute)
A	66	92
B	82	107
C	65	97
D	74	124
E	79	118
F	68	98
G	89	122

**data analysis**

302. The graph shown represents a change in event A that leads to changes in events B and C. Which row in the chart best identifies each event in the graph?

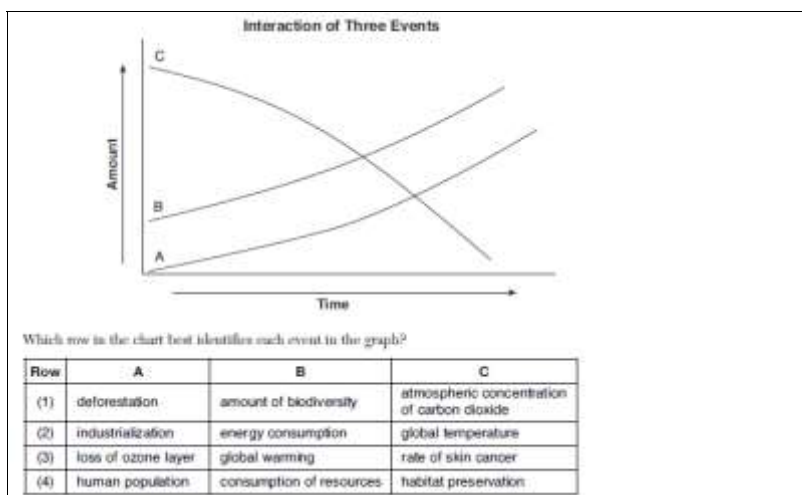
- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 973

Regents Date Aug2014-42.bmp

Aug2014  
42 8/14/2014 S4K7

Answer 4



**data analysis**

303. Which graph best shows changes in a population of yeast that develops in a test tube and completely consumes a limited supply of food?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

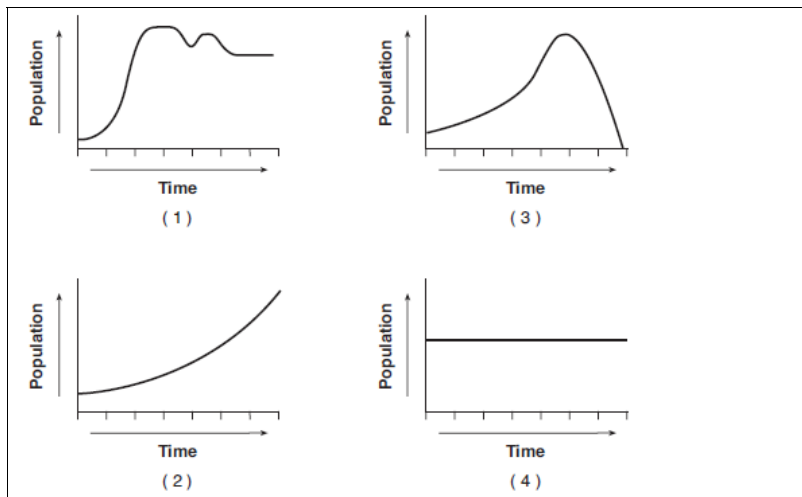
Data Base File Number: 974

Regents Date Aug2014-43.bmp

Aug2014

43 8/14/2014 S4K6

Answer 3



**data analysis**

304. Base your answer to this question on the information shown and on your knowledge of biology. Five groups of corn seeds, each containing 275 seeds, were soaked for 1 hour in different concentrations of gibberellic acid, a plant growth hormone. After 1 hour, the seeds were rinsed in tap water and drained of all excess water. The seeds were then placed on paper towels and kept moist for 7 days. After 7 days, the growing stems were cut and weighed to determine the increase in growth. Then, the percent increase in growth compared to the growth of a group of untreated seeds was calculated. The results were recorded and are shown in the data table. Which concentration of gibberellic acid produced the greatest percentage increase in growth?

- (1) 225
- (2) 300
- (3) 400
- (4) 500

Data Base File Number: 975

Regents Date Aug2014-44.bmp

Aug2014

44 8/14/2014 LABA

Answer 2

**Growth Rate in Corn Plants Treated with Gibberellic Acid**

Concentration of Gibberellic Acid in Parts per Million (ppm)	Increase in Growth * (%)
225	15
300	30
400	23
500	15
600	6

\* percent increase in growth compared to the growth of untreated seeds  
 Source: Adaped from www.super-grow.biz/GibberellicAcid.jsp

## data analysis

305. Base your answer to this question on the information given, the data table given and on your knowledge of biology. Daphnia (water fleas) are sensitive to many changes in pond ecosystems. For this reason they are often used in bioassays, tests in which organisms are exposed to various levels of a chemical to determine what levels are safe. The results of these tests determine whether or not the chemical being tested will affect other pond organisms. An experiment was designed to determine the toxicity of different salt solutions on cultures of daphnia. Five fish tanks were each filled with the same amount of water containing different concentrations of salt. Ten daphnia were placed into each tank. After 48 hours, the number of daphnia that had survived and the number of daphnia that had died in each tank were recorded and the percent mortality was calculated. The results of the experiment are shown in the data table. Which salt concentration was most toxic to the daphnia in this experiment?

(1) 1.25 g/L

(3) 5.0 g/L

(2) 2.5 g/L

(4) 10.0 g/L

Data Base File Number: 421

Regents Date June2012-44.bmp

June2012

44 6/19/2012 S1K3

Answer 4

Effect of Salt Concentration on Daphnia After 48 Hours

Salt Concentration (g/L)	Number that Survived	Number that Died	Mortality (%)
0.63	8	2	20
1.25	7	3	30
2.5	10	0	0
5.0	3	7	70
10.0	0	10	100



**data analysis**

306. Base your answer to this questions on the information and data table given and on your knowledge of biology. -----

Onondaga Lake is a small lake located near Syracuse, New York. Industrialized municipal wastes have been polluting the lake for decades. Eating fish from the lake has been banned due to mercury concentrations in the fish. The data table shown indicates the mercury concentrations in smallmouth bass taken from Onondaga Lake. Smallmouth bass eat smaller fish, which feed on aquatic plants. At each feeding level in the food chain, more mercury accumulates. The older and larger the fish, the greater the concentration of mercury. Which statement could be a possible explanation for the drop in mercury concentration in the fish of Onondaga Lake between the years 2002 and 2003?

- (1) Between 2000 and 2005, a large number of fish were sampled.
- (2) The dumping of industrial waste was prohibited in 2004.
- (3) More young fish were tested in 2003, compared to the other years.
- (4) The industrial waste contained more mercury in 2004.

Data Base File Number: 1001

Regents Date Jan2015-44.bmp

Jan2015

47 2/26/2015 S4K7

Answer 3

Year	Mercury Concentration (ppm – wet weight)
2000	1.5
2001	2.0
2002	1.75
2003	1.0
2004	2.5
2005	2.25

**data analysis**

307. Base your answer to this question on the information given and on your knowledge of biology. Five individuals had their pulses taken in beats per minute (bpm) before and after exercise. The data are shown in the chart. What is the average pulse rate BEFORE exercise for the group to the NEAREST TENTH.

(1) 68.2

(3) 66.2

(2) 70.2

(4) 54.2

Data Base File Number: 1124

Regents Date June2016-83.bmp

June2016

84 6/15/2016 LAB2

Answer 3

Individual	Pulse before Exercise (bpm)	Pulse after Exercise (bpm)
A	68	100
B	70	120
C	54	130
D	64	122
E	75	115

**data analysis**

308. Base your answer to this question on the information given and on your knowledge of biology. -----

**Found: A Plant-Eating Spider -----**

Spiders are meat-eaters. Until recently, scientists thought that was true for the roughly 40,000 spider species in the world. Now, researchers have discovered a spider that eats mostly plants.

"*Bagheera kiplingi*", a jumping spider, lives in Central America and Mexico. It nests in the leaves of acacia shrubs. Scientists have long known that ants live in these plants. The ants eat the plants' little yellow vegetables. But scientists had no idea that the spiders eat the vegetables too. Christopher Meehan was a college student when he found the plant nibbling spiders. "I thought I was hallucinating," he told TFK (Time for Kids). "But by the end of the day, I had seen about 100 more spiders eating plants". (Source: Time for Kids World Report, Edition 10/23/09 Vol. 15, #7 p.3). Examine the chart shown. Which row best characterizes "*Bagheera kiplingi*" and acacia shrubs?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base 1002  
File Number:

Regents Date Jan2015-50.bmp

Jan2015

50 2/26/2015 S4K6

Answer 2

Row	<i>Bagheera kiplingi</i>	Acacia
(1)	host	parasite
(2)	consumer	producer
(3)	autotroph	heterotroph
(4)	scavenger	herbivore

## data analysis

309. Base your answer to this question on the information and diagram given and on your knowledge of biology. -----

### Blood Doping -----

Blood is a fluid tissue, which means that blood cells are suspended in a fluid called plasma. Blood tests are concerned with not only the number of blood cells present, but with the amount of plasma that surrounds the cells. The diagram shown represents tubes containing blood samples from an athlete before and after blood doping. Blood doping is an illegal practice reportedly used by some athletes a few weeks before an athletic event, and involves removing whole blood from an athlete, separating the oxygen-carrying red blood cells (RBCs), and then freezing them. These RBCs are thawed and returned to the athlete's body just before the athlete competes. Serious health risks are associated with this practice. Why would athletes who practice blood doping be expected to perform better at an athletic event?

- (1) Their muscles are stronger.
- (2) An increased number of RBCs would carry more oxygen to muscle cells.
- (3) Increased RBCs carry more energy to muscle cells.
- (4) More lactic acid is produced.

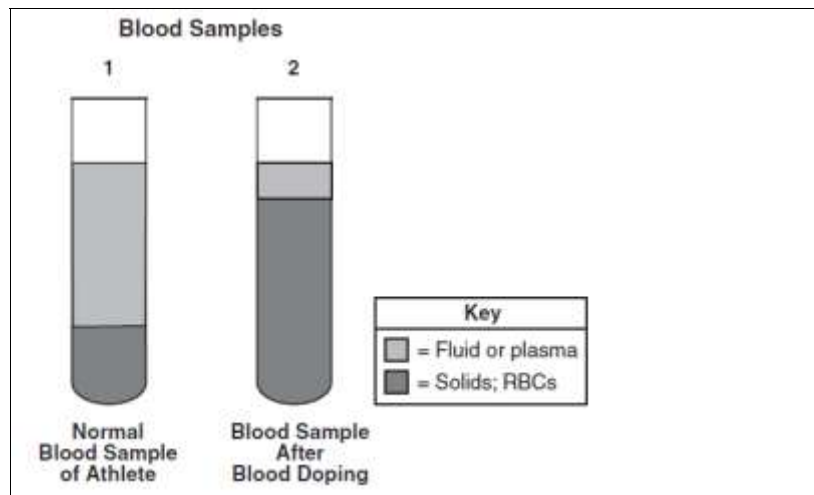
Data Base 1003  
File Number:

Regents Date Jan2015-65.bmp

Jan2015

65 2/26/2015 S4K5

Answer 2



**data analysis**

310. Base your answer to this question on the information given and on your knowledge of biology. A student designed an experiment to investigate a claim that athletes would have lower heart rates than nonathletes during exercise. After the students classified themselves as an athlete or a nonathlete, their resting pulses were determined. Then all the students performed the same exercise for four minutes and their heart rates were determined by recording the pulse rate in beats per minute. The students continued to measure their pulse rates for an additional four minutes. The average heart rate per minute for each group was determined. The data were recorded, as shown on the table. Which statement is best supported by the data in the chart?

- (1) After exercise, the nonathletic students had a lower heart rate than the athletic students
- (2) After exercise, the heart rates of the athletic students returned to resting pulse in four minutes.
- (3) During exercise, both groups of students had the same increase above their resting pulse.
- (4) During exercise, the athletic students had a higher heart rate than the nonathletic students.

**Data Base File Number:** 1194

**Regents Date** June2017-80.bmp

June2017

81 6/14/2017 LAB2

**Answer** 2

	Time (minutes)	Athlete Students	Nonathlete Students
Resting Pulse	0	68	72
Exercising Period	1	76	78
	2	82	90
	3	95	115
	4	110	130
After Exercise	5	100	125
	6	95	120
	7	85	100
	8	68	95

**data analysis**

311. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the number of breeding pairs of bald eagles in New York State from 1991 to 2003. In which time period did New York State see the largest increase in breeding pairs of bald eagles?

- (1) 1991-1993
- (2) 1993-1995
- (3) 1995-1997
- (4) 1999-2001

Data Base File Number: 885

Regents Date June2013-44.bmp

June2013

47 6/11/2013 S1K3

Answer 4

**Number of Breeding Pairs of Bald Eagles in New York State from 1991 to 2003**

Year	Number of Breeding Pairs
1991	15
1993	20
1995	25
1997	35
1999	45
2001	65
2003	75

**data analysis**

312. Base your answer to this question on the information and data table shown and on your knowledge of biology. The data table summarizes the changes that occurred to farmland in the years immediately following its abandonment. The land is located in a very stable ecosystem. It was abandoned after years of overuse and weathering, which resulted in the depletion of soil nutrients. Assuming the ecosystem remains undisturbed, which type of vegetation would you expect to be most common in this area 200 years after it was first abandoned?

- (1) grasses and weeds
- (2) shrubs
- (3) pine forest
- (4) hardwood forest

Data Base File Number: 1034

Regents Date June2015-54.bmp

June2015

54 6/16/2015 S4K6

Answer 4

**Common Types of Vegetation Present**

Years Since Abandoned	Grasses and Weeds	Shrubs	Pine Forest	Hardwood Forest
1	X			
18	X	X	X	
30			X	
70			X	X
100				X
118 (present)				X

## data analysis

313. The graph shown represents the growth in length and mass of a fetus up to week 32. The length is measured in millimeters (mm) and the mass in grams (g). Which statement best describes human fetal growth between weeks 26 and 32?

- (1) There is a faster rate of increase in mass than in length.
- (2) The rate of increase in mass levels off, while the increase in length constantly increases.
- (3) The fetal mass increases by 750 g and the fetal length increases by about 100 mm.
- (4) There are slight decreases in both length and mass.

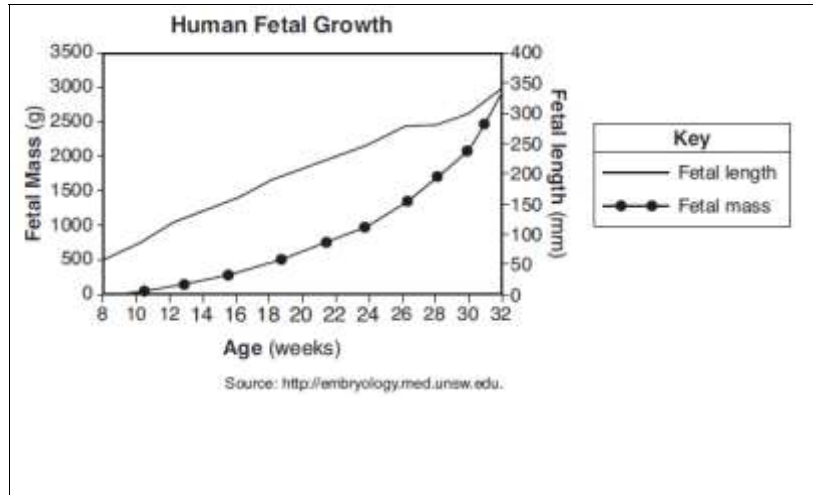
Data Base File Number: 968

Regents Date Aug2014-36.bmp

Aug2014

36 8/14/2014 S1K3

Answer 1



## data analysis

314. Base your answer to this question on the information given and on your knowledge of biology. An experiment was carried out to determine the effect of exposure to UV light on the growth of bacteria. Equal quantities of bacteria were spread on 5 petri dishes containing nutrient agar. Half of each petri dish was exposed to UV light for various amounts of time, and the other half was protected from the UV light with a UV screen, as shown in the diagram as (A). After the UV treatment, the bacteria were grown in an incubator for 24 hours, and the number of colonies was counted. The table, shown as (B), contains the data collected by counting the number of bacterial colonies growing on both the screen-covered side and the unscreened side. What effect does UV light have on the bacteria in this experiment, as exposure time to UV light increases?

- (1) the number of colonies increases
- (2) the number of colonies decreases
- (3) the number of colonies stays the same
- (4) no conclusion can be made based on the data given

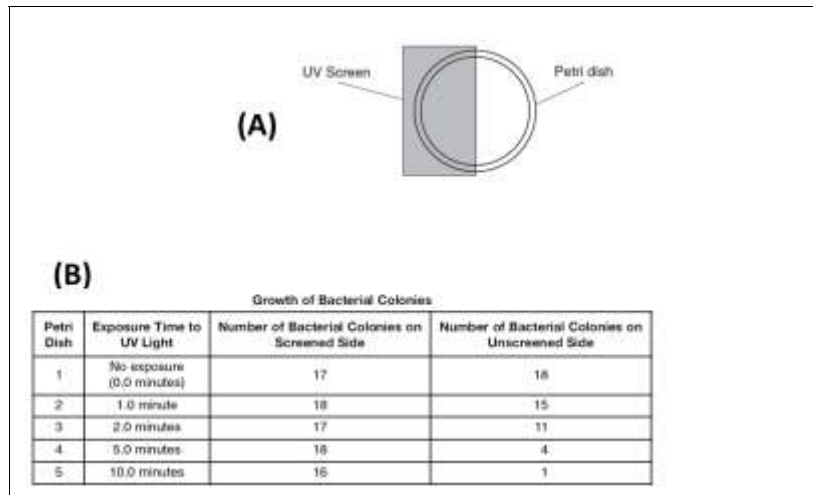
Data Base File Number: 1056

Regents Date August2015-44.b

Aug2015

44 8/12/2015 S1K3

Answer 2





**data analysis**

315. Base your answer to this questions on the information and graphs shown and on your knowledge of biology. The graphs show the relative enzymatic activity of four different enzymes in acidic (below pH 7) and basic (above pH 7) environments. Which enzyme would most likely function in the stomach?

- (1) chymotrypsin
- (2) pepsin
- (3) cholinesterase
- (4) papain

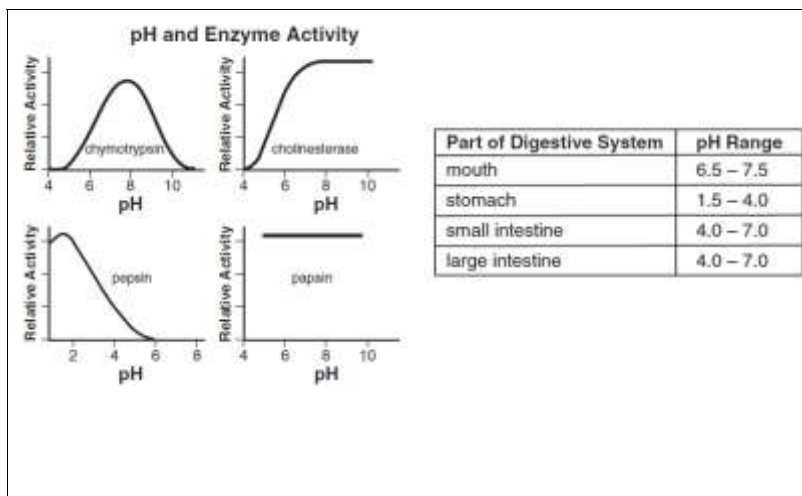
Data Base File Number: 1058

Regents Date August2015-49.b

Aug2015

49 8/12/2015 LABA

Answer 2



**data analysis**

316. A plant was discovered that contained a compound that was found to have potential medicinal value. However, the plant is rare, so it is important to see if a related plant might also produce the same compound. The chart shows some characteristics of the plant and four possible relatives. Which plant in the chart would be selected as most similar to the medicinal plant?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 1061

Regents Date August2015-73.b

Aug2015

73 8/12/2015 LAB1

Answer 3

Plant	Flower	Leaves	Amino Acid Sequence
Medicinal Plant	Red, 6 petals	simple, parallel veins	Ile-Ile-Try-Gly-Glu-Asp-Pro
A	Red, 9 petals	simple, parallel veins	Ile-Arg-Try-Gly-Glu-Asp-Ser
B	Yellow, 8 petals	compound, branched veins	Ile-Arg-Ala-Gly-Glu-Asp-Pro
C	Pink, 6 petals	simple, parallel veins	Ile-Ile-Try-Gly-Glu-Asp-Ser
D	Yellow, 6 petals	compound, parallel veins	Ile-Arg-Try-Gly-Glu-Asp-Pro

## data analysis

317. Base your answer to this question on the information given and on your knowledge of biology. Biology students conducted a preliminary survey to study the relationship between body height and resting pulse rate. The students collected data from 10 classmates and the results are shown in the graph. What is the relationship between height and resting pulse rate?

- (1) Tall students have a faster pulse rate.                      (3) Shorter students have a slower pulse rate.
- (2) The data do not show a relationship.                      (4) Pulse rate increases as activity increases.

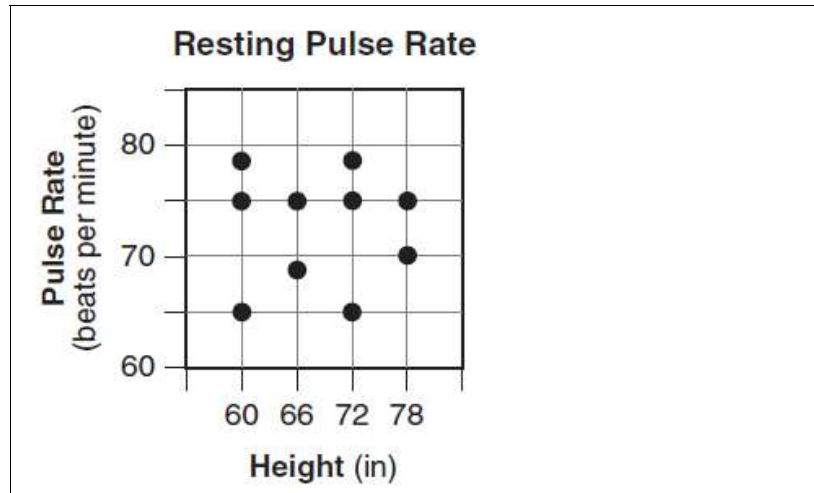
Data Base File Number: 1066

Regents Date August2015-84.b

Aug2015

84 8/12/2015 LAB2

Answer 2



## data analysis

318. Base your answer to this question on the diagram shown, which shows the evolution of Hawaiian Honey Creepers from a common ancestor. As their ancestors spread to new islands, they found a variety of different food sources. Gradually, behaviors and beak structures evolved that took advantage of these different food sources, resulting in the formation of several new species. How do the beaks of the bird species D, E, F, and J that eat fruits and seeds differ from the beaks of the bird species that eat only nectar?

- (1) Their beaks are shorter.
- (2) Their beaks are longer.
- (3) Their beaks are curved.
- (4) Their beaks are exactly like the common ancestor.

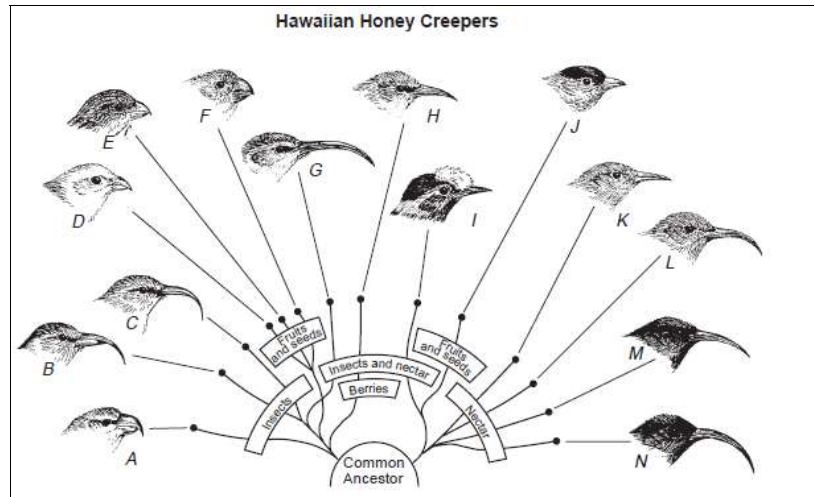
Data Base File Number: 1092

Regents Date Jan2016-83.bmp

Jan2016

83 1/27/2016 LAB3

Answer 1



**data analysis**

319. The table given shows the number of individual molecules obtained when a DNA molecule from a bacterial species is broken down. What data in the data table indicate that adenine pairs with thymine in a DNA molecule?

- (1) Sugar and Phosphate are present in equal numbers.
- (2) Cytosine and Guanine are present in equal numbers.
- (3) Adenine and Thymine are present in equal numbers.
- (4) Adenine and Thymine are present in unequal numbers.

Data Base File Number: 1067

Regents Date August2015-85.b

Aug2015

85 8/12/2015 LAB1

Answer 3

Molecule	Number
sugar	4.6 million
phosphate	4.6 million
adenine (A)	1.75 million
cytosine (C)	0.55 million
guanine (G)	0.55 million
thymine (T)	1.75 million

**data analysis**

320. A student proposes that, if volunteers warm up before squeezing a clothespin for one minute, they will increase the number of times that they can squeeze it without tiring. He states that this is because their muscles will be better prepared for exercise. The data from an experiment are shown in the data table. Which trial from the chart above provides the best data to support his claim?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1090

Regents Date Jan2016-80.bmp

Jan2016

80 1/27/2016 LAB2

Answer 2

Trial	Group	Group Description	Average Number of Squeezes/Minute
1	1	10 students who warm up before squeezing	72
1	2	10 students who do not warm up before squeezing	73
2	3	25 students who warm up before squeezing	67
2	4	25 students who do not warm up before squeezing	65

## data analysis

321. A student wished to determine the evolutionary relationships between three unidentified plant species (X, Y, and Z) and a known species "Botana curus". Using an indicator powder to test for the presence of a specific chemical, the student made the observations shown in the data table as shown. What could be a possible observation the student would record in the blank space in the data table if species Y were more closely related to "Botana curus" than it was to species X and Z?

- (1) produced a lot of bubbles  
(2) no reaction  
(3) produced very few bubbles  
(4) produced no bubbles

Data Base File Number: 1089

Regents Date Jan2016-79.bmp

Jan2016

79 1/27/2016 LAB1

Answer 1

Plant Species	Observations When Mixed With Indicator Powder
<i>Botana curus</i>	produced a lot of bubbles/fizzed
X	no reaction
Y	
Z	no reaction

## data analysis

322. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the number of fish species found at various ocean depths. The approximate number of fish species that can be found at 120 meters is

- (1) 5  
(2) 13  
(3) 18  
(4) 31

Data Base File Number: 372

Regents Date Aug2011-48.bmp

Aug2011

47 8/18/2011 S1K3

Answer 3

Water Depth (m)	Number of Fish Species Found
50	35
75	31
100	22
150	13
200	6

**data analysis**

323. A student measured her pulse rate for a 15-second period, three separate times, and recorded the results. She then calculated her pulse rate for 1 minute. What is the average pulse rate for the "15 Second Pulse Rate" column?

(1) 19

(3) 17

(2) 18

(4) 54

Data Base File Number: 1087

Regents Date Jan2016-77.bmp

Jan2016

77 1/27/2016 LAB2

Answer 2

Trial Number	15 Second Pulse Rate	1 Minute Pulse Rate
1	19	76
2	18	
3	17	68
Average		72

## data analysis

324. Base your answers to this question on the information and data table shown and on your knowledge of biology. Catalase is an enzyme found in nearly all living organisms that breathe or are exposed to oxygen. According to recent scientific studies, low levels of catalase may play a role in the graying process of human hair. The body naturally produces hydrogen peroxide, and catalase breaks it down into water and oxygen. If there is a dip in catalase levels, hydrogen peroxide cannot be broken down. This causes hydrogen peroxide to bleach hair from the inside out. Scientists believe this finding may someday be used in anti-graying treatments for hair. A pharmaceutical company, investigating ways to prevent hair from turning gray, took tissue samples from two different individuals. Both individuals were the same age. Each of the samples was placed in a solution of hydrogen peroxide. The volume of oxygen gas produced was measured every 5 minutes for 25 minutes. The data the company collected are shown in the table. If the temperature of the tissue samples used in the experiment had been raised from 37°C (body temperature) to 50°C, the results would have been different because

- (1) more enzymes are produced at higher temperatures, increasing the amount of hydrogen peroxide
- (2) more hydrogen peroxide is released at higher temperatures, increasing the activity of catalase
- (3) increasing temperatures altered the structure of catalase, decreasing oxygen production
- (4) increasing temperatures decreased the synthesis of amino acids, increasing levels of hydrogen peroxide

Data Base File Number: 1031

Regents Date June2015-44.bmp

June2015

44 6/16/2015 S4K1

Answer 3

Time (min)	Sample from Person A (mL oxygen)	Sample from Person B (mL oxygen)
5	2.0	4.5
10	3.5	8.5
15	5.0	12.0
20	7.5	15.5
25	9.5	20.0

**data analysis**

325. Base your answer to this question on the information given, the data table shown and on your knowledge of biology. An investigation was carried out on four different plant species to determine which of three species was most closely related to an unknown plant species. The results of the investigation are shown in the data table. Which plant species appears to be most closely related to the unknown species?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 934

Regents Date Jan2014-78.bmp

Jan2014  
78 1/27/2014 LAB1

Answer 2

Plant Species	Test for Enzyme M	Differences in Amino Acid Sequences	Gel Electrophoresis Banding Pattern
unknown	+		11, 8, 6, 2
1	-	4	24, 8, 5
2	+	1	11, 8, 6, 2
3	+	3	13, 7, 5, 2

**data analysis**

326. Base your answer to this question on the information and data table given and on your knowledge of biology. The rate of respiration of a freshwater sunfish was determined at different temperatures. The rate of respiration was determined by counting the number of times the gill covers of the fish opened and closed during 1-minute intervals at the various temperatures. The following data in the table shown were collected. According to the data, as the temperature increases, the rate of respiration of the sunfish

- (1) increases steadily
- (2) decreases steadily
- (3) increases, then decreases
- (4) decreases, then increases

Data Base File Number: 853

Regents Date June2001-40.bmp

June2001  
40 6/15/2001 S1K3

Answer 3

Temperature (°C)	Gill Cover Opening and Closing Per Minute
10	15
15	25
18	30
20	38
23	60
25	57
27	25



## data analysis

327. Base your answer to this question on the passage and data table given and on your knowledge of biology. The amount of oxygen gas dissolved in water is important to the organisms that live in a river. The amount of dissolved oxygen varies with changes in both physical factors and biological processes. The temperature of the water is one physical factor affecting dissolved oxygen levels as shown in the data table below. The amount of dissolved oxygen is expressed in parts per million (ppm). If the trend continues as shown in the data, what would the dissolved oxygen level most likely be if the temperature of the water was 35°C?

(1) 6

(3) 4

(2) 5

(4) 3

Data Base File Number: 496

Regents Date June2006-44.bmp

June2006

46 6/21/2006 S1K3

Answer 1

Water Temperature (°C)	Level of Dissolved Oxygen (ppm)
1	14
10	11
15	10
20	9
25	8
30	7

## data analysis

328. Base your answer to this question on the information given and on your knowledge of biology. This is a study of "Pocket Mice". Pocket mice are small rodents that feed mainly at night and are preyed upon by owls, hawks, and snakes. Scientists studied pocket mice living on dark volcanic rock in both New Mexico and fifty miles away in Arizona. They recorded their data in the chart as shown. What is a possible hypothesis that would explain the differences in the observed data between the two locations?

- (1) No hypothesis can be made because the data is insufficient.
- (2) Light fur is an advantage regarding survival of the mice.
- (3) Predators can see the mice better if their fur color does not match the rock color in Arizona.
- (4) There is no difference in the survival of the mice based on fur color.

Data Base File Number: 1223

Regents Date Aug2017-70.bmp

Aug2017

70 8/17/2017 S1K3

Answer 3

Number of Mice on Dark Volcanic Rock				
Year	New Mexico		Arizona	
	Light Fur	Dark Fur	Light Fur	Dark Fur
2000	120	122	16	125
2001	140	136	8	140
2002	134	130	6	135
2003	115	120	12	115
2004	122	126	8	129

**data analysis**

329. The data table shown contains information on the growth of eight white pine trees, planted in eight different locations, after a period of time. Which statement is best supported by the data in the table?

- (1) White pines grow best at higher elevations.
- (2) White pines are not found at elevations below 1,000 feet.
- (3) White pines have a long life span.
- (4) White pines can grow in acidic soil.

Data Base File Number: 859

Regents Date June2001-63.bmp

June2001

63 6/15/2001 S4K5

Answer 4

Tree Number	Trunk Diameter 1.2 Meters Above Soil Surface (m)	Soil pH	Elevation Above Sea Level (ft)
1	0.54	4.0	1,200
2	0.79	6.5	1,650
3	0.64	4.5	1,400
4	1.04	5.0	1,350
5	0.96	5.0	1,350
6	0.82	4.5	1,250
7	0.80	5.5	1,400
8	0.52	5.0	1,600

**data analysis**

330. Base your answer to this question on the information and data table shown and on your knowledge of biology. The concentration of a specific antibody in the blood of an individual was measured at various times over a period of 50 days. The results obtained are shown in the data table. The antibody level (in arb. units) of the individual on day 30 is closest to

- (1) 30
- (2) 70
- (3) 110
- (4) 160

Data Base File Number: 1218

Regents Date Aug2017-44.bmp

Aug2017

47 8/17/2017 LABA

Answer 3

Day	Antibody Concentration in Arbitrary Units (arb. units)
5	0
10	110
16	120
25	10
35	200
45	390
50	200

**data analysis**

331. Base your answer to this question on the information and data table shown and on your knowledge of biology. A student counted the total number of leaves in a group of duckweed plants ("Lemna gibba") over a 5-day period. The data collected are shown in the table. The time it takes for the number of leaves to increase from 15 to 30 is approximately

- (1) 2.0 days
- (2) 2.3 days
- (3) 2.9 days
- (4) 3.2 days

Data Base File Number: 868

Regents Date Aug2001-39.bmp

Aug2001

39 8/16/2001 S1K3

Answer 2

Time in Days	Number of Leaves
0	15
1	20
2	25
3	40
4	60
5	80

**data analysis**

332. The chart shows information about the relationship between the age of the mother and the occurrence of Down syndrome in the child. What is one conclusion that can be drawn from the chart concerning the relationship between the age of the mother and the chance of her having a child with Down syndrome.

- (1) The age of the mother does not make any difference in the chance of her having a child with Down syndrome.
- (2) The younger the mother the greater the chance of her having a child with Down syndrome.
- (3) The older the mother the greater the chance of her having a child with Down syndrome.
- (4) No conclusion can be drawn from the data given.

Data Base File Number: 869

Regents Date Aug2001-50.bmp

Aug2001

50 8/16/2001 S1K3

Answer 3

Age of Mother	Occurrence of Down Syndrome per 1000 Births
25	0.8
30	1.0
35	3.0
40	10.0
45	30.0
50	80.0

**data analysis**

333. In an investigation, students determined the average rate of movement of gill covers of a species of freshwater fish at different temperatures. The results are shown in the data table at the LEFT in the diagram. FROM THE CHOICES AT THE RIGHT IN THE DIAGRAM, which labeled axes should be used to graph the relationship between the two variables?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 870

Regents Date Aug2001-54C.bm

Aug2001

54 8/16/2001 S1K3

Answer 1

Data Table			
Group	Number of Fish	Temperature (°C)	Average Rate of Movement of Gill Covers per Minute
1	5	10	15
2	6	15	25
3	4	18	30
4	7	20	38
5	6	23	60
6	4	25	57
7	4	27	25

Average Rate of Movement of Gill Covers

( 1 )

Group

( 3 )

Number of Fish

( 2 )

Number of Fish

( 4 )

## data analysis

334. Base your answer to this question on the information given and on your knowledge of biology. An investigation was performed to determine the effects of enzyme X on three different disaccharides (double sugars) at 37°C. Three test tubes were set up as shown in the TOP of the diagram. At the end of 5 minutes, the solution in each test tube was tested for the presence of disaccharides (double sugars) and monosaccharides (simple sugars). The results of these tests are shown in the data table AT THE BOTTOM of the diagram. What can be concluded about the activity of enzyme X from the data table?

- (1) Enzyme X breaks down sugar A, B, and C.
- (2) Enzyme X breaks down sugar C to disaccharides.
- (3) Enzyme X breaks down sugar C to monosaccharides.
- (4) No conclusion can be drawn from the data provided.

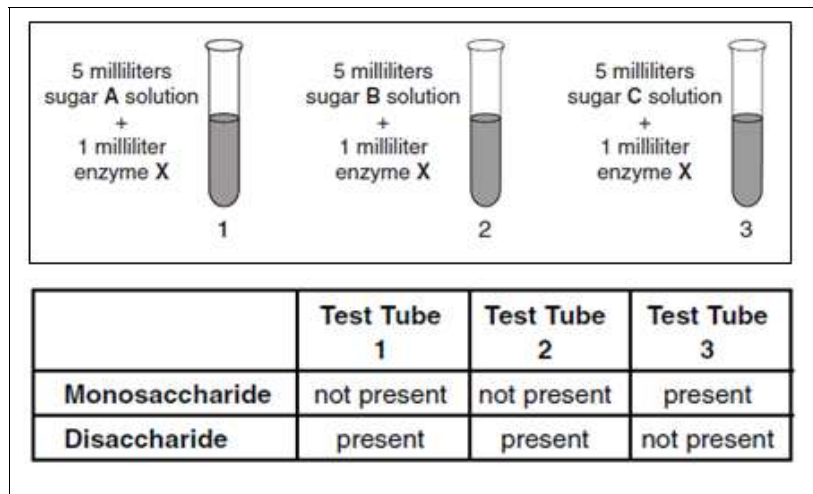
Data Base File Number: 872

Regents Date Aug2001-64C.bm

Aug2001

64 8/16/2001 S4K5

Answer 3



## data analysis

335. Base your answer to this question on the information given, the data table shown, and on your knowledge of biology. A student wanted to investigate the effect of light on the rate of ripening of tomatoes. She set up four pots of the same size with identical amounts of soil, water, and type of tomato plants. Each plant was exposed to a different intensity of light as shown in the table. To report the final results, which label would be most appropriate for the third column of the data table?

- (1) Height of Tomato Plants (cm)
- (2) Average Ripening Time (days)
- (3) Average Weight of Tomatoes per Plant (grams)
- (4) Acidity of Tomatoes (pH)

Data Base File Number: 1209

Regents Date Aug2017-36.bmp

Aug2017

36 8/17/2017 S1K2

Answer 2

Plant	Light Intensity (lumens)	
1	0	
2	1000	
3	5000	
4	10,000	

## data analysis

336. Base your answer to this question on the diagram shown and on your knowledge of biology. An observable trend in the wolf and moose data between 1980 and 1995 is

- (1) as the wolf population decreases, the moose population increases
- (2) as the wolf population decreases, the moose population decreases
- (3) the numbers of wolves and moose are relatively constant
- (4) the numbers of wolves and moose appear to be unrelated

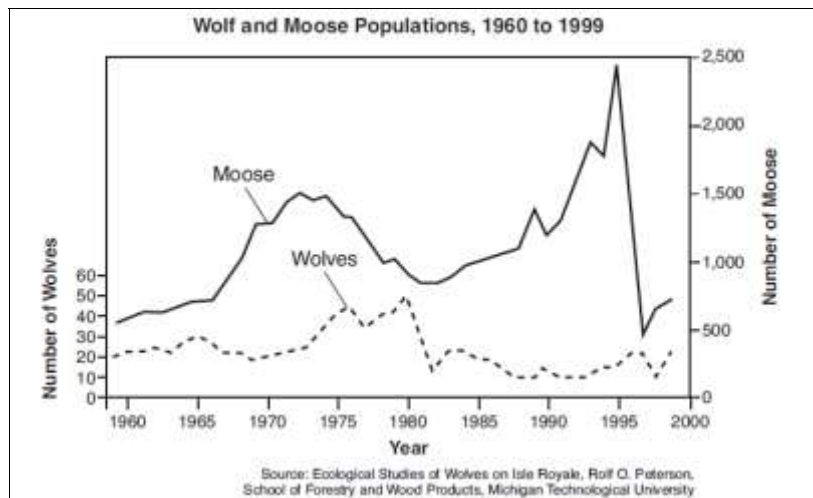
Data Base File Number: 970

Regents Date Aug2014-37.bmp

Aug2014

38 8/14/2014 S4K1

Answer 1



**data analysis**

337. A class is recording pulse rates of the students in a data table like the one shown. One student checks his pulse and counts 23 beats over a time interval of 20 seconds. In which row in the data table should the pulse rate of this student be recorded?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 932

Regents Date Jan2014-73.bmp

Jan2014

73 1/27/2014 LAB2

Answer 2

Row	Pulse Rate (beats per minute)	Number of Students
A	< 51	
B	51-70	
C	71-90	
D	>90	

**data analysis**

338. Base your answer to this question on the diagram shown and on your knowledge of biology. The population of wolves in 1980 was close to

- (1) 20
- (2) 50
- (3) 800
- (4) 1000

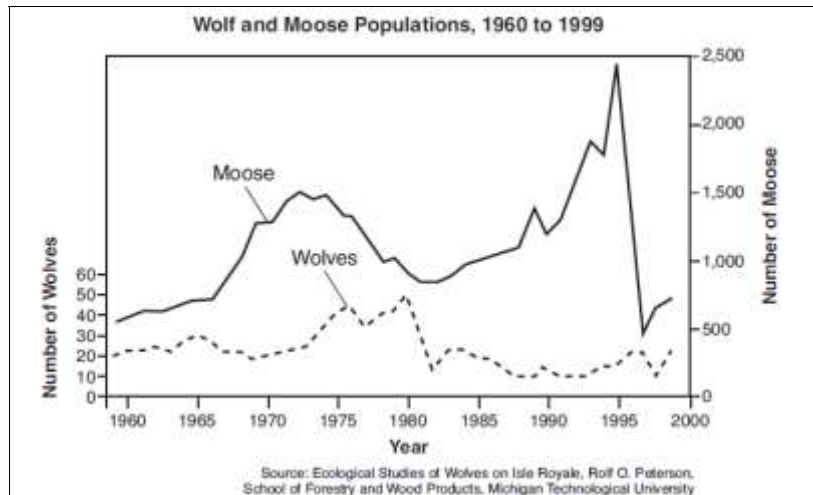
Data Base File Number: 969

Regents Date Aug2014-37.bmp

Aug2014

37 8/14/2014 S4K6

Answer 2





## data analysis

339. Base your answer to this question on the information and data table below and on your knowledge of biology. Fertilized eggs containing embryos from the same species of alligator were incubated at different temperatures. The sex of the hatched offspring is shown in the table below. The percent of surviving females at 32°C from the original number of eggs incubated was

(1) 13%

(3) 85%

(2) 2%

(4) 98%

Data Base 946  
File Number:

Regents Date June2014-38.bmp

June2014

39 6/17/2014 S1K3

Answer 3

	Temperature of Egg Incubation					
	26°C	28°C	30°C	32°C	34°C	36°C
Number of Eggs Used	100	100	100	100	100	100
Number of Embryos that Died	80	4	3	2	6	86
Number of Females Hatched	20	96	97	85	0	0
Number of Males Hatched	0	0	0	13	94	14

## data analysis

340. Base your answer to this question on the information given and on your knowledge of biology. A student added glucose indicator to a beaker of an unknown liquid. Starch indicator was added to a different beaker containing an equal amount of the same unknown liquid. The color of the indicator solutions before they were added to the beakers and the color of the contents of the beakers after adding the indicator solutions are recorded in the chart as shown. One conclusion the student could make about the unknown liquid based on the results shown is

- (1) There is no starch in the unknown liquid because the indicator turned blue-black.
- (2) There is glucose in the unknown liquid because the indicator turned blue-black.
- (3) There is starch in the unknown liquid because the indicator turned blue-black.
- (4) There is no starch present in any liquid sample.

Data Base File Number: 1195

Regents Date June2017-83.bmp

June2017

83 6/14/2017 LAB1

Answer 3

Beaker	Solution	Color of Indicator Solution Before Adding to Beaker	Color of Contents of Beaker After Adding Indicator Solution
1	unknown liquid + glucose indicator	blue	blue (after heating)
2	unknown liquid + starch indicator	amber	blue-black

## data analysis

341. Base your answer to this question on the information given and on your knowledge of biology. In an experiment to test the effectiveness of a new vaccine, 50 rats received an injection of equal doses of the vaccine and 50 other rats received an injection of equal doses of a weak salt solution. Two months later, all of the rats received injections that contained equal doses of live, disease-causing organisms. Was the vaccine effective in preventing the disease? The experimental results are shown in the chart.

- (1) Yes  
(2) No  
(3) No conclusion can be made.  
(4) More testing is needed.

Data Base File Number: 1192

Regents Date June2017-61.bmp

June2017

61 6/14/2017 S1K1

Answer 1

Injection: 50 Rats Received	Number of Rats That Developed the Disease	Number of Rats That Did Not Develop the Disease
vaccine	7	43
weak salt solution	48	2

## data analysis

342. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the concentration of estrogen in picograms per milliliter (pg/mL) in the blood of a woman over the course of 28 days. On which day was the concentration of estrogen the highest?

- (1) 1  
(2) 5  
(3) 10  
(4) 15

Data Base File Number: 951

Regents Date June2014-45.bmp

June2014

45 6/17/2014 S1K3

Answer 3

Day	Concentration of Estrogen (pg/mL)
1	30
5	80
10	200
15	180
20	30
28	25

## data analysis

343. Base your answer to this question on the information below and on your knowledge of biology. Three students took their pulse rates in beats per minute (bpm) while sitting in class. The results are shown in the data table. What is the average pulse rate, in bpm, for this group of students?

- (1) 57 (3) 85  
(2) 75 (4) 67

Data Base File Number: 955

Regents Date June2014-77.bmp

June2014

78 6/17/2014 LAB2

Answer 2

### Pulse Rates of Three Students

Student	Pulse Rate (bpm)
1	73
2	85
3	67

## data analysis

344. Base your answer to this question on the information and data table shown and on your knowledge of biology. In an experiment, three plants of the same species were grown in each of six identical pots. The heights of the plants were measured when growth began. Each of the pots was watered every day with salt solutions of different concentrations. The data for the experiment are shown in the table. What is the effect of increasing the percent of salt in the solution used to water the plants on the average final height of the plants in groups A through D?

- (1) It caused the plants to grow tall. (3) It caused the plants to dehydrate and die.  
(2) It caused the plants to remain at the same height. (4) It caused the plants to bloom.

Data Base File Number: 956

Regents Date June2014-79.bmp

June2014

79 6/17/2014 LAB5

Answer 3

Effect of Salt Solution on the Height of Plants

Plant Group	Percent Salt Solution Used for Watering the Plants	Average Initial Height (centimeters)	Average Final Height (centimeters)
A	0	2	30
B	1	2	28
C	2	3	15
D	3	2	10
E	4	3	(died)
F	5	3	(died)

**data analysis**

345. Base your answer to this question on the table shown and on your knowledge of biology. The table shows which of four enzymes are present in three related plant species. The tree diagram shows two possible evolutionary relationships between the three species. Which tree diagram shows the most probable evolutionary relationship between the three species?

- (1) Tree 1
- (2) Tree 2
- (3) Tree 1 and 2
- (4) Tree 2 and 1

Data Base File Number: 1150

Regents Date August2016-78B.

Aug2016

78 8/18/2016 LAB1

Answer 2

Plant Species	Enzyme W	Enzyme X	Enzyme Y	Enzyme Z
Species A	present	present	absent	present
Species B	absent	absent	present	absent
Species C	present	present	absent	present

The tree diagrams below show two possible evolutionary relationships between the three species.

Tree 1

Tree 2

**data analysis**

346. In the winter of 2009, volunteers from an Audubon group conducted a survey of roosting bald eagles at four locations in an area in the lower Hudson River Valley. The data given shows the average number of eagles sighted and the number of visits made by the volunteers each month. Among the other data collected were percent ice cover and percent cloud cover on the surface of the water. The eagles fly freely between these four sites, depending on a variety of conditions. Some of the data are shown in the table. Why did the number of eagles sighted showed a change at all four sites between February and March?

- (1) Predators killed some eagles.
- (2) Food supplies became scarce.
- (3) As winter ended, the eagles migrated away?
- (4) Hunters killed some eagles.

Data Base File Number: 1146

Regents Date August2016-65.b

Aug2016

67 8/18/2016 S4K6

Answer 3

Location	January		February		March	
	Average Number of Eagles	Number of Visits	Average Number of Eagles	Number of Visits	Average Number of Eagles	Number of Visits
Croton Reservoir	22.86	7	47.88	8	9.17	6
George's Island Park	27.00	7	18.38	8	5.00	4
George's Island North	12.29	7	4.43	7	2.20	5
Story Point	3.57	7	3.63	8	0.00	5

**data analysis**

347. Base your answer to this question on the information and data table below and on your knowledge of biology. The Thousand Islands region in upstate New York has many isolated islands. On one island, a fire burned most of the trees. The data table shown indicates the percentages of tan beetles and dark-brown beetles present before and after the fire. The increase in the percentage of dark-brown beetles over time was most likely due to the fact that the

- (1) dark-brown beetles could not find food as well as the tan beetles
- (2) dark-brown beetles were harder for predators to locate
- (3) tan beetles turned dark brown to blend in with the darker, ash-covered ground
- (4) exposure to ash from the fire changed the DNA of some of the tan beetles

Data Base File Number: 967

Regents Date Aug2014-35.bmp

Aug2014

35 8/14/2014 S4K3

Answer 2

Time	Tan Beetles (%)	Dark-Brown Beetles (%)
before fire	88	12
8 months after fire	80	20
16 months after fire	70	30
24 months after fire	65	35
48 months after fire	60	40
60 months after fire	56	44

**data analysis**

348. Select the interaction from the LIST SHOWN that is most closely associated with the following description: "The rhinoceros bird (organism A) feeds on parasites that live on the body of a rhinoceros (organism B). The rhinoceros allows the birds to feed on the parasites."

- (1) 1
- (2) 2
- (3) 3
- (4) 4

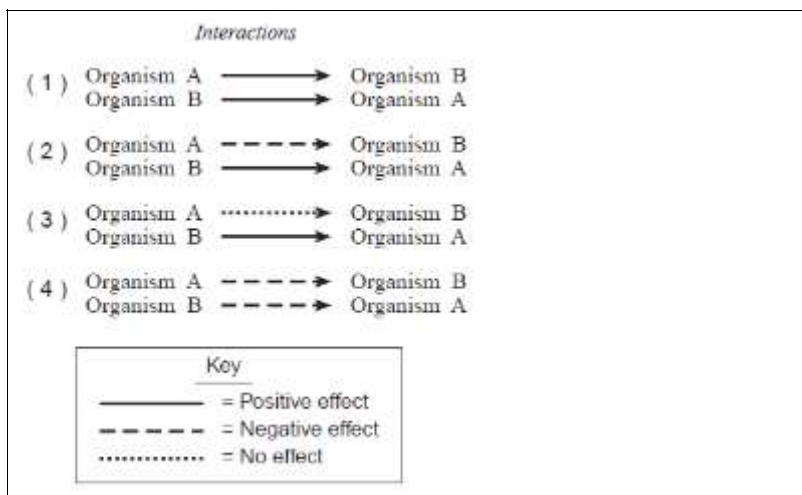
Data Base File Number: 852

Regents Date June2001-37.bmp

June2001

37 6/15/2001 S4K6

Answer 1



## data analysis

349. An experiment was conducted to determine the effect of activity on pulse rate. Data were collected and recorded in the table as shown. Which activity most likely corresponds to the pulse rate of the person while sleeping?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1084

Regents Date Jan2016-73.bmp

Jan2016

73 1/27/2016 LAB2

Answer 3

Activity #	Pulse Rate Recorded (per minute)
1	146
2	86
3	55
4	75

**data analysis**

350. Base your answer to this question on the information given and on your knowledge of biology. ----- Whitebark Pines in Yellowstone Park -----  
Scientists claim that mountain pine beetles have been blamed for the death of mature whitebark pine trees in the Greater Yellowstone forest ecosystem. The beetles burrow into the trees to lay their eggs. When the eggs hatch, the larvae feed on the tree, cutting off the flow of water. As a result, the trees become stressed and begin to die. An increase in the temperature is contributing to the increase in beetles. Cooler temperatures tend to keep the beetle population controlled. Many organisms, including squirrels, birds, and even grizzly bears, have been impacted by the decrease in the numbers of trees. Many organisms use whitebark pine seeds for food. The data table shows the proportion of live mature whitebark pine trees compared with their population in 2000. The nutritional roles of the whitebark pine trees and the beetles are best described as

- (1) producer and carnivore
- (2) producer and herbivore
- (3) predator and decomposer
- (4) herbivore and parasite

Data Base File Number: 1581

Regents Date June2023-45.bmp

June2023

47 6/14/2023 S4K6

Answer 2

Year	Proportion of Live Mature Whitebark Pine Trees Compared with Their Population in 2000
2000	1.00
2002	1.00
2004	0.70
2006	0.60
2008	0.40
2010	0.25
2012	0.25



**data analysis**

351. Students collected data about the capacities of their lungs by inflating balloons with a single breath. They measured the circumference of the balloons in centimeters. Each student completed three trials and calculated the average. Which student miscalculated her average?

- (1) student 1
- (2) student 2
- (3) student 3
- (4) student 4

Data Base File Number: 1163

Regents Date Jan2017-39.bmp

Jan2017

39 1/25/2017 S1K3

Answer 3

Student	Trial 1	Trial 2	Trial 3	Average
1	66.0	66.5	68.5	67.0
2	67.5	64.0	70.5	67.3
3	60.3	60.5	60.5	61.0
4	55.0	58.0	59.0	57.3

**data analysis**

352. The two maps show the number of human cases of West Nile Virus (WNV) per 100,000 people for the years 2007 and 2016. The data represented on the maps best indicate that

- (1) birds have spread WNV to every state in the United States
- (2) New York State has the highest rate of WNV infection for both of the years shown
- (3) once WNV reaches a state, the number of people infected increases every year
- (4) for any given year, it is difficult to know which states will have the greatest number of cases

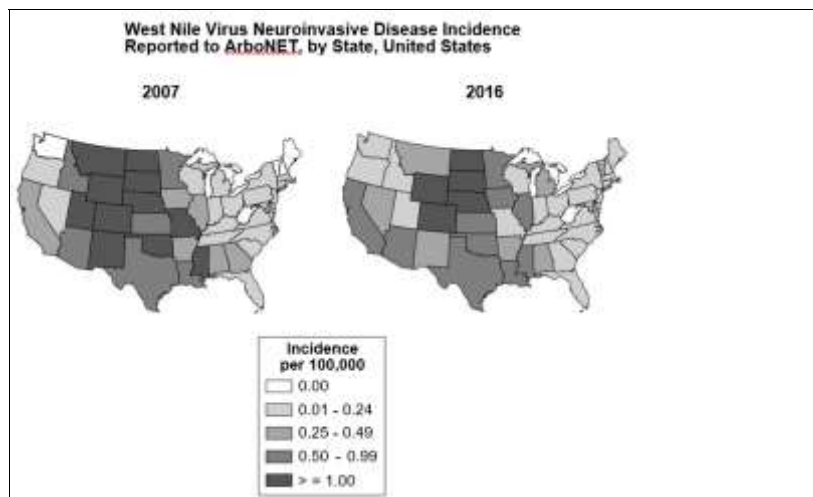
Data Base File Number: 1521

Regents Date Aug2022-47.bmp

Aug2022

47 8/17/2022 S1K1

Answer 4



## data analysis

353. Base your answer to this question on the information given and the data table shown and on your knowledge of biology.

Peregrine falcons are an endangered species in New York State. This crow-sized predator feeds primarily on birds. Starting in the 1940s, exposure to the pesticide DDT in their prey caused declines in the peregrine falcon population. These pesticides caused eggshell thinning, which drastically lowered breeding success. By the early 1960s, peregrine falcons no longer nested in New York State. After the United States banned DDT in 1972, efforts were made to reintroduce peregrine falcons into the Northeast. Since the 1980s, the peregrine falcons are once again breeding in many areas of New York State. The table shows the number of peregrine falcon offspring produced in New York State over a 20-year period. Which conclusion is best supported by the information presented in the table?

- (1) The greatest decrease was during the time period of 1992 and 1996.
- (2) The greatest increase was during the time period of 2004 and 2008.
- (3) There has been a steady decline since the banning of DDT in 1972.
- (4) The population reached carrying capacity in 2004.

Data Base File Number: 1437

Regents Date June2021-45.bmp

June2021

45 6/22/2021 S1K3

Answer 2

**Number of Peregrine Falcon Offspring Produced in New York State From 1992 to 2012**

Year	Number of Offspring Produced
1992	30
1996	48
2000	75
2004	79
2008	129
2012	148

## data analysis

354. Using a microscope, a student observed four different types of cells. For each structure he observed, he placed an X in the chart as shown to indicate the cells where the structure was observed. Which of the cells he viewed were most likely from heterotrophs?

(1) A and C

(3) C and B

(2) B and D

(4) D and C

Data Base File Number: 1694

Regents Date Aug2024-32.bmp

Aug2024

32 8/20/2024 S4K1

Answer 4

Structure	Cell A	Cell B	Cell C	Cell D
cell membrane	X	X	X	X
cell wall	X	X		X
chloroplasts	X	X		
DNA	X	X	X	X
nucleus	X		X	X

## data analysis

355. Base your answer to this question on the information given and on your knowledge of biology. A student measured oxygen and carbon dioxide concentration levels in an aquatic ecosystem during a 24 hour period. The data are represented in the graph shown. Which two biological processes are responsible for the production of varying amounts of carbon dioxide and oxygen within the aquatic ecosystem?

(1) active transport and ATP production

(3) respiration and photosynthesis

(2) synthesis of amino acids and glucose

(4) nitrogen fixation and transpiration

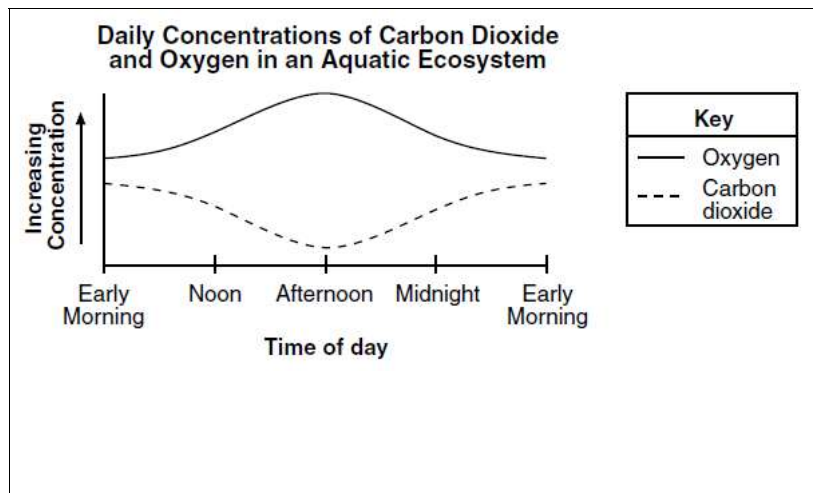
Data Base File Number: 1168

Regents Date Jan2017-55.bmp

Jan2017

55 1/25/2017 S4K5

Answer 3



## data analysis

356. Base your answer to this question on the information and data table shown and on your knowledge of biology. Two students collected data on their pulse rates while performing different activities. Their average results are shown in the data table. What is the relationship between activity and pulse rate?

- (1) pulse rate does not change                      (3) pulse rate is not directly related to activity
- (2) pulse rate is directly related to activity                      (4) pulse rate decreases as activity increases

Data Base File Number: 60

Regents Date Jan07-66.bmp

Jan2007

66 1/26/2007 LABS

Answer 2

Data Table

Activity	Average Pulse Rate (beats/min)
sitting quietly	70
walking	98
running	120

## data analysis

357. Base your answer to this question on the information given and on your knowledge of biology. Students in a high school biology class conducted an investigation on pulse rates. The thirty students performed three different activities and determined their pulse rates. Each activity was done three times. The average is shown in the graph. The students want to improve the validity of their conclusion. The best way to accomplish this is to

- (1) change the hypothesis
- (2) repeat the investigation several times
- (3) increase the number of variables
- (4) increase the height of participants in each group

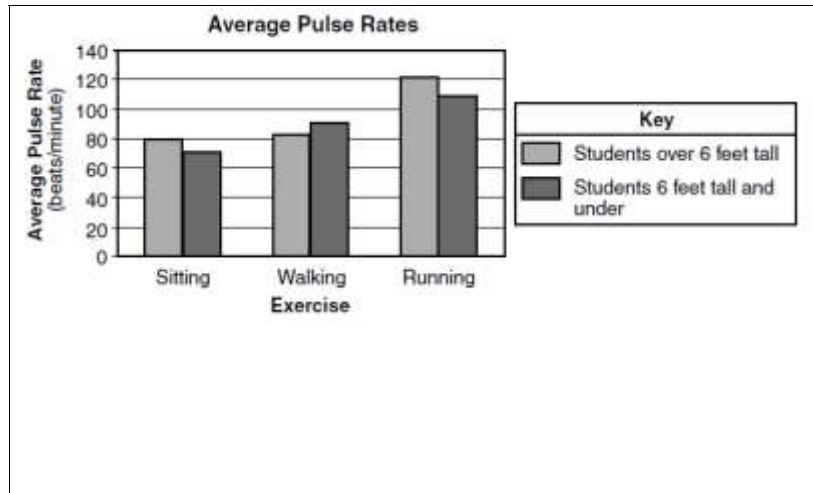
Data Base File Number: 1170

Regents Date Jan2017-82.bmp

Jan2017

82 1/25/2017 LAB2

Answer 2



**data analysis**

358. Base your answer to this question on the information and chart shown and on your knowledge of biology. In recent years, biologists have noticed that honeybees responsible for pollinating food crops across the United States are dying at an alarming rate. Farmers, economists, and biologists are very worried about the impact that the loss of honeybees might have on the food supply. Some of the most valuable fruits, vegetables, nuts and field crops depend on insect pollinators, particularly honeybees. Besides insects, other means of pollination include birds, wind and rainwater. Based on the information given and the graph provided, which crops are most at risk if honeybees continue to decline?

- (1) strawberries, peanuts, and grapes
- (2) almonds, apples, and blueberries
- (3) almonds, oranges, and soybeans
- (4) peaches, cotton, and grapes

Data Base  
File Number:

1164

Regents Date

Jan2017-40.bmp

Jan2017

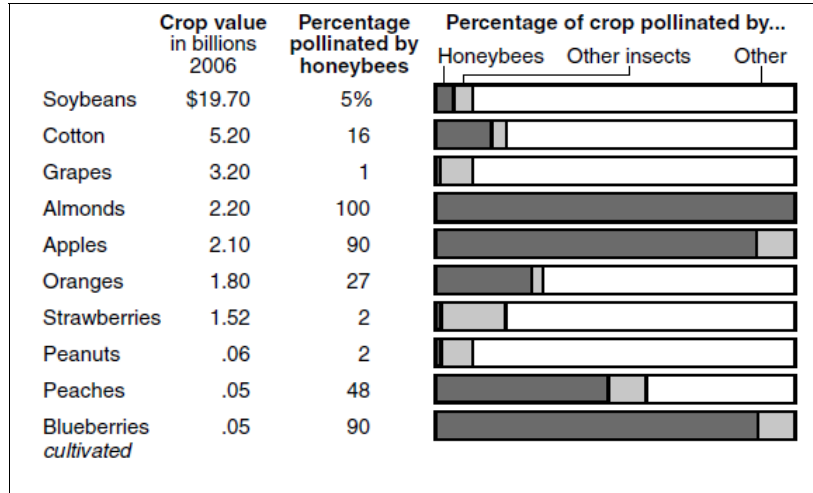
40

1/25/2017

LABA

Answer

2



## data analysis

359. Base your answer to this question on the information given and the graph shown and on your knowledge of biology. During a lab experiment a student took his resting pulse rate, counting 23 beats in 20 seconds. The student then exercised for several minutes. The student's pulse was taken immediately after the exercise, and then every minute for 6 minutes. The graph given shows changes in the pulse rate after the exercise was completed. What was the student's resting pulse rate in beats per minute?

(1) 100

(3) 69

(2) 125

(4) 59

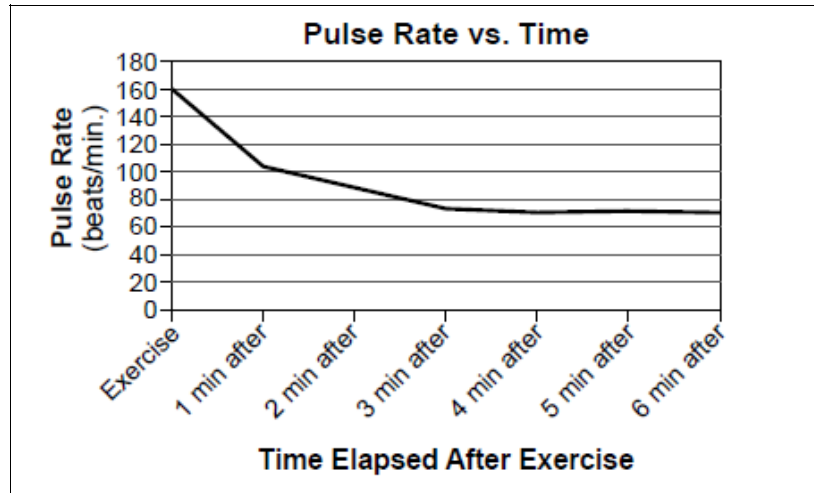
Data Base 1418  
File Number:

Regents Date Jan2020-84.bmp

Jan2020

84 1/21/2020 LAB2

Answer 3



## data analysis

360. Base your answer to this question on the information and data table shown and on your knowledge of biology. ---- Protecting Nesting Habitats ----

Sea turtles repeatedly return to the same beach to nest and there is no parental care once the eggs have been deposited in the nest. Therefore, the characteristics of the nest determine whether the eggs will survive or not. The mother turtle must choose her nest site carefully. Nests farther inland are more likely to dry out, and due to the distance that the hatchlings have to travel to reach the sea, there is a greater chance that they will be preyed upon. Nests too close to the sea are more likely to be damaged by erosion or flooding. Two endangered turtle species are regularly found around Akumal, a popular tourist destination in the Caribbean. The local beaches are an important nesting ground for the loggerhead turtle and green turtle. The beaches are managed by a local organization that makes daily patrols to locate turtle nests and place protective barriers around them. Night patrols ensure that turtle nests are not disturbed by tourists. Local residents have agreed to minimize light pollution by closing all shops, bars, and restaurants before 11 p.m., and local fishermen and tour boats avoid areas of sea grasses that are roped off, so that feeding turtles will not be disturbed. The data table shows the results of efforts to increase the numbers of loggerhead and green turtles. Based on the information and data provided, identify which turtle population is having the most success in rebuilding their numbers.

- (1) Green turtles  
(2) Loggerhead turtles  
(3) Both Green and Loggerhead turtles  
(4) Neither Green or Loggerhead turtles

Data Base 1553  
File Number:

Regents Date Jan2023-44.bmp

Jan2023

44 1/24/2023 S1K3

Answer 1

Year	Number of Turtle Hatchlings (in thousands)	
	Green Turtles	Loggerhead Turtles
2006	8	4.5
2007	6	8
2008	18	10
2009	11	9
2010	29	8
2011	23	10
2012	43	14



## data analysis

361. **Base your answer to this question on the information given and on your knowledge of biology.** Scientists are interested in studying the effects of a mother's alcohol consumption on the brain development of the fetus during pregnancy. In order to collect data, scientists typically use newborn rats because the rats' brain development after birth is roughly equivalent to that of a human fetus during the third trimester (late in pregnancy). Scientists divided newborn rats into four groups and exposed them to alcohol using the following methods, as shown in the diagrams given. At the end of the experiment, scientists measured the total brain weight of the newborn rats, as represented in the graphs below (LOWER part of diagram). What is the the relationship between peak blood alcohol concentration and total brain weight for alcohol-exposed newborn rats?

- (1) As blood alcohol concentration increases, total brain weight decreases.
- (2) As blood alcohol concentration increases, total brain weight increases.
- (3) No conclusion can be made because there is insufficient data.
- (4) As blood alcohol concentration increases, total brain weight remains the same..

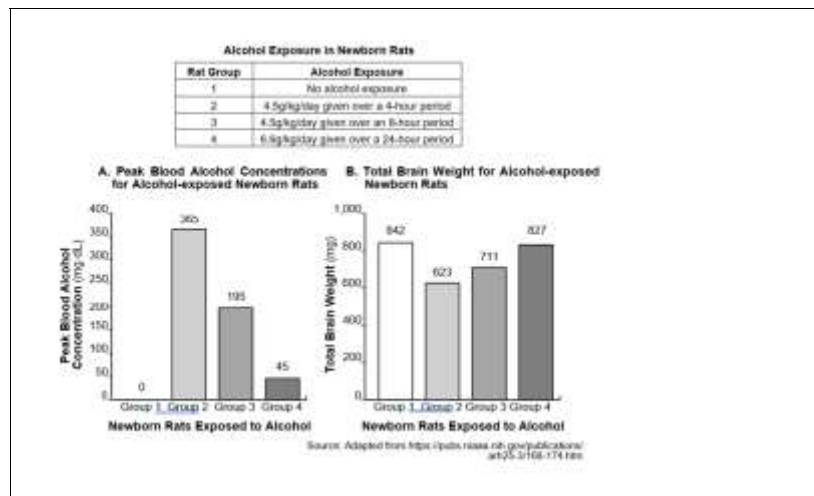
Data Base File Number: 1524

Regents Date Aug2022-52C.bm

Aug2022

52 8/17/2022 LABA

Answer 1



**data analysis**

362. The graph below provides information about the number of mitochondria in various types of cells. Which type of cells most likely require the greatest input of oxygen?

- (1) white blood cells
- (2) skin cells
- (3) fat cells
- (4) liver cells

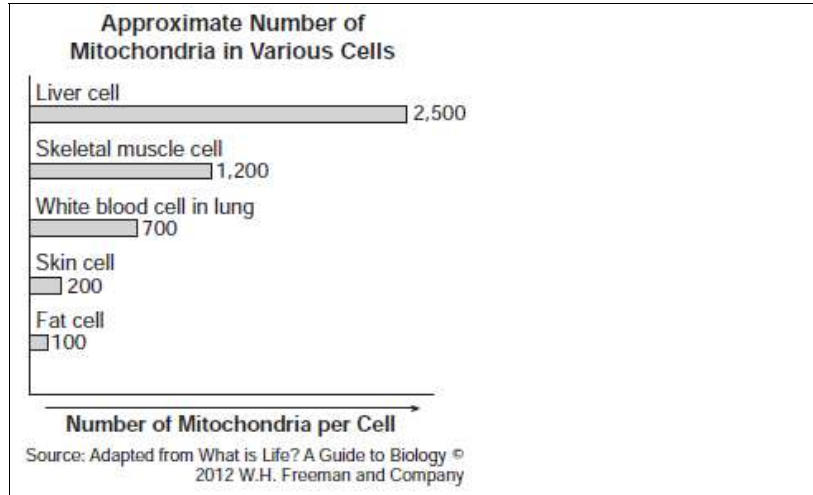
Data Base File Number: 1608

Regents Date Aug2023-33.bmp

Aug2023

33 8/17/2023 S4K1

Answer 4



**data analysis**

363. Base your answer to this question on the graph shown and on your knowledge of biology. The temperature range in a pond in which all three fish species could grow and survive is most likely

- (1) 2 degrees C to 8 degrees C
- (2) 12 degrees C to 18 degrees C
- (3) 22 degrees C to 28 degrees C
- (4) 32 degrees C to 38 degrees C

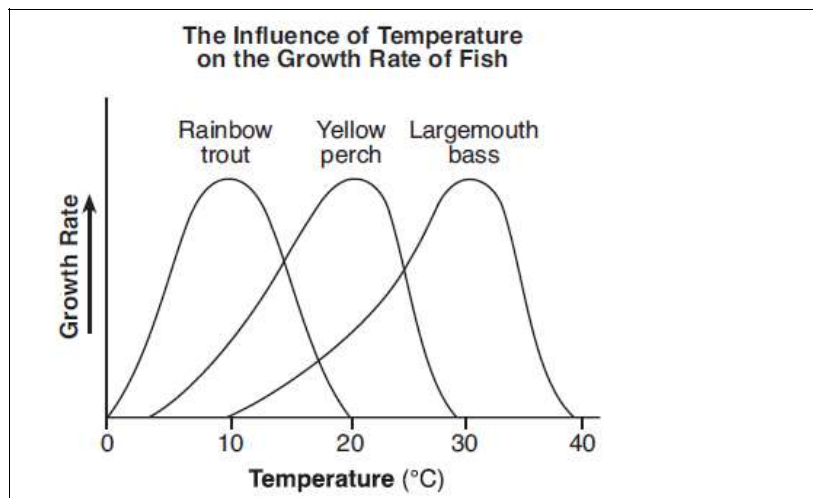
Data Base File Number: 976

Regents Date Aug2014-49.bmp

Aug2014

49 8/14/2014 S1K3

Answer 2



## data analysis

364. Base your answer to this question on the data table and on your knowledge of biogy. Tooth decay occurs when bacteria living in the mouth produce an acid that dissolves tooth enamel (the outer, protective covering of a tooth). Which statement is a valid conclusion regarding tooth decay?

- (1) As sugar intake increases, the acidity in the mouth decreases, reducing tooth decay.
- (2) As sugar intake increases, tooth decay increases in Europe and the Americas, but not in Africa and Southeast Asia.
- (3) The greater the sugar intake, the greater the average number of decayed teeth.
- (4) The greater the sugar intake, the faster a tooth decays.

Data Base File Number: 20

Regents Date Aug07-54.bmp

Aug2007

54 8/16/2007 S4K1

Answer 3

The Effect of Sugar Intake on Tooth Decay

World Regions	Average Sugar Intake per Person (kg/year)	Average Number of Teeth with Decay per Person
Americas	40	3.0
Africa	18	1.7
Southeast Asia	14	1.6
Europe	36	2.6

## data analysis

365. The graph shown compares the number of species found in ecosystems with different salt concentrations. Based on the data presented in the graph, which ecosystems are most likely to remain stable over time?

- (1) fresh water and seawater because more species in an ecosystem increases the variety of genetic material available
- (2) fresh water and seawater because an increased number of species causes salt concentration in the water to increase
- (3) brackish water and seawater because high salt concentration increases the number of species in water ecosystems
- (4) brackish water and salt lakes because salty water damages DNA, which results in fewer species surviving

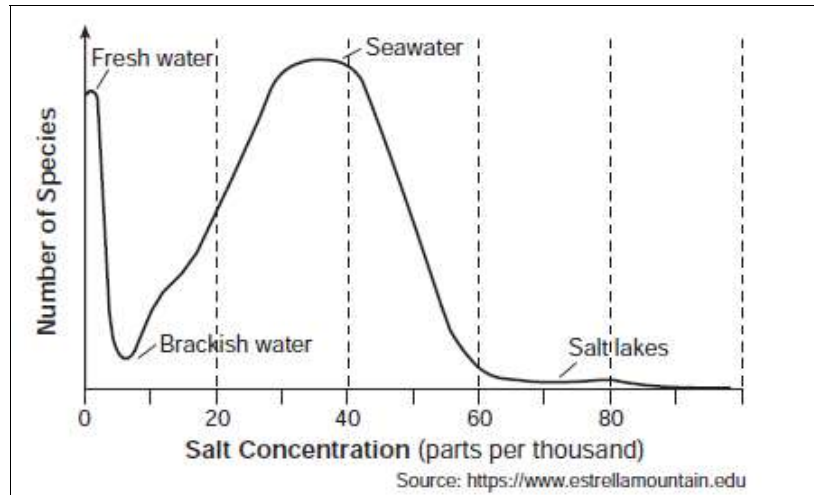
Data Base File Number: 1613

Regents Date Aug2023-39.bmp

Aug2023

39 8/17/2023 S4K6

Answer 1



## data analysis

366. Base your answer to this question on the information and graph shown and on your knowledge of biology. The graph shows the change in the blood glucose level of one person after eating a cookie. Why do most human cells require a supply of glucose?

- (1) Cells require glucose to produce ATP  
 (2) Cell require glucose to produce oxygen.  
 (3) Cells require glucose to produce waste.  
 (4) Cells require glucose to produce proteins.

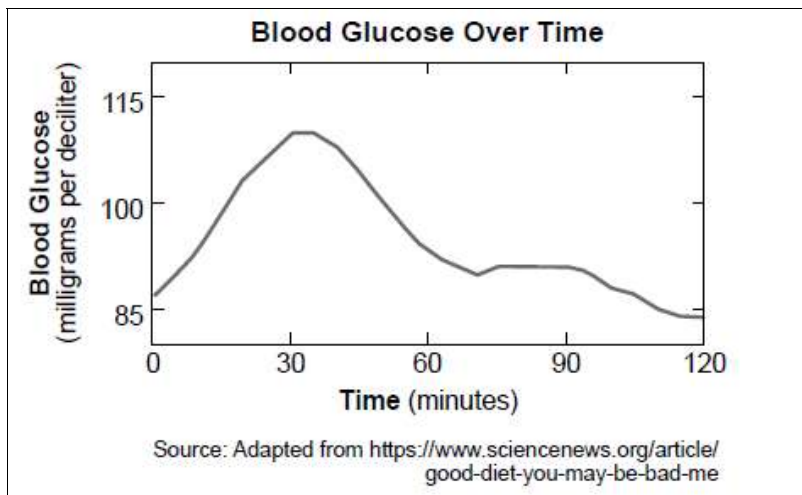
Data Base File Number: 1412

Regents Date Jan2020-64.bmp

Jan2020

64 1/21/2020 S4K5

Answer 1



## data analysis

367. Information concerning the diet of crocodiles of different sizes is contained in the table shown. Which statement is NOT a valid conclusion based on the data?

- (1) Overharvesting of fish could have a negative impact on Group C.  
 (2) The smaller the crocodile is, the larger the prey.  
 (3) Group B has no preference between reptiles and birds.  
 (4) Spraying insecticides would have the most direct impact on Group A.

Data Base File Number: 35

Regents Date June07-32.bmp

June2007

32 6/20/2007 S4K6

Answer 2

Food Source	Group A 0.3–0.5 Meter	Group B 2.5–3.9 Meters	Group C 4.5–5.0 Meters
mammals	0	18	65
reptiles	0	17	48
fish	0	62	38
birds	0	17	0
snails	0	25	0
shellfish	0	5	0
spiders	20	0	0
frogs	35	0	0
insects	100	2	0

## data analysis

368. Base your answer to this question on the information shown and on your knowledge of biology. The line graphs shown represent trends in prey fish populations for each of the five Great Lakes. In which of the Great Lakes would you see the greatest increase in the number of predatory fish in 2008 and 2009?

(1) Lake Erie

(3) Lake Huron

(2) Lake Superior

(4) Lake Michigan

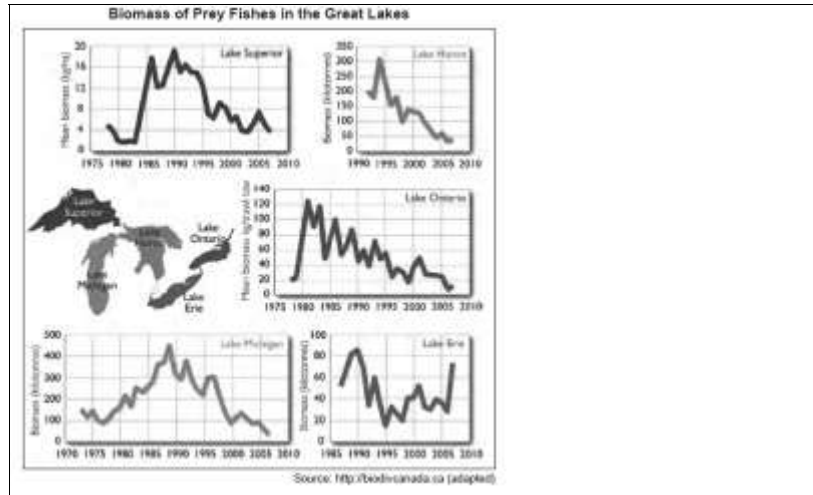
Data Base 1407  
File Number:

Regents Date Jan2020-48.bmp

Jan2020

48 1/21/2020 S4K1

Answer 1



## data analysis

369. Base your answer to this question the information given and on your knowledge of biology. Fighting the Flu ----- A new technique to attack flu virus antigens is being tested on mice. Normally, antibodies attack the "head" portion of antigens on the surface of the flu virus. Since the "head" portions mutate frequently, the antibodies do not provide protection for very long. The new technique is to develop antibodies that attack the "stem" portion of the antigen. Since the "stem" regions do not mutate very often, the effectiveness of the vaccine should last longer. This technique is represented in the diagram as shown. Which statement describes an observation that would best support the continued study of using antibodies produced by this new technique against the flu?

- (1) A group of 50 mice with flu antibodies formed using the new technique were exposed to mutated forms of the flu. None of the mice became ill.
- (2) The use of these antibodies in mice stopped mutations that occur in flu viruses.
- (3) Chemical tests showed that the stem antibodies attached to the heads of some flu viruses and destroyed them.
- (4) Blood tests showed that only "stem" antibodies attacking the stem of flu antigens can cause the flu in mice. Those attacking the "head" did not.

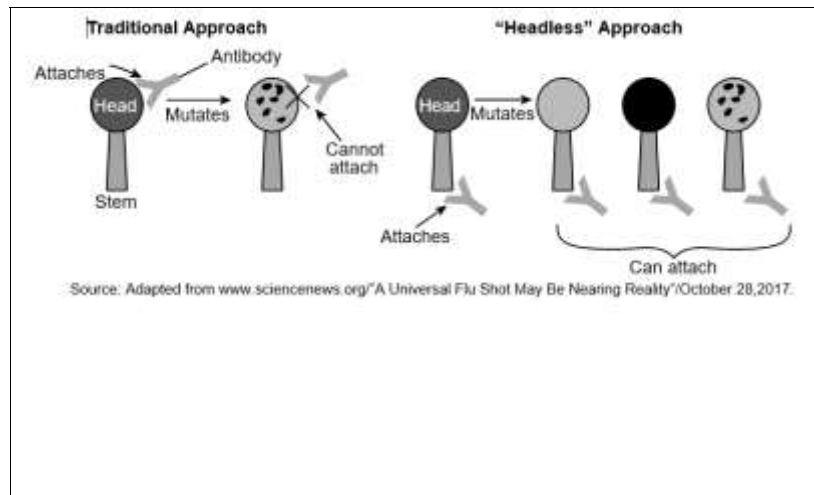
Data Base File Number: 1516

Regents Date Aug2022-39.bmp

Aug2022

39 8/17/2022 S4K5

Answer 1



**data analysis**

370. Base your answer to this question on the information shown and on your knowledge of biology. The relationship between lung capacity and gender was studied in a laboratory investigation. Relative lung capacity was measured by having each student fill a balloon with a deep breath and then measuring the circumference of the balloon. Each student was given three trials and the average balloon circumference was recorded in the data table as shown. What is the group average based on the data shown?

- (1) 441.8
- (2) 55.22
- (3) 51.6
- (4) 62.3

Data Base File Number: 983

Regents Date Aug2014-83.bmp

Aug2014

83 8/14/2014 LAB2

Answer 2

Gender (male/female)	Average Balloon Circumference (cm)
female	51.6
female	52.7
female	53.3
female	55.0
male	54.6
male	56.0
male	56.3
male	62.3

**data analysis**

371. Base your answer to this question on the information given and on your knowledge of biology. A student conducted an experiment to determine the effect of exercising on breathing rate. The student measured the breathing rate of three classmates at rest and again after exercising for intervals of 30, 60, and 90 seconds. Her results are shown in the data table. The purpose of checking the breathing rate before exercising is that it

- (1) serves as a control for the experiment
- (2) is needed to form a hypothesis
- (3) can be changed to form a conclusion
- (4) can be used to predict the results

Data Base File Number: 1592

Regents Date June2023-76.bmp

June2023

76 6/14/2023 LAB2

Answer 1

Time Exercising (seconds)	Student A	Student B	Student C	Average
0 (Resting)	12	12	15	_____
30	25	18	20	21
60	38	27	28	31
90	43	33	38	38



## data analysis

372. The table given shows data collected during an experiment conducted by Jan Baptista van Helmont in the 1600s. The soil was dried before all masses were taken. Which explanation is consistent with the data collected?

- (1) The increased mass of the willow tree came only from materials taken in from the soil in which it was planted.
- (2) The increased mass of the willow tree was the result of cellular respiration during the five-year period.
- (3) The willow tree did not use any material from the soil during the five-year period.
- (4) The increased mass of the willow tree was the result of the tree taking in materials from its environment.

Data Base File Number: 1607

Regents Date Aug2023-32.bmp

Aug2023

32 8/17/2023 S4K1

Answer 4

	Start of Experiment	After Five Years of Growth
Soil mass (kg)	90.9	90.8
Willow tree mass (kg)	2.3	76.8

## data analysis

373. Base your answer to this question on the information shown and on your knowledge of biology. In a test for diabetes, blood samples were taken from an individual every 4 hours for 24 hours. The glucose concentrations were recorded and are shown in the data table. One likely cause of the change in blood glucose concentration between hour 16 and hour 20 is

- (1) The individual ate some food.
- (2) The blood insulin level increased.
- (3) The individual exercised vigorously.
- (4) The individual went to sleep.

Data Base File Number: 165

Regents Date Jan09-50.bmp

Jan2009

50 1/27/2009 S1K3

Answer 1

Blood Glucose Level Over Time

Time (h)	Blood Glucose Concentration (mg/dL)
0	100
4	110
8	128
12	82
16	92
20	130
24	104

**data analysis**

374. Base your answer to this question on the histograms shown and on your knowledge of biology. Students in a class recorded their resting pulse rates and their pulse rates immediately after strenuous activity. The data obtained are shown in the histograms. According to the data, compared to the average resting pulse rate, the average pulse rate immediately after strenuous activity generally

- (1) decreased
- (2) increased
- (3) remained the same
- (4) decreased and leveled off

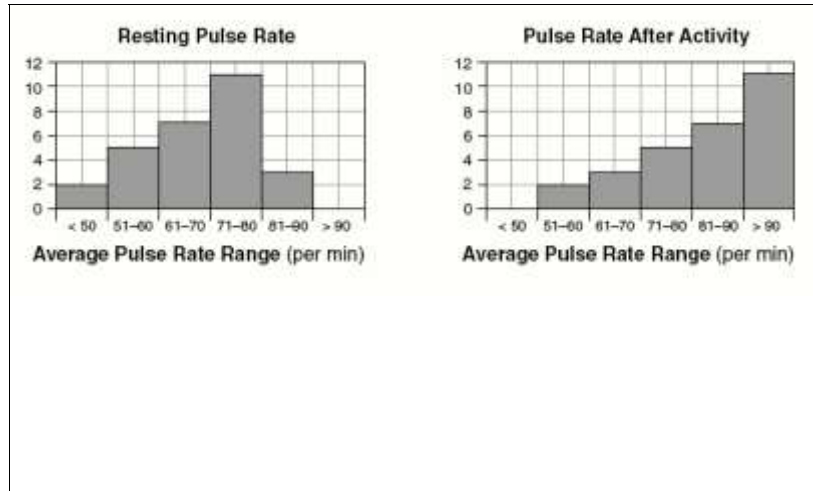
Data Base File Number: 168

Regents Date Jan09-71.bmp

Jan2009

72 1/27/2009 LABS

Answer 2



## data analysis

375. Base your answer to this question on the information and graph given and on your knowledge of biology. An unusually cool and wet spring prevented certain farmers from planting corn at the usual time. They normally planted their crop on May 1, but the altered weather patterns delayed planting until June 1. Based on the information given, what is the most likely impact of the delayed planting on the production of corn?

- (1) Corn yield will remain at 100% because higher temperatures in June will make plants grow faster.
- (2) The corn yield may be reduced by about 20% because of the delay in planting.
- (3) Corn yield may be reduced by about 80% because of the delayed planting.
- (4) Crops planted on June 1 will have the same yield as those planted on April 1.

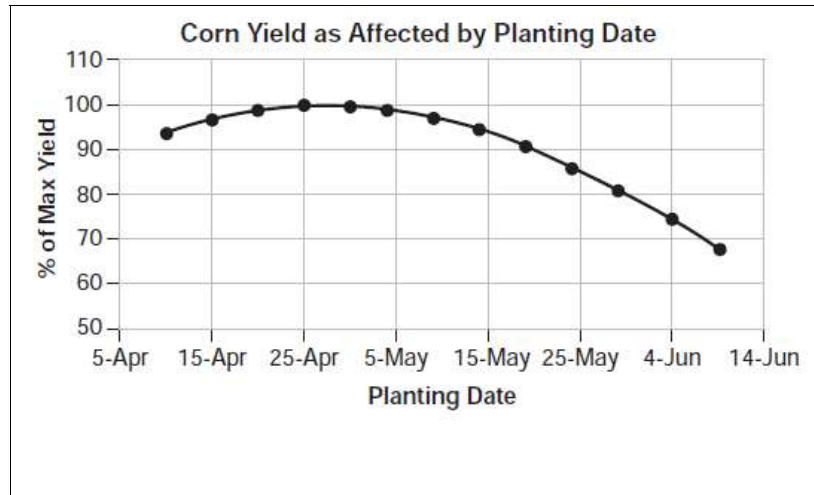
Data Base File Number: 1697

Regents Date Aug2024-36.bmp

Aug2024

36 8/20/2024 S1K1

Answer 2



## decomposer

376. ROTATE the chart into normal reading position. The chart shown represents some of the events that occur during the cycling of nutrients in an ecosystem. Which organisms would most appropriately complete the chart when written in the circle at X?

- (1) producers
- (2) herbivores
- (3) carnivores
- (4) decomposers

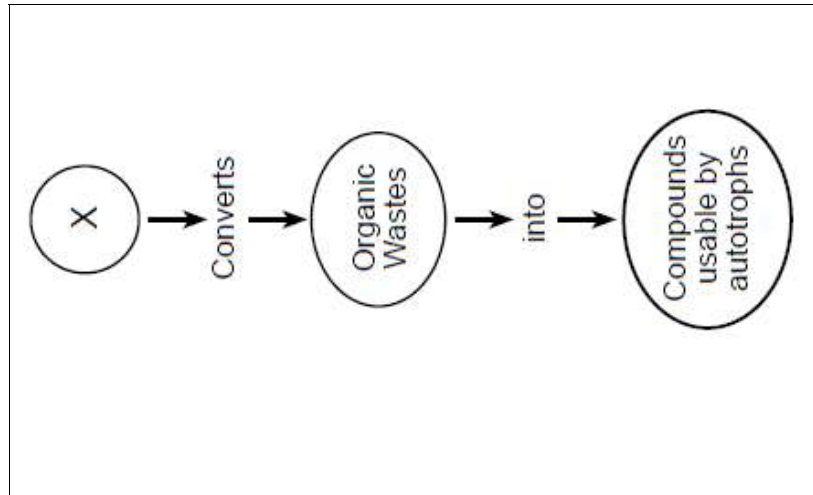
Data Base File Number: 1248

Regents Date June2018R-11.b

June2018

11 6/13/2018 S4K1

Answer 4



## decomposer

377. The diagram shown represents three groups of organisms that are part of an ecosystem. Which organisms, of those shown, are decomposers?

- (1) A and B
- (2) A, only
- (3) B, only
- (4) C, only

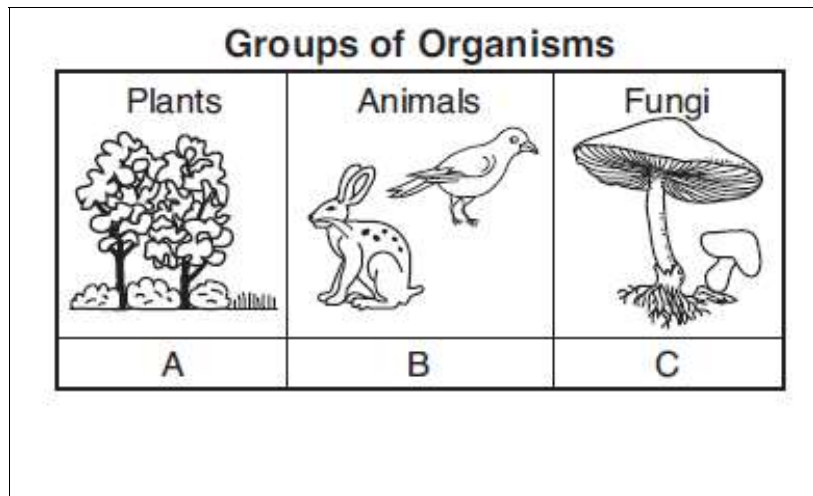
Data Base File Number: 914

Regents Date Aug2013-65.bmp

Aug2013

65 8/14/2013 S4K5

Answer 4



## decomposer

378. A partial food chain is represented in the diagram as shown. A student observed owls hunting mice in a field. Some chemicals from the waste products of the owls were made available to be absorbed by the roots of the grasses due to the action of

- (1) autotrophs
- (2) carnivores
- (3) herbivores
- (4) decomposers

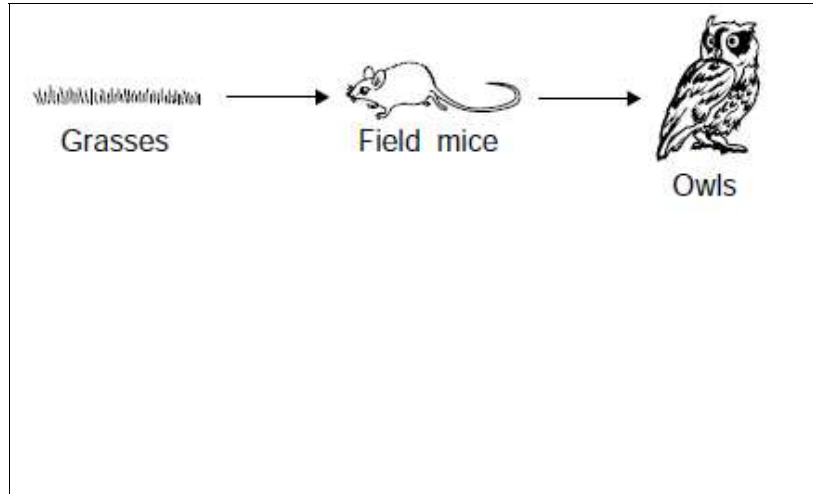
Data Base File Number: 1664

Regents Date June2024-23.bmp

June2024

23 6/14/2024 S4K1

Answer 4



## decomposer

379. Organisms from a particular ecosystem are shown in the diagram. Which statement concerning an organism in this ecosystem is correct?

- (1) Organism 2 is heterotrophic.
- (2) Organism 3 helps recycle materials.
- (3) Organism 4 obtains all of its nutrients from an abiotic source.
- (4) Organism 5 must obtain its energy from organism 1.

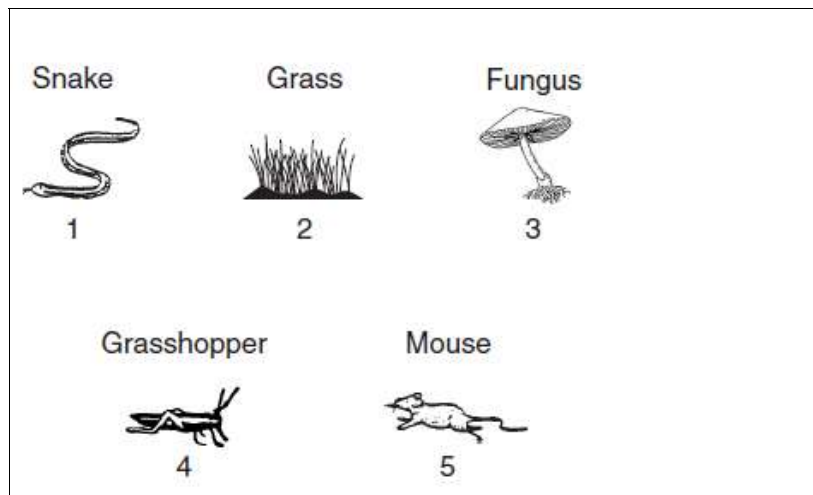
Data Base File Number: 654

Regents Date June2004-5.bmp

June2004

5 6/18/2004 S4K1

Answer 2



## decomposer

380. The diagram shown represents some energy transfers in an ecosystem. Which type of organism is most likely represented by letter X?

- (1) decomposer
- (2) autotroph
- (3) producer
- (4) herbivore

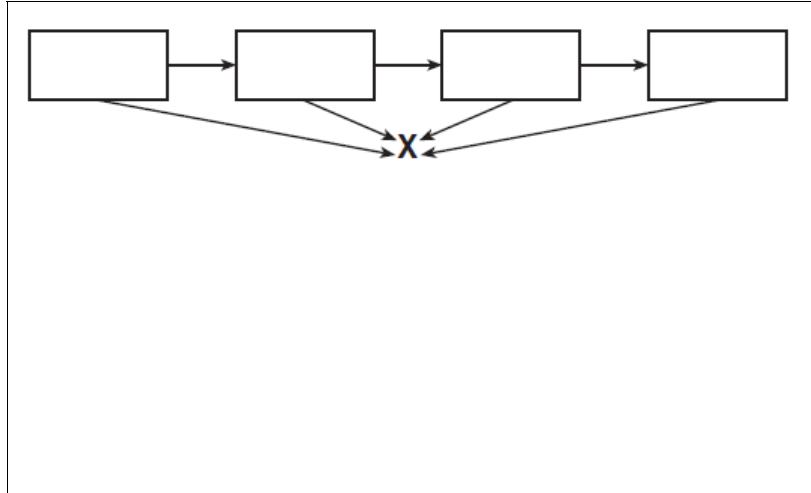
Data Base 486  
File Number:

Regents Date June2006-28.bmp

June2006

28 6/21/2006 S4K6

Answer 1



## decomposer

381. Untreated organic wastes were accidentally discharged into a river from a sewage treatment plant. The graph shows the dissolved oxygen content of water samples taken from the river at specific distances downstream from the plant, both before, and then three days after the discharge occurred. Use the data given in the graph and your knowledge of biology to answer this question. Why would this accident be expected to benefit decomposers?

- (1) The raw sewage provides a sudden increase in the food supply for the decomposers which in turn requires more oxygen to support the decomposers.
- (2) The raw sewage itself uses more oxygen.
- (3) No conclusion can be made based on the data given.
- (4) The decrease in the oxygen levels in the river is caused by some other natural process in the water.

Data Base  
File Number:

82

Regents Date

Jan08-57.bmp

Jan2008

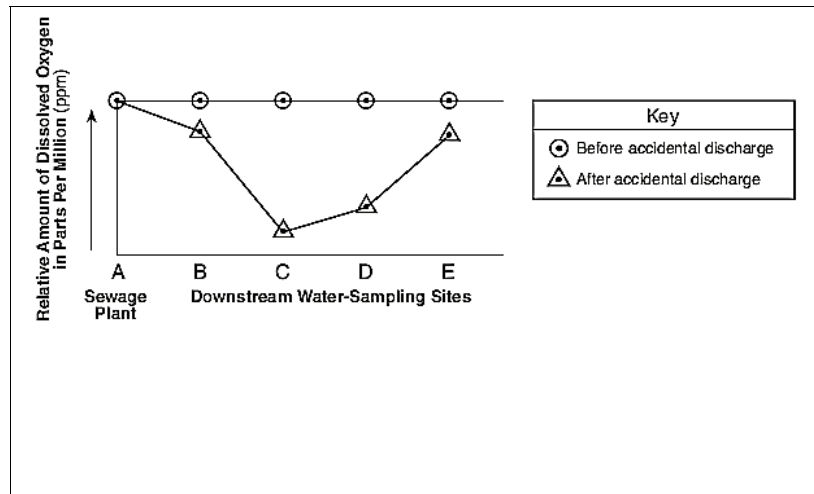
57

1/25/2008

S4K6

Answer

1



## decomposer

382. Which row in the chart shown best describes decomposers?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 897

Regents Date Aug2013-2.bmp

Aug2013

2 8/14/2013 S4K1

Answer 2

Row	Method of Nutrition	Recycles
(1)	autotrophic	nutrients
(2)	heterotrophic	nutrients
(3)	autotrophic	energy
(4)	heterotrophic	energy

## decomposer

383. In the diagram shown, what does X most likely represent?

(1) autotrophs

(3) decomposers

(2) herbivores

(4) carnivores

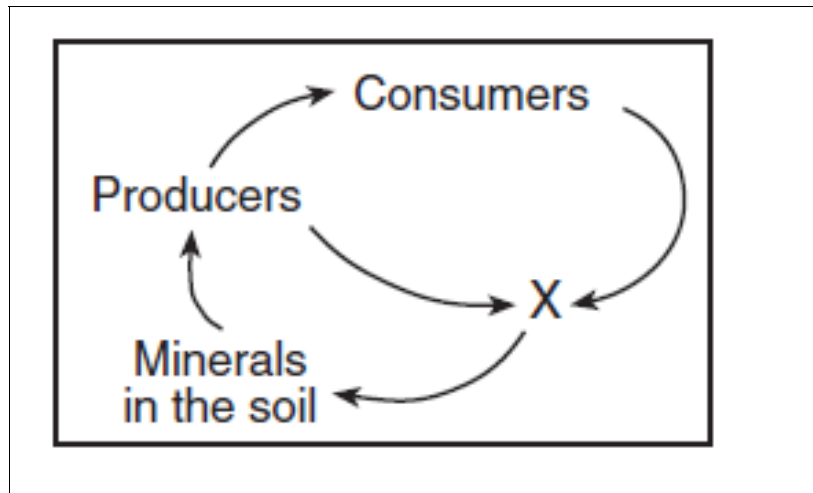
Data Base File Number: 452

Regents Date Jan2006-1.bmp

Jan2006

1 1/27/2006 S4K1

Answer 3





## decomposer

384. The diagram shows the relationships between the organisms in and around a pond. One additional biotic factor needed to make this a stable ecosystem is the presence of

- (1) producers
- (2) herbivores
- (3) decomposers
- (4) consumers

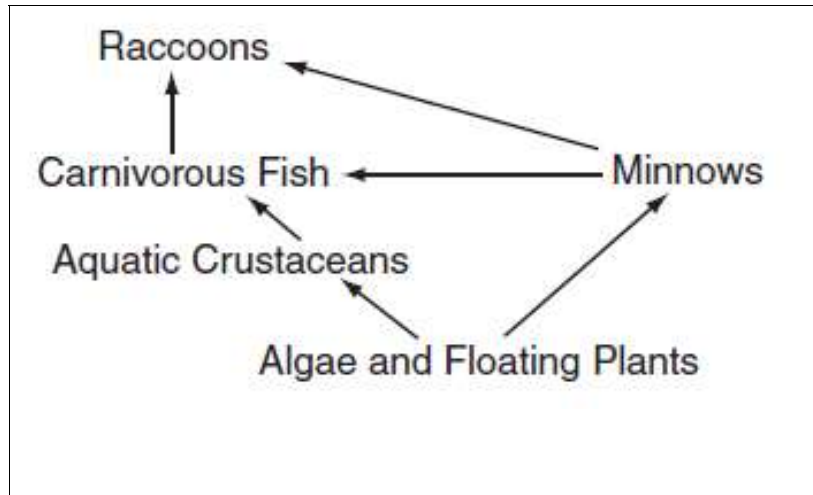
Data Base File Number: 865

Regents Date Aug2001-27.bmp

Aug2001

27 8/16/2001 S4K6

Answer 3



## decomposer

385. The process illustrated in the sequence shown occurs constantly in the biosphere. Which type of organism is most likely represented by X?

- (1) decomposer
- (2) producer
- (3) herbivore
- (4) carnivore

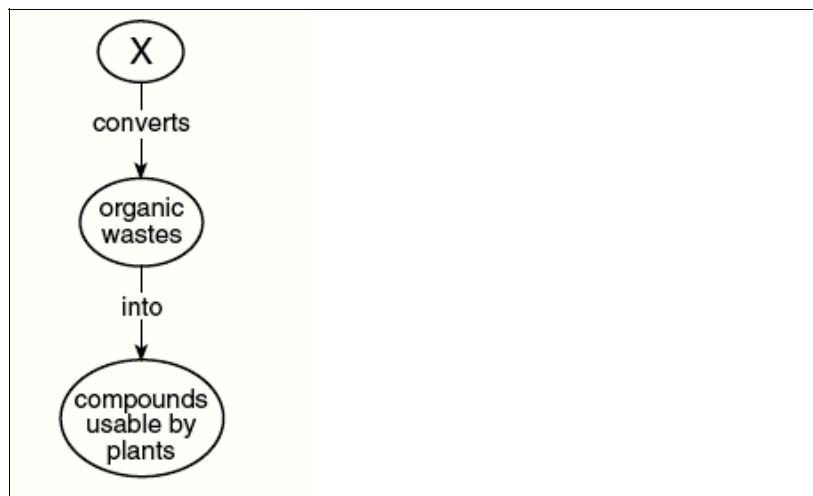
Data Base File Number: 159

Regents Date Jan09-38.bmp

Jan2009

38 1/27/2009 S4K6

Answer 1



## deforestation

386. Which row in the chart shown represents the most likely changes in the atmosphere due to widespread deforestation?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1246

Regents Date June2018-10.bmp

June2018

10 6/13/2018 S4K7

Answer 3

Row	Oxygen Concentration	Carbon Dioxide Concentration
(1)	increases ↑	increases ↑
(2)	increases ↑	decreases ↓
(3)	decreases ↓	increases ↑
(4)	decreases ↓	decreases ↓

## dependent variable

387. Base your answer to this question on the information and data table shown and on your knowledge of biology. The effect of temperature on the action of pepsin, a protein-digesting enzyme present in stomach fluid, was tested. In this investigation, 20 milliliters of stomach fluid and 10 grams of protein were placed in each of five test tubes. The tubes were then kept at different temperatures. After 24 hours, the contents of each tube were tested to determine the amount of protein that had been digested. The results are shown in the table. The dependent variable in this investigation is the

(1) size of the test tube

(3) amount of stomach fluid

(2) time of digestion

(4) amount of protein digested

Data Base File Number: 573

Regents Date June2005-46.bmp

June2005

46 6/22/2005 LABA

Answer 4

Tube #	Temperature (°C)	Amount of Protein Digested (grams)
1	5	0.5
2	10	1.0
3	20	4.0
4	37	9.5
5	85	0.0

## dependent variable

388. Base your answer to this question on the information given and on your knowledge of biology. Before watching a scary movie, the members of a theater audience agreed to have their heart rates monitored. They were asked to sit in silence for 10 minutes before the film began. The movie was then shown from beginning to end.

The scatter plot shown summarizes the data collected by all of the heart monitors from ten minutes before the start of the movie to the end of the movie. In this experiment, the dependent variable is the

- (1) heart rate of the audience members
- (2) scene being viewed by the audience
- (3) amount of time the movie played
- (4) number of viewers with heart-rate monitors

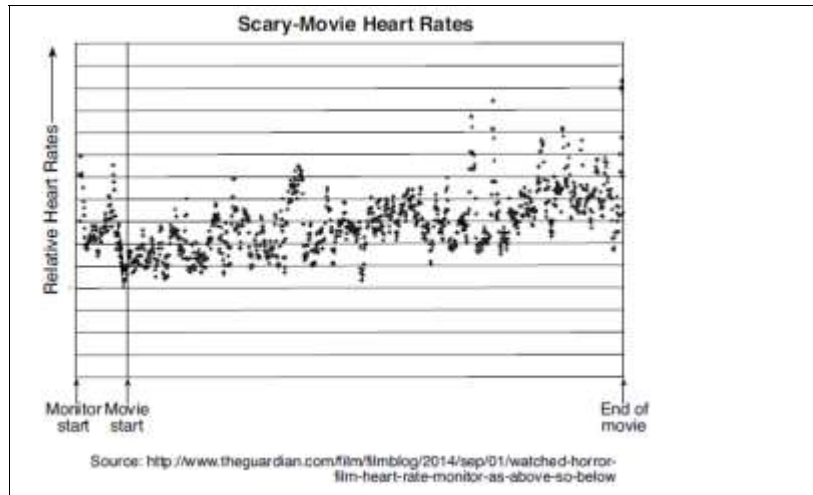
Data Base File Number: 1491

Regents Date June2022-73.bmp

June2022

73 6/15/2022 LAB2

Answer 1



**dependent variable**

389. Base your answer to this question on the information given and on your knowledge of biology. ----- Pulse Rates ----- A student heard a sports news report that several fans who were wearing smart watches received irregular heart rate warnings as they were viewing the last few minutes of a football playoff game. The alert stated that they had an irregular increase in heart rate during a time in which they were inactive. The student decided to conduct his own experiment in order to determine if watching an exciting sporting event would increase the pulse rates of viewers. He asked six of his friends to watch a championship game and had them take their pulse rates during the first quarter of the game and at the end of the game. The results are recorded in the data table as shown. The dependent variable in this experiment is the

- (1) number of friends participating
- (2) times when the pulse rate was taken
- (3) pulse rate of each person
- (4) viewing of the sporting event

Data Base File Number: 1624

Regents Date Aug2023-76.bmp

Aug2023  
76 8/17/2023 LAB2

Answer 3

Friend	1	2	3	4	5	6
Pulse Rate First Quarter of Game	98	86	70	101	89	110
Pulse Rate End of Game	125	111	98	122	90	130

## dependent variable

390. Base your answer to this question on the information given and on your knowledge of biology. A student set up an experiment to test the effect of the number of seedlings planted in one pot on the rate of growth. All conditions in the experiment were the same, except for the number of plants in each pot. The results are shown in the graph. The dependent variable for this experiment was

- (1) the number of plants per pot  
(2) time in days  
(3) average plant growth  
(4) the amount of water per pot

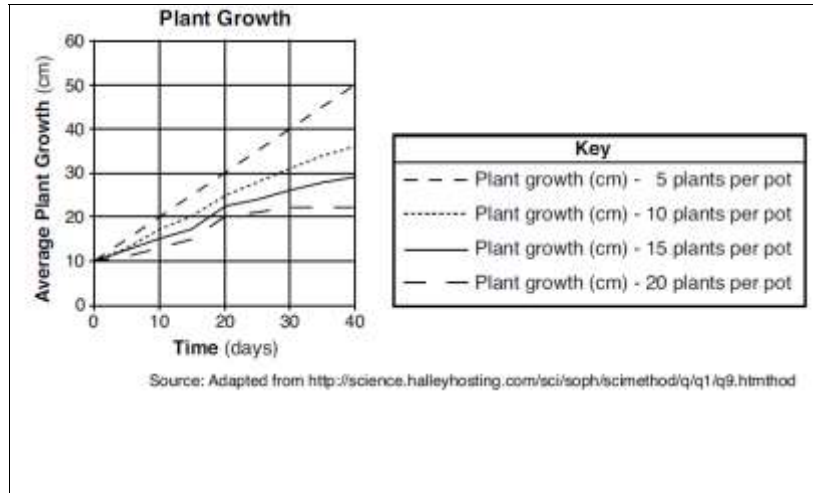
Data Base File Number: 1429

Regents Date June2021-31.bmp

June2021

33 6/22/2021 LABA

Answer 3



## development

391. The diagram below summarizes some of the steps in the development of humans.

- (1) A  
(2) B  
(3) C  
(4) D

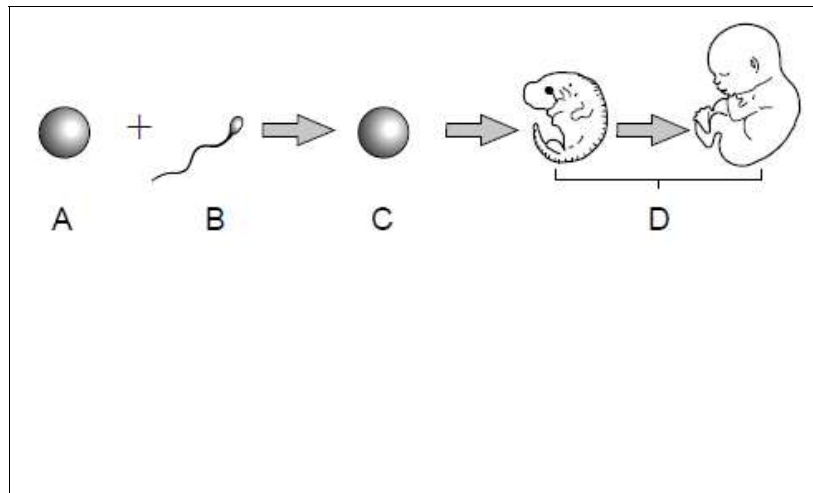
Data Base File Number: 1253

Regents Date June2018-23.bmp

June2018

23 6/13/2018 S4K4

Answer 3



## development

392. The diagram shown represents some stages in the process of development. Stage 2 represents a cell that

- (1) contains half the genetic material of an adult cell
- (2) shows clear evidence of tissue differentiation
- (3) has the complete genetic information to form an adult
- (4) is genetically identical to one of the parents that produced it

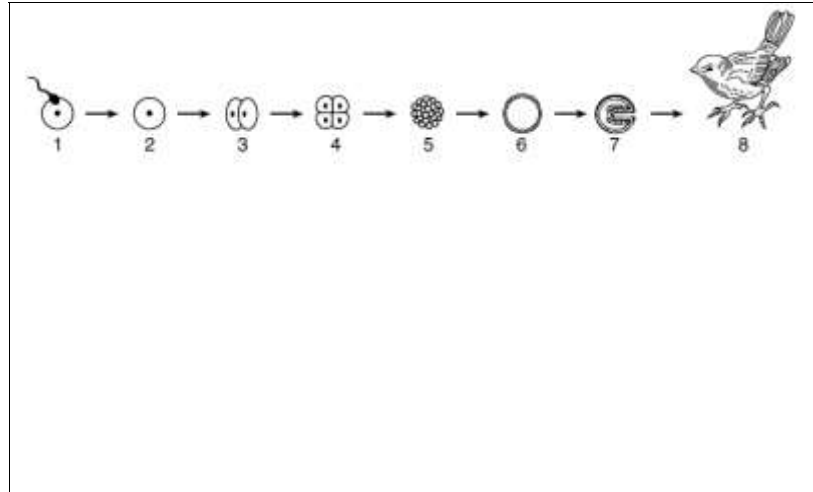
Data Base File Number: 1310

Regents Date Jan2019-36.bmp

Jan2019

36 1/22/2019 S4K4

Answer 3



## development

393. Some stages in the development of an individual are listed as shown. Which sequence represents the correct order of these stages?

- (1) A-B-C-D
- (2) B-C-A-D
- (3) D-B-C-A
- (4) B-D-A-C

Data Base File Number: 779

Regents Date Aug2002-16.bmp

Aug2002

16 8/13/2002 S4K4

Answer 4

- (A) differentiation of cells into tissues
- (B) fertilization of egg by sperm
- (C) organ development
- (D) mitotic cell division of zygote

## development / organism

394. Some stages in the development of an organism are represented in the diagram below. Which levels of biological organization do stages 2 and 7 have in common?

- (1) cells and organs
- (2) cells and tissues
- (3) tissues and organelles
- (4) organelles and cells

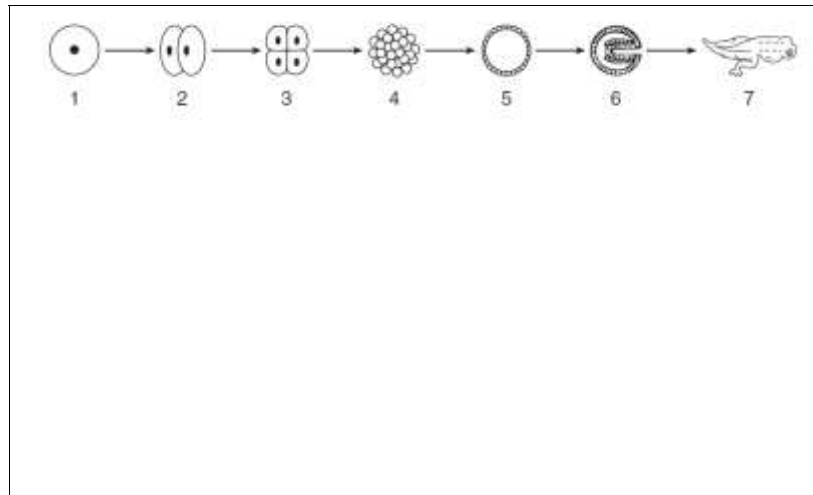
Data Base File Number: 276

Regents Date Aug2010-8.bmp

Aug2010

8 8/18/2010 S4K1

Answer 4



## dialysis

395. Base your answer to this question on the information given and on your knowledge of biology. The diagram shown represents a lab setup. The artificial cell (dialysis tube) contains a starch solution and the beaker contains a solution of starch indicator and water. The setup is left undisturbed for twenty minutes. Which molecule(s), present in this setup, will be able to pass through the dialysis tubing?

- (1) starch
- (2) water
- (3) starch indicator
- (4) Both choice 2 and choice 3

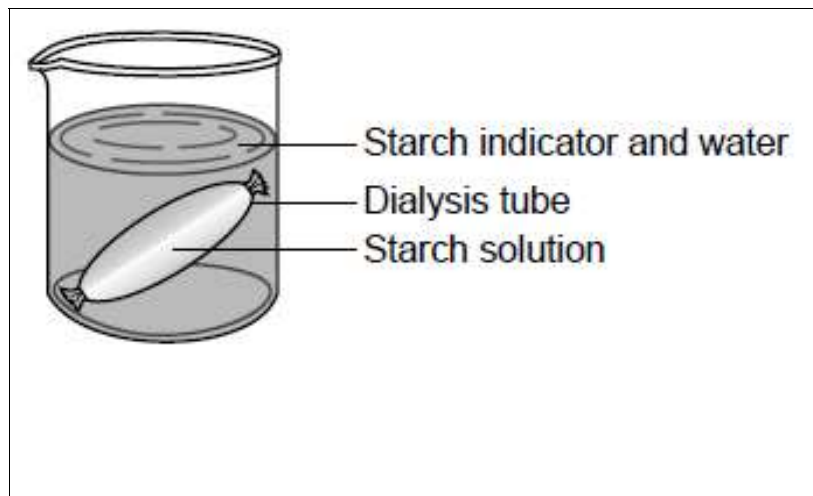
Data Base File Number: 1414

Regents Date Jan2020-77.bmp

Jan2020

77 1/21/2020 LAB5

Answer 4



## dialysis

396. Base your answer to this question on the information given, the diagram shown, and your knowledge of biology. Starch turns blue black in the presence of a starch indicator. Dialysis tubing tied at both ends and containing starch solution is placed in a beaker of water. Yellowish brown starch indicator is then added to the water. What will the solutions in the beaker and the tubing look like after 20 minutes?

- (1) The indicator solution in the beaker will be blue black and the starch solution in the tubing will not change color.
- (2) The starch solution in the tubing will be blue black and the indicator solution in the beaker will not change color
- (3) Neither the indicator solution nor the starch solution will be blue black.
- (4) Both the indicator solution and the starch solution will be blue black.

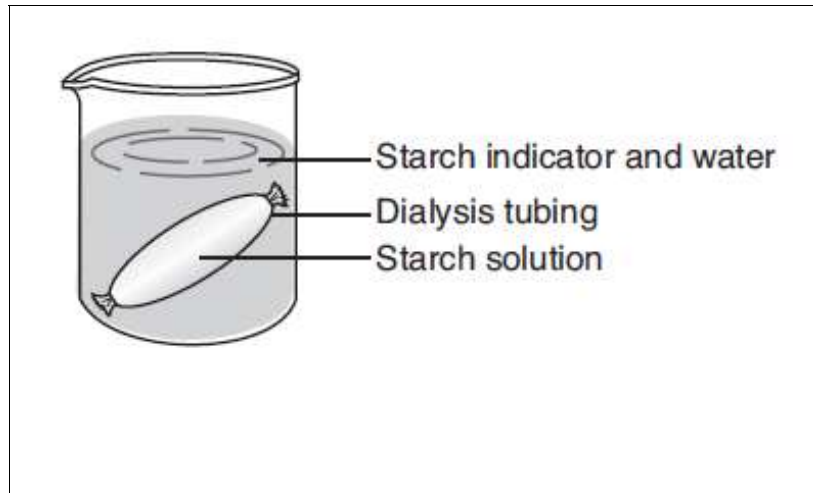
Data Base 228  
File Number:

Regents Date August2009-67.b

Aug2009

67 8/13/2009 LABS

Answer 2





## dialysis

397. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the changes that occurred in a beaker after 30 minutes. The beaker contained water, food coloring, and a bag made from dialysis tubing membrane. When the colors yellow and blue are combined they produce a green color. Which statement most likely describes the relative sizes of the yellow and blue food-coloring molecules in the diagram?

- (1) The yellow food-coloring molecules are small, while the blue food-coloring molecules are large.
- (2) The yellow food-coloring molecules are large, while the blue food-coloring molecules are small.
- (3) Both the yellow food-coloring molecules and the blue food-coloring molecules are large.
- (4) Both the yellow food-coloring molecules and the blue food-coloring molecules are small.

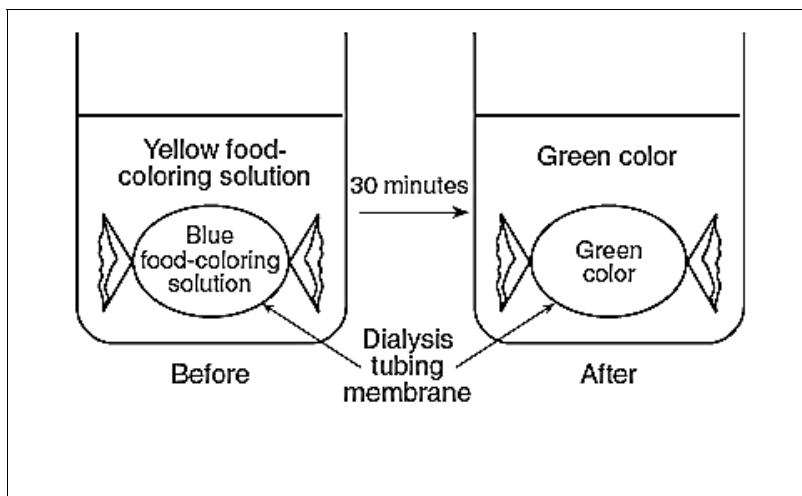
Data Base File Number: 47

Regents Date June07-71.bmp

June2007

71 6/20/2007 LABS

Answer 4



## dialysis

398. An experimental setup using a model cell is shown in the diagram. What cell structure does the dialysis tubing represent?

- (1) cell membrane
- (2) cell wall
- (3) vacuole
- (4) chromosome

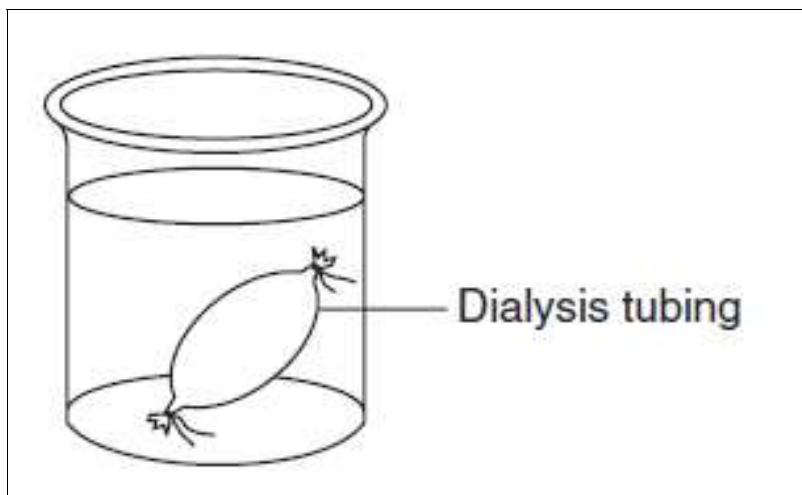
Data Base File Number: 378

Regents Date Aug2011-80.bmp

Aug2011

80 8/18/2011 LAB5

Answer 1



## dialysis

399. The diagram shown represents a container of water divided by a dialysis membrane into two areas, X and Y. Starch solution was added to the water on side X. One hour later, amber-colored starch indicator solution was added to both sides. What is the color that could be observed at X after the addition of the starch indicator.

- (1) blue-black
- (2) amber
- (3) red
- (4) yellow

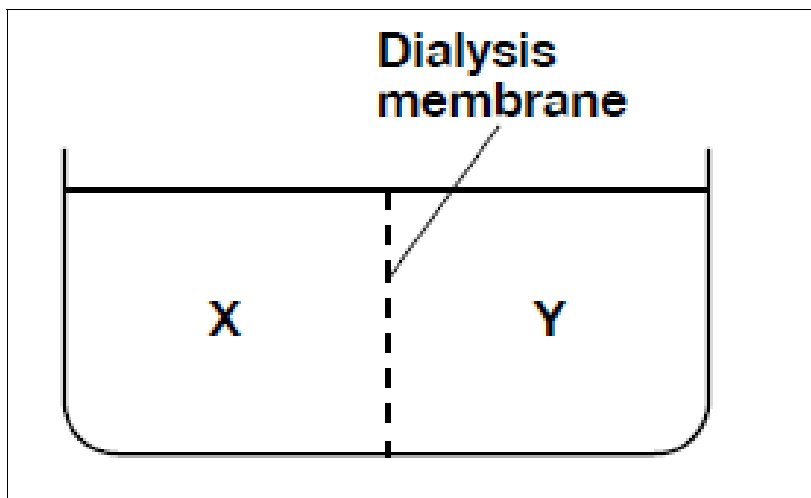
Data Base File Number: 1300

Regents Date Aug2018-85.bmp

Aug2018

85 8/17/2018 LAB5

Answer 1



## dialysis

400. Base your answer to this question on the experimental setup shown and your knowledge of biology. The experimental setup is allowed to sit for one hour. What is one possible observation after the one hour?

- (1) There will be no change in the distribution of the molecules.
- (2) Starch molecules will move from within the dialysis membrane to the water in the beaker.
- (3) The inside of the dialysis membrane will turn blue-black in color.
- (4) The water in the beaker will turn blue-black.

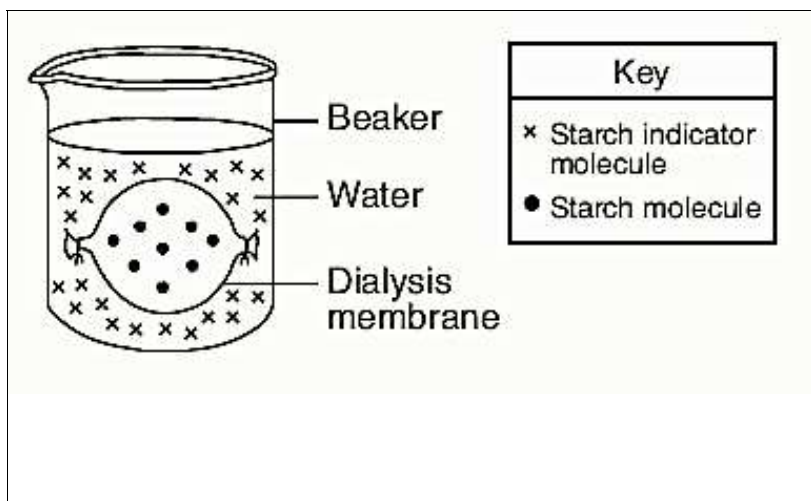
Data Base File Number: 114

Regents Date June08-76.bmp

June2008

76 6/24/2008 LABS

Answer 3



## dialysis

401. The masses of six sections of dialysis tubing, each containing 20 mL of a 25% sugar solution, were recorded. They were then placed in beakers each containing 100-mL solutions of varying sugar concentrations, as shown in the diagrams. The sections of tubing remained in the beakers for 30 minutes. They were then removed and the outside of each section of tubing was blotted dry. Following this, the mass of each section of tubing was measured again. Which section of tubing most likely had the GREATEST increase in mass?

- (1) 25% sugar solution inside the tubing and 0% sugar solution in the beaker
- (2) 25% sugar solution inside the tubing and 5% sugar solution in the beaker
- (3) 25% sugar solution inside the tubing and 10% sugar solution in the beaker
- (4) 25% sugar solution inside the tubing and 25% sugar solution in the beaker

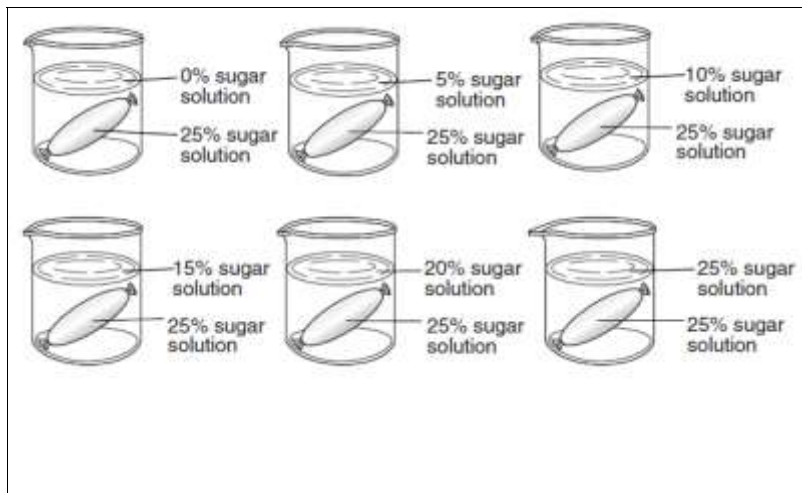
Data Base File Number: 244

Regents Date Jan2010-46A.bm

Jan2010

46 1/26/2010 LABS

Answer 1



## dialysis

402. Base your answer to this question on the information shown and on your knowledge of biology. Students prepared four models of cells by using dialysis tubing containing the same blue solution. Each of the model cells originally weighed 10 grams. They then placed each model cell in a beaker containing a different concentration of water. After 24 hours, they recorded the mass of the model cells as shown in the data table. Why did the model cell that was placed in 100% water increase in mass?

- (1) Water diffused into the model cell.
- (2) Water diffused out of the model cell.
- (3) Water achieved equilibrium on the outside of the model cell.
- (4) No conclusion can be made based on the data given.

Data Base File Number: 472

Regents Date Jan2006-72.bmp

Jan2006

72 1/27/2006 LAB5

Answer 1

Concentration of Water Surrounding the Model Cell	Mass of Model Cell
100%	12 grams
90%	11 grams
80%	10 grams
70%	9 grams

## dialysis

403. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents an experimental setup. Which statement best describes what would most likely be observed after 20 minutes?

- (1) The contents of the dialysis tube would turn blue-black.
- (2) The liquid in the beaker would turn blue-black.
- (3) The dialysis tube would burst.
- (4) There would be no change visible.

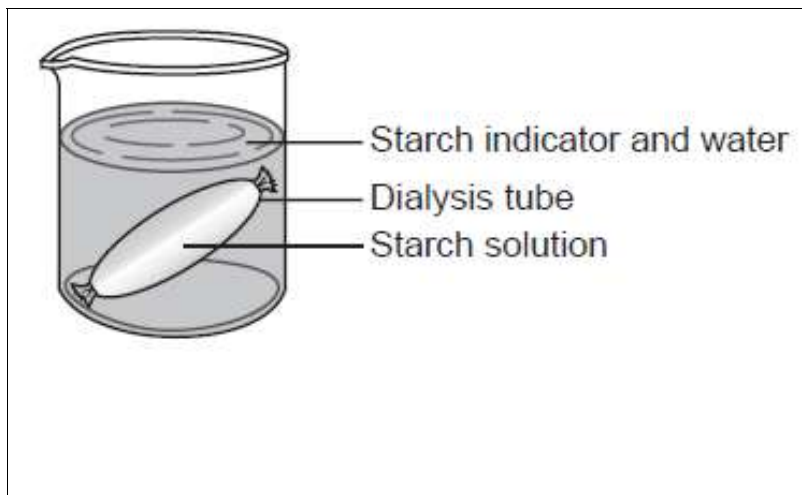
Data Base File Number: 1120

Regents Date June2016-73.bmp

June2016

73 6/15/2016 LAB5

Answer 1



## dialysis

404. Base your answer to this question on the information and diagram shown and on your knowledge of biology. In an experiment, students placed a dialysis bag containing 100 mL of a starch-water mixture in a beaker of water, as shown in the diagram. They left the setup until class the next day, when they removed the dialysis bag and measured the volume of the contents. They found that there were now 125 mL of the starch-water mixture. To measure the volume of the starch-water mixture in the dialysis bag, the students should have used a

- (1) meterstick
- (2) triple-beam balance
- (3) graduated cylinder
- (4) test tube

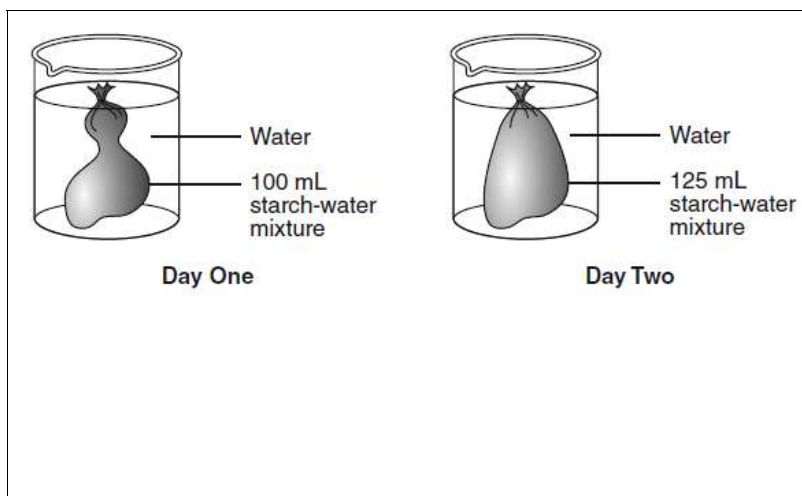
Data Base File Number: 451

Regents Date Aug2012-82.bmp

Aug2012

82 8/17/2012 LAB5

Answer 3



**dichotomous key**

405. A dichotomous key was used by students in reference to the picture shown. What were the students most likely trying to do?

- (1) identify the organism
- (2) identify the scientific name of the organism
- (3) determine whether the organism has teeth or tusks
- (4) all of the above are possible answers

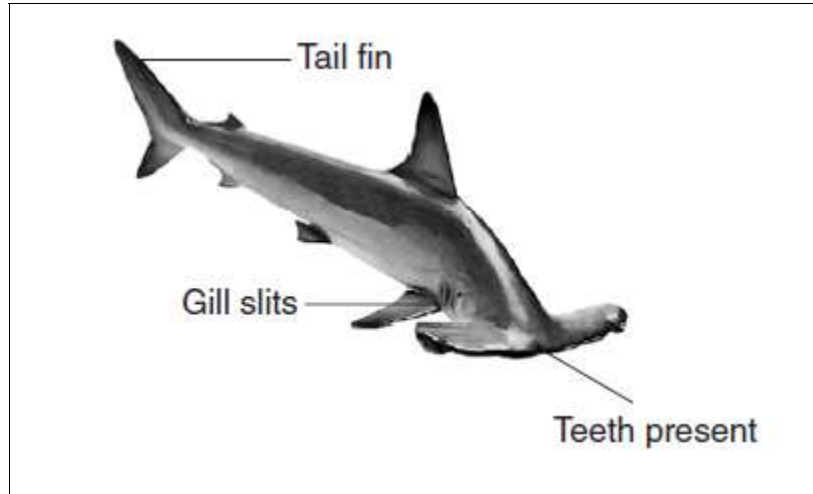
Data Base File Number: 247

Regents Date Jan2010-55A.bm

Jan2010

55 1/26/2010 S4K6

Answer 4



**dichotomous key**

406. Base your answer to this question diagram given and on your knowledge of biology. The diagram shows four types of bacteria. A dichotomous key to these bacterial types is shown at the bottom of the diagram. Which information would be correct to complete the missing parts for sections 3a. and 3b. in the key so that the key is complete for all four types?

- (1) 3a. - Single cells      3b.- Chains of cells      (3) 3a. - Type C      3b. - Type D
- (2) 3a. - Spirillum      3b. - Bacillus      (4) 3a. - Bacillus      3B. - Type C

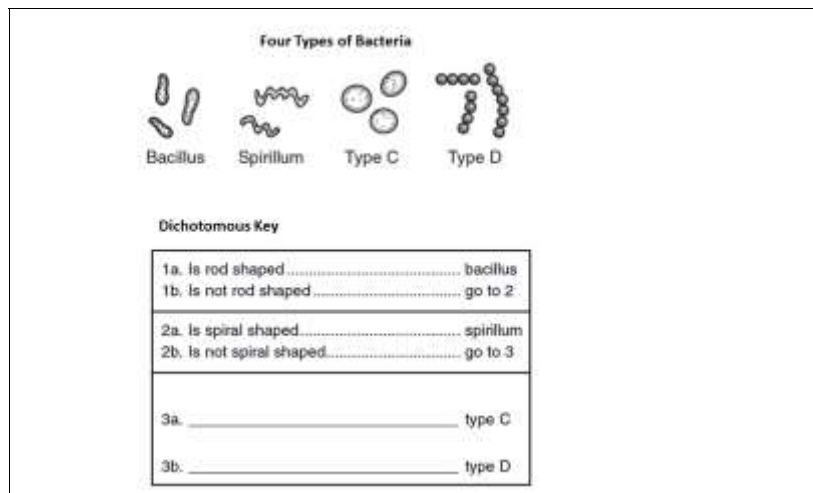
Data Base File Number: 1059

Regents Date August2015-55.b

Aug2015

55 8/12/2015 LABA

Answer 1



**dichotomous key**

407. The dichotomous key shown below can be used to identify birds W, X, Y, and Z. Bird X is most likely

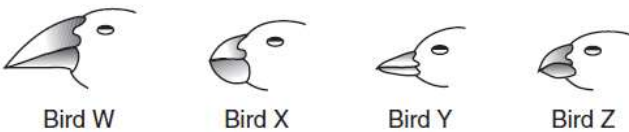
- (1) "Certhidea"
- (2) "Geospiza"

- (3) "Camarhynchus"
- (4) "Platyspiza"

Data Base File Number: 492

Regents Date June2006-38.bmp  
June2006  
38 6/21/2006 LABA

Answer 4



Bird W Bird X Bird Y Bird Z

Dichotomous Key to Representative Birds

- 1. a. The beak is relatively long and slender.....*Certhidea*
- b. The beak is relatively stout and heavy.....go to 2
- 2. a. The bottom surface of the lower beak is flat and straight .....*Geospiza*
- b. The bottom surface of the lower beak is curved .....go to 3
- 3. a. The lower edge of the upper beak has a distinct bend .....*Camarhynchus*
- b. The lower edge of the upper beak is mostly flat .....*Platyspiza*

**dichotomous key**

408. A student was using a dichotomous key like the one shown in the diagram. The most likely use for the dichotomous key would be

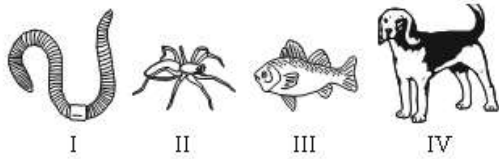
- (1) to explain evolutionary relationships between the animals shown
- (2) to use the key to identify the four animals shown

- (3) to show which animals are the oldest in evolution
- (4) to determine the origins of each animal shown

Data Base File Number: 200

Regents Date June09-50.bmp  
June2009  
50 6/18/2009 LABS

Answer 2



I II III IV

Dichotomous Key

- 1. a. Legs present..... Go to 2
- b. Legs not present..... Go to 3

## dichotomous key

409. The dichotomous key shown provides a way to classify some animals into groups according to their physical characteristics. The key can be used to classify each of the four animals represented below. Which row in the chart shows the correct classification group for each animal?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 903

Regents Date Aug2013-31C.bm

Aug2013

31 8/14/2013 LABA


Answer 4

**Dichotomous Key**

I wings..... go to II  
no wings..... group A

II feathers..... group B  
no feathers..... go to III

III two legs..... group C  
six legs..... group D



Wasp    Ant    Tiger    Bird

Which row in the chart shows the correct classification group for each animal?

Row	Wasp	Ant	Tiger	Bird
(1)	group D	group D	group A	group B
(2)	group B	group A	group D	group C
(3)	group B	group D	group A	group C
(4)	group D	group A	group A	group B

## differentiation

410. Following fertilization, a zygote divides and soon becomes a multicelled embryo with many different cell types, as represented in the diagram shown. Which statement best explains this development?

(1) Specialization occurs, resulting in the formation of a great variety of cell types.

(3) The expression of genes responsible for the different cell types is controlled by the placenta.

(2) Genes are inserted into the zygote to allow for the formation of different cell types.

(4) The genetic information in the zygote is divided to produce a complete set for each cell type.

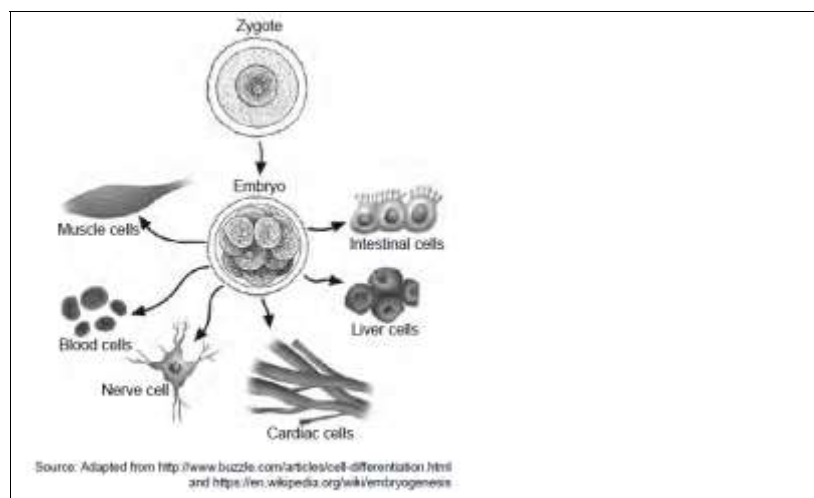
Data Base File Number: 1397

Regents Date Jan2020-29.bmp

Jan2020

29 1/21/2020 S4K2

Answer 1





**differentiation**

411. The diagram shown represents early stages of embryo development. The greatest amount of differentiation for organ formation most likely occurs at arrow

- (1) A
- (2) B
- (3) C
- (4) D

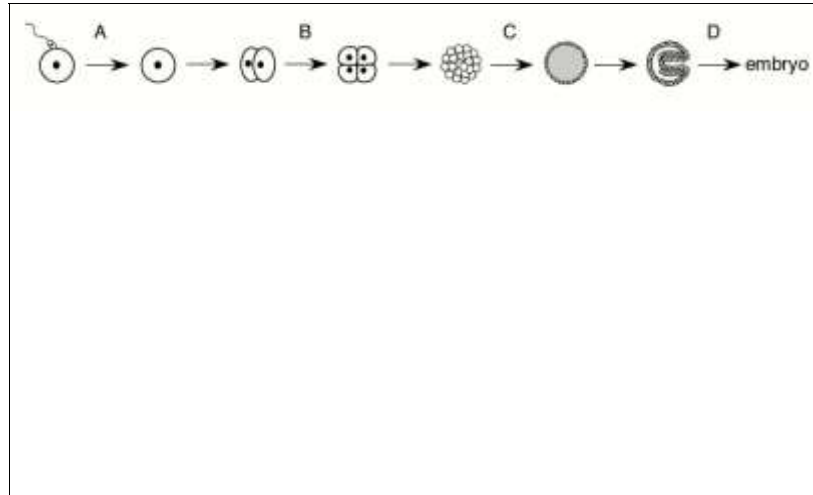
Data Base File Number: 123

Regents Date Aug08-21.bmp

Aug2008

21 8/13/2008 S4K4

Answer 4



**differentiation**

412. The diagram and chart shown represent some of the changes a zygote undergoes during its development. The processes that are most directly responsible for these changes are

- (1) sorting and recombination of genetic information
- (2) mitosis and differentiation
- (3) meiosis and adaptation
- (4) fertilization and cycling of materials

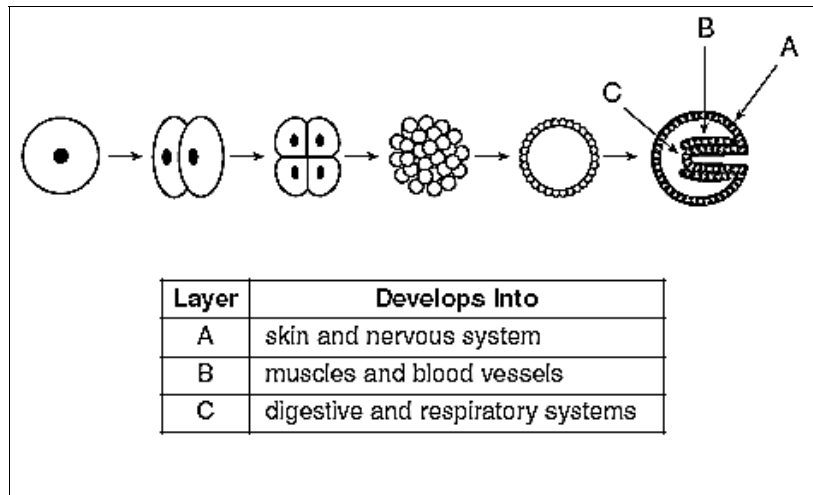
Data Base File Number: 7

Regents Date Aug07-20.bmp

Aug2007

20 8/16/2007 S4K4

Answer 2



## differentiation

413. The types of human cells shown in the diagram are different from one another, even though they all originated from the same fertilized egg and contain the same genetic information. Why do these genetically identical cells differ in structure and function?

- (1) External environmental factors can change the appearance and function of cells.
- (2) The cells originated from a single zygote.
- (3) Different parts of genetic information are used in different cells.
- (4) The reasons that genetically identical cells appear different is not known.

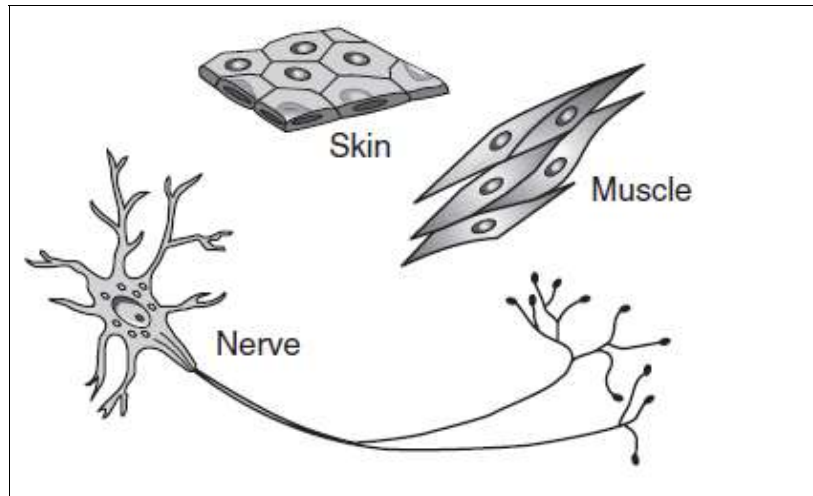
Data Base File Number: 571

Regents Date June2005-40.bmp

June2005

40 6/22/2005 S4K2

Answer 3



## differentiation

414. Base your answer to this question on the information and diagram shown and on your knowledge of biology. Each body cell contains the same genetic information, but can differ in appearance and size. The diagram shows three different types of cells found in the human body. Why are differences in these human body cells a biological advantage?

- (1) This allows these cells to form gametes.
- (2) This allows these cells to be specialized for a specific function.
- (3) This allows these cells to undergo meiosis.
- (4) This allows these cells to join together to form an entirely different cell type.

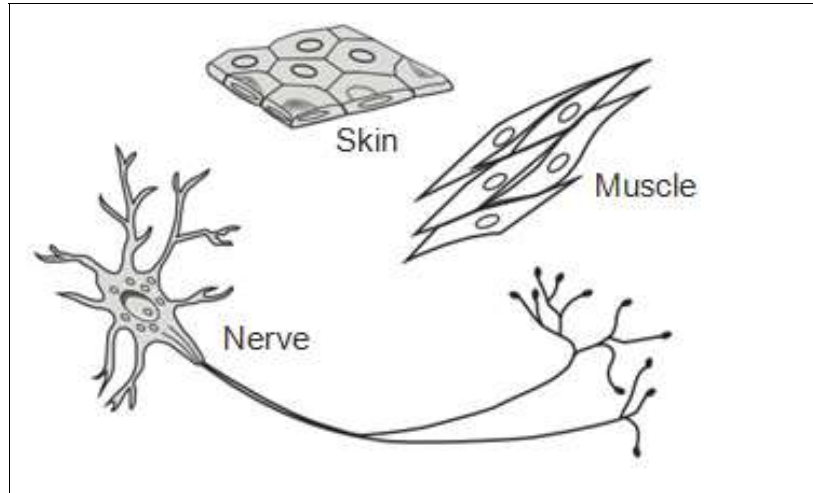
Data Base File Number: 1220

Regents Date Aug2017-54.bmp

Aug2017

55 8/17/2017 S4K1

Answer 2



## differentiation

415. Which developmental process is represented by the diagram shown?

- (1) fertilization
- (2) differentiation
- (3) evolution
- (4) mutation

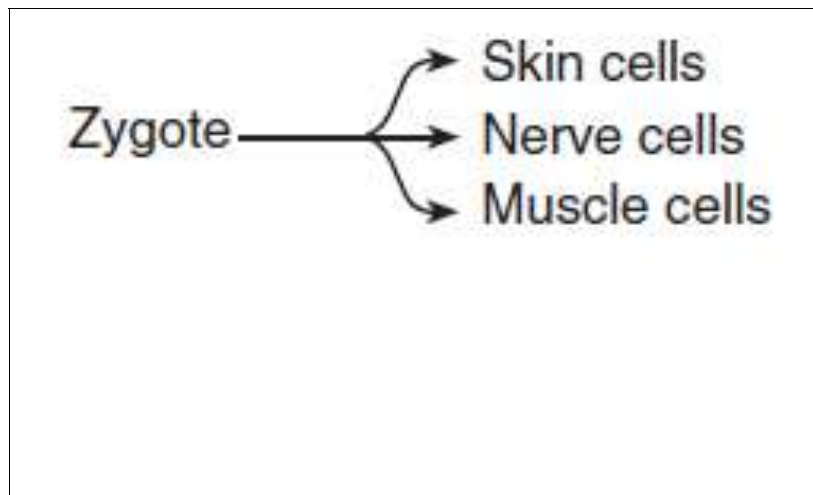
Data Base File Number: 480

Regents Date June2006-17.bmp

June2006

17 6/21/2006 S4K4

Answer 2



## differentiation

416. The development of an embryo is represented in the diagram shown. These changes in the form of the embryo are a direct result of

- (1) uncontrolled cell division and mutations                      (3) antibodies and antigens inherited from the father  
 (2) differentiation and growth    (4) meiosis and fertilization

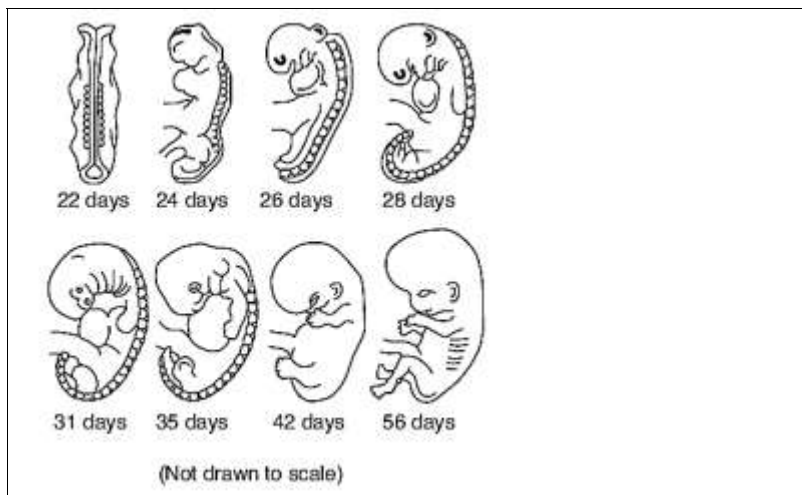
Data Base File Number: 95

Regents Date June08-22.bmp

June2008

22 6/24/2008 S4K4

Answer 2



## differentiation

417. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents events that occur during embryonic development. Letters A through E represent structures. Between which two letters does differentiation occur?

- (1) A and b    (3) C and D  
 (2) B and C    (4) D and E

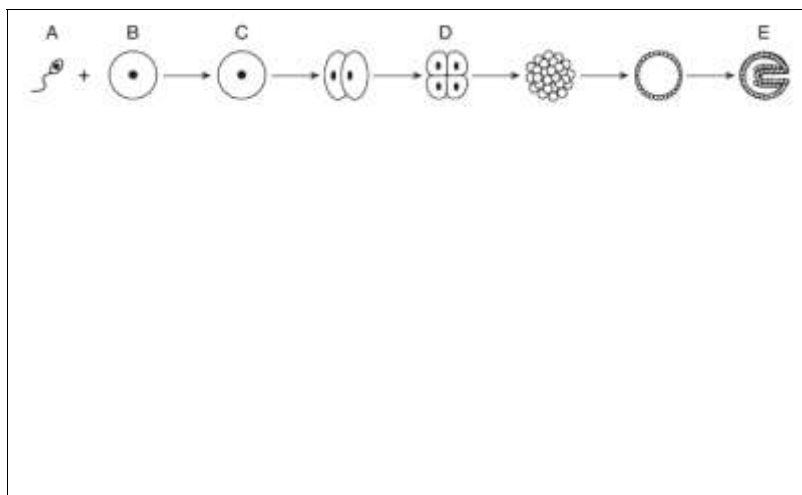
Data Base File Number: 972

Regents Date Aug2014-40.bmp

Aug2014

41 8/14/2014 S4K1

Answer 4



diffusion

418. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents two solutions, A and B, separated by a selectively permeable membrane. A sample from solution A and solution B were each tested with blue-colored glucose indicator solution before the solutions were placed in the beaker. Which row represents the results (refer to the chart at the right, in the diagram shown)?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

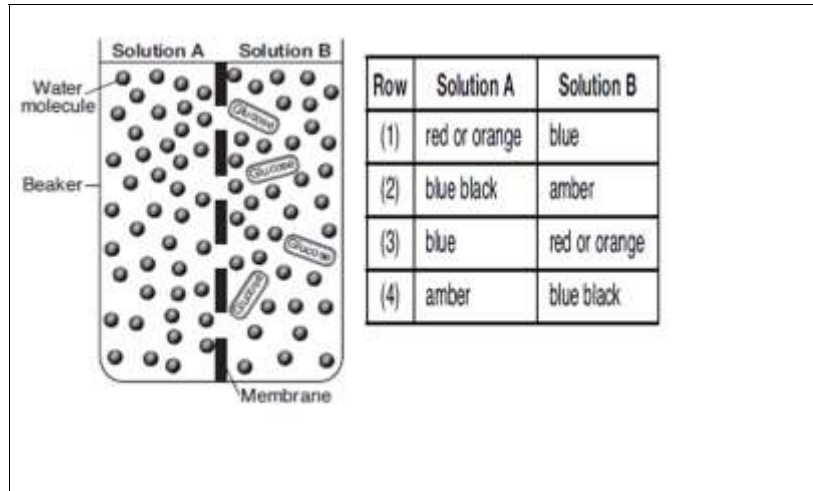
Data Base File Number: 981

Regents Date: Aug2014-81AB.b

Aug2014

81 8/14/2014 LAB5

Answer: 3



diffusion

419. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram illustrates an investigation carried out in a laboratory activity on diffusion. The beaker and the artificial cell also contain water. What would happen over time regarding the location of molecules I, G, and S?

- (1) All molecules remain in their original locations.
- (2) I, G, and S are outside the cell.
- (3) I, G, and S are inside the cell.
- (4) S, only, moves out of the cell.

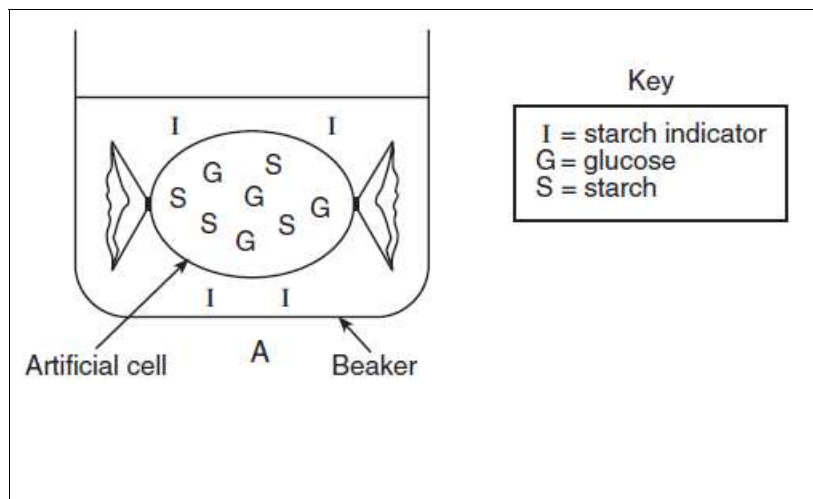
Data Base File Number: 527

Regents Date: Aug2006-60.bmp

Aug2006

60 8/16/2006 LAB5

Answer: 3



diffusion

420. The diagram shown represents a laboratory setup used to demonstrate the movement of molecules across a selectively permeable membrane. The setup is allowed to sit for 15 minutes. What would be the distribution of molecules on either side of the membrane after 15 minutes?

- (1) no change
- (2) all molecules move to the right side of the membrane
- (3) starch molecules stay at left and all glucose molecules move to the right side of the membrane.
- (4) starch molecules stay at left and glucose molecules are equally distributed on both sides of the membrane.

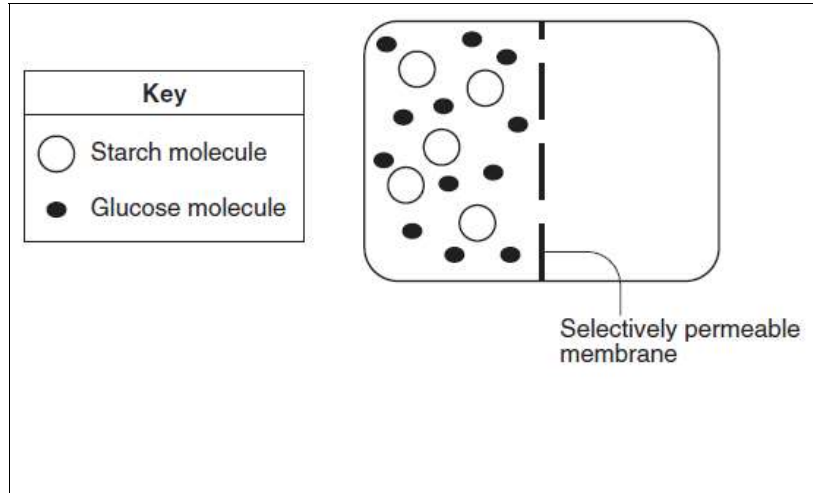
Data Base File Number: 1006

Regents Date Jan2015-77.bmp

Jan2015

77 2/26/2015 LAB5

Answer 4



diffusion

421. Base your answer to this question on the diagram shown of sugar in a beaker of water and on your knowledge of biology. In lab setup B, structure Z prevents the movement of sugar molecules into side 1. Which part of a living cell serves the same purpose as structure Z?

- (1) cell wall
- (2) cell membrane
- (3) cell cytoplasm
- (4) cell mitochondria

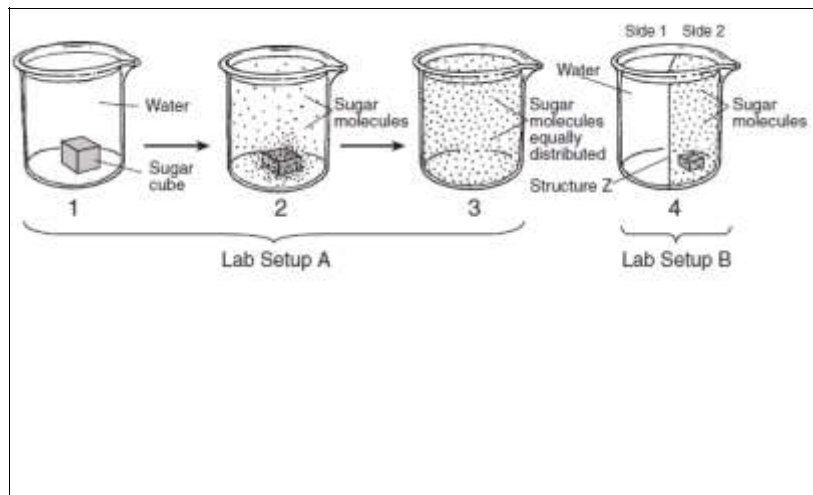
Data Base File Number: 790

Regents Date Aug2002-50.bmp

Aug2002

50 8/13/2002 S4K1

Answer 2



## diffusion

422. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents two solutions, A and B, separated by a selectively permeable membrane. Which statement best describes the outcome after 20 minutes?

- (1) Solution A will contain approximately the same number of glucose molecules as solution B.
- (2) Solution A will contain all of the water molecules.
- (3) Solution B will remain unchanged.
- (4) Solution B will lose all of the glucose molecules to solution A.

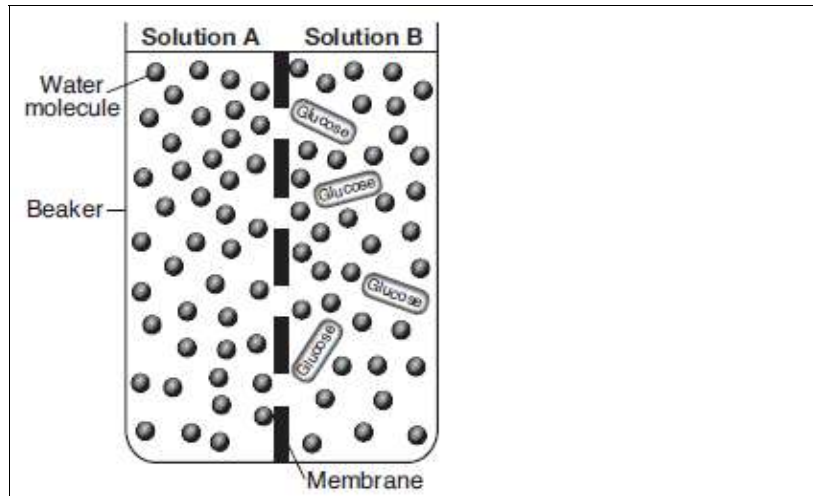
Data Base File Number: 982

Regents Date Aug2014-81.bmp

Aug2014

82 8/14/2014 LAB5

Answer 1



## diffusion

423. The diagram shown represents the major parts of a growing onion plant. Nutrients are represented in the soil around the onion. Which statement best describes how nutrients enter the root cells of the onion plant?

- (1) Only nutrients needed by the plant enter root cells.
- (2) The nutrients usually move from an area of high concentration in the soil to an area of low concentration in root cells.
- (3) Nutrients always move into the plant cells by active transport.
- (4) The nutrients always move from an area of low concentration in the soil to an area of high concentration in root cells.

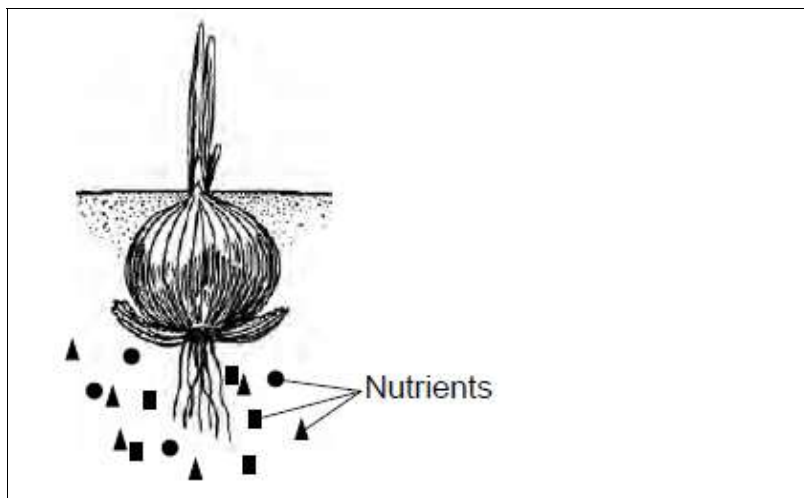
Data Base File Number: 1269

Regents Date June2018-73.bmp

June2018

73 6/13/2018 LAB5

Answer 2



## diffusion

424. Base your answer to this question on the laboratory setup illustrated and on your knowledge of biology. This laboratory setup would most likely be used to demonstrate

- (1) carbohydrate synthesis
- (2) active transport
- (3) diffusion
- (4) dehydration

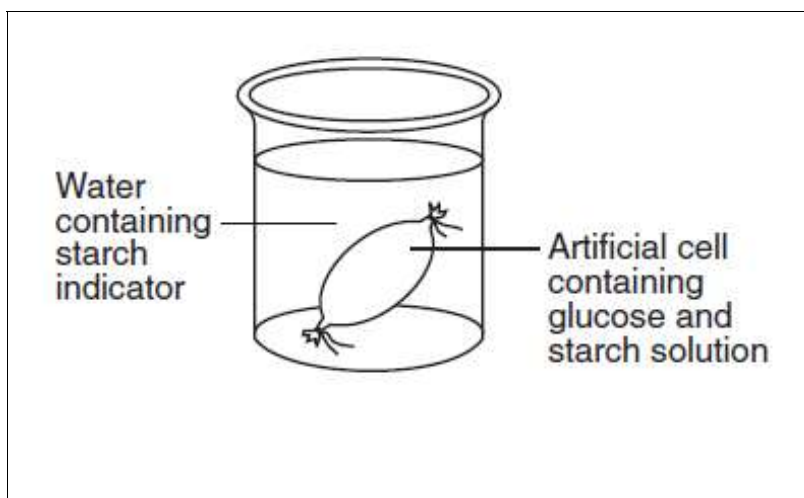
Data Base File Number: 300

Regents Date Aug2010-73.bmp

Aug2010

75 8/18/2010 LABS

Answer 3





## diffusion

425. Base your answer to this question on the diagrams shown and on your knowledge of biology. The UPPER diagram represents a sugar cube being dropped into an undisturbed beaker of water at room temperature. One sugar molecule is labeled. Which beaker in the LOWER part of the diagram represents the distribution of sugar molecules in the water four days later? (Assume there is NO evaporation of the water.)

(1) 1

(3) 3

(2) 2

(4) 4

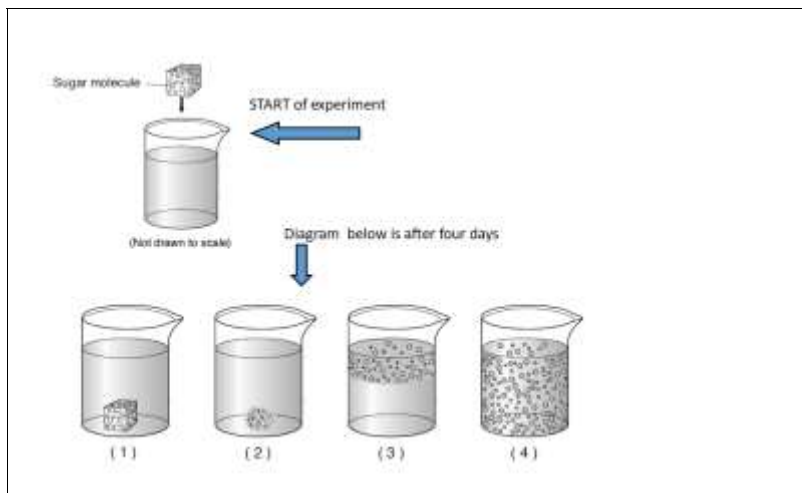
Data Base File Number: 1445

Regents Date June2021-81C.b

June2021

81 6/22/2021 LAB5

Answer 4



## diffusion

426. Base your answer to this question on the information given and on your knowledge of biology. An artificial cell filled with a glucose solution was placed in a beaker of water, as represented in the diagram on the left. The beaker was left undisturbed for 20 minutes. In the diagram at the RIGHT, a student was instructed to show the distribution of glucose using the black dots. How would the glucose molecules be distributed in the diagram at the right after twenty minutes?

(1) equally on the inside and outside of the membrane

(3) more glucose on the outside of the membrane

(2) more glucose on the inside of the membrane

(4) no change from the original on the left

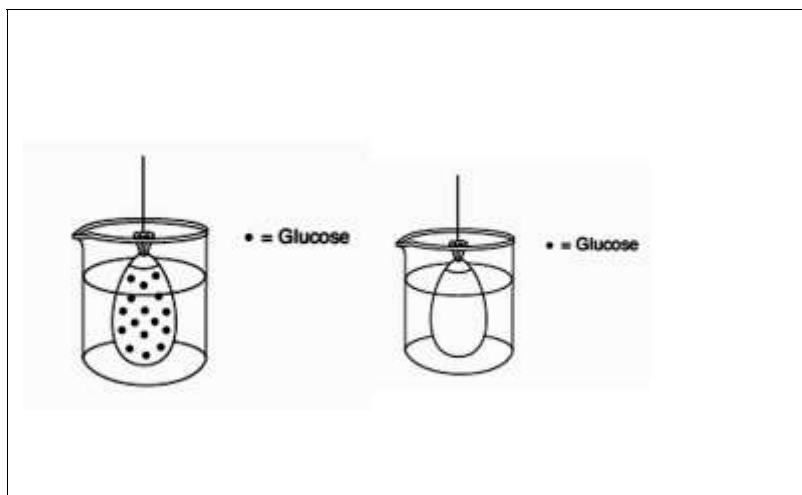
Data Base File Number: 428

Regents Date June2012-78C.b

June2012

78 6/19/2012 LAB5

Answer 1



diffusion

427. The diagram shows the relative concentration of molecules inside and outside of a cell, Which statement best describes the general direction of diffusion across the membrane of this cell?

- (1) Glucose would diffuse into the cell.
- (2) Protein would diffuse out of the cell.
- (3) Carbon dioxide would diffuse out of the cell.
- (4) Oxygen would diffuse into the cell.

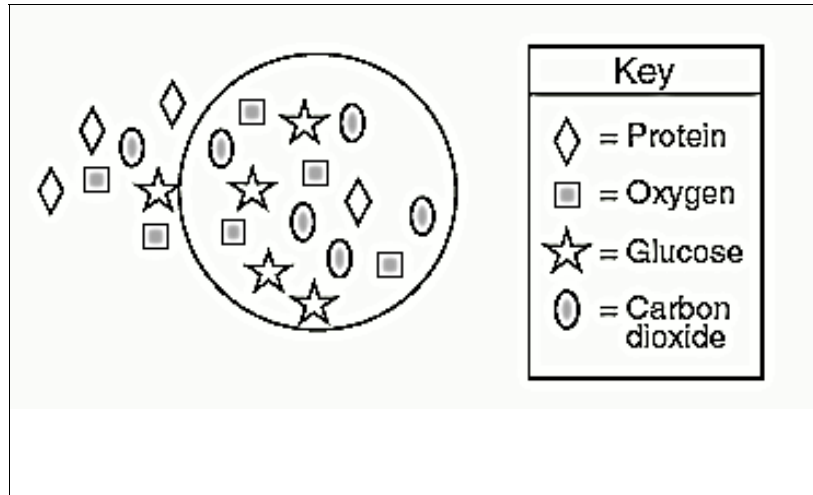
Data Base File Number: 54

Regents Date Jan07-32.bmp

Jan2007

32 1/26/2007 S4K1

Answer 3



diffusion

428. The diagram SHOWN AS "A" represents a specialized cell located in the root of a plant. The arrows in the diagram indicate the movement of molecules of oxygen and water into the cell. Which row in the chart SHOWN AS "B" correctly identifies the process responsible for the movement of each type of molecule represented in the diagram "A"?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

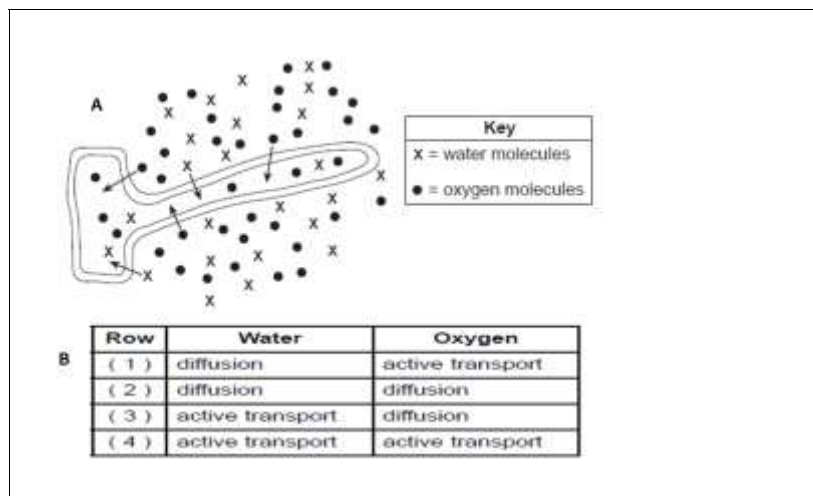
Data Base File Number: 943

Regents Date June2014-34C.b

June2014

34 6/17/2014 S4K1

Answer 2



## diffusion

429. The diagram shown represents a cell in water. Formulas of molecules that can move freely across the cell membrane are shown. Some molecules are located inside the cell and others are in the water outside the cell. Based on the distribution of these molecules, what would most likely happen after a period of time?

- (1) The concentration of O<sub>2</sub> will increase inside the cell.
- (2) The concentration of CO<sub>2</sub> will remain the same inside the cell.
- (3) The concentration of O<sub>2</sub> will remain the same outside the cell.
- (4) The concentration of CO<sub>2</sub> will decrease outside the cell.

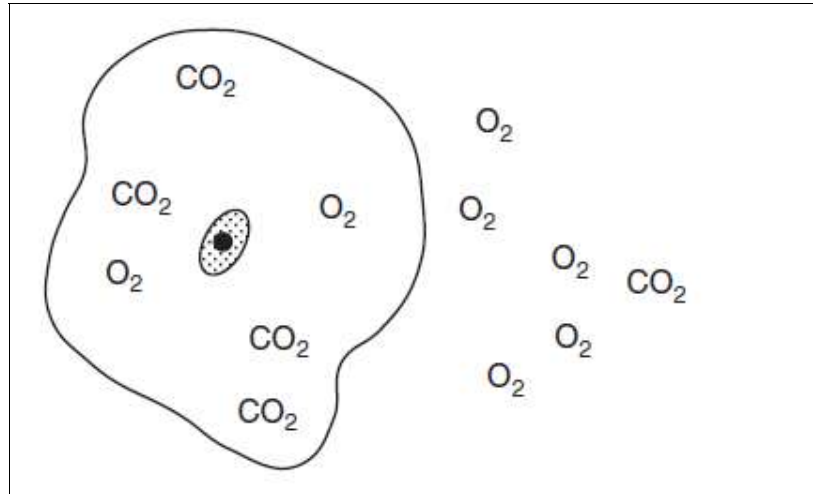
Data Base File Number: 862

Regents Date Aug2001-9.bmp

Aug2001

9 8/16/2001 S4K1

Answer 1



## diffusion

430. Base your answer to this question on the information given, the diagram shown, and on your knowledge of biology. A concentrated starch solution was placed in a thistle tube with a semi-permeable membrane covering the wide opening. It was then placed in a beaker of water. The height of the solution in the tube was measured every 5 minutes for 25 minutes. After 25 minutes the height of the column in the thistle tube was 11 cm. The setup is shown in the diagram. The experiment was repeated, and an amber-colored solution was added to the water in the beaker. After 10 minutes, the water in the beaker remained amber-colored and the starch solution had turned blue-black. The most likely reason for this observation is that

- (1) starch molecules moved out of the thistle tube
- (2) water molecules moved into the thistle tube
- (3) amber-colored solution moved into the thistle tube
- (4) water molecules moved out of the thistle tube

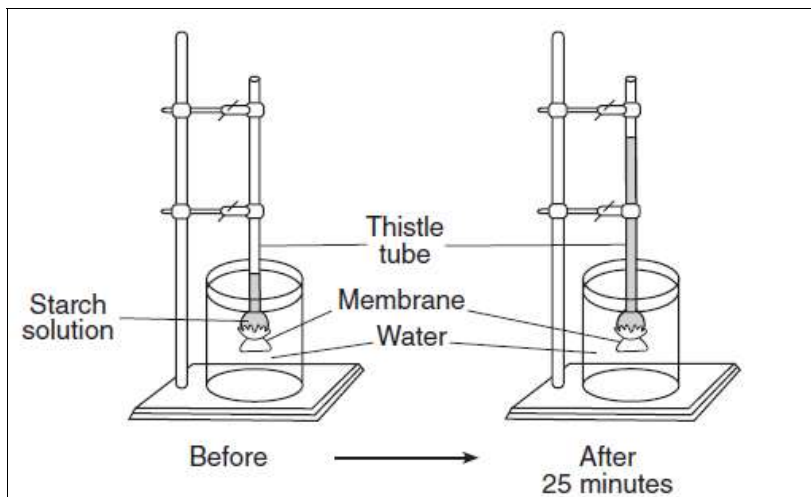
Data Base 1140  
File Number:

Regents Date August2016-44A.

Aug2016

47 8/18/2016 S1K1

Answer 3



## diffusion

431. The diagram shown represents a laboratory setup used by a student during an investigation of diffusion. Which statement best explains why the liquid in tube A will rise over a period of time?

- (1) The starch concentrations are equal on both sides of the membrane.
- (2) The water will pass from a region of lower starch concentration to one of higher starch concentration.
- (3) Water and starch volumes are the same in both tubes A and B.
- (4) The fluids in both tubes A and B will change from a higher temperature to a lower temperature.

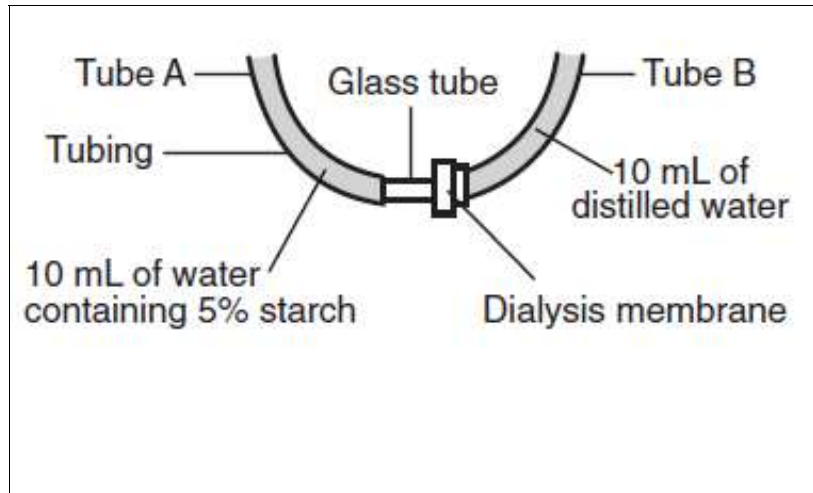
Data Base File Number: 501

Regents Date June2006-72.bmp

June2006

72 6/21/2006 LAB5

Answer 2



## diffusion

432. Base your answer to this question on the information given and diagram shown and on your knowledge of biology. A student added equal volumes of water to two different beakers. He then added blue food dye to one and yellow to the other. Next, he placed a white paper towel across the two beakers so that it went down into the liquid and connected the two beakers. After 20 minutes, the section of paper towel connecting the two beakers had turned color. The towel most likely turned green as a result of the

- (1) separation of the dye molecules through the process of chromatography
- (2) dyes moving across the towel due to the process of electrophoresis
- (3) diffusion of the blue- and yellow-dyed water across the towel
- (4) active transport of the blue and yellow food dyes

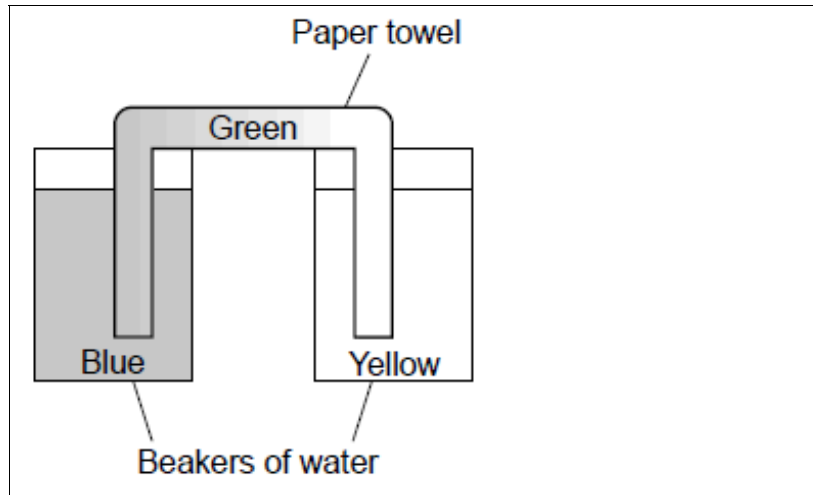
Data Base File Number: 1416

Regents Date Jan2020-81.bmp

Jan2020

81 1/21/2020 LAB5

Answer 3



## diffusion

433. A model of a cell is prepared and placed in a beaker of fluid as shown in the diagram. The letters A, B, and C represent substances in the initial experimental setup. The amber color is from iodine placed into the water. The whitish color is from starch placed inside the dialysis tube membrane also with water. After twenty minutes, the color of the water outside the membrane is amber and the color of the chemical mixture inside the membrane is blue-black. Why is only the inside of the membrane blue-black? Base your answer to this question on the information given and on your knowledge of biology.

- (1) Iodine moves into the cell because of its small molecular size, while starch cannot move out of the cell because of its large molecular size..
- (2) Iodine and starch both move through the membrane.
- (3) Only starch moves through the membrane.
- (4) Only water moves through the membrane.

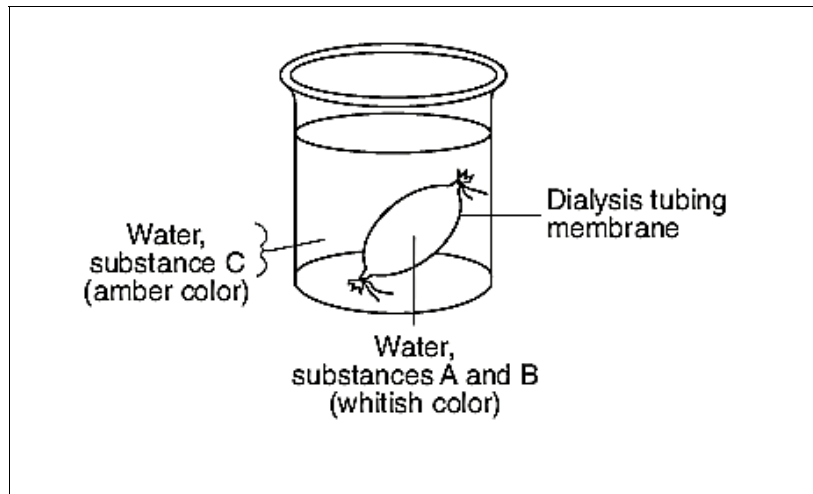
Data Base 87  
File Number:

Regents Date Jan08-72.bmp

Jan2008

72 1/25/2008 LABS

Answer 1



## diffusion

434. The diagram shown represents changes in some red onion cells being observed with a compound microscope after a particular solution was added. Which statement best explains the changes observed?
- (1) Distilled water was added to the slide and diffusion caused water to move out of the onion cells.
  - (2) Salt solution was added to the slide and active transport caused water to move out of the onion cells.
  - (3) Distilled water was added to the slide and active transport caused water to move out of the onion cells.
  - (4) Salt solution was added to the slide and diffusion caused water to move out of the onion cells.

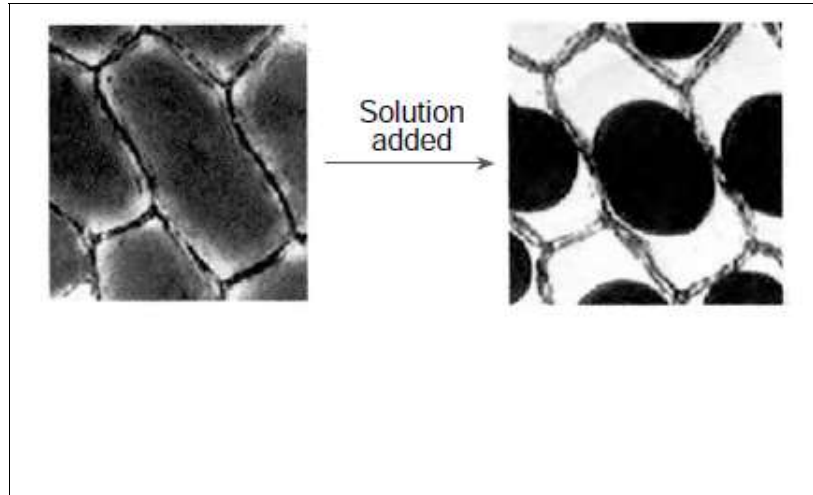
Data Base File Number: 1681

Regents Date June2024-74.bmp

June2024

74 6/14/2024 LAB5

Answer 4





diffusion

435. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a model cell setup. The locations of three different substances are indicated in the diagram. What will most likely happen after several minutes?

- (1) The contents of the model cell will change color.
- (2) The liquid outside the model cell will change color.
- (3) The model cell will shrink.
- (4) The model cell will rupture.

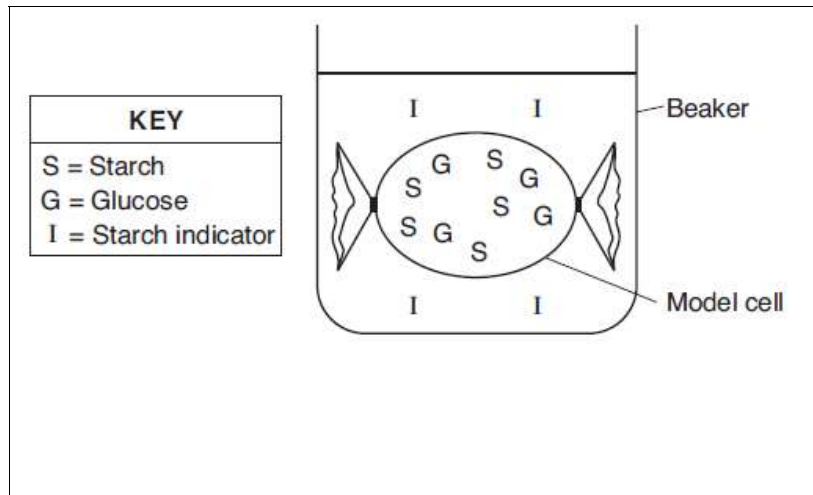
Data Base File Number: 635

Regents Date Jan2013-81.bmp

Jan2013

81 1/23/2013 LAB5

Answer 1



diffusion

436. Two molecules, A and B, and their distribution inside and outside of a cell are represented in the diagram shown. What is a possible reason molecule A could diffuse across the membrane of the cell but molecule B could not?

- (1) The membrane is selectively permeable to A.
- (2) The membrane is selectively permeable to B.
- (3) Molecule B is too small to pass through the membrane.
- (4) Molecule B cannot be forced through the membrane.

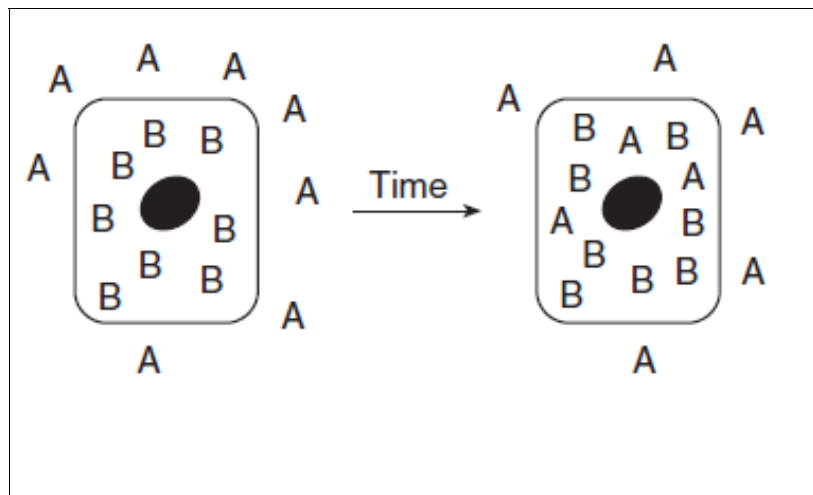
Data Base File Number: 376

Regents Date Aug2011-77.bmp

Aug2011

77 8/18/2011 LAB5

Answer 1



diffusion

437. Base your answer to this question on the information given and the diagram shown. A student prepared a wet-mount slide of red onion skin and observed it under high power of a compound light microscope (view A). After adding a substance to the slide and waiting one minute, the student observed that there were changes in the cells (view B). What substance could have been added to the cells on the slide in view A that would make them resemble the cells observed in view B?

- (1) distilled water
- (2) tap water
- (3) salt water
- (4) water with oxygen

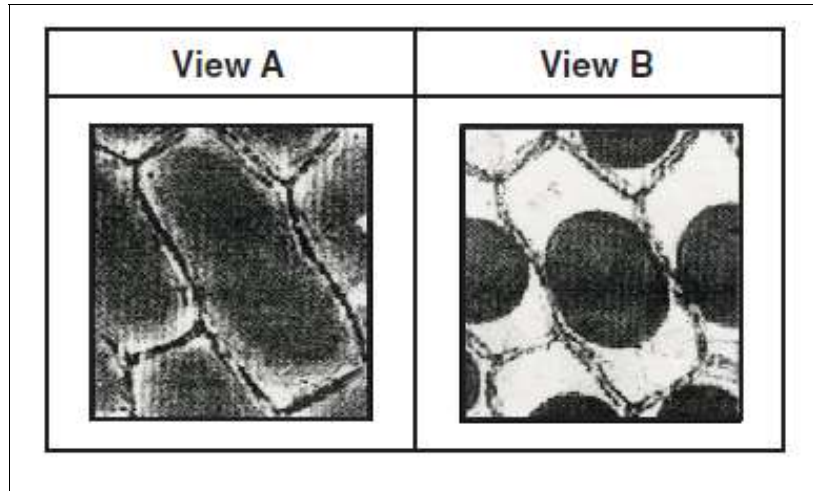
Data Base File Number: 600

Regents Date Aug2005-62.bmp

Aug2005

62 8/16/2005 LAB5

Answer 3



diffusion

438. A student wants to prepare a chart as shown in the diagram. Which of the choices shown would be correct information to enter into the chart as A and B?

- (1) A-Mouth and B-starch
- (2) A-Small intestine and B-glucose
- (3) A-stomach and B-fat
- (4) A-large intestine and B-amino acids

Data Base File Number: 674

Regents Date June2004-41.bmp

June2004

41 6/18/2004 S4K1

Answer 2

An organ in the human body where molecules diffuse into the blood	A specific molecule that diffuses into the blood at this organ
A	B

## diffusion

439. An investigation was set up to study the movement of water through a membrane. The results are shown in the diagram. Based on these results, which statement correctly predicts what will happen to red blood cells when they are placed in a beaker containing a water solution in which the salt concentration is much higher than the salt concentration in the red blood cells?

- (1) The red blood cells will absorb water and increase in size.
- (2) The red blood cells will lose water and decrease in size.
- (3) The red blood cells will first absorb water, then lose water and maintain their normal size.
- (4) The red blood cells will first lose water, then absorb water, and finally double in size.

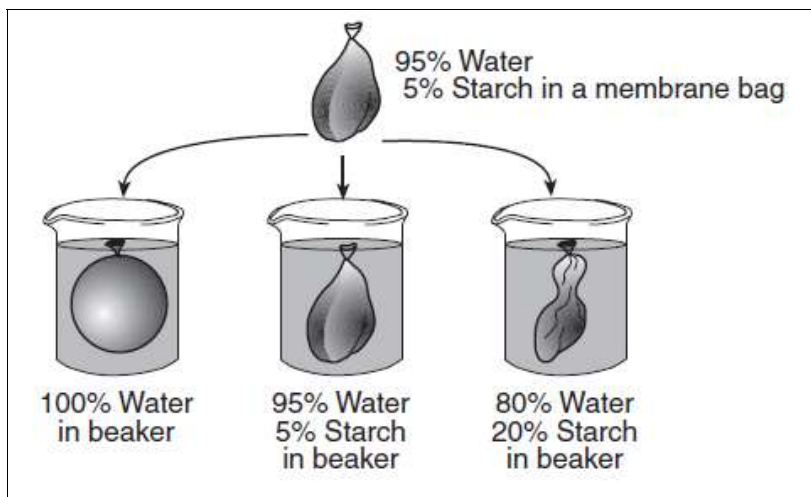
Data Base File Number: 684

Regents Date June2004-67.bmp

June2004

67 6/18/2004 LAB5

Answer 2



## diffusion

440. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the changes in distribution of certain molecules inside and outside of an artificial cell over a period of time. The change in the distribution of oxygen molecules was most likely due to

- (1) membrane receptors
- (2) active transport
- (3) synthesis
- (4) diffusion

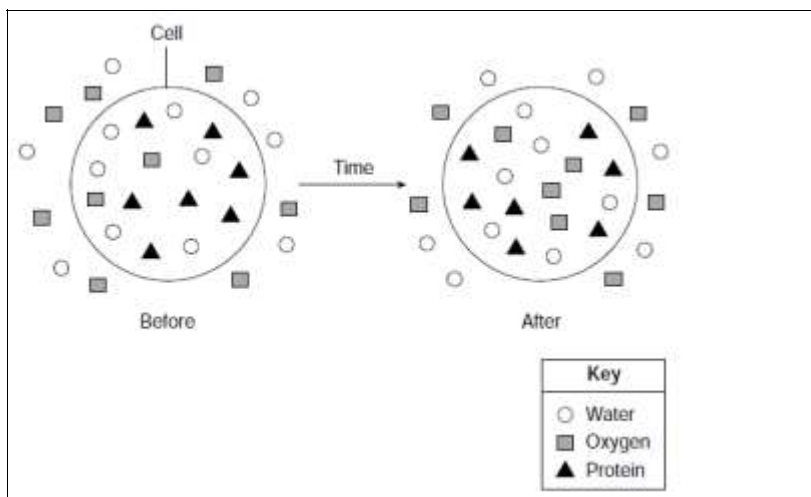
Data Base File Number: 1685

Regents Date June2024-82.bmp

June2024

82 6/14/2024 LAB5

Answer 4



## diffusion

441. The diagram shown represents one of many microscopic air sacs in a human lung. The alveolus (air sac) is the place where oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) move into or out of the blood, as represented in the diagram. Which statement best explains why these gases are able to move in the directions shown in the diagram?

- (1) The  $CO_2$  moves out of the capillary and into the alveolus to make more room for the blood to carry  $O_2$ .
- (2) The  $O_2$  is needed by the cells, so it is actively transported into the blood. The  $CO_2$ , which is not needed, is actively transported out of the blood.
- (3) The blood coming to the lungs is low in  $CO_2$  and high in  $O_2$ , so the gases each diffuse from a lower to a higher concentration in this area.
- (4) The blood coming to the lungs is high in  $CO_2$  and low in  $O_2$ , so the gases each diffuse from a higher to a lower concentration in this area.

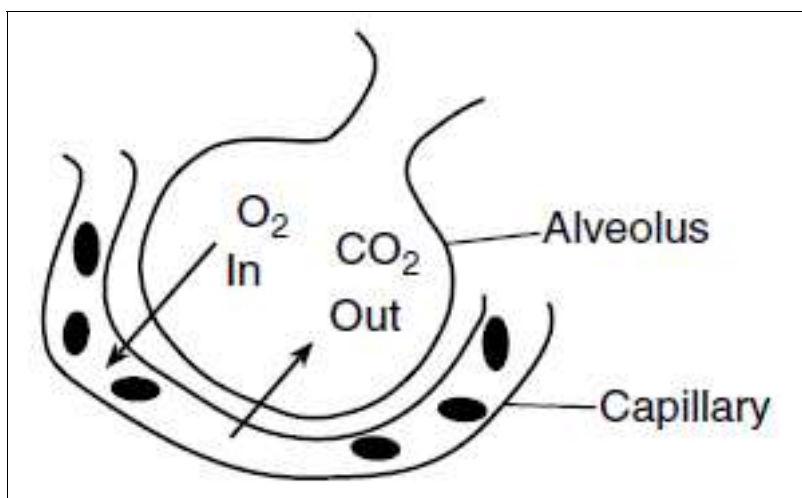
Data Base 1297  
File Number:

Regents Date Aug2018-73.bmp

Aug2018

73 8/17/2018 LAB5

Answer 4



## diffusion

442. A model cell setup is represented in the "Initial State" as shown in the UPPER half of the diagram. The LOWER diagram shows some possible results after 20 minutes. Which diagram in the LOWER HALF indicates the areas where each of the substances would be located?

(1) 1

(3) 3

(2) 2

(4) 4

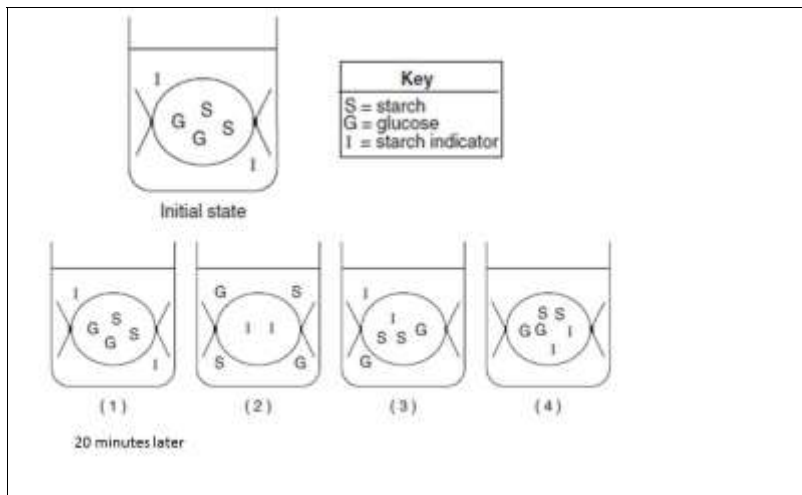
Data Base File Number: 352

Regents Date June2011-73AB.b

June2011

73 6/21/2011 LAB5

Answer 3



## diffusion / membrane

443. Phenolphthalein is a chemical that turns pink in the presence of a base. A student set up the demonstration shown in the diagram. The appearance of the pink color was due to the movement of

(1) phenolphthalein molecules from low concentration to high concentration

(3) water molecules through the membrane from high concentration to low concentration

(2) base molecules from high concentration through the membrane to low concentration

(4) phenolphthalein molecules in the water from high concentration to low concentration

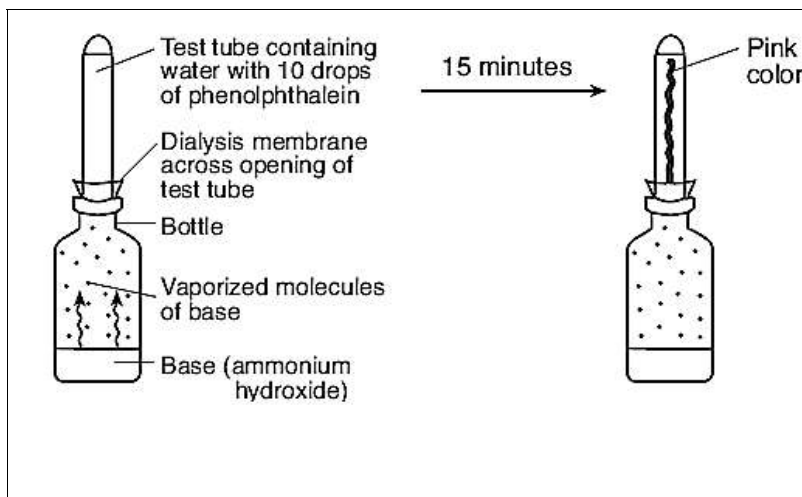
Data Base File Number: 145

Regents Date diffusion membr

Aug2008

80 8/13/2008 LABS

Answer 2



## diffusion / membrane

444. Base your answer to this question on the information given in the data table shown and on your knowledge of biology. A student cut three identical slices from a potato. She determined the mass of each slice. She then placed them in labeled beakers and added a different solution to each beaker. After 30 minutes, she removed each potato slice from its solution, removed the excess liquid with a paper towel, and determined the mass of each slice. The change in mass was calculated and the results are shown in the data table below. What is the process that is responsible for the change in mass of each of the three slices.

- (1) osmosis  
(2) diffusion  
(3) passive transport  
(4) all three choices are correct

Data Base File Number: 146

Regents Date Aug08-81.bmp

Aug2008

81 8/13/2008 LABS

Answer 4

Change in Mass of Potato in Different Solutions

Beaker	Solution	Change in Mass
1	distilled water	gained 4.0 grams
2	6% salt solution	lost 0.4 gram
3	16% salt solution	lost 4.7 grams

## diffusion / membrane

445. A step in a procedure used in the "Diffusion Through a Membrane" lab is represented in the diagram as shown. Which procedure is represented in the diagram?

- (1) adding distilled water to the top of a cover glass on a slide  
(2) making an artificial cell  
(3) adding salt solution to a specimen under the cover glass  
(4) making a thin sample to prepare a slide of red onion cells

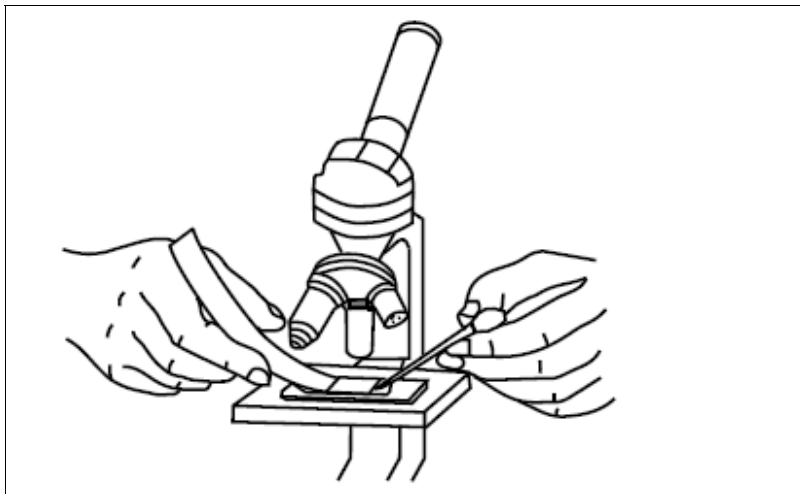
Data Base File Number: 1241

Regents Date Jan2018-74.bmp

Jan2018

74 1/22/2018 LAB5

Answer 3



diffusion / membrane

446. Molecule X moves across a cell membrane by diffusion. Which row in the chart shown best indicates the relationship between the relative concentrations of molecule X and the use of ATP for diffusion?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 506

Regents Date Aug2006-5.bmp

Aug2006

5 8/16/2006 S4K1

Answer 2

Row	Movement of Molecule X	Use of ATP
(1)	high concentration → low concentration	used
(2)	high concentration → low concentration	not used
(3)	low concentration → high concentration	used
(4)	low concentration → high concentration	not used

diffusion / membrane

447. The diagram shown represents a container of water and two different kinds of molecules, A and B, separated into two chambers by a membrane through which only water and molecule A can pass. How would the molecules, A and B, be distributed on either side of the membrane after the net movement of these molecules stops?

- (1) Molecule A is equally distributed on either side of the membrane and molecule B is only on the right side.
- (2) Molecules A and B are equally distributed on either side of the membrane.
- (3) The molecules remain the same as shown in the diagram.
- (4) Distribution of molecules A and B cannot be determined by the information given.

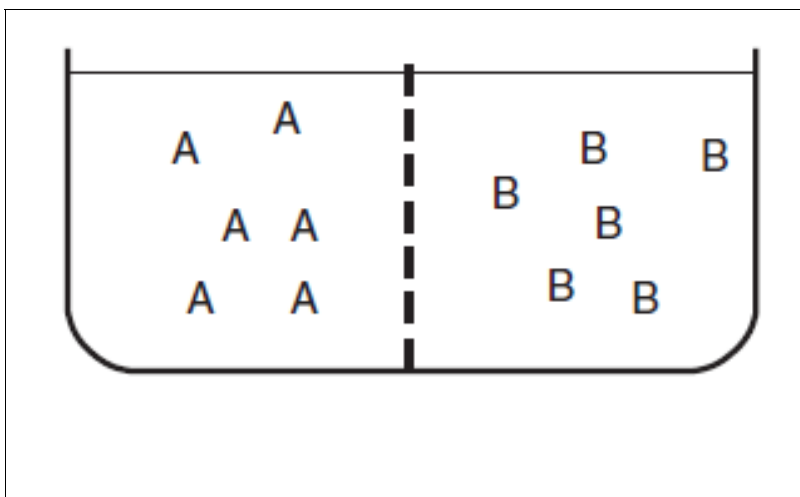
Data Base File Number: 470

Regents Date Jan2006-66.bmp

Jan2006

66 1/27/2006 LAB5

Answer 1



## diffusion / membrane

448. Base your answer to this question on the information and diagram given and on your knowledge of biology. The diagram shows an experimental setup using an artificial plant cell. Molecules A and B are commonly found in plant cells. When tested, it was discovered that molecule A quickly passed through the artificial plant cell membrane. Molecule B did not pass through. The locations of molecules A and B at the beginning of the experiment are shown. Which statement best describes what was observed when the setup was examined 20 minutes later?

- (1) Molecule A remained inside the artificial cell and molecule B remained outside.
- (2) Only molecule A was found both inside and outside the artificial cell.
- (3) Only molecule B was found both inside and outside the artificial cell.
- (4) Both molecules A and B were found inside and outside the artificial cell.

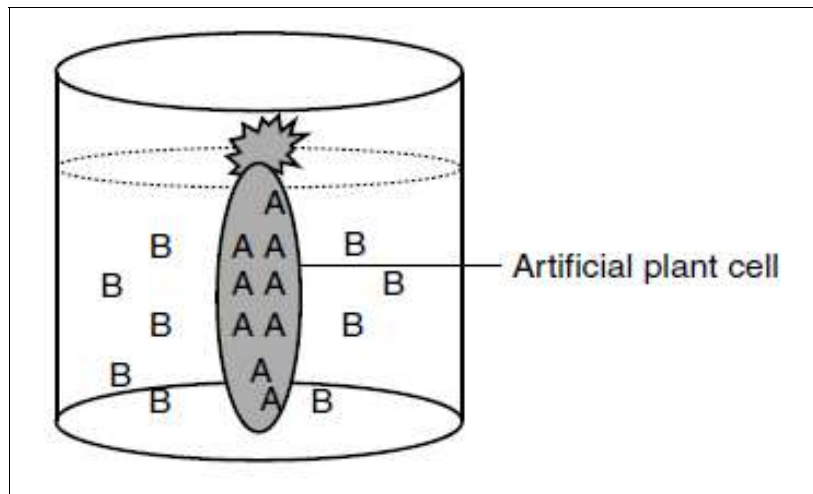
Data Base File Number: 1243

Regents Date Jan2018-76.bmp

Jan2018

76 1/22/2018 LAB5

Answer 2





## diffusion / membrane

449. Elodea is a plant that lives in freshwater. The diagram shown represents one Elodea cell in its normal freshwater environment. How would the contents of the Elodea cell change if the cell was placed in saltwater for several minutes?

- (1) The cell contents would shrink inward.
- (2) The cell contents would not change.
- (3) The cell would die.
- (4) The cell contents would explode.

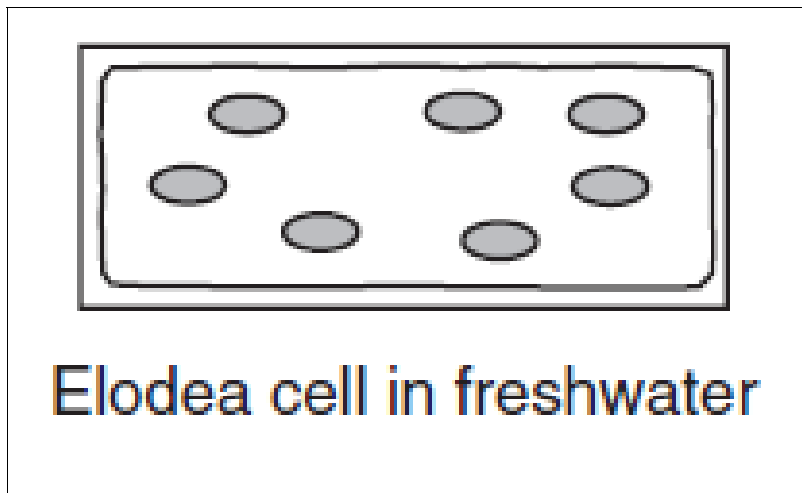
Data Base File Number: 700

Regents Date Aug2004-64.bmp

Aug2004

64 8/17/2004 LAB5

Answer 1



## diffusion / membrane

450. Base your answer to this question on the information given and on your knowledge of biology. In an experiment, a membrane bag containing 95% water and 5% salt was placed in a beaker containing 80% water and 20% salt, as shown in the diagram. The setup was put aside until the next day. Based on the information given, what is one way the bag or its contents will have changed by the next day?

- (1) The bag will become smaller.
- (2) The bag will become larger.
- (3) The bag will be stay the same size.
- (4) There is not enough data to determine the size of the bag.

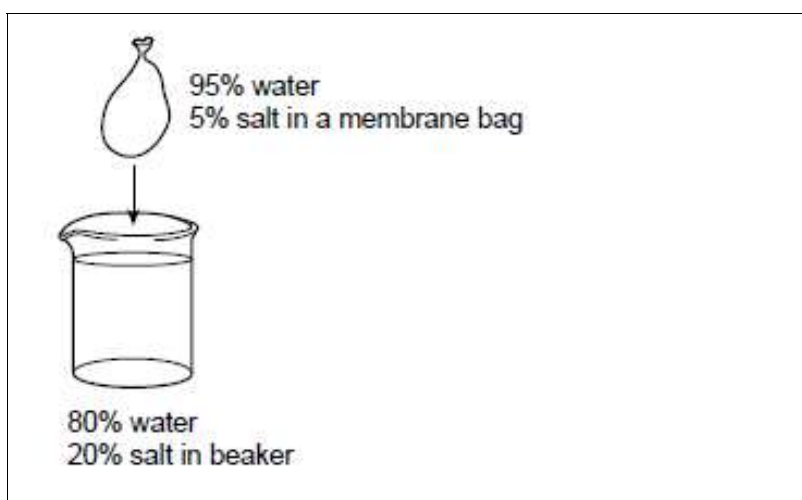
Data Base File Number: 1387

Regents Date Aug2019-85.bmp

Aug2019

85 8/14/2019 LAB5

Answer 1



diffusion / membrane

451. A solution containing both starch and glucose was placed inside the model cell represented in the diagram shown. The model cell was then placed in a beaker containing distilled water. Identify one specific substance that should have been added to the distilled water so that observations regarding movement of starch could be made.

- (1) iodine solution
- (2) Benedict's solution
- (3) phenolphthalein solution
- (4) sucrose solution

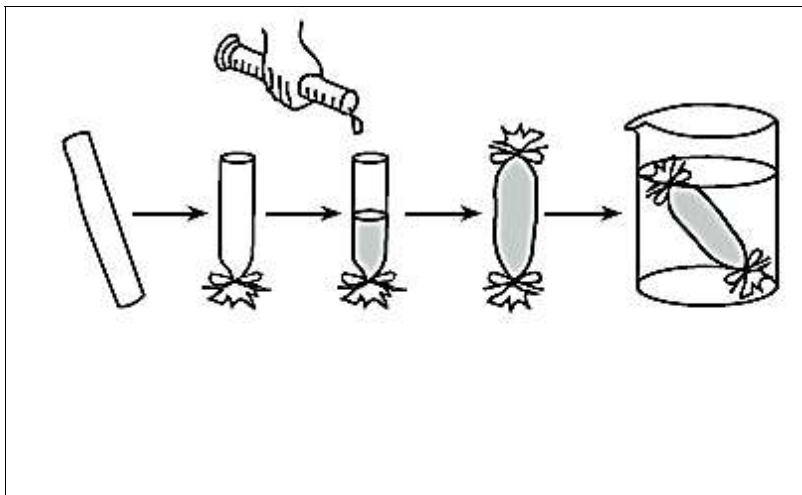
Data Base File Number: 147

Regents Date Aug08-84.bmp

Aug2008

84 8/13/2008 LABS

Answer 1



diffusion / membrane

452. Base your answer to this question on the information and diagram given and on your knowledge of biology.

A cube cut from a potato is placed in a beaker of distilled water. The potato cells have a relatively high concentration of starch and a relatively low concentration of water. The diagram represents the water and starch molecules in and around one of the potato cells in contact with the water in the beaker. Which row in the chart correctly describes what would be expected to occur in the potato cells, with regard to both the starch and water molecules?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

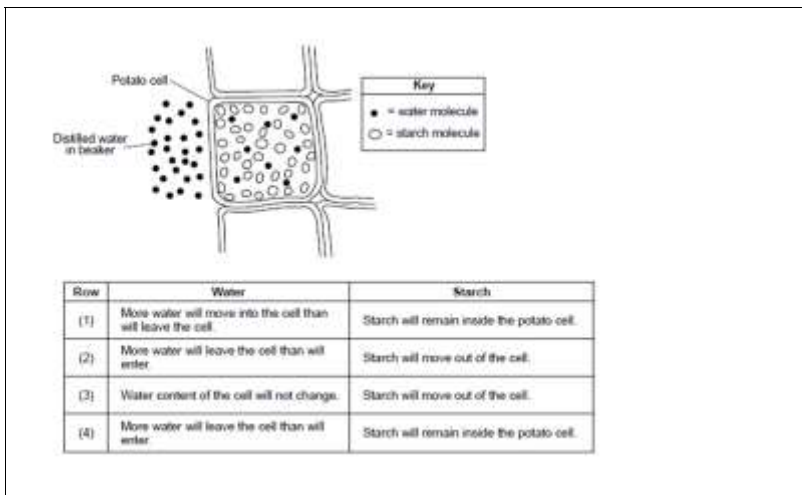
Data Base File Number: 1384

Regents Date Aug2019-81C.bm

Aug2019

81 8/14/2019 LAB5

Answer 1



## digestion

453. The diagram shown represents a beaker containing a solution of various molecules involved in digestion. Which structures represent products of digestion?

- (1) A and D  
(2) B and C  
(3) B and E  
(4) D and E

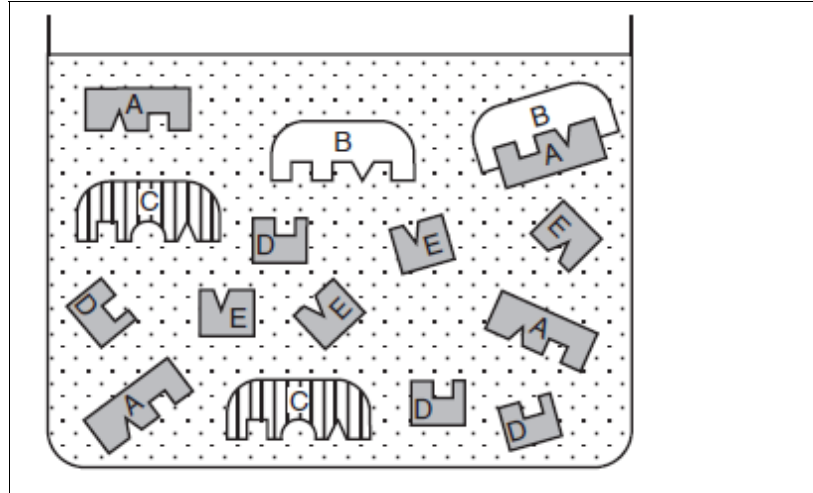
Data Base File Number: 663

Regents Date June2004-18.bmp

June2004

18 6/18/2004 S4K5

Answer 4



## digestion

454. Base your answer to this question on the information given, the diagram shown, and on your knowledge of biology. An enzyme and soluble starch were added to a test tube of water and kept at room temperature for 24 hours. Then, 10 drops of glucose indicator solution were added to the test tube, and the test tube was heated in a hot water bath for 2 minutes. The test was performed in order to

- (1) measure the quantity of fat that is converted to starch  
(2) determine if digestion took place  
(3) evaporate the water from the test tube  
(4) cause the enzyme to bond to the water

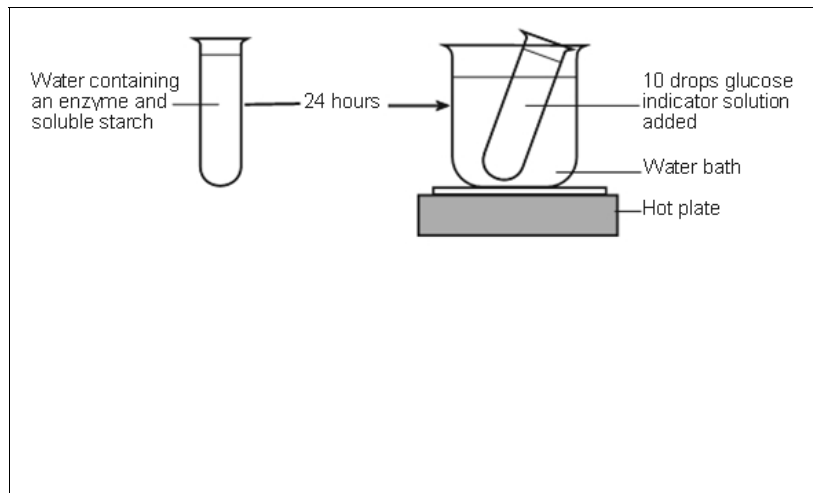
Data Base File Number: 204

Regents Date June09-62.bmp

June2009

62 6/18/2009 LABS

Answer 2



## digestion

455. Base your answers to this question on the diagram shown, which represents stages in the digestion of a starch, and on your knowledge of biology. The products would most likely contain

- (1) simple sugars
- (2) fats
- (3) amino acids
- (4) minerals

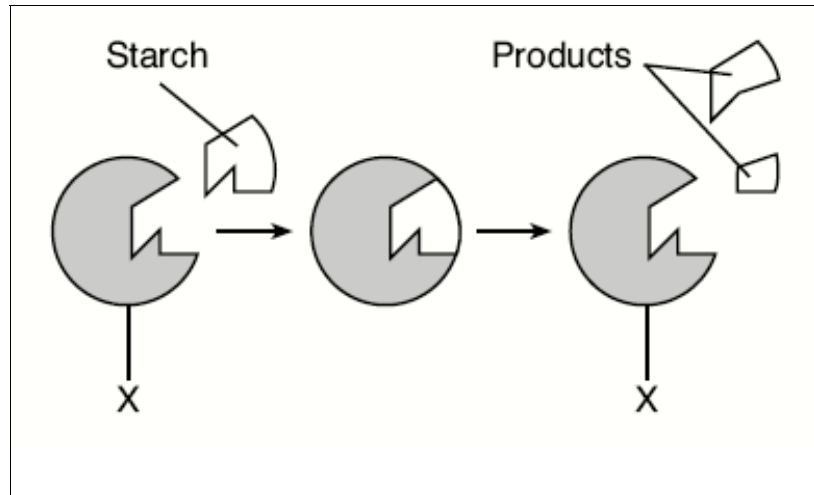
Data Base File Number: 131

Regents Date Aug08-36.bmp

Aug2008

36 8/13/2008 S4K1

Answer 1



## digestion

456. Base your answer to this question on the information given and on your knowledge of biology. The Venus flytrap is a plant that uses specialized leaves in order to capture and digest small insects. Enzymes secreted by cells in the leaves of the Venus flytrap can digest

- (1) proteins into amino acids
- (2) sugars into starches
- (3) amino acids into fats
- (4) proteins into sugars

Data Base File Number: 1433

Regents Date June2021-36.bmp

June2021

37 6/22/2021 S4K1

Answer 1



Source: <https://www.britannica.com/plant/Venus-flytrap>

## digestion

457. The diagram to the LEFT represents one metabolic activity of a human. Refer to the chart at the RIGHT to answer this question. Letters A and B are best represented by which row in the chart at the RIGHT?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 729

Regents Date June2003-5C.bm

June2003

5 6/19/2003 S4K1

Answer 4

Metabolic Activity A

Protein → B B B B

Row	Metabolic Activity A	B
(1)	respiration	oxygen molecules
(2)	reproduction	hormone molecules
(3)	excretion	simple sugar molecules
(4)	digestion	amino acid molecules

## digestion

458. A word equation is shown. This reaction is most directly involved in the process of

(1) reproduction

(3) replication

(2) protein synthesis

(4) heterotrophic nutrition

Data Base File Number: 693

Regents Date Aug2004-36.bmp

Aug2004

36 8/17/2004 S4K1

Answer 4

Starch molecules  $\xrightarrow{\text{(biological catalyst)}}$  Simple sugars

## digestion

459. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a series of events that occur within living organisms. The process that occurs at Step 1 is

- (1) respiration
- (2) circulation
- (3) excretion
- (4) digestion

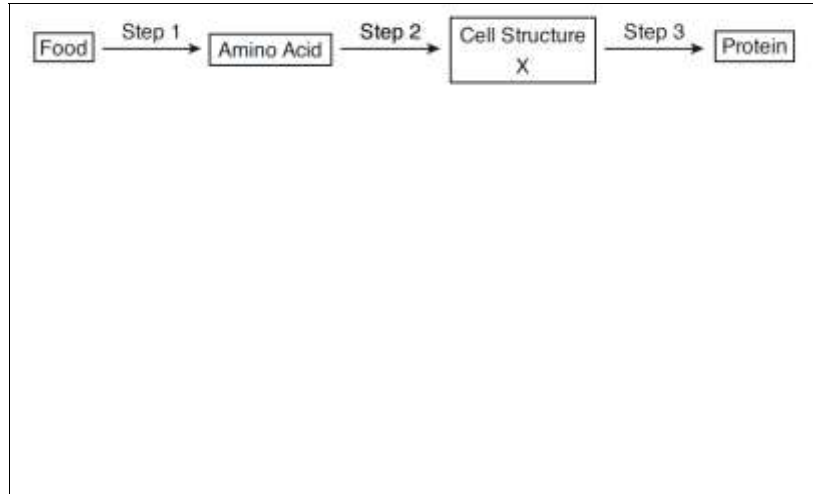
Data Base File Number: 1483

Regents Date June2022-38.bmp

June2022

38 6/15/2022 S4K1

Answer 4



## digestion

460. The diagram shown represents a process that occurs in human systems. This process is known as

- (1) excretion
- (2) respiration
- (3) circulation
- (4) digestion

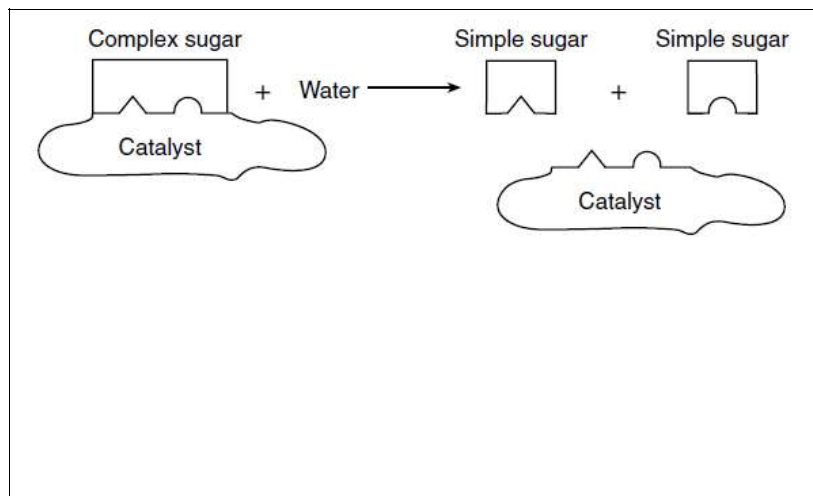
Data Base File Number: 1159

Regents Date Jan2017-29.bmp

Jan2017

29 1/25/2017 S4K1

Answer 4



## digestion

461. Which words best complete the lettered blanks in the two sentences shown in the diagram?

- (1) A--large, B--simple sugars, C--amino acids
- (2) A--small, B--simple sugars, C--amino acids
- (3) A--large, B--amino acids, C--simple sugars
- (4) A--small, B--amino acids, C--simple sugars

Data Base File Number: 718

Regents Date Jan2003-38.bmp

Jan2003

38 1/30/2003 S4K1

Answer 3

Organic compounds, such as proteins and starches, are too A to diffuse into cells. Proteins are digested into B and starches are digested into C.

## digestion

462. The diagram shown represents a process that occurs in organisms. Which row in the chart indicates what A and B in the boxes could represent?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

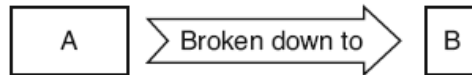
Data Base File Number: 182

Regents Date June09-17.bmp

June2009

17 6/18/2009 S4K1

Answer 3



Which row in the chart indicates what A and B in the boxes could represent?

Row	A	B
(1)	starch	proteins
(2)	starch	amino acids
(3)	protein	amino acids
(4)	protein	simple sugars

## disease transmission

463. "Plasmodium falciparum", one parasite that causes malaria, spreads rapidly, infecting up to 500 million people every year. Malaria spreads when an infected mosquito bites an uninfected human, who then becomes infected. This infected human is bitten by an uninfected mosquito, which then becomes infected. This infected mosquito then bites and infects an uninfected human. Malaria transmission is illustrated in the diagram. Scientists have a new idea about how this disease spreads. When the malaria parasite is passed to humans through the bite of an infected mosquito, there is a great possibility that this action alters the chemical scent of the human. The altered human body scent then attracts more uninfected mosquitoes, which bite the infected person, thus spreading the disease. To test this hypothesis, an experiment was conducted on humans infected with malaria. The results indicate that malaria gametocytes (a stage of the parasite) may trigger the production of chemicals that change the scent of the human. The change in human scent makes humans more appealing to mosquitoes. Which statement best describes the role of gametocytes in the spread of malaria?

- (1) They give off a scent that attracts infected mosquitoes.
- (2) They absorb human body scents that attract mosquitoes.
- (3) They release a scent into the human body.
- (4) They cause a chemical reaction that alters human scent.

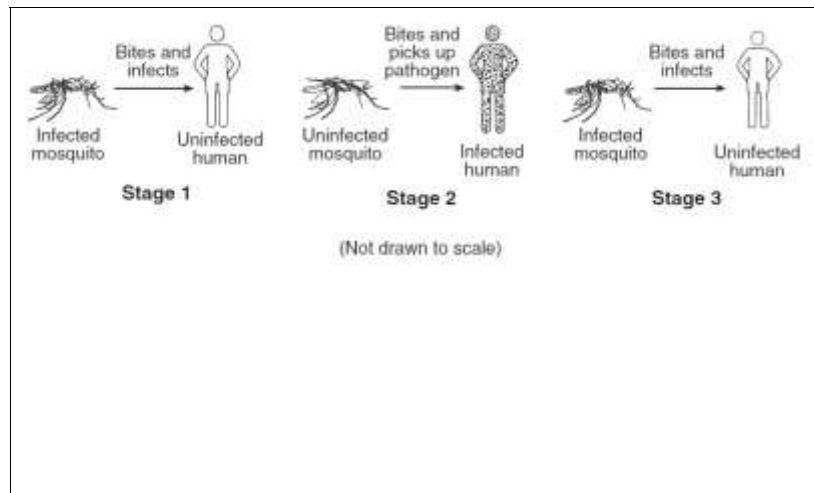
Data Base 325  
File Number:

Regents Date Jan2011-51.bmp

Jan2011

51 1/25/2011 S4K5

Answer 4





## diversity

464. Base your answer to this question on the information given and on your knowledge of biology. The three great lakes in Africa (Victoria, Tanganyika, and Malawi) contain a greater number of fish species than any other lakes in the world. Lake Malawi alone has 200 species of cichlid fish. The diversity of cichlid species in these African lakes could have been caused by changes in water level over thousands of years. According to one hypothesis, at one time the three lakes were connected as one large lake and all the cichlids could interbreed. When the water level fell, groups of cichlids were isolated in smaller lakes as shown in the diagram. Over time, the groups of cichlids developed genetic differences. When the water levels rose again, the isolated populations were brought back into contact. Due to significant genetic differences, these populations were unable to interbreed. Variations in water level over thousands of years resulted in today's diversity of cichlid species. Which discovery would support this explanation of cichlid diversity?

- (1) The water level changed little over time.
- (2) The local conditions in each of the small lakes were very different.
- (3) Differences between cichlid species are small and interbreeding is possible.
- (4) Once formed, the lakes remained isolated from each other.

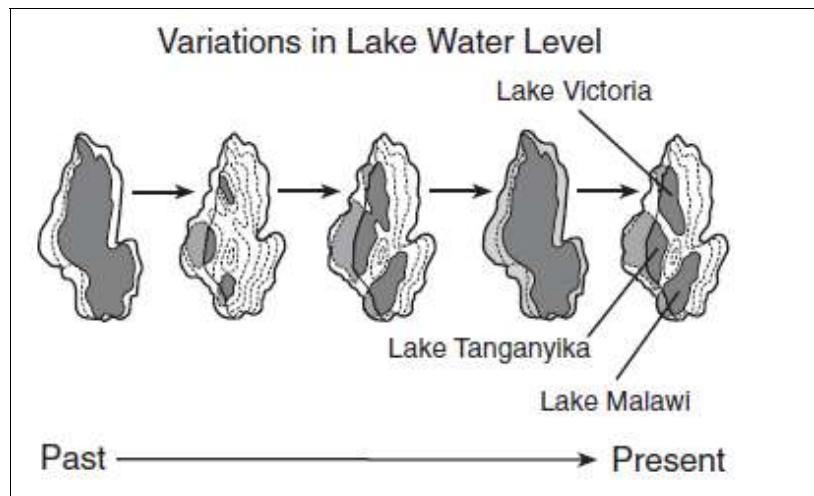
Data Base 598  
File Number:

Regents Date Aug2005-50.bmp

Aug2005

50 8/16/2005 S4K3

Answer 2



diversity

465. Species of finches are represented in the diagram below. Which species of finch from the diagram would be most likely to compete with the small tree finch if they lived on the same island?

- (1) Large tree finch.
- (2) Large ground finch.
- (3) Small ground finch
- (4) Cactus finch.

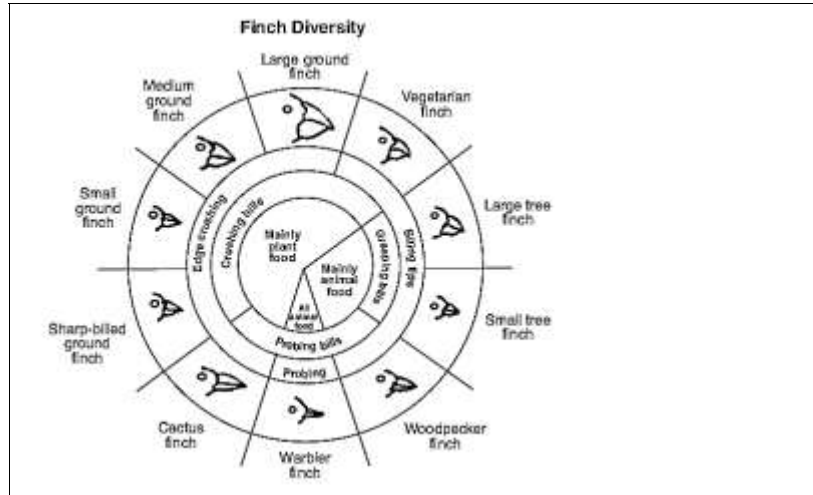
Data Base File Number: 88

Regents Date Jan08-74.bmp

Jan2008

74 1/25/2008 LABS

Answer 1



diversity

466. Base your answer to this question on the finch diversity diagram shown and on your knowledge of biology. Warbler finches are classified as

- (1) producers
- (2) herbivores
- (3) carnivores
- (4) decomposers

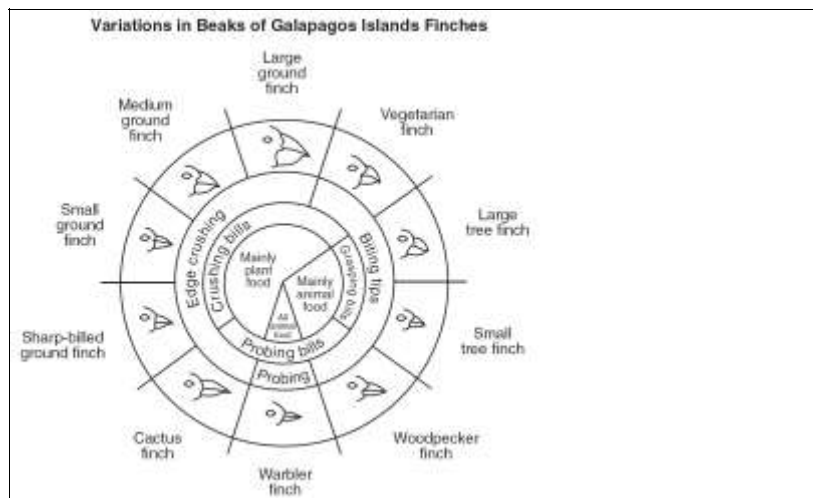
Data Base File Number: 353

Regents Date June2011-75.bmp

June2011

75 6/21/2011 LAB3

Answer 3



diversity

467. Base your answer to this question on the information and graph shown and on your knowledge of biology. A population composed of tan snails and black snails inhabits the same sandy beach. A nearby volcano erupted, and black lava particles washed down to the beach. The once tan beach was now black. The graph shows the population of tan snails and black snails before and after the volcanic eruption. Variation in snail color is an example of

- (1) environmental stability
- (2) a natural limitation
- (3) equilibrium
- (4) diversity

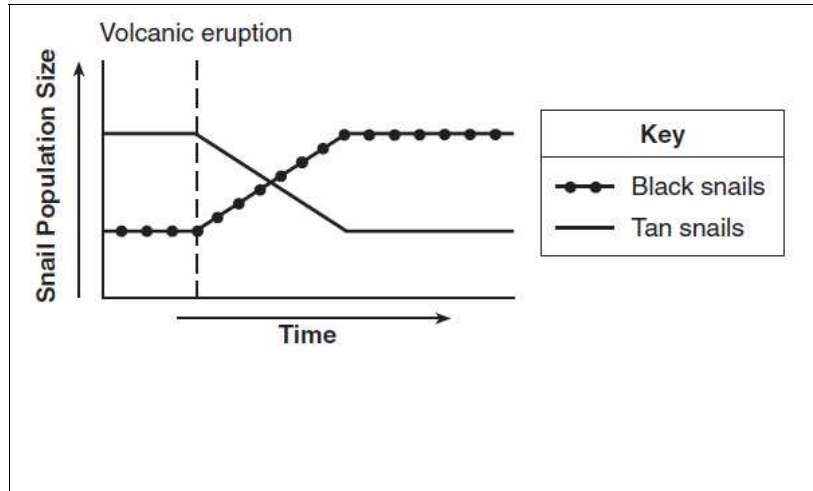
Data Base File Number: 1048

Regents Date August2015-31.b

Aug2015

33 8/12/2015 S4K1

Answer 4



DNA

468. In the diagram shown, strands I and II represent portions of a DNA molecule. Strand II would normally include

- (1) ACG
- (2) TCG
- (3) TAC
- (4) GAT

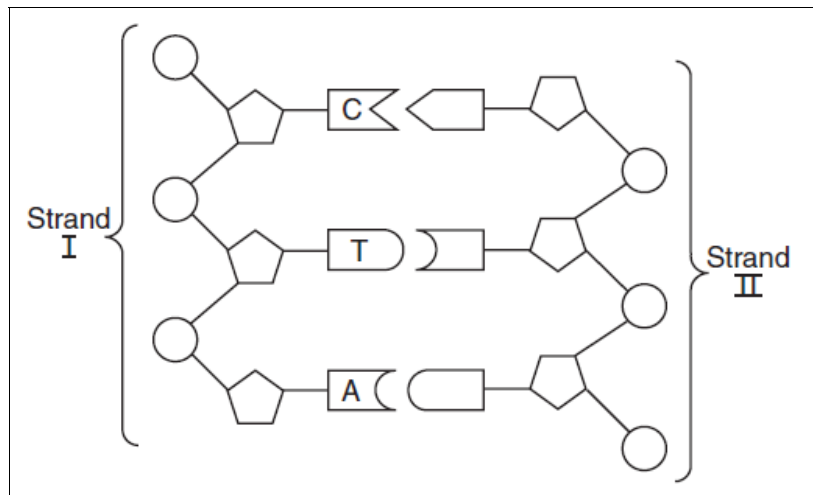
Data Base File Number: 776

Regents Date Aug2002-10.bmp

Aug2002

10 8/13/2002 S4K2

Answer 4



## DNA

469. Human genetic material is represented in the diagram shown. The region labeled A is made up of a section of

- (1) a protein that becomes an enzyme
- (2) DNA that may direct protein synthesis
- (3) a carbohydrate made from amino acids
- (4) glucose that may be copied to make DNA

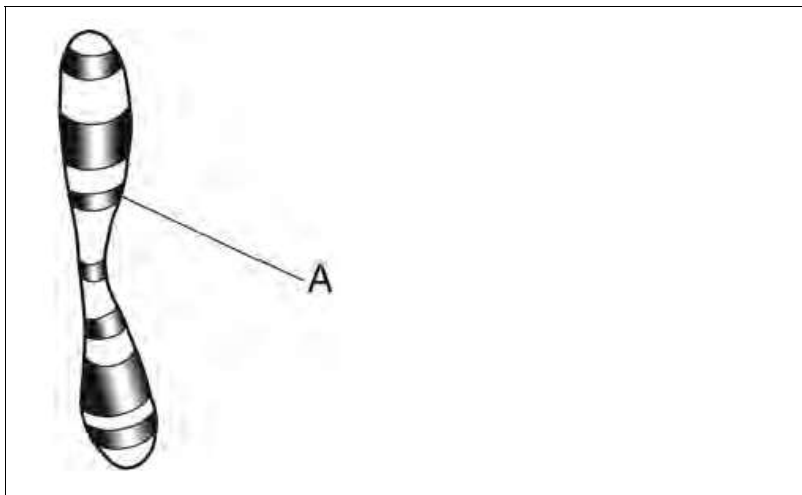
Data Base File Number: 918

Regents Date Jan2014-2.bmp

Jan2014

2 1/27/2014 S4K2

Answer 2



## DNA

470. The diagram shown represents a portion of a type of organic molecule present in the cells of organisms. What will most likely happen if there is a change in the base sequence of this molecule?

- (1) The molecule will be converted into an inorganic compound.
- (2) The amino acid sequence may be altered during protein synthesis.
- (3) The chromosome number will decrease in future generations.
- (4) The chromosome number may increase within the organisms.

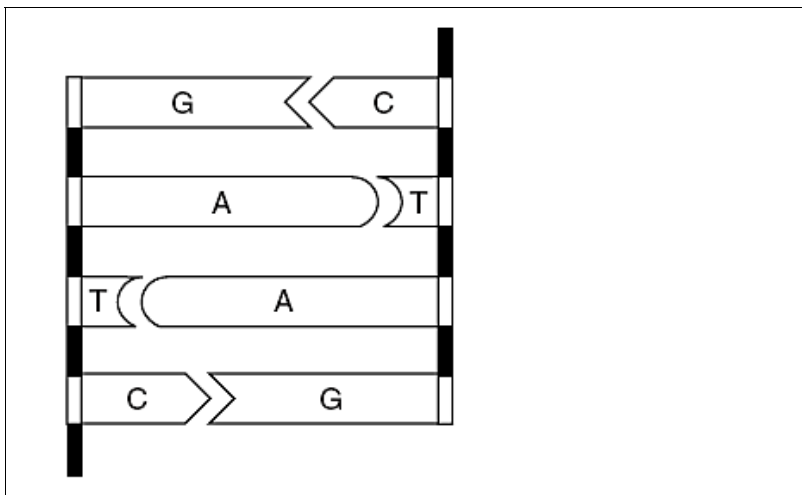
Data Base File Number: 4

Regents Date Aug07-10.bmp

Aug2007

10 8/16/2007 S4K2

Answer 3



**DNA**

471. The photo shown is of a magnified podocyte, a highly specialized cell that produces special proteins for filtering fluid in the human kidney. The specialized function of this cell is most dependent on
- (1) mutations that produce cells that have a specific shape for filtering the blood
  - (2) the differentiation of the cell membrane and the functioning of vacuoles
  - (3) the DNA codes in the cell and the activity of ribosomes
  - (4) mitochondria in the cell that produce filtering organelles for the kidney

Data Base File Number: 1569

Regents Date June2023-24.bmp

June2023

24 6/14/2023 S4K2

Answer 3



Source: <https://s-media-cache-ak0.pinimg.com/originals/>

**DNA**

472. In the diagram shown. Which sequence best represents the relationship between DNA and the traits of an organism?
- (1) 1
  - (2) 2
  - (3) 3
  - (4) 4

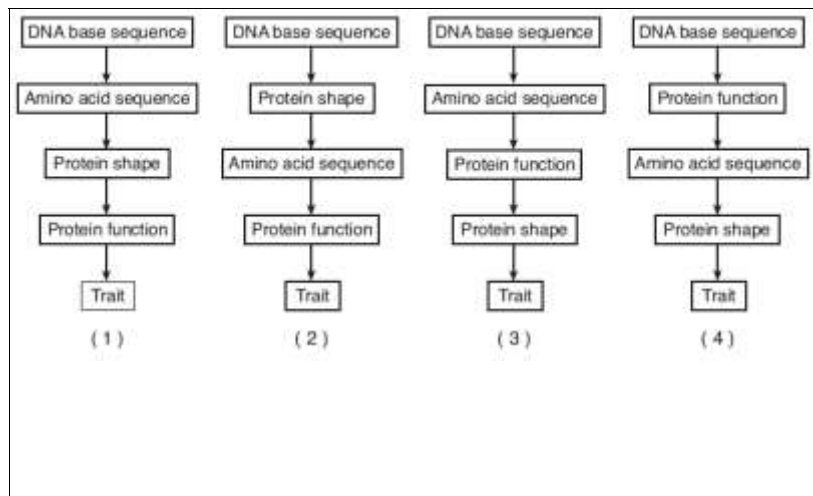
Data Base File Number: 179

Regents Date June09-8.bmp

June2009

8 6/18/2009 S4K2

Answer 1



## DNA

473. The percent of DNA that species A has in common with species B, C, D, and E are shown in the graph. Which statement is a valid conclusion that can be drawn from this graph?
- (1) Species A is closely related to species B, but is not related to species E.
  - (2) Fewer mutations have occurred in species B and C than in species A.
  - (3) Species A and E have the greatest similarity in protein structure.
  - (4) Environment influences the rate of evolution.

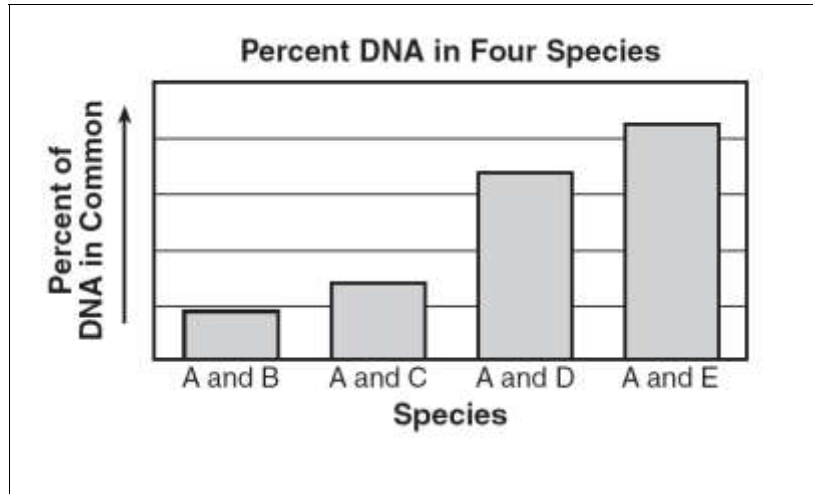
Data Base File Number: 345

Regents Date June2011-41.bmp

June2011

41 6/21/2011 S4K2

Answer 3



## DNA

474. The diagram shown represents a section of a molecule that carries genetic information. The pattern of numbers represents
- (1) a sequence of paired bases
  - (2) the order of proteins in a gene
  - (3) folds of an amino acid
  - (4) positions of gene mutations

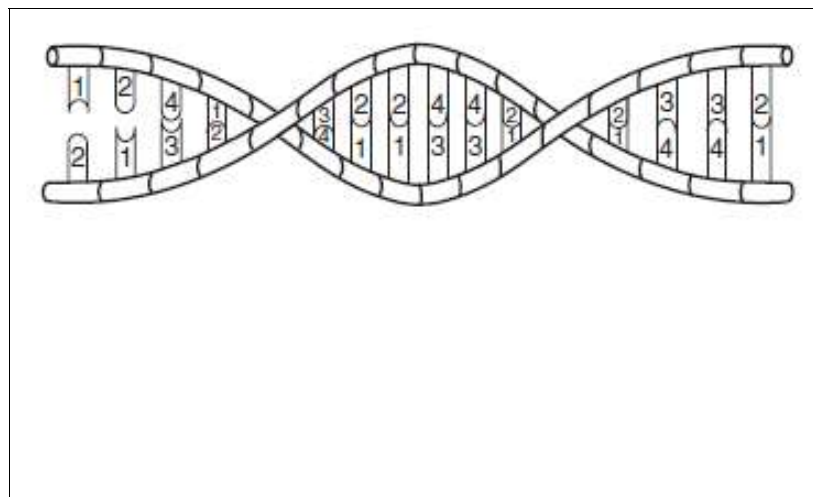
Data Base File Number: 657

Regents Date June2004-9.bmp

June2004

9 6/18/2004 S4K2

Answer 1



## DNA

475. Base your answer answer to this question on the information given and on your knowledge of biology.  
----- Trixie's Pedigree -----

Pet owners today have access to genetic technologies that can provide them with information about their pets. For example, ancestry charts (pedigrees) can be developed for dogs by analyzing specific DNA sequences that are present in their cells. The presence of these DNA sequences can be used to determine the types of breeds present in the dogs' ancestors. The chart shown represents the family tree of a dog named Trixie. Why is only a sample of cheek cells present in the dog's saliva needed, rather than using a mix of cells present in different tissues of the dog, to determine the breeds making up the dog's ancestry?

- (1) One of the dog's body cells contains all the DNA of the dog.
- (2) The ribosomes contain all the dog's DNA
- (3) The mitochondria contain all the dogs' DNA
- (4) Red blood cells contain all the dog's DNA.

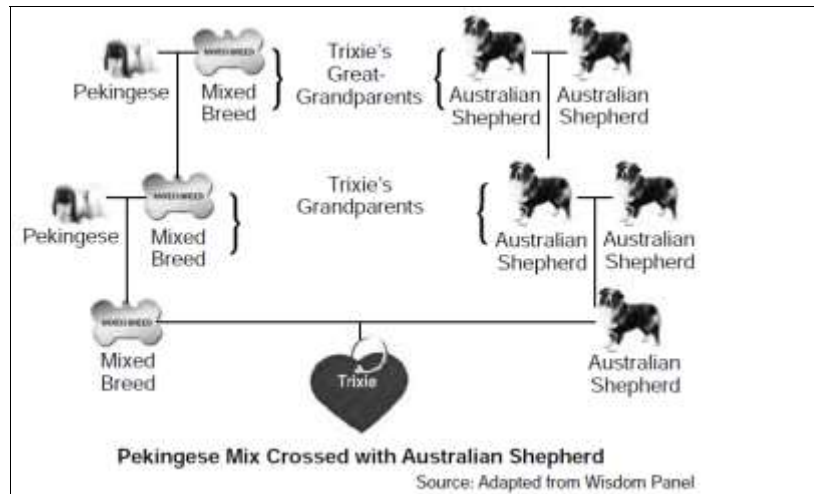
Data Base File Number: 1583

Regents Date June2023-52.bmp

June2023

52 6/14/2023 S4K2

Answer 1



## DNA

476. Base your answer to this question on the information given and on your knowledge of biology. The segments of DNA shown were extracted from two different species of plants. The segments represent the same region of DNA that codes for a particular pigment (color) in these species. A restriction enzyme is used to cut the DNA from species A and B. The enzyme binds to the sequence GGGATT and cuts between G and A. State how many cuts will be made in the DNA sequence of PLANT SPECIES A when this enzyme is used.

- (1) 0  
(2) 1  
(3) 2  
(4) 3

Data Base File Number: 377

Regents Date Aug2011-79.bmp

Aug2011

79 8/18/2011 LAB1

Answer 2

Plant Species A: ACCGCAGGGATTGCGC

Plant Species B: ACCGGAGCGATTGCGC

## DNA

477. The diagram shown represents a genetic procedure. Which statement best describes the outcome of this procedure?
- (1) Bacterial cells will destroy defective human genetic material.  
(2) Bacterial cells may form a multicellular embryo  
(3) The inserted human DNA will change harmful bacteria to harmless ones  
(4) The inserted human DNA may direct the synthesis of human proteins

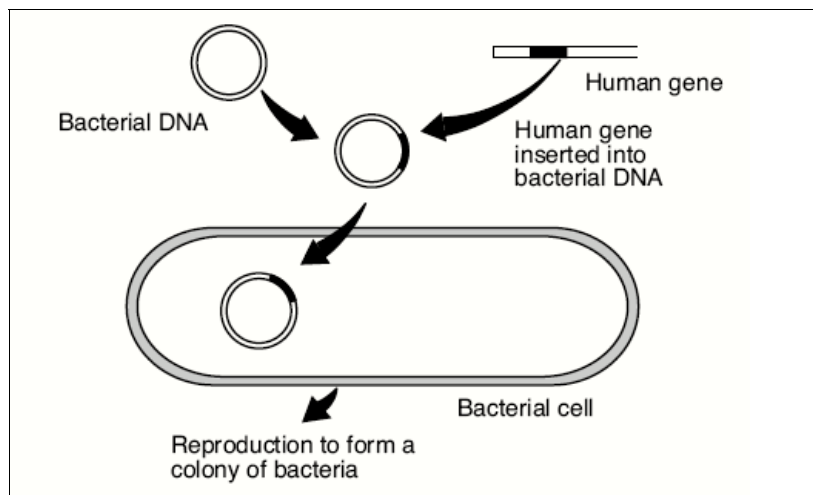
Data Base File Number: 118

Regents Date Aug08-10.bmp

Aug2008

9 8/13/2008 S4K2

Answer 4





**DNA**

478. The table given shows a section of messenger RNA for five species of similar organisms. What is the DNA sequence that codes for the messenger RNA codons shown in Species X?

- (1) AAT GGG ATT TCT
- (2) ACC AAT GGG TCT
- (3) AAT GGG TTA TCT
- (4) TCT AAT GGG TCT

Data Base File Number: 1595

Regents Date June2023-bmp

June2023

82 6/14/2023 LAB1

Answer 3

Species	Messenger RNA Codons
X	UUA CCC AAU AGA
1	CUG CCC AAU AGA
2	GUC CCC AAU AGA
3	UGG CCC CAU ACA
4	UGU CGC UUU GCG

**DNA**

479. The diagram shown illustrates some of the changes that occur during gamete formation. Which graph best represents the changes in the amount of DNA in one of the cells at each stage?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

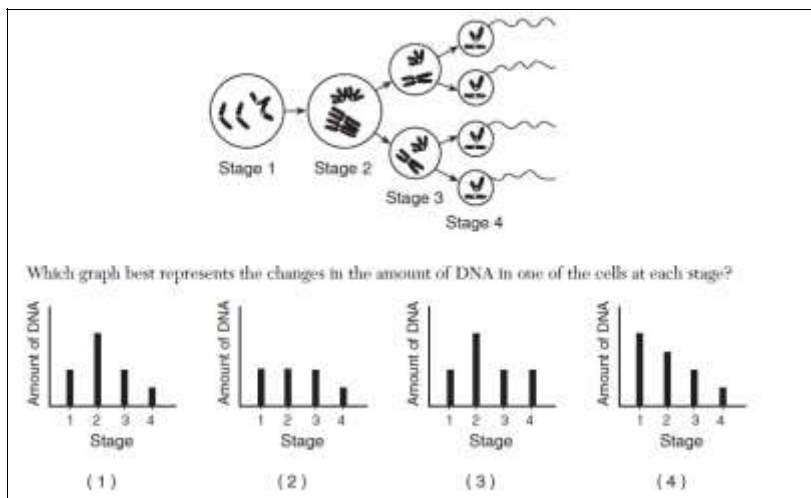
Data Base File Number: 465

Regents Date Jan2006-38.bmp

Jan2006

38 1/27/2006 S1K1

Answer 1



## DNA

480. The molecule DNA contains the four bases shown in the list. Which base pairings normally occur during DNA replication?

- (1) Guanine pairs with cytosine. Thymine pairs with thymine.
- (2) Adenine pairs with thymine. Cytosine pairs with guanine.
- (3) Thymine pairs with guanine. Cytosine pairs with adenine.
- (4) Cytosine pairs with cytosine. Thymine pairs with thymine.

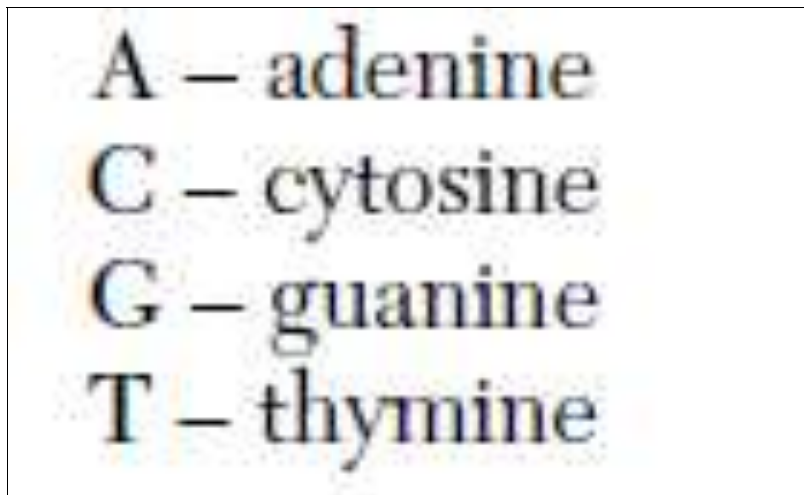
Data Base File Number: 1013

Regents Date June2015-12.bmp

June2015

12 6/16/2015 S4K2

Answer 2



## DNA

481. The diagram shown represents a laboratory process. The substance represented by the scissors shown cutting the DNA is

- (1) an enzyme
- (2) a starch molecule
- (3) a carbohydrate
- (4) a fat molecule

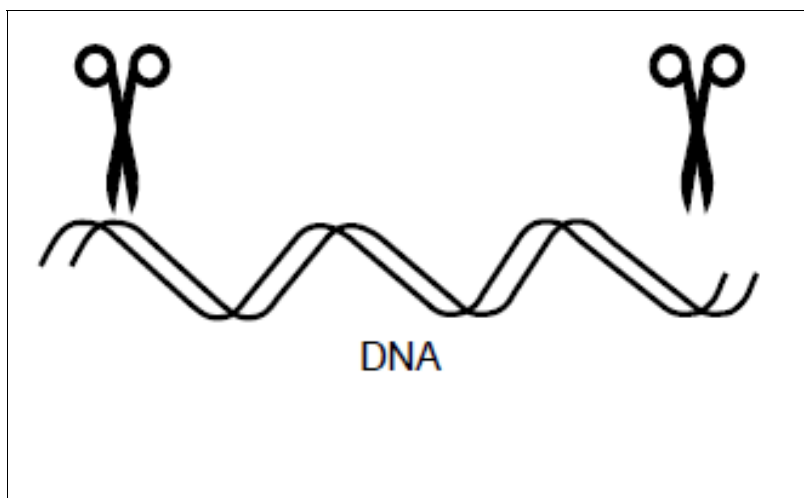
Data Base File Number: 1348

Regents Date June2019-40.bmp

June2019

40 6/18/2019 S4K2

Answer 1



## DNA

482. Which statement best expresses the relationship between the three structures represented in the diagram shown?

- (1) DNA is produced from protein absorbed by the cell.
- (2) Protein is composed of DNA that is produced in the cell.
- (3) DNA controls the production of protein in the cell.
- (4) Cells make DNA by digesting protein.

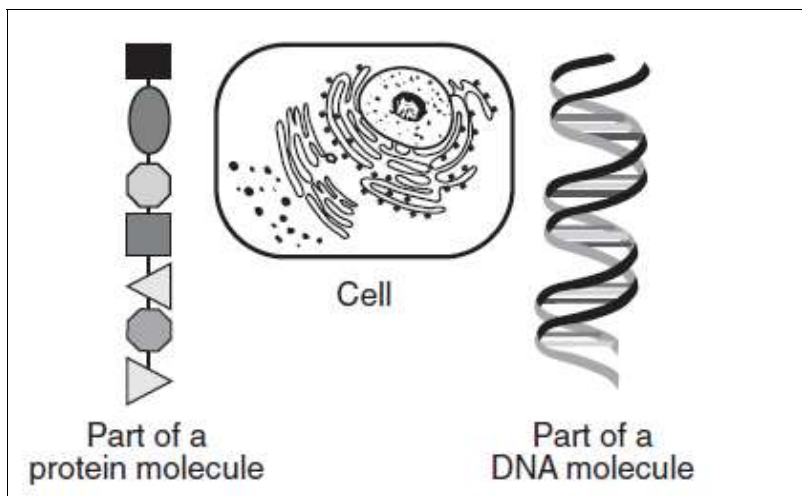
Data Base File Number: 454

Regents Date Jan2006-7.bmp

Jan2006

7 1/27/2006 S4K2

Answer 3



## DNA

483. Base your answer to this question on the diagram shown and on your knowledge of biology. This technique used to analyze DNA directly results in

- (1) synthesizing large fragments of DNA
- (2) separating DNA fragments on the basis of size
- (3) producing genetically engineered DNA molecules
- (4) removing the larger DNA fragments from the samples

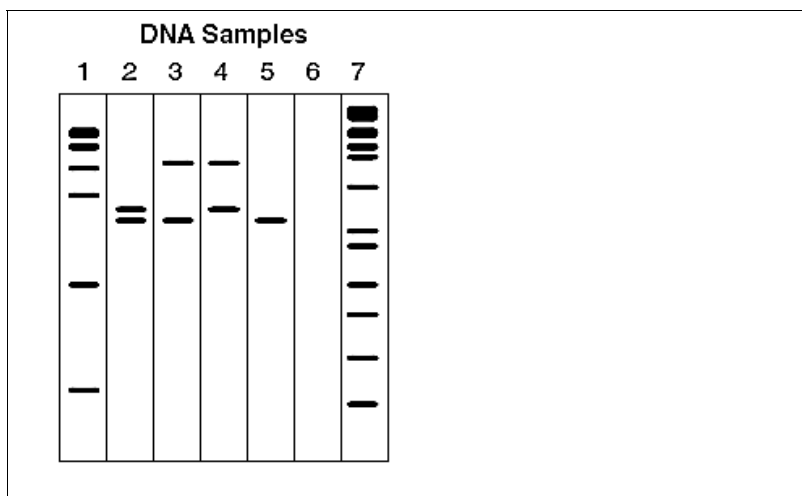
Data Base File Number: 46

Regents Date June-07-65.bmp

June2007

65 6/20/2007 LABS

Answer 2



## DNA

484. The diagram shown represents a structure found in most cells. The section labeled A in the diagram is most likely a

- (1) protein composed of folded chains of base subunits
- (2) biological catalyst
- (3) part of a gene for a particular trait
- (4) chromosome undergoing a mutation

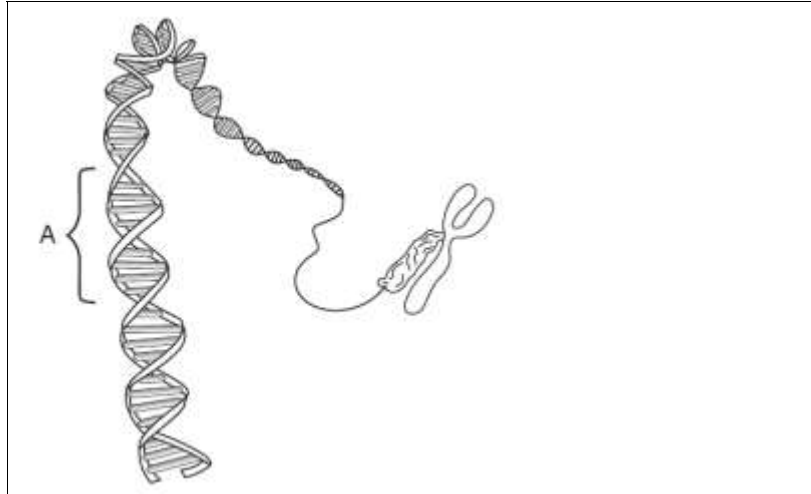
Data Base File Number: 304

Regents Date Jan2011-9.bmp

Jan2011

9 1/25/2011 S4K2

Answer 3



## DNA

485. Base your answer to this question on the information given and your knowledge of biology. Examine the diagram as shown. The diagram represents part of a laboratory exercise involving nucleic acid complementary coding in human cells. Does the diagram as shown represent the correct complementary coding of part of a human nucleic acid?

- (1) Yes
- (2) No
- (3) The portion of code shown is too short to determine correct complementary coding.
- (4) The portion of code shown is too long to determine correct complementary coding.

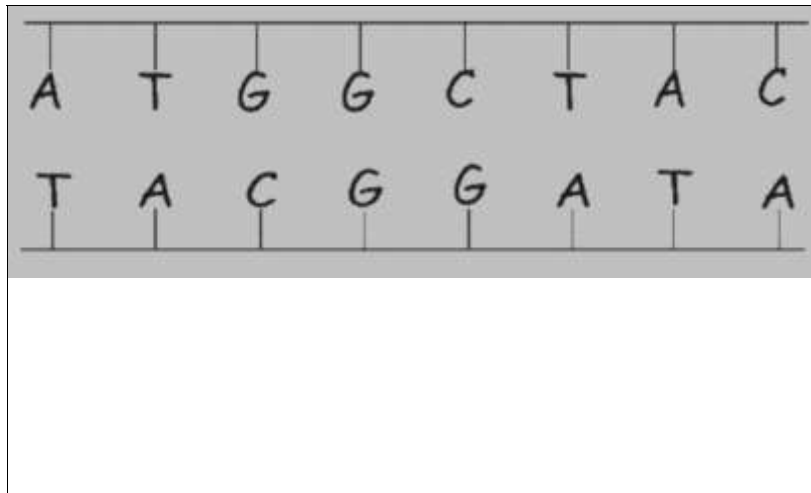
Data Base File Number: 1463

Regents Date DNASTrand.bmp-

RBS2021

1 6/22/2021 RBS

Answer 2



## DNA

486. Base your answer to this question on the information given and on your knowledge of biology. The sequences shown represent the same portions of a DNA molecule from the same gene used by a student to study the relationship between two plant species. A biological catalyst that recognizes the CCGG site is used to cut the DNA molecules into pieces. The catalyst cuts the DNA between the C and G of the site. How many CUTS are made in the DNA of SPECIES 1.

- (1) 1  
(2) 2  
(3) 3  
(4) 4

Data Base File Number: 396

Regents Date Jan2012-78.bmp

Jan2012

78 1/25/2012 LAB1

Answer 2

Species 1: T A C C G G A T T A G T T A T G C C G G A T C G  
Species 2: T A C G G A T G C C G G A T C G G A A T T C G

## DNA

487. The data table shows the presence or absence of DNA in four different cell organelles. Information in the table suggests that DNA functions

- (1) within cytoplasm and outside of the cell membrane  
(2) both inside and outside of the nucleus  
(3) only within energy-releasing structures  
(4) within cell vacuoles

Data Base File Number: 130

Regents Date Aug08-35.bmp

Aug2008

35 8/13/2008 S4K2

Answer 2

Data Table

Organelle	DNA
cell membrane	absent
cell wall	absent
mitochondrion	present
nucleus	present

## DNA

488. A portion of a molecule is shown in the diagram. Which statement best describes the main function of this type of molecule?

- (1) It is a structural part of the cell wall.
- (2) It stores energy for metabolic processes.
- (3) It determines what traits may be inherited.
- (4) It transports materials across the cell membrane.

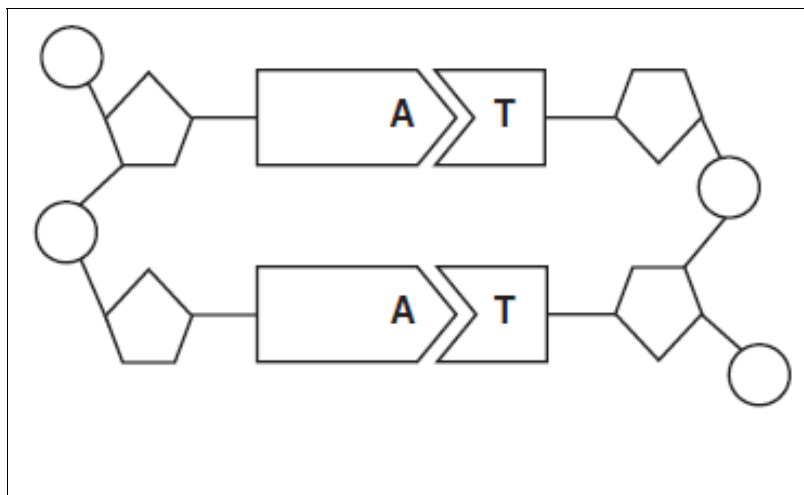
Data Base File Number: 757

Regents Date Aug2003-14.bmp

Aug2003

14 8/13/2003 S4K2

Answer 3



## DNA

489. The type of molecule represented in the diagram is found in organisms. Which statement correctly describes the sequence of bases found in this type of molecule?

- (1) It changes every time it replicates.
- (2) It determines the characteristics that will be inherited.
- (3) It is exactly the same in all organisms.
- (4) It directly controls the synthesis of starch within a cell.

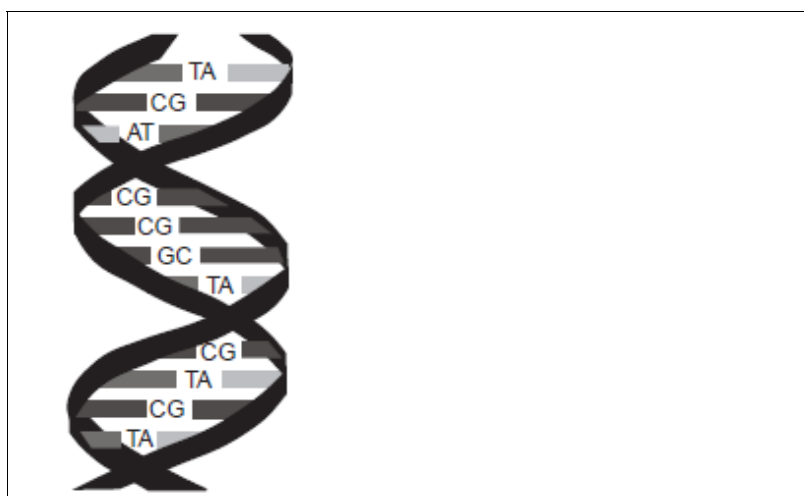
Data Base File Number: 831

Regents Date Jan2002-13.bmp

Jan2002

13 1/23/2002 S4K2

Answer 2



## DNA

490. The diagram shown represents a portion of a DNA molecule. The letters represent different types of

- (1) sugar molecules
- (2) molecular bases
- (3) enzymes
- (4) proteins

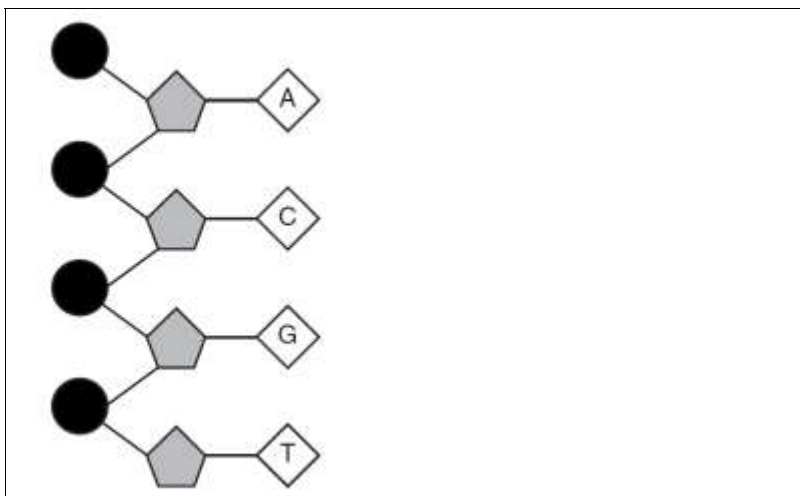
Data Base File Number: 337

Regents Date June2011-16.bmp

June2011

16 6/21/2011 S4K2

Answer 2



## DNA

491. Three structures are represented in the diagram shown. What is the relationship between these three structures?

- (1) DNA is made up of proteins that are synthesized in the cell.
- (2) Protein is composed of DNA that is stored in the cell.
- (3) DNA controls the production of protein in the cell.
- (4) The cell is composed only of DNA and protein.

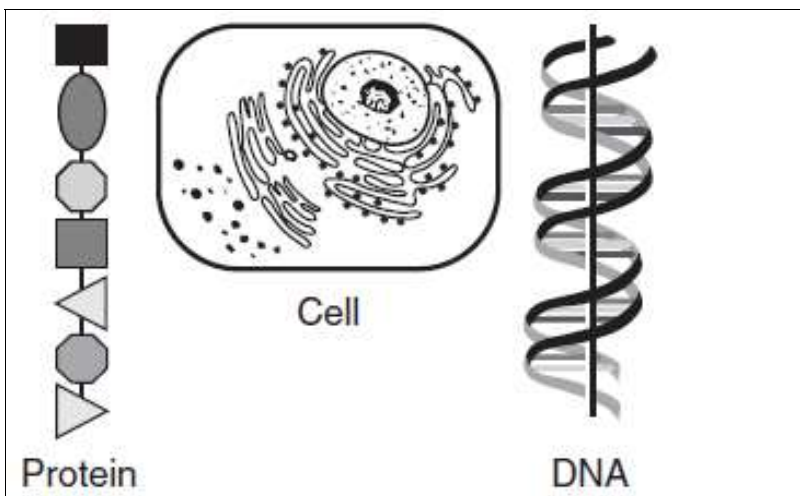
Data Base File Number: 507

Regents Date Aug2006-8.bmp

Aug2006

8 8/16/2006 S4K2

Answer 3



## DNA

492. The diagram shown represents an incomplete section of a DNA molecule. The boxes represent unidentified bases. When the boxes are filled in, the total number of bases represented by the letter A (both inside and outside the boxes) will be

(1) 1

(3) 3

(2) 2

(4) 4

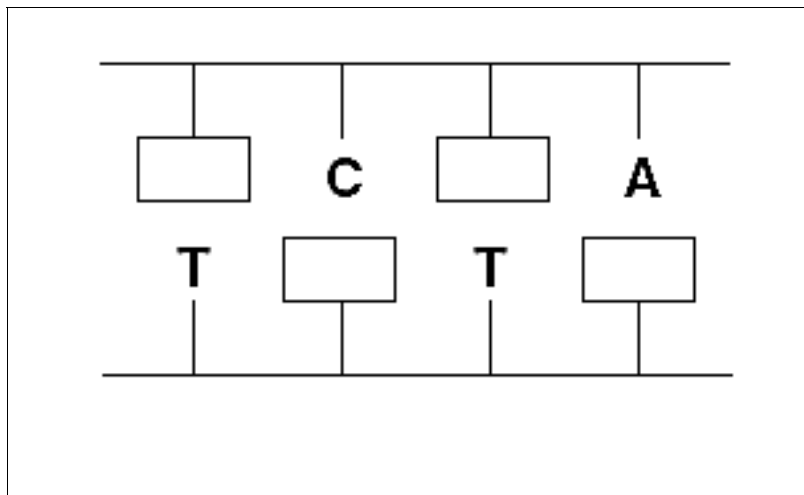
Data Base File Number: 36

Regents Date June07-33.bmp

June2007

33 6/20/2007 S4K5

Answer 3



## DNA

493. The molecule represented in the diagram is found in living things. Which statement describes one characteristic of this molecule?

(1) It is the template for the replication of genetic information.

(3) It is different in each cell of an organism.

(2) Organic catalysts are made up of these molecules.

(4) Cell membranes contain many of these molecules.

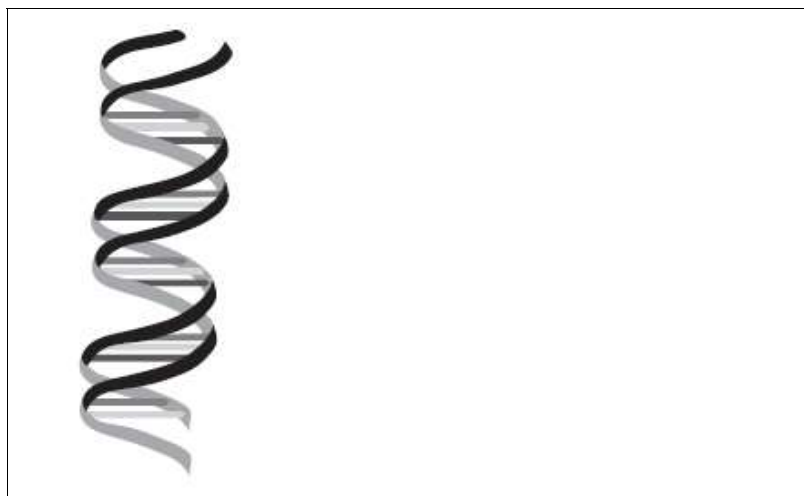
Data Base File Number: 232

Regents Date Jan2010-10.bmp

Jan2010

10 1/26/2010 S4K2

Answer 1





## DNA

494. Using the DNA base sequences shown, identify which two species are more closely related.

- (1) A and B  
(2) A and C  
(3) B and C  
(4) B and A

Data Base File Number: 1040

Regents Date June2015-78.bmp

June2015

78 6/16/2015 LAB1

Answer 1

Species A: CAC GTG GAC AGA GGA CAC CTC

Species B: CAT GTG GAC AGA GGA CAC CTC

Species C: CAC GTA GAC TGA GGA CTT CTC

## DNA

495. The diagram shown represents the chemical pathway of a process in a human liver cell. A particular liver cell is unable to make substance C. One possible explanation for the inability of this cell to make substance C is that

- (1) excess energy for step 2 prevented the conversion of substance B to substance C  
(2) an excess of enzyme X was present, resulting in a decrease in the production of substance B  
(3) nuclear DNA was altered resulting in the cell being unable to make enzyme Y  
(4) a mutation occurred causing a change in the ability of the cell to use substance C

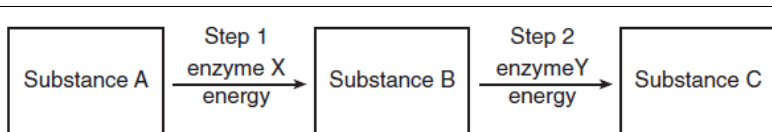
Data Base File Number: 731

Regents Date June2003-14.bmp

June2003

14 6/19/2003 S4K2

Answer 3



## DNA

496. The diagram shown represents a process that occurs during normal human development. Which statement is correct regarding the cells and DNA?
- (1) All the cells have identical DNA.
- (2) The DNA of the fertilized egg differs from the DNA of all the other cells.
- (3) The DNA of the fertilized egg differs from some, but not all, of the other cells.
- (4) Only the fertilized egg contains DNA

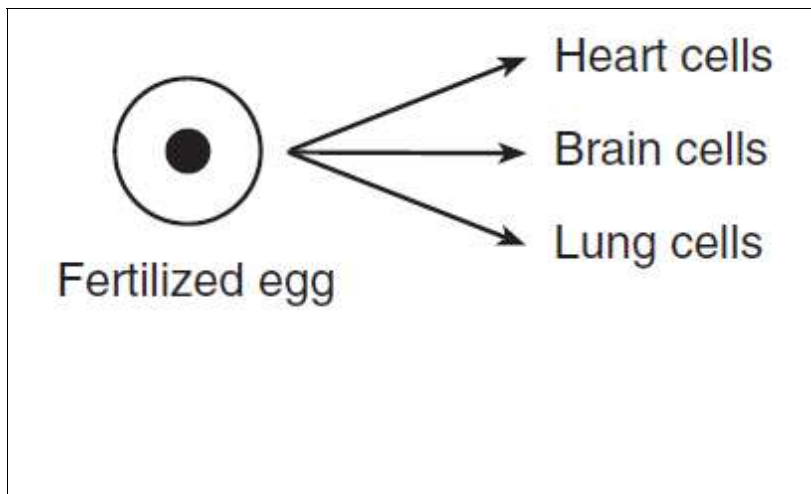
Data Base 311  
File Number:

Regents Date Jan2011-30.bmp

Jan2011

30 1/25/2011 S4K2

Answer 1



## DNA / base pairing

497. Four different segments of a DNA molecule are shown. There is an error in the DNA molecule in
- (1) segment 1, only
- (2) segment 3, only
- (3) segments 2 and 3
- (4) segments 2 and 4

Data Base 360  
File Number:

Regents Date Aug2011-7.bmp

Aug2011

7 8/18/2011 S4K2

Answer 2

Segment 1	Segment 2	Segment 3	Segment 4
T-A-G-G-C	G-G-T-G-A	G-A-T-T-A	C-A-A-T-G
A-T-C-C-G	C-C-A-C-T	C-C-A-A-T	G-T-T-A-C

## DNA / base pairing

498. NOTE: You may wish to ROTATE the diagram to the LEFT by turning your paper. The diagram shown represents a portion of an organic molecule. This molecule controls cellular activity by directing the synthesis of

- (1) carbohydrates
- (2) minerals
- (3) fats
- (4) proteins

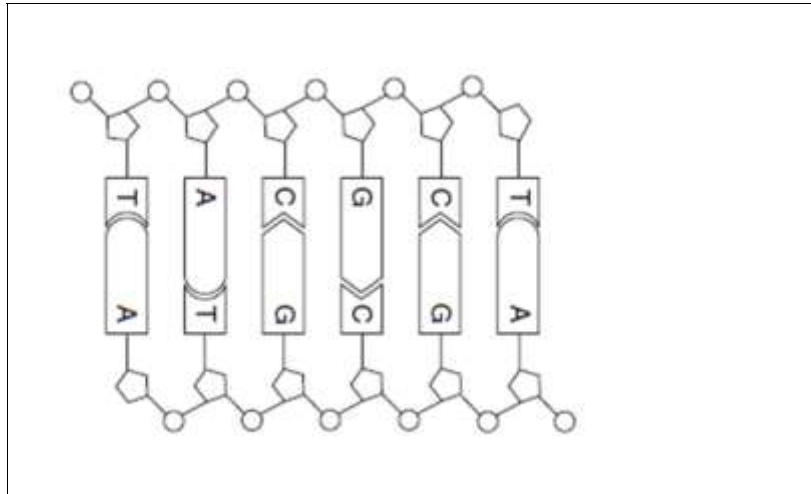
Data Base File Number: 581

Regents Date Aug2005-6B.bmp

Aug2005

6 8/16/2005 S4K2

Answer 4



## DNA / base pairing

499. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a segment of DNA in a body cell that has undergone a change in one of the molecular base pairs. What is a possible result of the change shown in the diagram?

- (1) The number of chromosomes would decrease.
- (2) The gene would move to another chromosome.
- (3) A specific enzyme would no longer be made.
- (4) More amino acids would be produced.

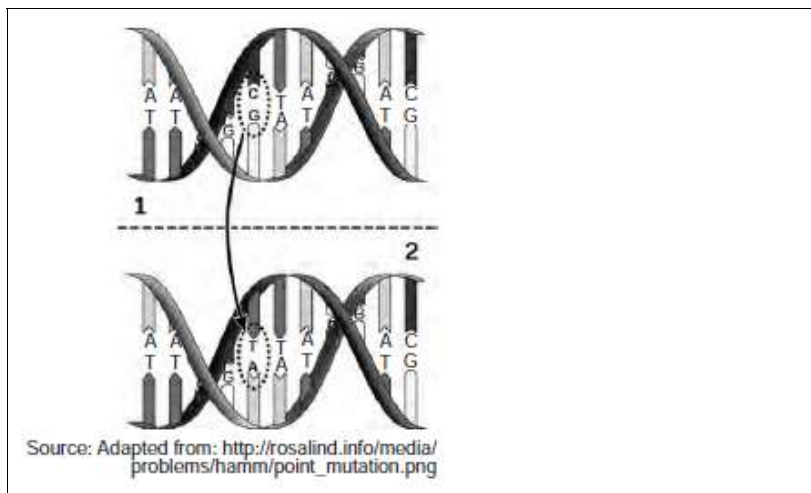
Data Base File Number: 1617

Regents Date Aug2023-50.bmp

Aug2023

50 8/17/2023 S4K2

Answer 3



## DNA / base pairing

500. A double-stranded DNA sample was analyzed to establish the percentage of different molecular bases present. The data table shows the percentage of adenine bases found. Calculate the percentage of C (cytosine).

- (1) 10  
(2) 20  
(3) 30  
(4) 40

Data Base File Number: 1315

Regents Date Jan2019-48.bmp

Jan2019

48 1/22/2019 S4K2

Answer 3

Base	Percent Found (%)
A (Adenine)	20
T (Thymine)	_____
G (Guanine)	_____
C (Cytosine)	_____

## DNA analysis

501. Base your answer to this question on the information shown and on your knowledge of biology. To demonstrate techniques used in DNA analysis, a student was given two paper strip samples of DNA. The two DNA samples are shown in the diagram. The student cut between the C and G in each of the shaded "CCGG" sequences in sample 1 and between the "AA" in each of the shaded "TAAT" sequences in sample 2. Both sets of fragments were then arranged on a paper model of a gel. The results of this type of DNA analysis are often used to help determine

- (1) the number of DNA molecules in an organism  
(2) if two species are closely related  
(3) the number of mRNA molecules in DNA  
(4) if two organisms contain carbohydrate molecules

Data Base File Number: 61

Regents Date Jan07-68.bmp

Jan2007

70 1/26/2007 LABS

Answer 2

Sample 1: ATTCCGGTAATCCCGTAATGCCGGATAATACTCCGGTAATATC

Sample 2: ATTCCGGTAATCCCGTAATGCCGGATAATACTCCGGTAATATC

## DNA analysis

502. The DNA from three different bacterial species are compared with a specific strain of "E. coli" bacteria. These data were used to construct the evolutionary tree as shown. Which row in the data table as shown best supports the evolutionary diagram constructed by the scientists?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1591

Regents Date June2023-75.bmp

June2023

75 6/14/2023 LAB1

Answer 2

Which row in the data table below best supports the evolutionary diagram constructed by the scientists?

**Species Comparison**  
(Percent of Identical DNA)

Row	E. coli	Species G	Species R	Species P
(1)	100%	99%	95%	93%
(2)	100%	93%	95%	99%
(3)	100%	99%	93%	99%
(4)	100%	95%	99%	93%

## DNA base sequences

503. Base your answer to this question on the table shown which represents the DNA codes for several amino acids. A certain DNA strand has the following base sequence: TACACAAACGGGG. What sequence of amino acids is synthesized from this code if it is read from left to right?

(1) cysteine-tryptophan-valine-proline-asparagine

(3) methionine-cysteine-valine-cysteine-proline

(2) methionine-asparagine-proline-cysteine-cysteine

(4) proline-cysteine-valine-methionine-tryptophan

Data Base File Number: 773

Regents Date Aug2003-58.bmp

Aug2003

58 8/13/2003 S4K2

Answer 3

Amino Acid	DNA Code Sequence
Cysteine	ACA or ACG
Tryptophan	ACC
Valine	CAA or CAC or CAG or CAT
Proline	GGA or GGC or GGG or GGT
Asparagine	TTA or TTG
Methionine	TAC

## DNA base sequences

504. The chart shows a list of events that might occur in a cell. Which is the correct sequence in which these events could occur?

(1) D - B - A - C

(3) B - A - C - D

(2) C - D - B - A

(4) D - C - A - B

Data Base File Number: 1597

Regents Date Aug2023-7.bmp

Aug2023

7 8/17/2023 S4K2

Answer 4

A – synthesis of a new protein  
B – a cell function changes  
C – alteration of the base sequence on a strand of DNA  
D – exposure to radiation

## DNA base sequences

505. A researcher recently discovered a new species of bacteria in the body of a tubeworm living near a hydrothermal vent. He compared the DNA of this new bacterial species to the DNA of four other species of bacteria. The DNA sequences came from the same part of the bacterial chromosome of all four species. According to these data, the unknown bacterial species is most closely related to

(1) species I

(3) species III

(2) species II

(4) species IV

Data Base File Number: 217

Regents Date August2009-35.b

Aug2009

35 8/13/2009 S4K2

Answer 4

Species	DNA Sequence
unknown species	ACT GCA CCC
species I	ACA GCA CCG
species II	ACT GCT GGA
species III	ACA GCA GGG
species IV	ACT GCA CCG

## DNA base sequences

506. Base your answer to this question on the table and information given and your knowledge of biology. The TOP TABLE is for REFERENCE. In DNA, a sequence of three bases is a code for the placement of a certain amino acid in a protein chain. The TOP TABLE shows some amino acids with their abbreviations and DNA codes. A DNA base sequence is shown in the MIDDLE of the diagram. The sequence is "CAAGTTAAATTATTGTGA". Which amino acid chain would be produced by this DNA base sequence? Your choices are shown in the BOTTOM part of the diagram!

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 679

Regents Date June2004-50.bmp

June2004

50 6/18/2004 S4K2

Answer 3

Amino Acid	Abbreviation	DNA Code
Phenylalanine	Phe	AAA, AAG
Tryptophan	Try	ACC
Serine	Ser	AGA, AGG, AGT, AGC, TCA, TCG
Valine	Val	CAA, CAG, CAT, CAC
Proline	Pro	GGA, GGG, GGT, GGC
Glutamine	Glu	GTT, GTC
Threonine	Thr	TGA, TGG, TGT, TGC
Asparagine	Asp	TTA, TTG

**C-A-A-G-T-T-A-A-A-T-T-A-T-T-G-T-G-A**

(1) Val — Glu — Phe — Asp — Thr — Asp

(2) Val — Pro — Phe — Asp — Asp — Thr

(3) Val — Glu — Phe — Asp — Asp — Thr

(4) Val — Glu — Phe — Thr — Asp — Asp

## DNA base sequences

507. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows a small segment of DNA taken from a gene before and after it is copied. Changes made during the copying process are represented by \* in the diagram. The errors indicated by \* could affect a cell by

- (1) altering the number of chromosomes present in the cytoplasm
- (2) converting the original cell into a different type of cell
- (3) converting sugar molecules into molecules of protein
- (4) changing the sequence of amino acids during the formation of a specific protein

Data Base File Number: 1313

Regents Date Jan2019-42.bmp

Jan2019

42 1/22/2019 S4K2

Answer 4





## DNA base sequences

508. The photograph shows two penguins of the same species displaying different feather color patterns. The newly discovered all-black penguin had only black feathers since emerging from the egg. The sudden appearance of this characteristic was most likely due to
- (1) a change in environmental conditions
  - (2) deposition of oil on the feathers due to pollution
  - (3) a random change in the sequences of bases in DNA
  - (4) a change in the diet of the penguin chick

Data Base File Number: 877

Regents Date June2013-28.bmp

June2013

28 6/11/2013 S4K2

Answer 3



Source: [http://green.yahoo.com/blog/guest\\_bloggers/24/all-black-penguin-discovered.html](http://green.yahoo.com/blog/guest_bloggers/24/all-black-penguin-discovered.html)

## DNA base sequences

509. The table shown represents a segment of a DNA molecule found in a stomach cell, both before and after undergoing replication. Which statement best describes a change that would most likely be observed in the cells formed as a result of this mitotic division?
- (1) An enzyme the cell produces might no longer function.
  - (2) The cells would begin to form gametes to be released.
  - (3) Many new hormones would be synthesized by the cells.
  - (4) Chloroplasts would be produced by the ribosomes.

Data Base File Number: 1215

Regents Date Aug2017-41.bmp

Aug2017

41 8/17/2017 S4K3

Answer 1

DNA Segment Before and After Replication

Before replication	TGT	ATG	AAA	CAC	AAT	TAT
After replication	TGT	ATT	AAA	CAC	AAT	TTT

## DNA base sequences

510. The cells in the diagram shown were present in the same individual. These cells are most similar in the

- (1) amount of energy they release
- (2) type of proteins they synthesize
- (3) rate of their metabolism
- (4) information stored in their DNA

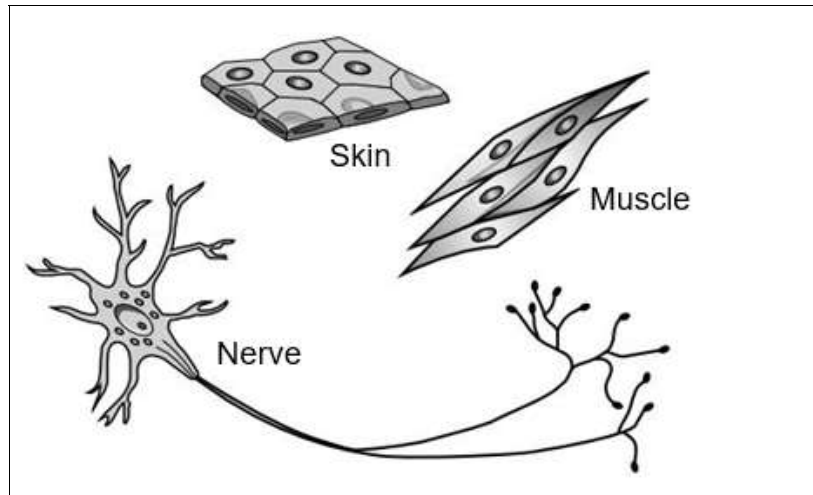
Data Base File Number: 1501

Regents Date Aug2022-15.bmp

Aug2022

15 8/17/2022 S4K1

Answer 4



## DNA base sequences

511. Molecule 1 represents a segment of hereditary information, and molecule 2 represents the portion of a molecule that is determined by information from molecule 1. What will most likely happen if there is a change in the first three subunits on the upper strand of molecule 1?

- (1) The remaining subunits in molecule 1 will also change.
- (2) A portion of molecule 2 may be different.
- (3) Molecule 1 will split apart, triggering an immune response.
- (4) Molecule 2 may form two strands rather than one.

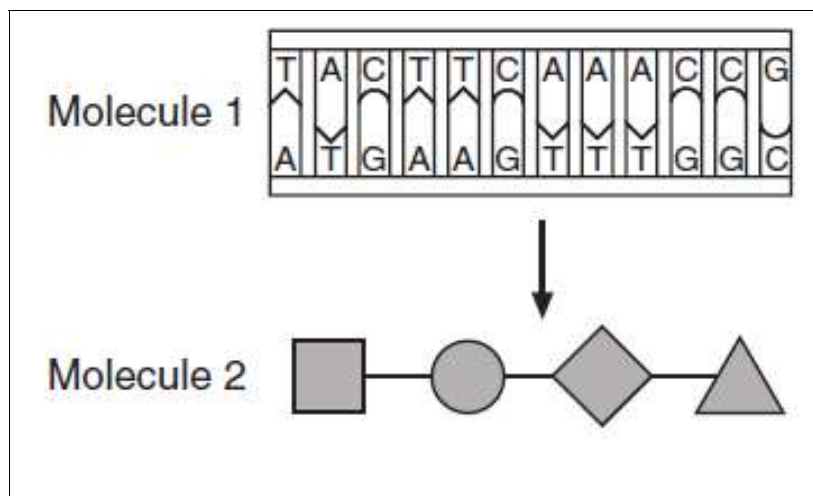
Data Base File Number: 803

Regents Date June2002-11.bmp

June2002

11 6/19/2002 S4K2

Answer 2



## DNA base sequences

512. The diagram shown represents a segment of a gene on two chromosomes. The change in the gene sequence is an example of

- (1) an insertion
- (2) a deletion
- (3) a substitution
- (4) a replication

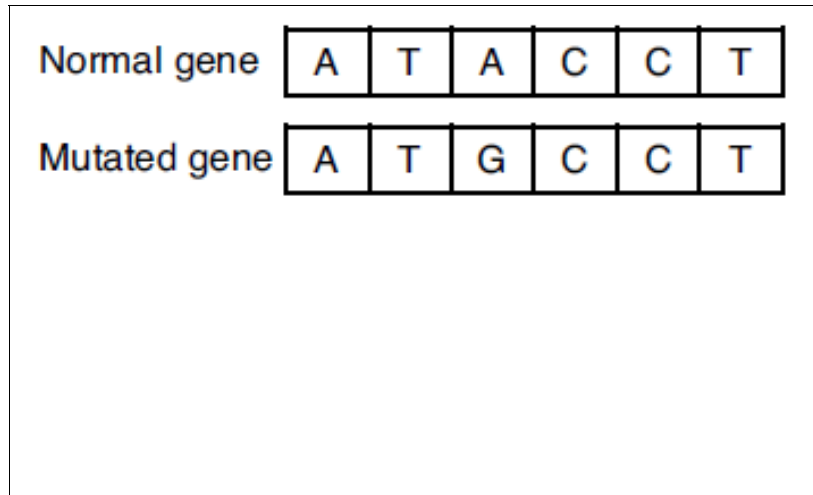
Data Base File Number: 900

Regents Date Aug2013-10.bmp

Aug2013

10 8/14/2013 S4K2

Answer 3



## DNA bases

513. Which graph would most accurately represent the relationship between the four kinds of bases found in DNA?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

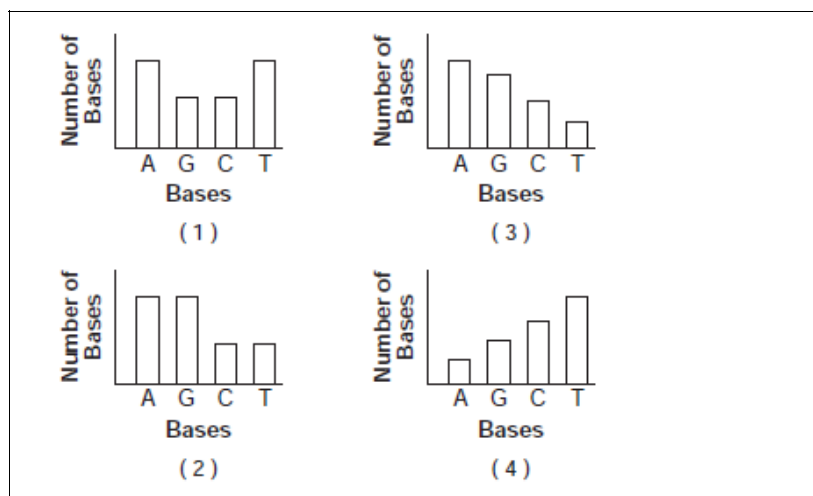
Data Base File Number: 1631

Regents Date Jan2024-33.bmp

Jan2024

33 1/23/2024 S4K2

Answer 1



## DNA bases

514. Which row in the chart shown best describes what happens when some DNA bases are deleted from a gene?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 211

Regents Date August2009-11.b

Aug2009

11 8/13/2009 S4K2

Answer 4

Row	Gene	Trait Controlled By the Original DNA
(1)	is not changed	is never changed
(2)	is not changed	may be changed
(3)	is changed	is never changed
(4)	is changed	may be changed

## DNA bases

515. A scientist analyzed a segment of DNA from a human chromosome and found that the percentage of thymine molecular bases (T) was 35%. Which row in the chart below contains the correct percentages of the other molecular bases in the DNA segment?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1340

Regents Date June2019-31.bmp

June2019

31 6/18/2019 S4K2

Answer 3

Row	Guanine (G)	Cytosine (C)	Adenine (A)
(1)	15%	25%	25%
(2)	25%	25%	15%
(3)	15%	15%	35%
(4)	35%	15%	15%

### DNA electrophoresis

516. DNA electrophoresis is used to study evolutionary relationships of species. The diagram shows the results of DNA electrophoresis for four different animal species. Which species has the most DNA in common with species A?

- (1) X and Y, only
- (2) Y, only
- (3) Z, only
- (4) X, Y, and Z

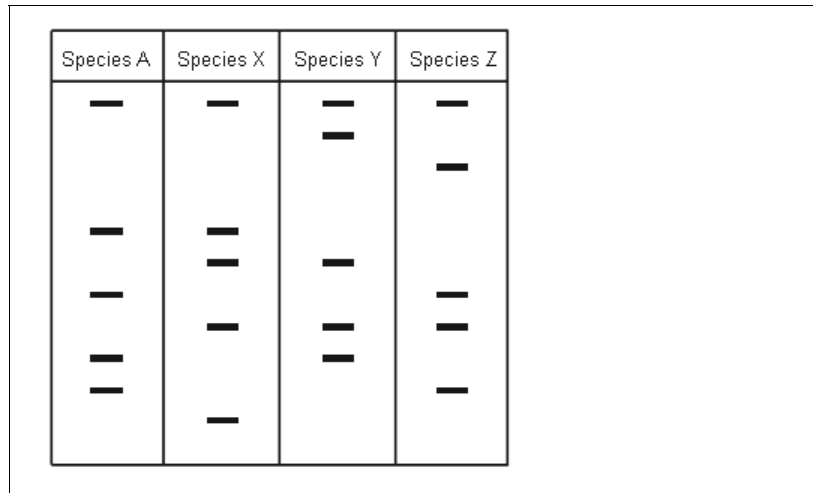
Data Base File Number: 209

Regents Date June09-70.bmp

June2009

70 6/18/2009 LABS

Answer 3



### dynamic equilibrium

517. Which graph best illustrates the body temperature in an individual maintaining dynamic equilibrium?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

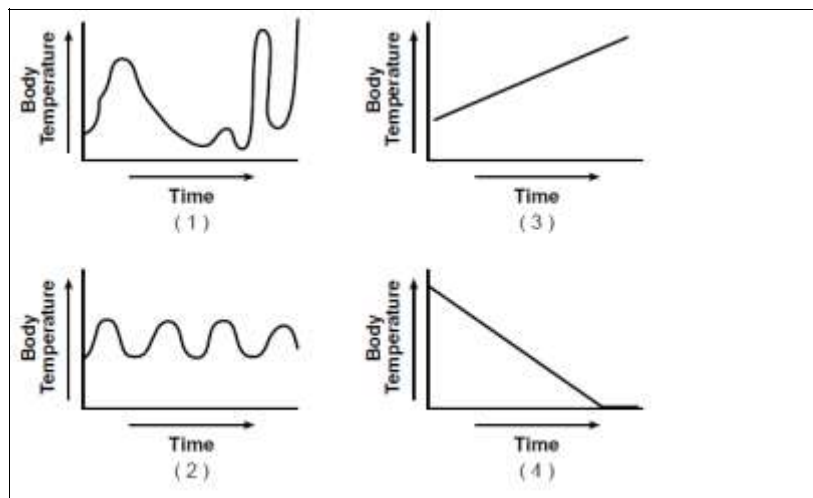
Data Base File Number: 1289

Regents Date Aug2018-40.bmp

Aug2018

40 8/17/2018 S4K5

Answer 2



**dynamic equilibrium**

518. Changes in external temperatures often result in a person either sweating or shivering, as represented in the diagram shown. These responses are one way

- (1) to counteract feedback mechanisms that would otherwise be beneficial
- (2) to make the body release insulin to control blood circulation
- (3) the body is able to maintain dynamic equilibrium
- (4) skin and muscle cells are able to disrupt homeostasis

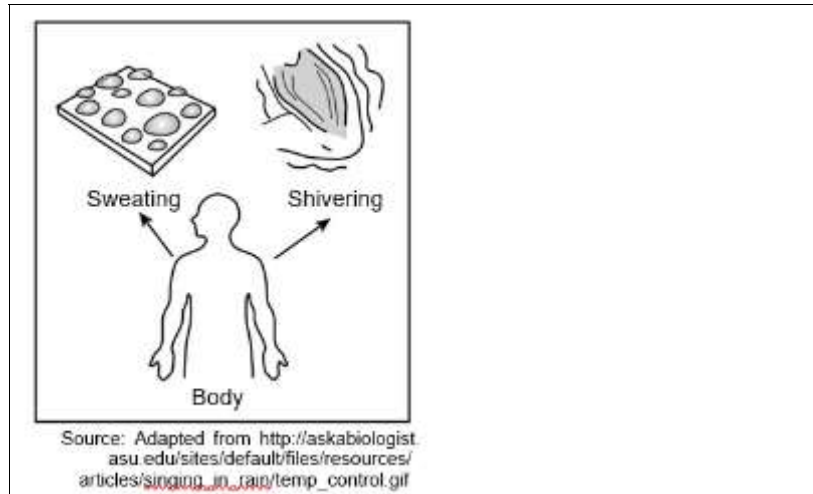
Data Base File Number: 1504

Regents Date Aug2022-24.bmp

Aug2022

24 8/17/2022 S4K5

Answer 3



**dynamic equilibrium**

519. Which graph of blood sugar level over a 12-hour period best illustrates the concept of dynamic equilibrium in the body?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

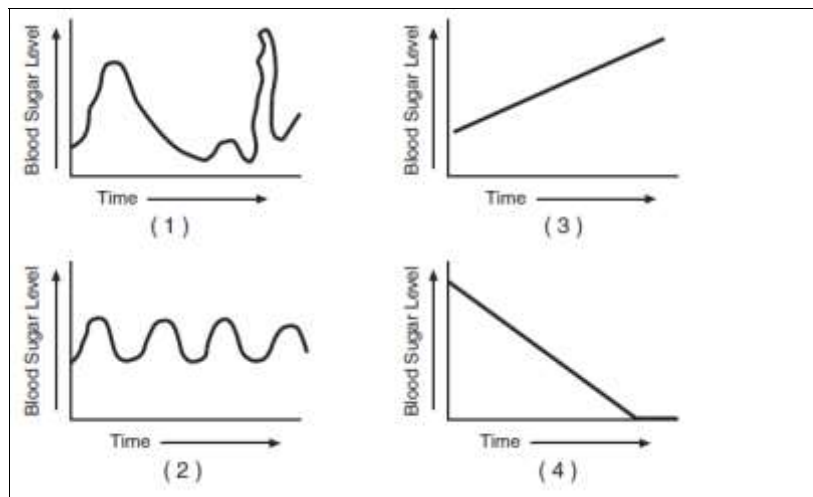
Data Base File Number: 815

Regents Date June2002-38.bmp

June2002

38 6/19/2002 S4K5

Answer 2



## dynamic equilibrium

520. The graph shows the number of birds in a population. Which statement best explains section X of the graph?
- (1) Interbreeding between members of this population increased the mutation rate.
  - (2) An increase in the bird population caused an increase in the producer population.
  - (3) The population reached a state of dynamic equilibrium due to limiting factors.
  - (4) Another species came to the area and provided food for the birds.

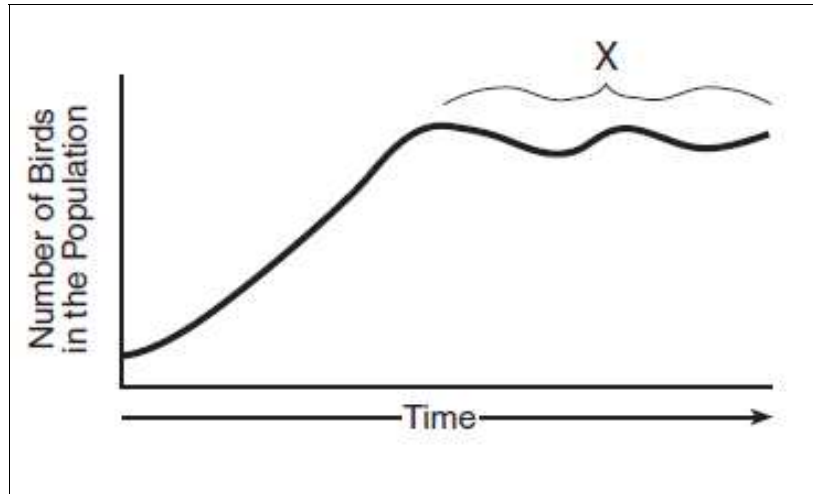
Data Base File Number: 586

Regents Date Aug2005-29.bmp

Aug2005

29 8/16/2005 S4K6

Answer 3



## dynamic equilibrium

521. The diagram shown represents changes that take place within the human body. The diagram represents
- (1) cellular differentiation
  - (2) dynamic equilibrium
  - (3) gene interaction
  - (4) biological evolution

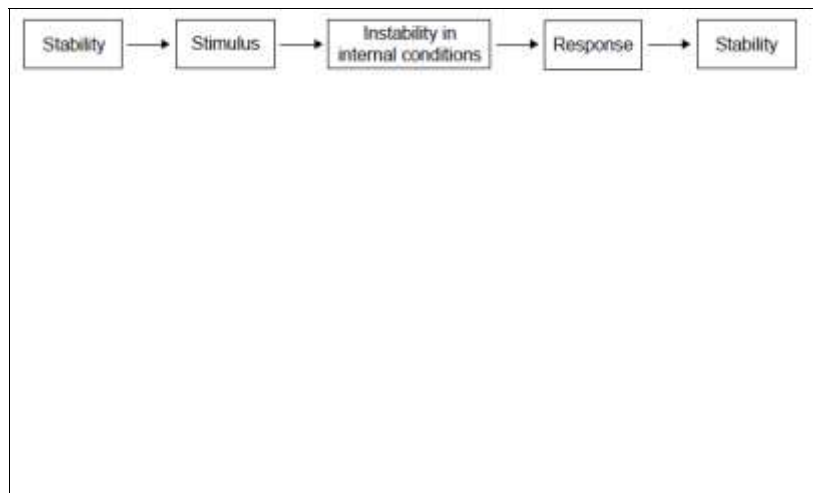
Data Base File Number: 1398

Regents Date Jan2020-30.bmp

Jan2020

30 1/21/2020 S4K5

Answer 2



## dynamic equilibrium

522. Which graph illustrates changes that indicate a state of dynamic equilibrium in a mosquito population?

(1) 1

(3) 3

(2) 2

(4) 4

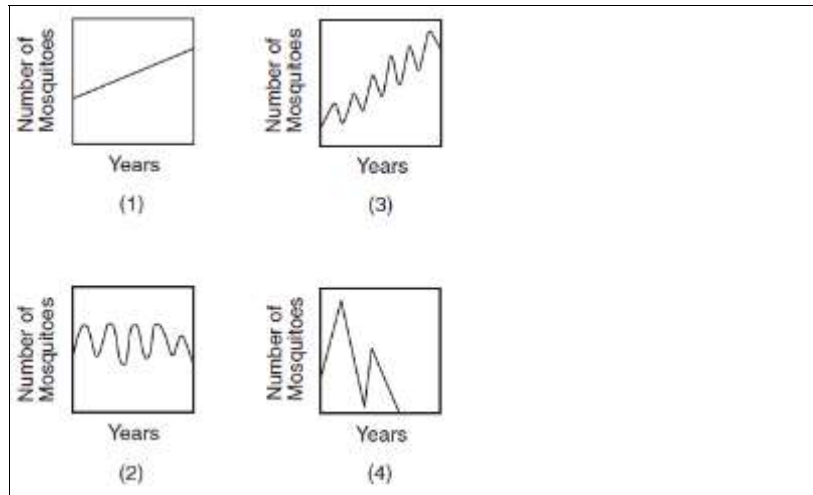
Data Base File Number: 512

Regents Date Aug2006-27.bmp

Aug2006

27 8/16/2006 S4K1

Answer 2



## dynamic equilibrium

523. The graph shows changes in the level of glucose in the blood of a person over a period of time. The graph represents the

(1) maintenance of dynamic equilibrium

(3) reaction of white blood cells to a pathogen

(2) failure of homeostasis

(4) oxygen carrying capacity of the blood

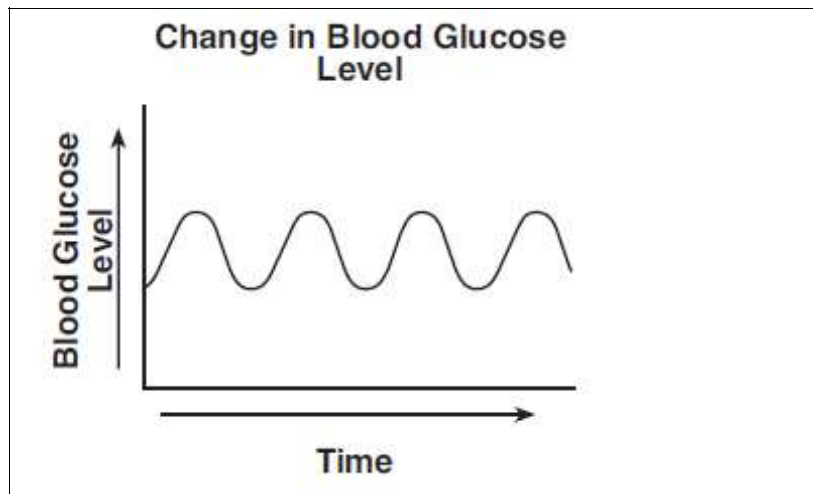
Data Base File Number: 966

Regents Date Aug2014-34.bmp

Aug2014

34 8/14/2014 S4K5

Answer 1





## dynamic equilibrium

524. The data in the graph included, shows evidence of disease in the human body. A disruption in dynamic equilibrium is indicated by the temperature change between points

- (1) A and B  
 (2) B and C  
 (3) C and D  
 (4) E and F

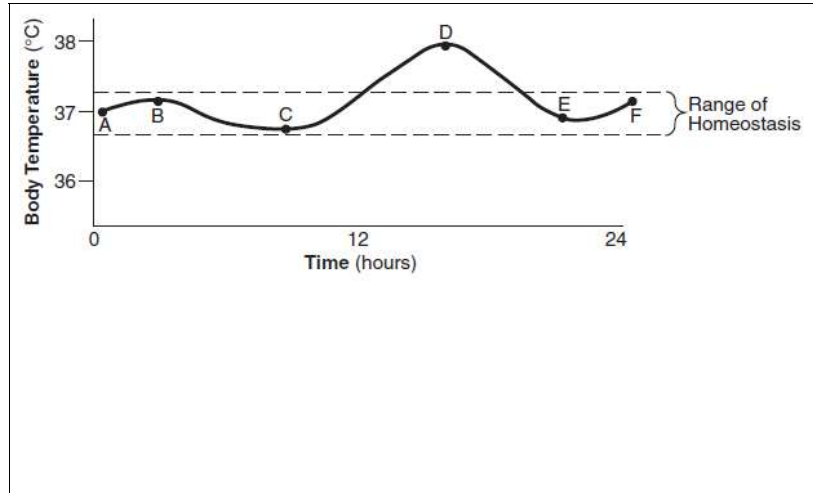
Data Base File Number: 705

Regents Date Jan2003-9.bmp

Jan2003

9 1/30/2003 S4K1

Answer 3



## ecological succession

525. The diagram as shown represents a biological process. Which statement is true about the biological process shown?

- (1) This is a short-term process resulting from sudden changes.  
 (2) This process cannot be altered by humans and other organisms.  
 (3) If the hardwood trees are destroyed, the altered ecosystem cannot recover.  
 (4) The shrubs modify the environment, making it more suitable for the softwood trees.

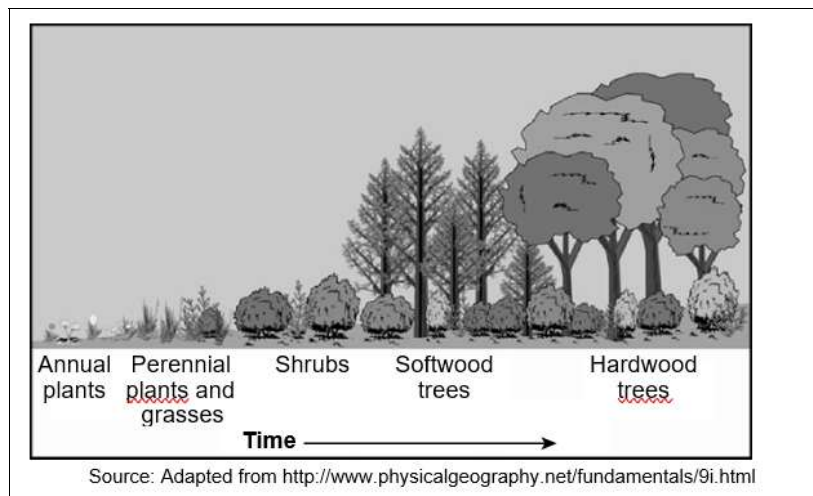
Data Base File Number: 1508

Regents Date Aug2022-29.bmp

Aug2022

29 8/17/2022 S4K6

Answer 4



Source: Adapted from <http://www.physicalgeography.net/fundamentals/9i.html>

**ecological succession**

526. Which process is represented in the diagram shown?

- (1) energy flow
- (2) biological evolution
- (3) cellular communication
- (4) ecological succession

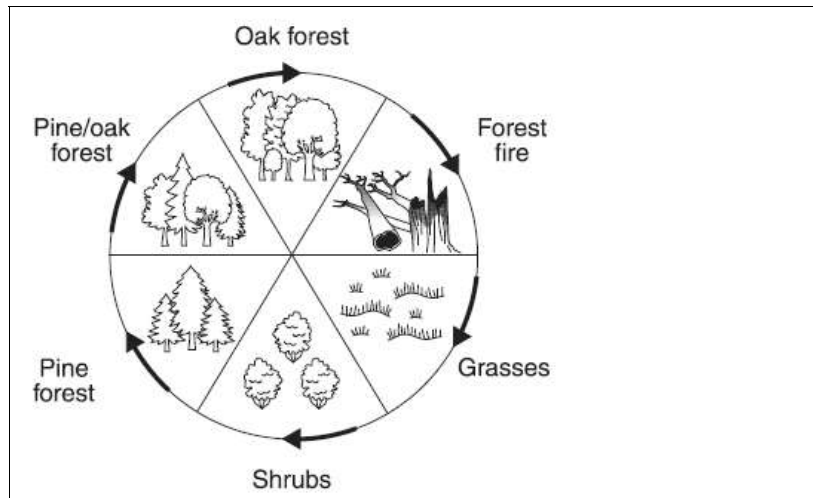
Data Base File Number: 389

Regents Date Jan2012-40.bmp

Jan2012

40 1/25/2012 S4K6

Answer 4



**ecological succession**

527. Which concept is best represented in the diagram shown?

- (1) random mutations
- (2) ecological succession
- (3) genetic engineering
- (4) direct harvesting

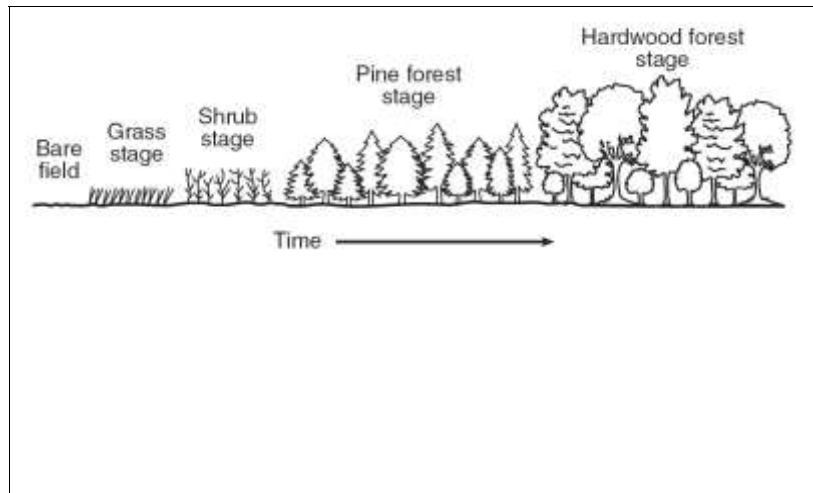
Data Base File Number: 335

Regents Date June2011-12.bmp

June2011

12 6/21/2011 S4K6

Answer 2



**ecological succession**

528. The diagram shows various ecological communities that occupied an area over a period of 300 years. Which statement best describes the diagram?

- (1) Community A is the most stable community.
- (2) Community B replaced community C after a period of 100 years
- (3) Community C developed into community A after a period of 75 years.
- (4) Community D modified the environment, making it more suitable for community E.

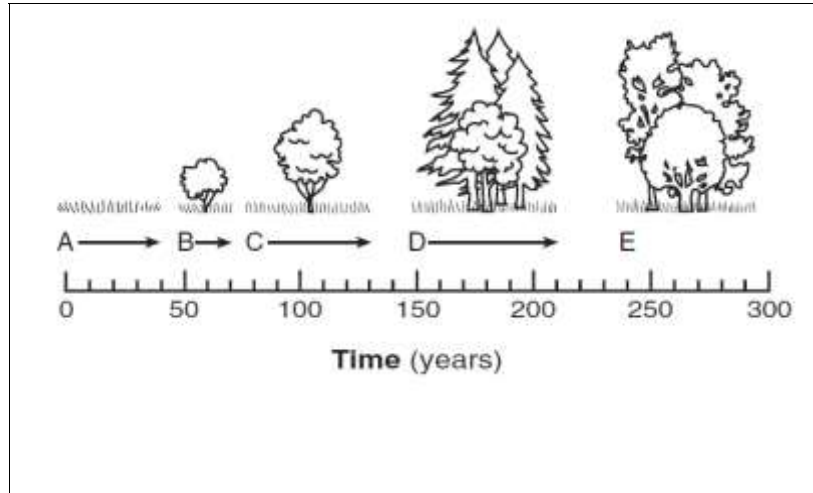
Data Base File Number: 320

Regents Date Jan2011-41.bmp

Jan2011

41 1/25/2011 S4K6

Answer 4



**ecological succession**

529. The diagram shown represents the changes over time in an area. Which example is NOT a natural process that could return a hardwood forest to the grass stage once again?

- (1) a forest fire caused by a lightning strike
- (2) the aging and falling of trees
- (3) clearing the land for agriculture
- (4) a hurricane or tornado

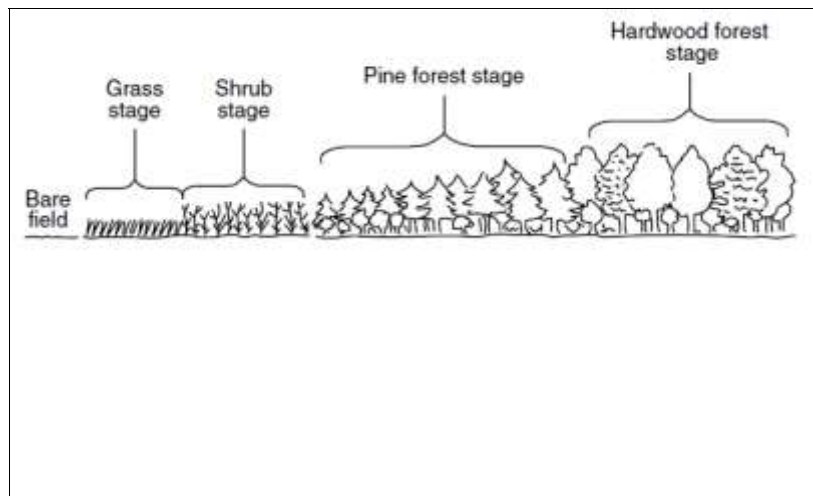
Data Base File Number: 1156

Regents Date Jan2017-18.bmp

Jan2017

18 1/25/2017 S4K6

Answer 3



**ecological succession**

530. The diagram represents the changes in an area over time. This series of changes in the area over hundreds of years is known as

- (1) evolution
- (2) feedback
- (3) ecological succession
- (4) direct harvesting

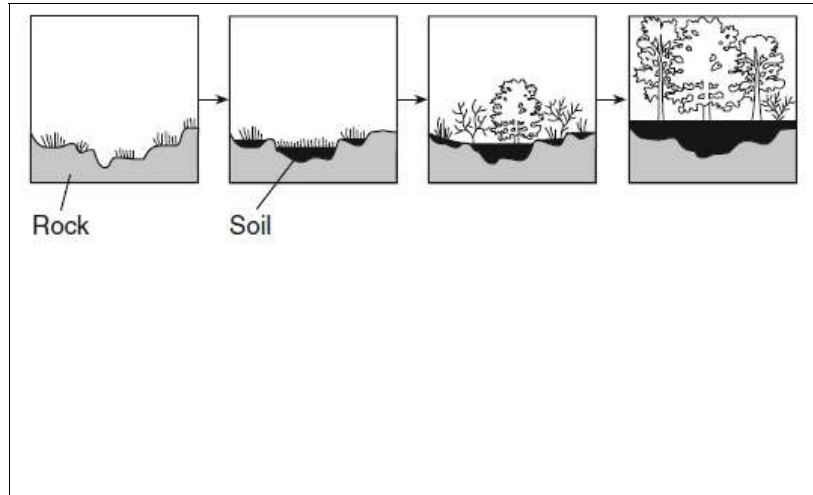
Data Base File Number: 612

Regents Date Jan2013-30.bmp

Jan2013

30 1/23/2013 S4K6

Answer 3



**ecological succession**

531. The chart shows a sequence of events that was observed at an abandoned ski center over a period of years. This sequence of changes is the result of

- (1) ecological succession
- (2) decreased biodiversity
- (3) biological evolution
- (4) environmental trade-offs

Data Base File Number: 1366

Regents Date Aug2019-18.bmp

Aug2019

18 8/14/2019 S4K6

Answer 1

**Changes in Plant Species Over Time**

Year	Dominant Plant Species Observed
1985	grasses
1995	shrubs and bushes
2005	cherry, birch, and poplar trees

**ecological succession**

532. Base your answer to this question on the information given and on your knowledge of biology. The diagram represents an ecological process that occurs in New York State over a long period of time. What name is given to the ecological process that is represented from stage A through stage D in the diagram shown?

Is important to the stage that follows it.

- (1) ecological succession
- (2) ecological evolution
- (3) ecological progression
- (4) ecological relationships

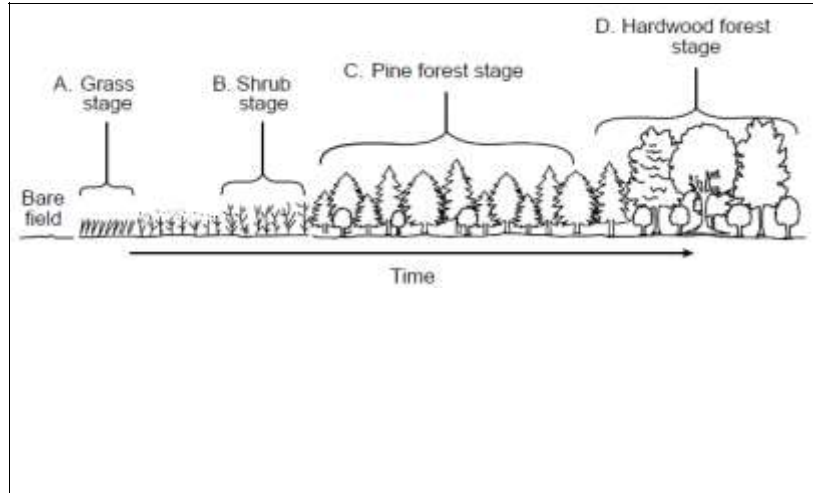
Data Base File Number: 1351

Regents Date: June2019-53.bmp

June2019

53 6/18/2019 S4K6

Answer: 1



**ecological succession**

533. Base your answer to this question on the information shown in the chart and on your knowledge of biology. If farm fields in the Piedmont region of North Carolina are abandoned, there is a regular sequence of plant species that will inhabit the field. The data table shows a typical sequence of dominant plant species. This regular sequence of plant species over the 150-year period is known as

- (1) degrading of the ecosystem
- (2) loss of biodiversity
- (3) ecological succession
- (4) biological evolution

Data Base File Number: 226

Regents Date: August2009-54.b

Aug2009

54 8/13/2009 S4K6

Answer: 3

Years After Last Cultivation	Dominant Plant Species
0	crabgrass
1	horseweed
2	aster
3	broomsedge
5-15	shortleaf pine
50-150	oak trees

**ecological succession**

534. An ecological process is represented in the diagram. Which statement describes an event in this process?

- (1) Community B modifies the environment, making it suitable for community C.
- (2) Community D modifies the environment, making it suitable for community C.
- (3) Community E will develop into community A, if the environment remains stable.
- (4) Community A organisms will develop directly into community D organisms.

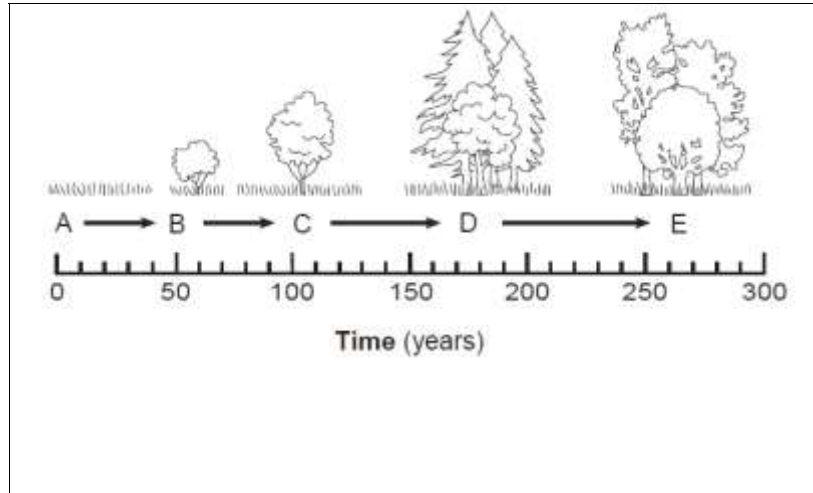
Data Base File Number: 920

Regents Date Jan2014-12.bmp

Jan2014

12 1/27/2014 S4K6

Answer 1



**ecological succession**

535. The diagram shown represents the various stages of ecological succession in New York State. If the ecosystem is not altered, which stage would be the most stable?

- (1) grass
- (2) shrub
- (3) pine forest
- (4) hardwood forest

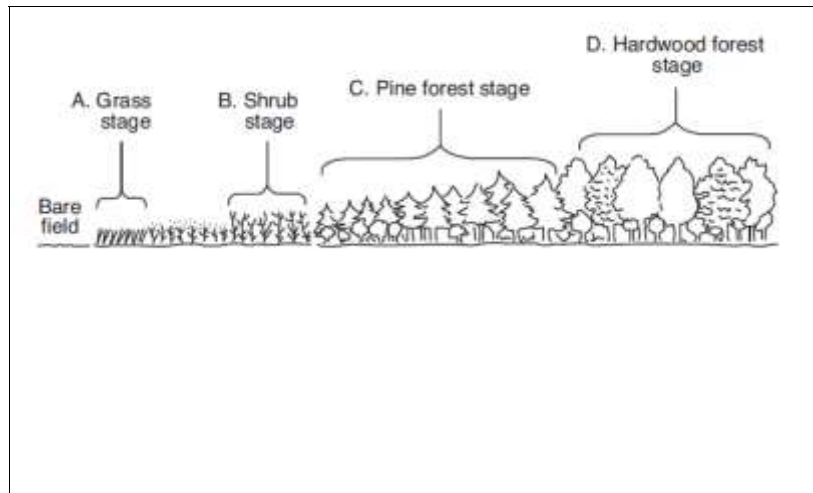
Data Base File Number: 259

Regents Date June2010-29.bmp

June2010

29 6/16/2010 S4K6

Answer 4



**ecological succession**

536. Base your answer to this question on the photographs shown and on your knowledge of biology. Mt. St. Helens erupted in 1980. The photographs represent the changing environment in the area of the Mt. St. Helens volcano in 1988 and 2001. Following the volcanic eruption in 1980, which process occurred that resulted in an increase in the number of species?

- (1) ecological succession
- (2) deforestation
- (3) biological evolution
- (4) differentiation

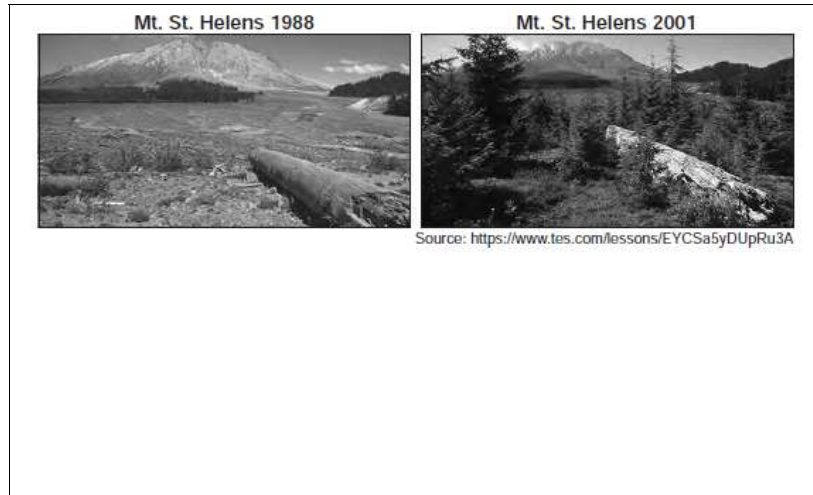
Data Base File Number: 1606

Regents Date Aug2023-31.bmp

Aug2023

31 8/17/2023 S4K6

Answer 1



**ecological succession**

537. Base your answer to this question on the diagram shown, which represents the changes in an ecosystem over a period of 100 years, and on your knowledge of biology. Which human activity could be responsible for the change from C to D?

- (1) human caused fire
- (2) secondary succession
- (3) pioneer organisms introduced
- (4) energy flow

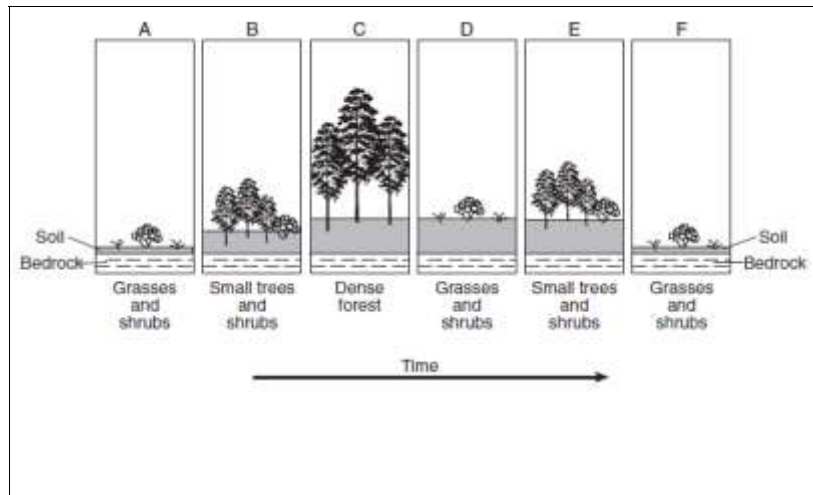
Data Base File Number: 698

Regents Date Aug2004-53.bmp

Aug2004

54 8/17/2004 S4K6

Answer 1





**ecological succession**

538. Events that occur in four different ecosystems are shown in the chart. Which ecosystem would most likely require the most time for ecological succession to restore it to its original state?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 766

Regents Date Aug2003-38.bmp

Aug2003

38 8/13/2003 S4K6

Answer 3

Ecosystem	Events
A	A severe ice storm occurs during the winter, damaging trees and shrubs. No ice storms occur for the next 20 years.
B	A severe drought causes most of the leaves to fall from the trees during a single summer. There are no serious droughts for the next 20 years.
C	An island with a dense shrub population becomes submerged for 3 years. When the river water lowers, the island does not become submerged for the next 20 years.
D	A fire burns through a large grassy area. Fires do not occur in the area for the next 20 years.

**ecological succession**

539. The diagram shown represents different stages of an ecosystem over a period of time. Which stage of the ecosystem has the greatest long-term stability?

- (1) A
- (2) B
- (3) C
- (4) D

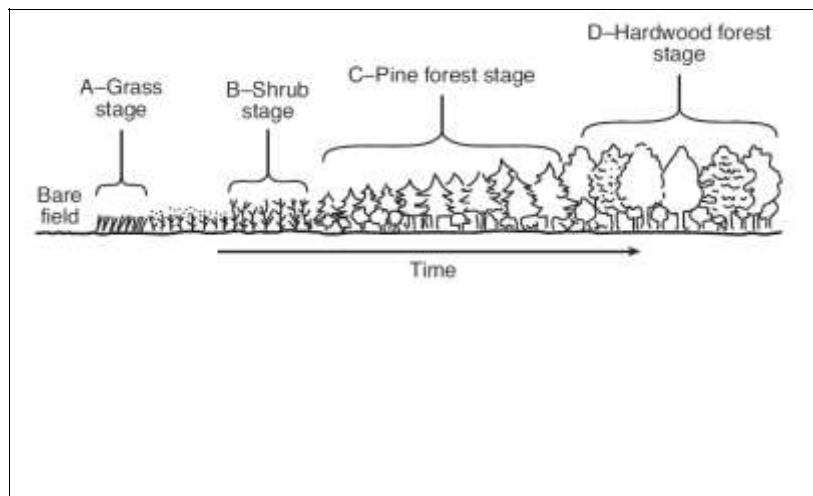
Data Base File Number: 878

Regents Date June2013-29.bmp

June2013

29 6/11/2013 S4K6

Answer 4





**ecology**

540. The chart show three ecological terms used to describe levels of organization on Earth. Which diagram best represents the relationship of these ecological terms?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 437

Regents Date Aug2012-35.bmp

Aug2012

35 8/17/2012 S4K1

Answer 1

A	ecosystem
B	population
C	biosphere

Which diagram best represents the relationship of these ecological terms?

(1)

(2)

(3)

(4)

**ecosystem**

541. Which ecological term includes everything represented in the illustration?

- (1) ecosystem
- (2) community
- (3) population
- (4) species

Data Base File Number: 730

Regents Date June2003-7.bmp

June2003

7 6/19/2003 S4K1

Answer 1



ecosystem

542. Base your answer to this question on the information and graph shown and on your knowledge of biology. The graph contains information about an ecosystem. The graph shows the carrying capacities of an ecosystem for three different species, 1, 2, and 3, that inhabit an area and the actual population sizes of these three different species in the area. Which species population would most likely have the greatest competition among its members?

(1) 1

(3) 3

(2) 2

(4) 4

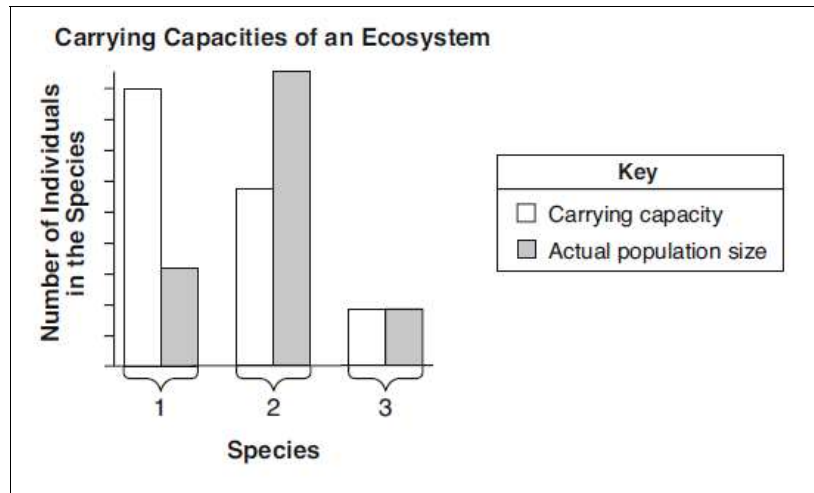
Data Base 425  
File Number:

Regents Date June2012-54.bmp

June2012

54 6/19/2012 S4K6

Answer 2



ecosystem

543. Base your answer to this question on the information given and on your knowledge of biology. A study was done to determine the effect of a temperature increase on an ocean ecosystem. Panels equipped with heating elements were placed on the ocean floor 50 feet below the surface in the Antarctic Ocean. Some of the panels were heated so that they were 1°C warmer than the water surrounding them. Others were heated to be 2°C warmer, and some were not heated. Over a period of nine months, the researchers returned to the site and documented the changes in marine life they observed. They noted that 1°C of warming resulted in a substantial change in marine life. One species of invertebrate grew rapidly and became the dominant species. It replaced multiple other species +1°C typically present in the area. The results were less consistent on the panels that were 2°C warmer than the water surrounding them. The photographs show the results observed on the three sets of panels. Based on this experiment, ONE result of the future warming of the Antarctic Ocean could be

- (1) an increase in the stability of the Antarctic ecosystem
- (2) the disruption of existing Antarctic marine food webs
- (3) marine organisms evolving more rapidly in order to compete for resources
- (4) the need to import predators to eat the tiny invertebrates

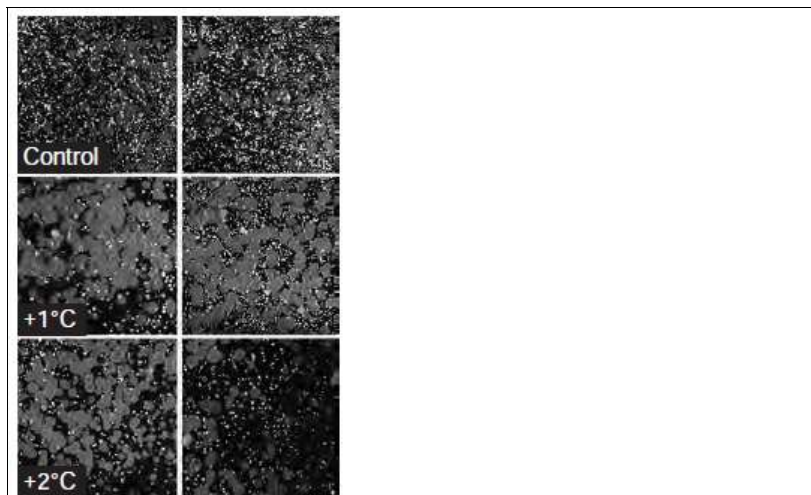
Data Base File Number: 1701

Regents Date Aug2024-40.bmp

Aug2024

40 8/20/2024 S4K6

Answer 2



ecosystem

544. The diagram shown represents an energy pyramid constructed from data collected from an aquatic ecosystem. Which statement best describes this ecosystem?

- (1) The ecosystem is most likely unstable.
- (2) Long-term stability of this ecosystem will continue.
- (3) The herbivore populations will continue to increase in size for many years.
- (4) The producer organisms outnumber the consumer organisms.

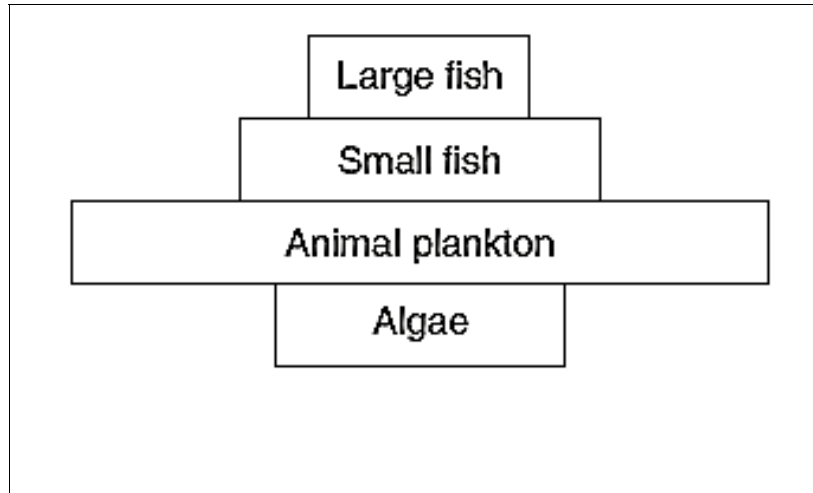
Data Base File Number: 31

Regents Date June07-28.bmp

June2007

28 6/20/2007 S4K6

Answer 1



ecosystem

545. The graph shows photosynthetic activity in a ecosystem over a 24-hour period. Data for a study on respiration in this ecosystem should be collected during

- (1) interval A, from only the producers in the ecosystem
- (2) intervals A and B, from only the consumers in the ecosystem
- (3) intervals A and B, from both the producers and consumers in the ecosystem
- (4) interval A only, from abiotic but not biotic components of the ecosystem

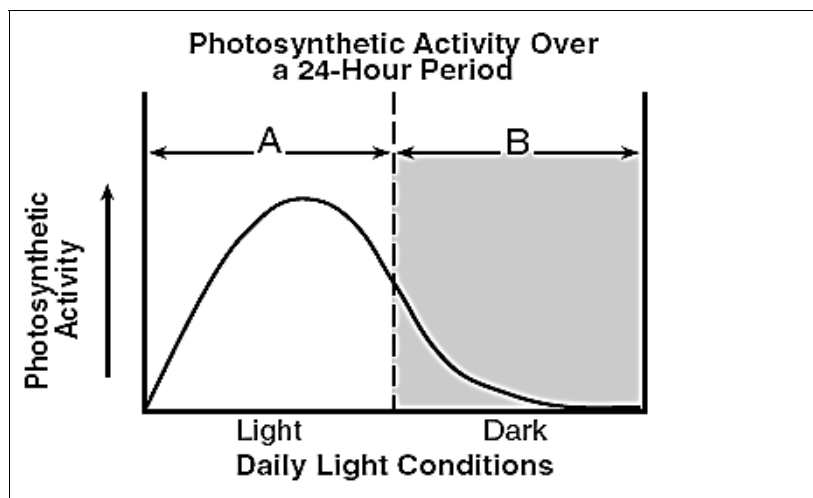
Data Base File Number: 14

Regents Date Aug07-33.bmp

Aug2007

33 8/16/2007 S4K5

Answer 3



**ecosystem**

546. The diagram shown represents relationships in a community. After a pathogen reduced the population of grasshoppers, the number of mice increased, while the numbers of toads and rabbits decreased. These changes in the community demonstrate that

- (1) ecosystems are shaped by nonliving factors
- (2) autotrophs convert solar energy into food
- (3) grasshoppers are producers that are essential for ecosystem stability
- (4) populations are linked with many others in the ecosystem

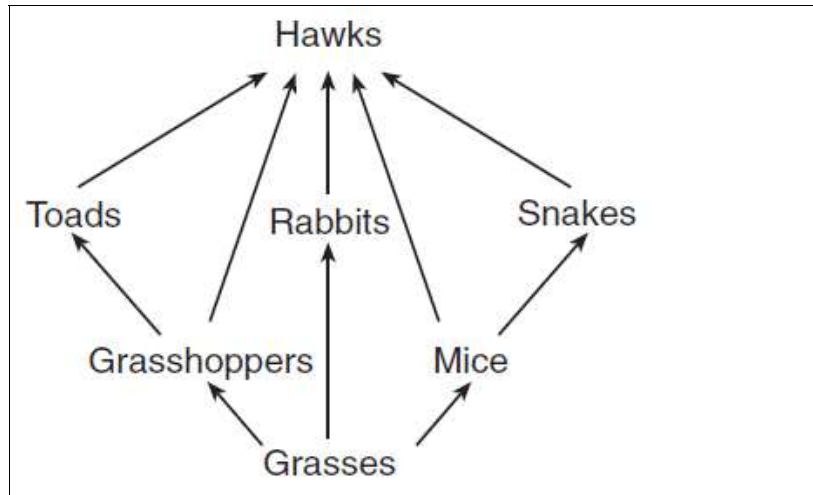
Data Base File Number: 1049

Regents Date August2015-34.b

Aug2015

34 8/12/2015 S4K1

Answer 4



**ecosystem**

547. Base your answer to this question on the chart shown and on your knowledge of biology. The chart shows seasonal changes in an ecosystem and the overall carrying capacity of the ecosystem. Why did the populations decrease between July and December?

- (1) population decrease was due to disease
- (2) population decrease was due to colder weather
- (3) population decrease was due to parasite infection
- (4) population decrease was due to a forest fire

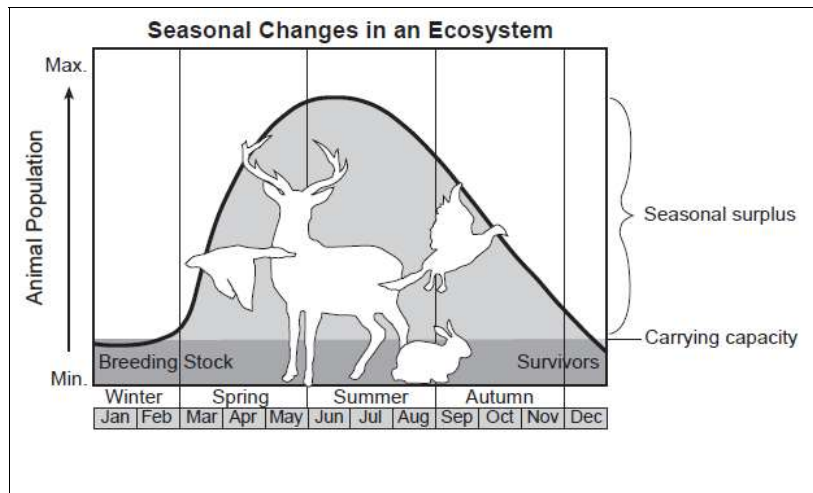
Data Base File Number: 1083

Regents Date Jan2016-57.bmp

Jan2016

57 1/27/2016 S4K1

Answer 2



ecosystem

548. An ecosystem is represented in the diagram shown. The organisms represented as "algae and seaweeds" are found in the area shown due to which factor?

- (1) pH
- (2) sediment
- (3) light intensity
- (4) colder temperature

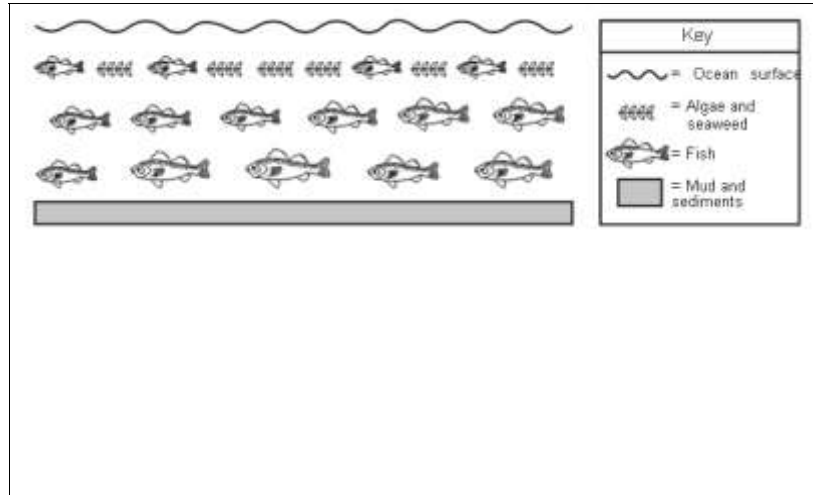
Data Base File Number: 196

Regents Date June09-41.bmp

June2009

41 6/18/2009 S4K6

Answer 3



ecosystem

549. The model shown summarizes one pathway of energy transfer in an ocean ecosystem. The type of organism represented by the box labeled "X" could be

- (1) algae
- (2) fungi
- (3) small fish
- (4) sea birds

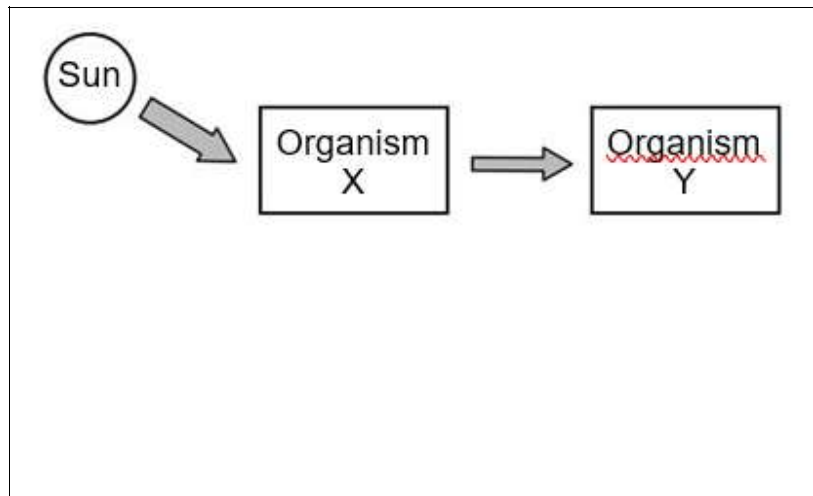
Data Base File Number: 1502

Regents Date Aug2022-17.bmp

Aug2022

17 8/17/2022 S4K1

Answer 1



**ecosystem**

550. The diagram shown represents many species of plants and animals and their surroundings. The diagram best represents

- (1) a population
- (2) a community
- (3) an ecosystem
- (4) the biosphere

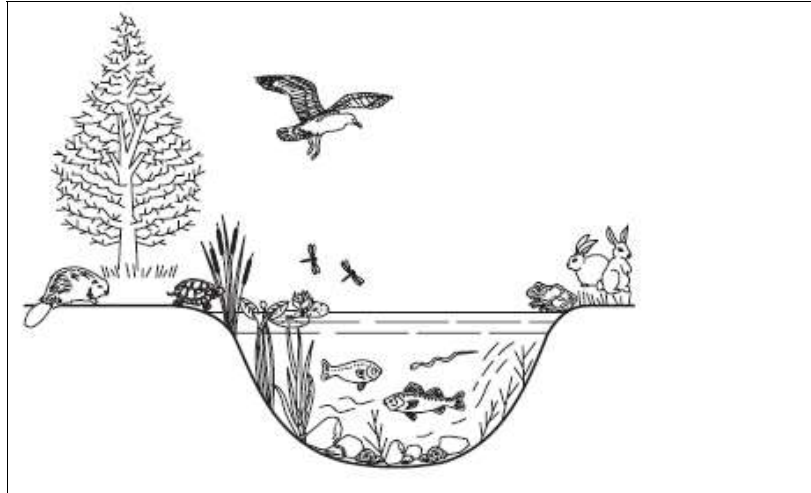
Data Base File Number: 359

Regents Date Aug2011-4.bmp

Aug2011

4 8/18/2011 S4K1

Answer 3



**ecosystem**

551. Which statement describes the ecosystem represented in the diagram as shown?

- (1) This ecosystem would be the first stage in ecological succession.
- (2) This ecosystem would most likely lack decomposers.
- (3) All of the organisms in this ecosystem are producers.
- (4) All of the organisms in this ecosystem depend on the activities of biological catalysts.

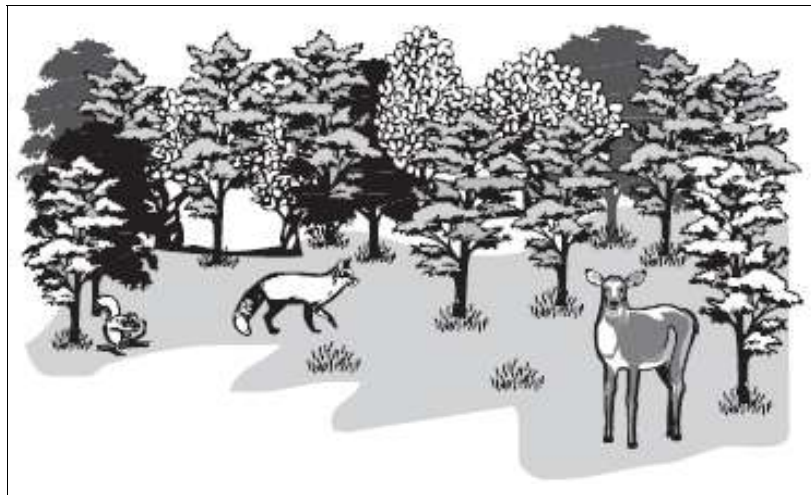
Data Base File Number: 568

Regents Date June2005-36.bmp

June2005

36 6/22/2005 S4K5

Answer 4





**ecosystem**

552. Base your answer to this question on the diagram below that shows some interactions between several organisms located in a meadow environment and on your knowledge of biology. A rapid DECREASE in the frog population results in a change in the hawk population. A possible change in the food relationship is that the hawk population will

- (1) decrease because there will be fewer snakes since there are fewer frogs for them to eat
- (2) will increase because there will be more grasshoppers for the shrews to eat and more shrews for the hawks to eat
- (3) both 1 and 2 are possible changes
- (4) 1 and 2 are incorrect changes

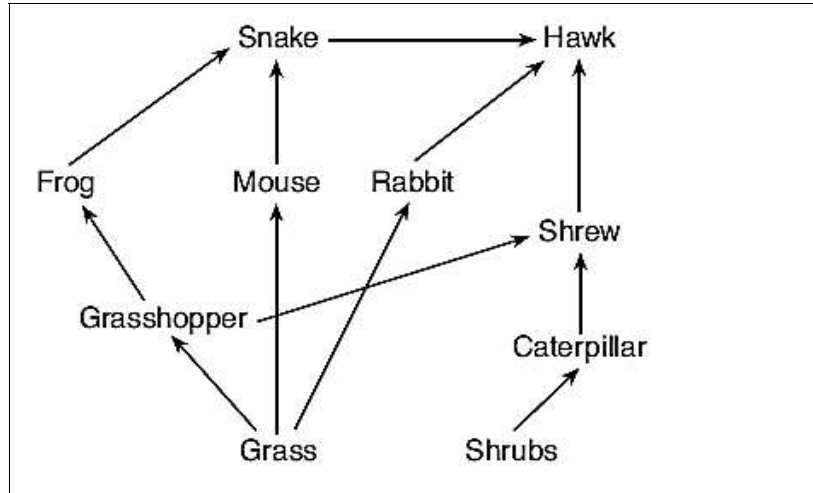
Data Base File Number: 109

Regents Date June08-47.bmp

June2008

48 6/24/2008 S4K1

Answer 3



**ecosystem**

553. Which diagram best illustrates the relationship between humans (H) and ecosystems (E)?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

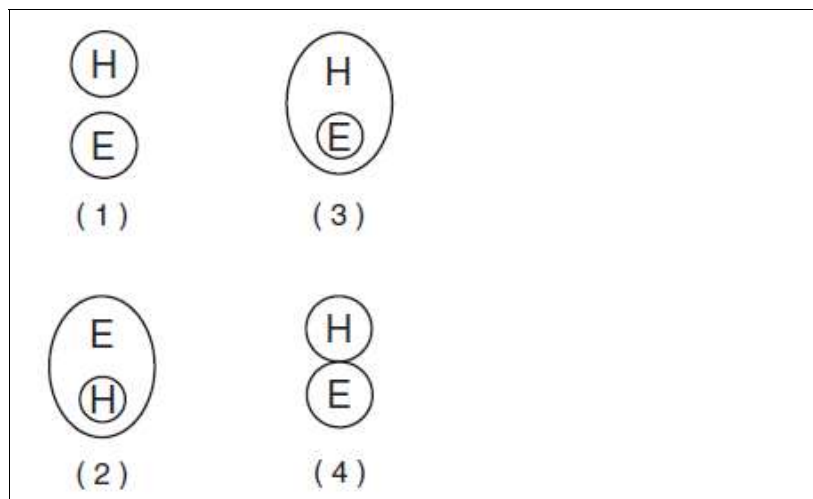
Data Base File Number: 562

Regents Date June2005-29.bmp

June2005

29 6/22/2005 S4K7

Answer 2





ecosystem

554. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents various levels of interaction between organisms in a prairie ecosystem. If the amount of carbon dioxide in the atmosphere were to decrease, which organism in the diagram would be one of the first affected by this change?

- (1) hawks
- (2) wheat
- (3) locusts
- (4) molds

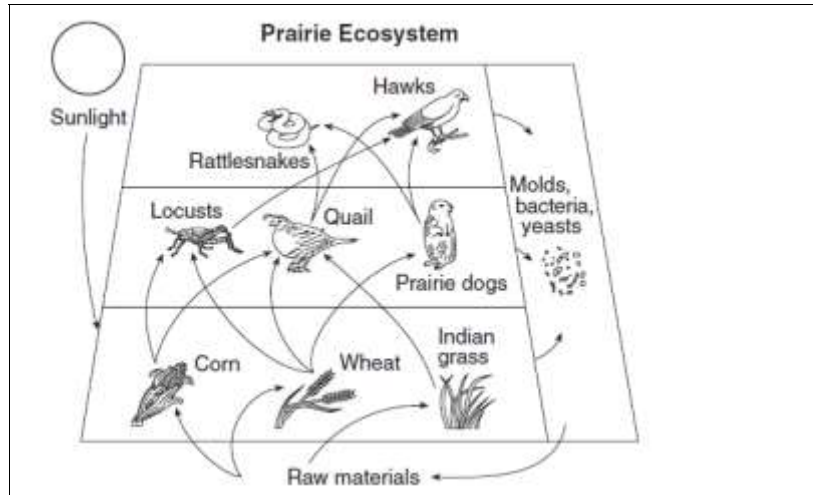
Data Base File Number: 390

Regents Date Jan2012-41.bmp

Jan2012

41 1/25/2012 S4K6

Answer 2



ecosystem

555. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents an energy pyramid for an ecosystem in the Australian outback. Wombats are classified as herbivores because they can

- (1) get energy from the Sun
- (2) provide energy for the kookaburras
- (3) get nutrition from the grasses and sedges
- (4) provide nutrition for the kangaroos

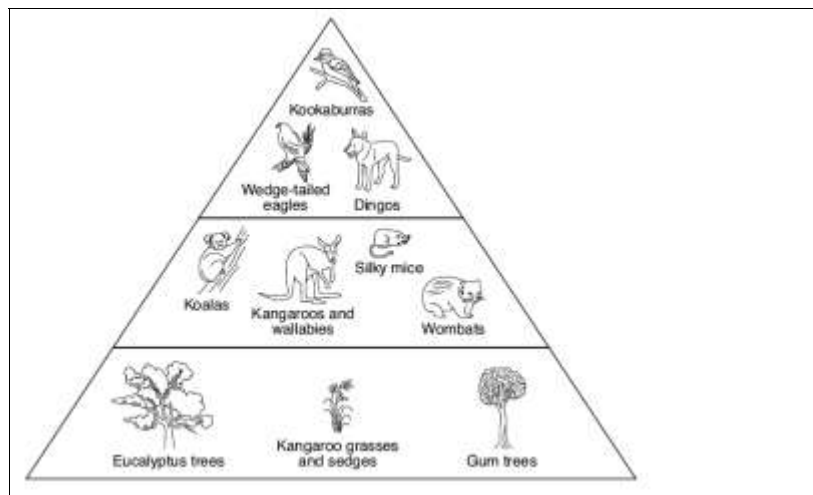
Data Base File Number: 418

Regents Date June2012-41.bmp

June2012

41 6/19/2012 S4K1

Answer 3



**ecosystem**

556. Base your answers to this question on the information shown and on your knowledge of biology. An ecologist made some observations in a forest ecosystem over a period of several days. Some of the data collected are shown in the data table. Which statement describes how one biotic factor of the forest uses one of the abiotic factors listed in the data table?

- (1) Trees absorb water as a raw material for photosynthesis.
- (2) Insects eat and digest the leaves of trees.
- (3) Erosion of sedimentary rock adds phosphorous to the soil.
- (4) Fungi release oxygen from the trees back into the air.

Data Base File Number: 199

Regents Date June09-49.bmp

June2009

49 6/18/2009 S4K1

Answer 2

Date	Observed Feeding Relationships	Ecosystem Observations
8/2	<ul style="list-style-type: none"> <li>• white-tailed deer feeding on maple tree leaves</li> <li>• woodpecker feeding on insects</li> <li>• salamander feeding on insects</li> </ul>	<ul style="list-style-type: none"> <li>• 2 cm of rain in 24 hours</li> </ul>
8/5	<ul style="list-style-type: none"> <li>• fungus growing on a maple tree</li> <li>• insects feeding on oak trees</li> </ul>	<ul style="list-style-type: none"> <li>• several types of sedimentary rock are in the forest</li> </ul>
8/8	<ul style="list-style-type: none"> <li>• woodpecker feeding on insects</li> <li>• red-tailed hawk feeding on chipmunk</li> </ul>	<ul style="list-style-type: none"> <li>• air contains 20.8% oxygen</li> </ul>
8/11	<ul style="list-style-type: none"> <li>• chipmunk feeding on insects</li> <li>• insect feeding on maple tree leaves</li> <li>• chipmunk feeding on a small salamander</li> </ul>	<ul style="list-style-type: none"> <li>• soil contains phosphorous</li> </ul>

**ecosystem**

557. Base your answer to this question on the lake ecosystem represented as shown and on your knowledge of biology. Which organisms represented in the diagram provides the vital link for the transfer of energy from the Sun to the other organisms in the ecosystem?

- (1) primary consumers
- (2) secondary consumers
- (3) autotrophs
- (4) heterotrophs

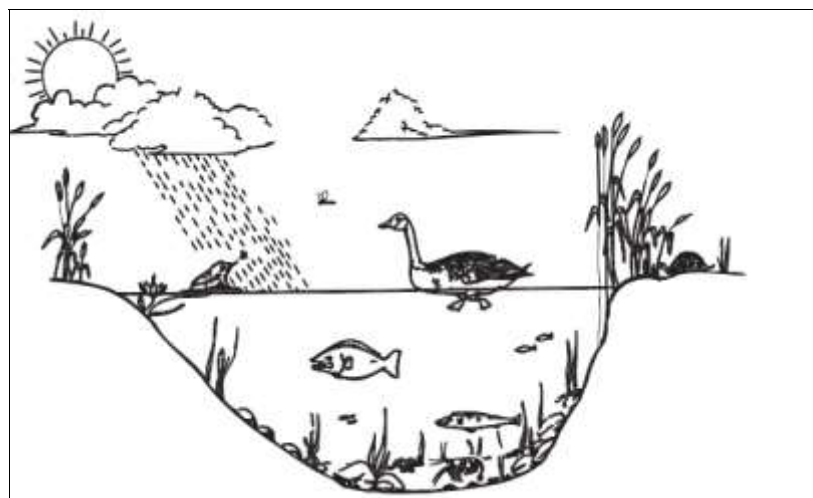
Data Base File Number: 550

Regents Date Jan2005-51.bmp

Jan2005

51 1/28/2005 S4K6

Answer 3



## ecosystem

558. Which statement concerning the producers in the ocean ecosystem, shown in the diagram, is correct?
- (1) An increase in the types of producers will most likely decrease the available energy for the squid.
  - (2) A producer in this ecosystem is the zooplankton.
  - (3) If all the producers in this ecosystem are destroyed, the number of heterotrophs will increase, but the ecosystem will reach a new equilibrium.
  - (4) Since there is only one group of producers their numbers must be large enough to supply the energy for the rest of the food web.

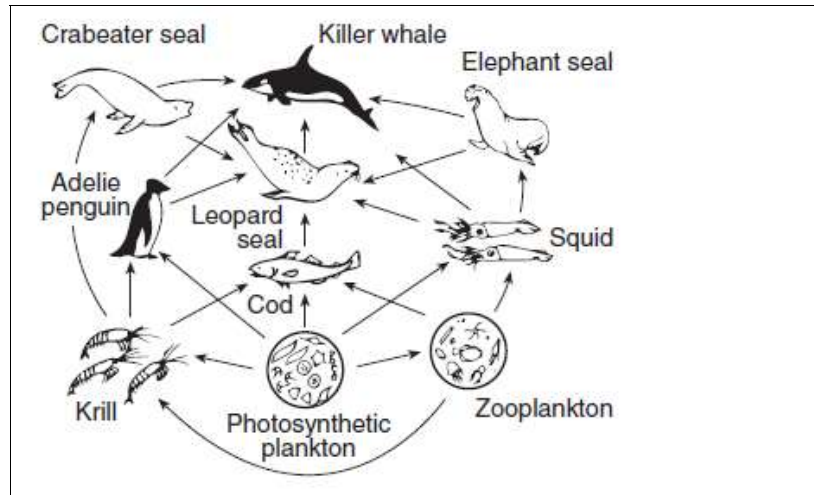
Data Base File Number: 762

Regents Date Aug2003-30.bmp

Aug2003

30 8/13/2003 S4K6

Answer 4



## ecosystem

559. The diagram shown represents interactions between organisms in a stable ecosystem. Which statement correctly describes organisms in this ecosystem?

- (1) Organisms in level B obtain their energy directly from the Sun.
- (2) Organisms in level C obtain their nutrients directly from organisms in level D.
- (3) Organisms in level A are herbivores.
- (4) Organisms in level D are heterotrophic.

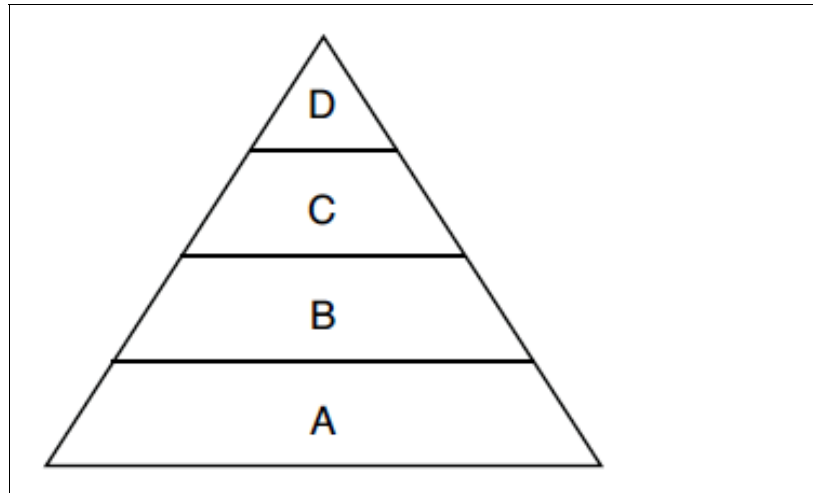
Data Base File Number: 400

Regents Date June2012-2.bmp

June2012

2 6/19/2012 S4K1

Answer 4



## ecosystem

560. The graphs show dissolved oxygen content, sewage waste content, and fish populations in a lake between 1950 and 1970. What happened to the amount of dissolved oxygen and the number of fish species as the amount of sewage waste increased?

- (1) oxygen levels increased and number of fish species increased
- (2) oxygen levels decreased and number of fish species decreased
- (3) oxygen levels increased and number of fish species decreased
- (4) oxygen levels decreased and sewage levels increased

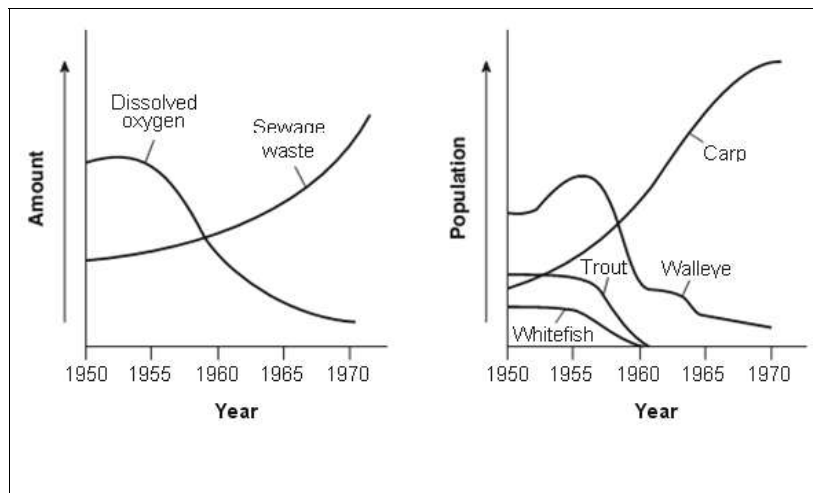
Data Base File Number: 197

Regents Date June09-42.bmp

June2009

42 6/18/2009 S4K5

Answer 2



**ecosystem**

561. Base your answer to this question on the passage given which describes an ecosystem in New York State and on your knowledge of biology. -- The Pine Bush ecosystem near Albany, New York, is one of the last known habitats of the nearly extinct Karner Blue butterfly. The butterfly's larvae feed on the wild green plant, lupine. The larvae are in turn consumed by predatory wasps. The four groups shown represent other organisms living in this ecosystem. The Karner Blue larvae belong in which group?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 494

Regents Date June2006-40.bmp

June2006  
40 6/21/2006 S4K6

Answer 2

Group A	Group B	Group C	Group D
algae mosses ferns pine trees oak trees	rabbits tent caterpillars moths	hawks moles hognosed snakes toads	soil bacteria molds mushrooms

**ecosystem**

562. On which day did the population represented in the graph shown reach the carrying capacity of the ecosystem?

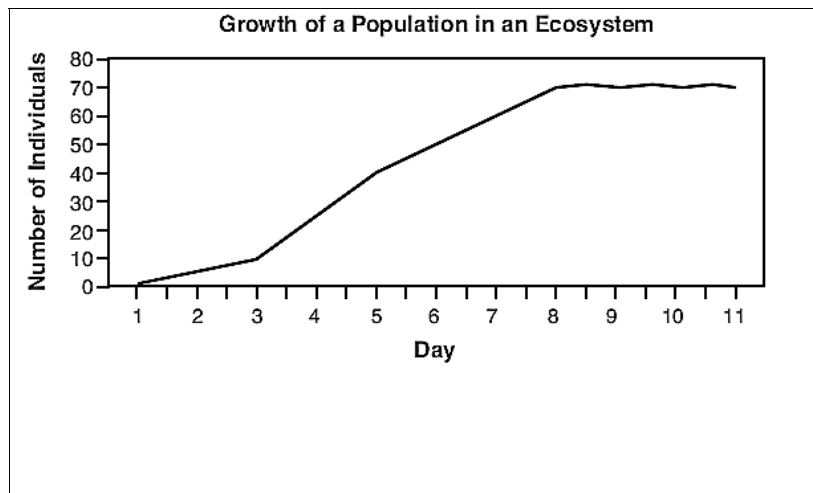
- (1) day 11
- (2) day 8
- (3) day 3
- (4) day 5

Data Base File Number: 107

Regents Date June08-42.bmp

June2008  
42 6/24/2008 S4K1

Answer 2



ecosystem

563. Base your answer to this question on the information given in the chart and on your knowledge of biology. Every population is linked, directly or indirectly, with many others in an ecosystem. The table shows the size of the moose and wolf populations that live on an island in Lake Superior. What is one possible ecological reason, other than human activity, for the change in the moose population between 1975 and 1980?

- (1) There were more wolves, so the moose were being killed off.
- (2) There may have been less food available for the moose, since the moose population had been growing for 20 years.
- (3) Disease may have affected the moose population.
- (4) All of the above could be correct.

Data Base File Number: 374

Regents Date Aug2011-65.bmp

Aug2011

66 8/18/2011 S4K6

Answer 4

Year	Population Size	
	Moose	Wolves
1960	610	22
1965	733	28
1970	1295	18
1975	1355	41
1980	910	50
1985	1115	22
1990	1216	15
1995	2422	16
2000	850	29

ecosystem

564. A pond ecosystem is represented in the diagram as shown. Energy for this ecosystem originally comes from

- (1) water
- (2) consumers
- (3) sunlight
- (4) plants

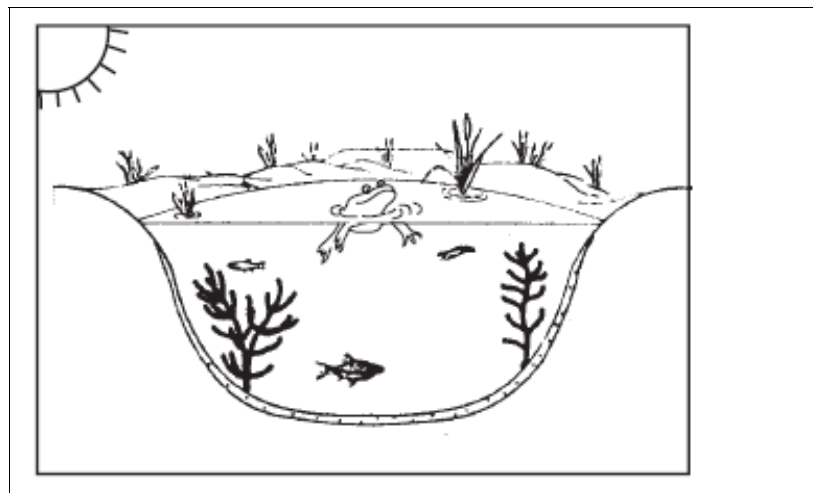
Data Base File Number: 833

Regents Date Jan2002-22.bmp

Jan2002

22 1/23/2002 S4K6

Answer 3



**ecosystem**

565. The diagram shown represents relationships in an ecosystem. What is the primary source of energy in this environment?

- (1) cellular respiration in the plants
- (2) energy from minerals in the soil
- (3) fossil fuels
- (4) solar energy

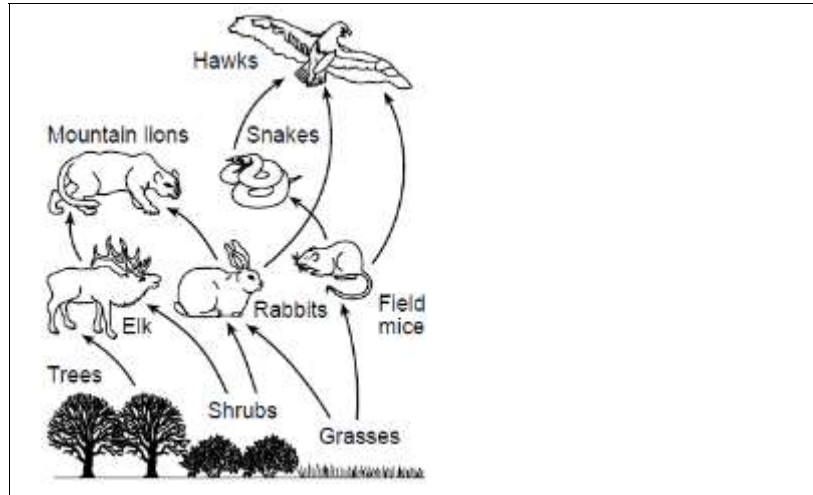
Data Base File Number: 1244

Regents Date June2018-6.bmp

June2018

6 6/13/2018 S4K6

Answer 4



**ecosystem**

566. A pond ecosystem is shown in the diagram, Which statement describes an interaction that helps maintain the dynamic equilibrium of this ecosystem?

- (1) The frogs make energy available to this ecosystem through the process of photosynthesis.
- (2) The algae directly provide food for both the rotifers and the catfish.
- (3) The green-backed heron provides energy for the mosquito larvae.
- (4) The catfish population helps control the populations of water boatman and water fleas.

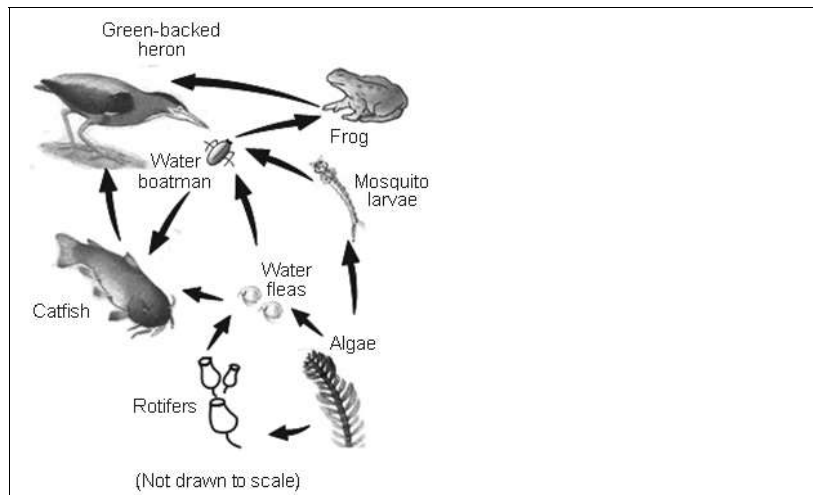
Data Base File Number: 190

Regents Date June09-34.bmp

June2009

34 6/18/2009 S4K1

Answer 4





ecosystem

567. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web in an ecosystem. If the population of hawks in this area increases, their prey populations might decrease. Later, with fewer prey, the hawk population might decrease. The prey populations might then increase. This is an example of

- (1) an ecosystem that is completely out of balance
- (2) how ecosystems maintain stability over time
- (3) interaction between biotic and abiotic factors within an ecosystem
- (4) ecological succession in an ecosystem

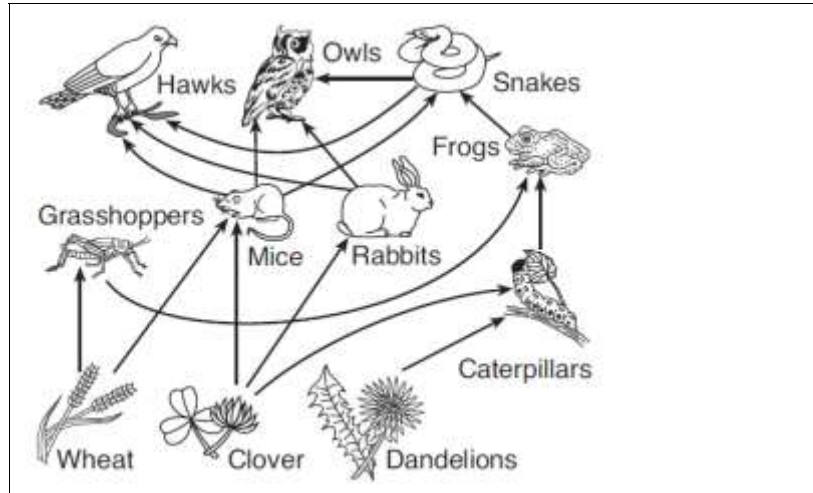
Data Base File Number: 880

Regents Date June2013-32.bmp

June2013

32 6/11/2013 S4K6

Answer 2



ecosystem

568. The graph shown represents the populations of two different species in an ecosystem over a period of several years. Which statement is a possible explanation for the changes shown?

- (1) Species A is better adapted to this environment.
- (2) Species A is a predator of species B.
- (3) Species B is better adapted to this environment.
- (4) Species B is a parasite that has benefited species A.

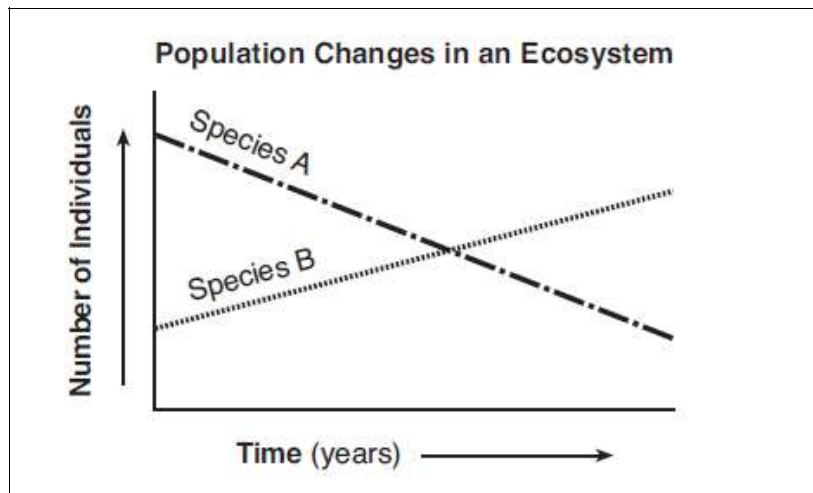
Data Base File Number: 261

Regents Date June2010-32.bmp

June2010

32 6/16/2010 S4K1

Answer 3





ecosystem

569. The diagram shown represents interactions that occur between some organisms in an ecosystem. Which factor would most likely cause an increase in the number of frogs?

- (1) an increase in the number of deer
- (2) a decrease in the amount of grasses
- (3) an increase in the number of snakes
- (4) a decrease in the amount of trees

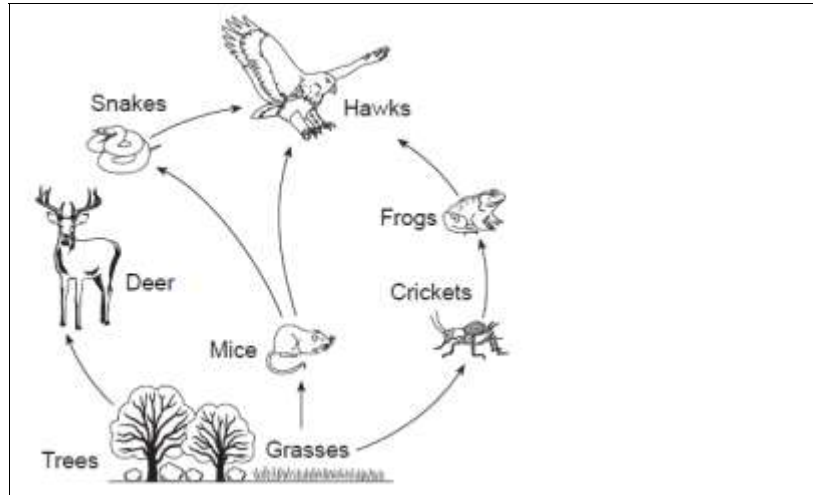
Data Base File Number: 1073

Regents Date Jan2016-26.bmp

Jan2016

26 1/27/2016 S4K6

Answer 3



ecosystem

570. What is the primary source of energy for all the organisms in the ecosystem represented in the diagram?

- (1) photosynthesis in the producers
- (2) respiration in the heterotrophs
- (3) light energy from the Sun
- (4) light energy from the Sun

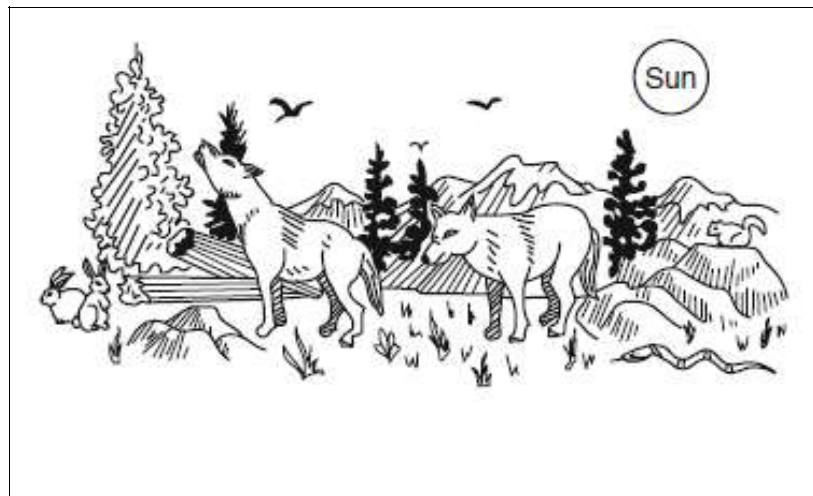
Data Base File Number: 433

Regents Date Aug2012-19.bmp

Aug2012

19 8/17/2012 S4K5

Answer 3



**ecosystem**

571. A proposal for a new manufacturing plant has been brought to a town’s planning board. A committee has been assigned the task of presenting the positive and negative effects that this new facility could have on the town and its ecosystem. Which row of the chart most accurately states possible effects of building this manufacturing plant?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1604

Regents Date Aug2023-29.bmp

Aug2023

29 8/17/2023 S4K7

Answer 1

Row	Positive	Negative
(1)	more jobs for residents	increased demand for energy
(2)	more space available for farming	people will have to move
(3)	increased use of fossil fuels	more pollution
(4)	more tax revenue for the town	decrease in the unemployment rate

**ecosystem / altered**

572. The diagram shown represents factors that affect New York State ecosystems. An increase in human activity at X would most likely result in

- (1) a decrease in rainfall in the area
- (2) a decrease in available carbon dioxide
- (3) an increase in air pollution in the area
- (4) an increase in the supply of fossil fuels

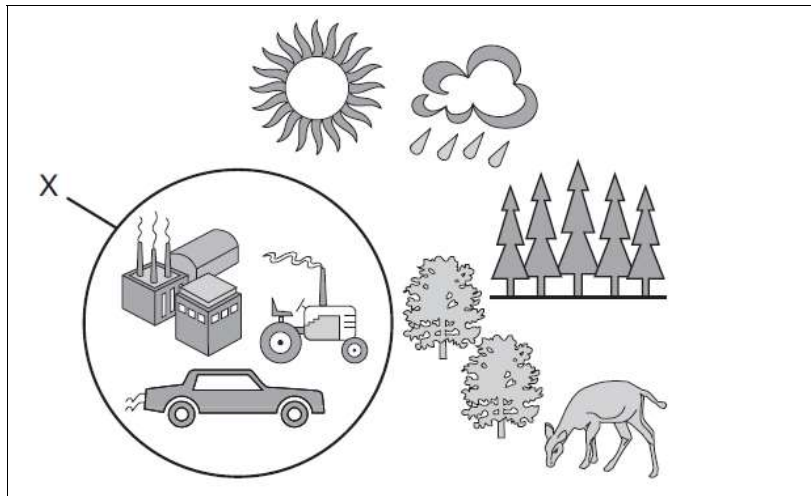
Data Base File Number: 873

Regents Date June2013-4.bmp

June2013

4 6/11/2013 S4K7

Answer 3



## ecosystem / altered

573. A list of environmental issues is shown. All of these issues are the result of

- |   |   |
|---|---|
| (1) introduction of nonnative species into stable ecosystems      | (3) preservation of habitats due to human population growth |
| (2) genetic engineering without using adequate safety precautions | (4) use of foreign species to replace native predators      |

Data Base 997  
File Number:

Regents Date Jan2015-40.bmp

Jan2015

40 2/26/2015 S4K7

Answer 1

- Rabbits transported from Europe overrun and deplete farmlands in Australia.
- Many areas in the southeastern United States are overgrown with the kudzu plant from Asia.
- In parts of New York State, bluebirds must compete with starlings originally brought here from England.

## ecosystem / altered

574. Hydrilla, a plant native to Central Africa, was widely used in home aquaria. Hydrilla was often dumped with aquarium water into drains, sewers, or ponds. It then thrived and has become an invasive species, disrupting aquatic ecosystems from Florida through the northeast United States. Removing Hydrilla from these ecosystems will most likely require either physically removing it or adding chemicals to the affected waters to kill it. The result of the introduction of Hydrilla into native ecosystems in the United States has shown that

- (1) chemical controls will now be necessary to maintain every stable ecosystem
- (2) Hydrilla will not continue to expand beyond one year because it is not native to the United States
- (3) organisms in ecosystems of the United States can eventually build up an immunity to Hydrilla
- (4) when humans alter ecosystems by adding specific organisms, serious consequences can result

Data Base 1535  
File Number:

Regents Date Jan2023-8.bmp

Jan2023

8 1/24/2023 S4K7

Answer 4



Source: South Carolina Department of Natural Resources

**ecosystem / carrying capacity**

575. Which graph represents a population that grew and is maintained at the carrying capacity of its ecosystem?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

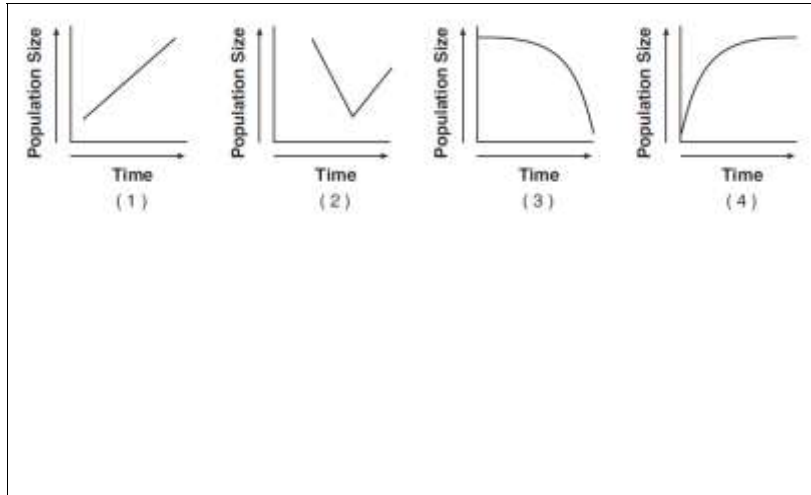
Data Base File Number: 214

Regents Date August2009-29.b

Aug2009

30 8/13/2009 S4K6

Answer 4



**ecosystem / stable**

576. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents interactions between organisms in an ecosystem. Which statement correctly describes an interaction that contributes to the stability of this ecosystem?

- (1) Species E is not affected by the activity of species A.
- (2) Species E is not affected by the activity of species A.
- (3) Species C recycles nutrients from species B and D to obtain energy.
- (4) Species D is directly dependent on the autotrophic activity of species B.

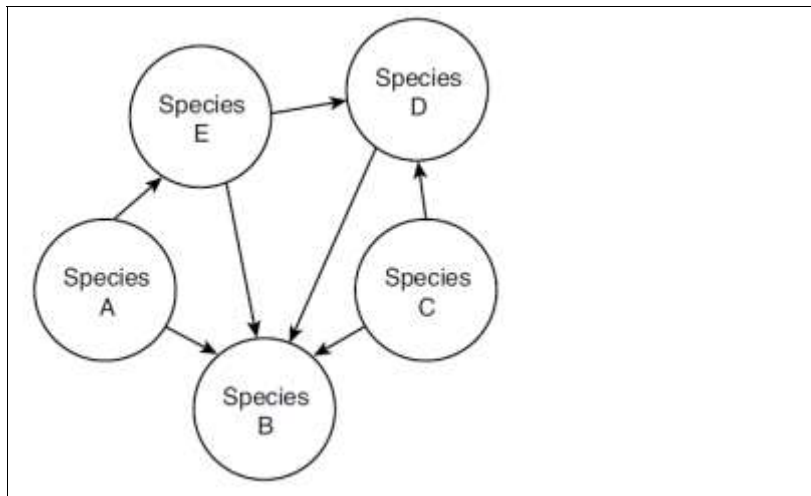
Data Base File Number: 1431

Regents Date June2021-34.bmp

June2021

35 6/22/2021 S4K1

Answer 2



ecosystem / stable

577. The graph shows changes in the stability of an ecosystem over a period of time. Which statement best describes the change in ecosystem stability shown in the graph?

- (1) A stable ecosystem can be altered, then it can recover to a point of stability
- (2) An ecosystem remains unchanged as its stability decreases.
- (3) The stability of an ecosystem remains unchanged but its biodiversity decreases.
- (4) A stable ecosystem cannot recover after it is altered.

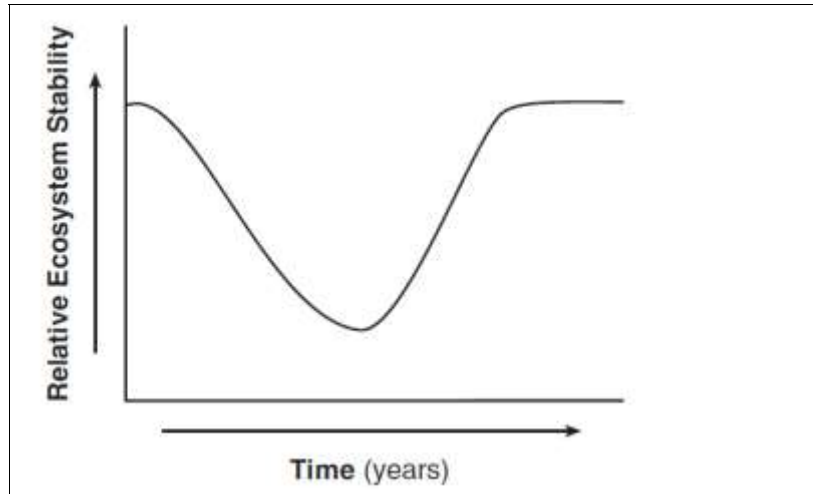
Data Base File Number: 285

Regents Date Aug2010-35.bmp

Aug2010

35 8/18/2010 S1K3

Answer 1



ecosystem / stable

578. Energy transfers in a natural ecosystem are represented in the diagram as shown. Which statement about this ecosystem is correct?

- (1) A reduction in the number of species present would most likely upset the stability of this ecosystem.
- (2) This ecosystem would not be affected if decomposers did not perform their function.
- (3) This ecosystem lacks producer organisms.
- (4) There are most likely more foxes than rabbits in this ecosystem.

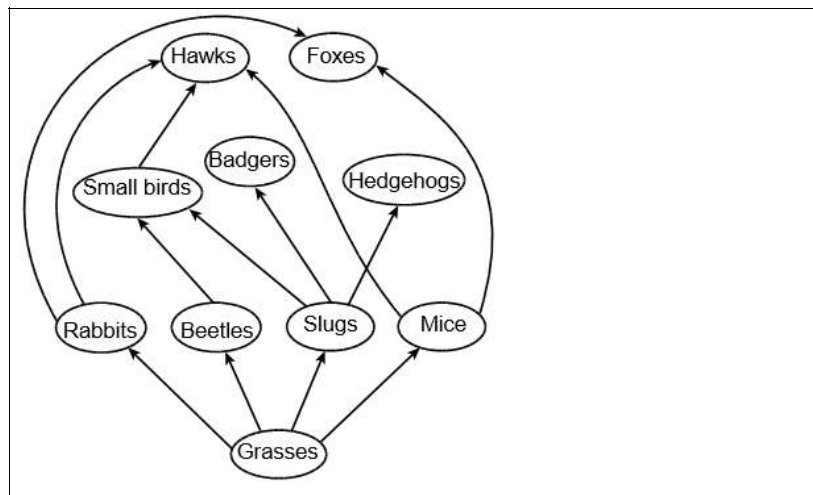
Data Base File Number: 1656

Regents Date June2024-4.bmp

June2024

4 6/14/2024 S4K1

Answer 1



**ecosystem / stable**

579. Changes in an ecosystem over a long period of time are shown in the diagram. These changes will most likely lead to a

- (1) stable ecosystem that can last for many years
- (2) loss of heterotrophs that cannot be recovered
- (3) long-term rise in environmental temperatures
- (4) forest consisting of only producers and decomposers

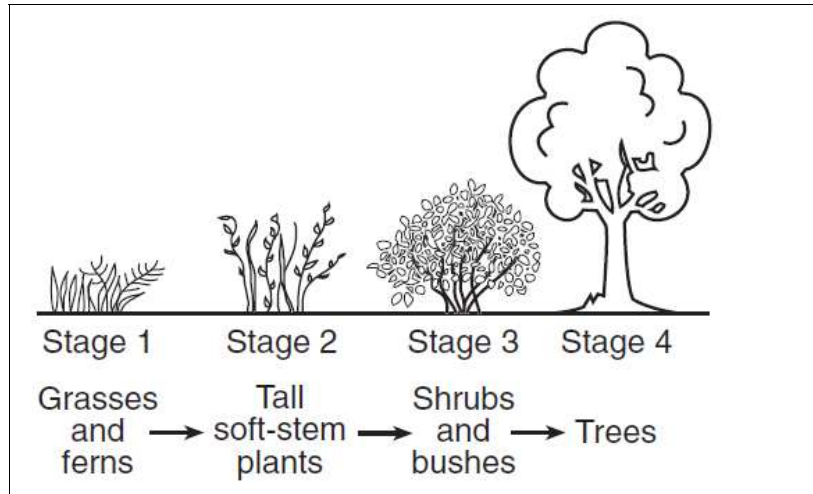
Data Base File Number: 281

Regents Date Aug2010-24.bmp

Aug2010

24 8/18/2010 S4K1

Answer 1



**ecosystem / stable**

580. In New York State, it is common for farmers to plant large fields of one crop, such as the cornfield shown in the photograph. A NEGATIVE outcome of this practice is that

- (1) the corn will interbreed with weeds in the area
- (2) new predators will be introduced into the ecosystem
- (3) the stability of the ecosystem will be reduced
- (4) new species of insect-resistant corn will evolve

Data Base File Number: 1503

Regents Date Aug2022-20.bmp

Aug2022

20 8/17/2022 S4K7

Answer 3



Source: [https://www.123rf.com/photo\\_40944515\\_corn-fields.html](https://www.123rf.com/photo_40944515_corn-fields.html)



**ecosystem / stable**

581. The chart shows the environmental functions that some organisms perform in a stable ecosystem. How would a decrease in the number of organisms that perform these functions most likely affect the ecosystem?

- (1) The interactions between other organisms would stop immediately.
- (2) The functions carried out by these organisms would no longer be necessary.
- (3) The ecosystem would remain stable.
- (4) The ecosystem would become less stable.

Data Base File Number: 850

Regents Date June2001-34.bmp

June2001

34 6/15/2001 S4K6

Answer 4

Environmental Functions	Performed By
Pollination	bees, bats
Biodegradation	microorganisms
Soil aeration	earthworms
Recycling of atoms	soil bacteria
CO <sub>2</sub> – O <sub>2</sub> exchange	plants
Water storage	plants

**ecosystem / stable**

582. The bar graph shows the number of species in four pond ecosystems. Based on this information, which ecosystem is likely to be the most stable?

- (1) A
- (2) B
- (3) C
- (4) D

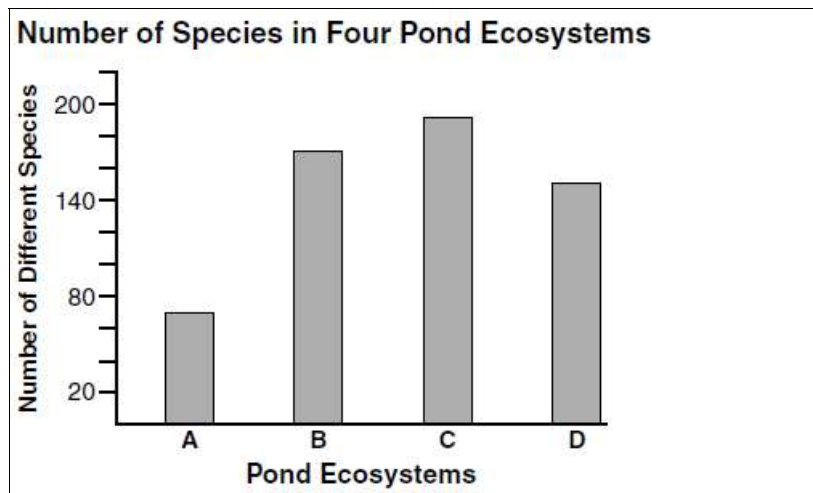
Data Base File Number: 1230

Regents Date Jan2018-17.bmp

Jan2018

17 1/22/2018 S4K6

Answer 3





ecosystem / stable

583. Base your answer to this question on the information given and on your knowledge of biology. Pikas are small mammals found in the grassland ecosystems of the Tibetan plateau. Pikas are prey for many of the predators also inhabiting the Tibetan grasslands, which serves as an important watershed for the area. This watershed drains large amounts of groundwater during the rainy season. Pikas have large burrow systems that help to quickly drain the groundwater. The burrows also serve as nesting sites for numerous bird species. Because they compete with livestock for grass, many people want the pikas totally removed from the Tibetan plateau. ----- If the pika populations are completely removed from the grasslands of the Tibetan plateau, the most likely result will be that the grassland ecosystems will become

- (1) unstable, because predators will have fewer prey, the birds will have fewer nesting sites, and groundwater supplies will be disrupted
- (2) more stable, because the pikas will be replaced by other species, the birds will adapt to nesting above ground, and the soil will become more fertile since it is not drained by groundwater
- (3) unstable, because predators will migrate to nearby ecosystems, birds will nest in nearby trees, and other small animals will make burrows in the soil
- (4) more stable, because the pikas will no longer be eating the grasses, the birds will migrate to other ecosystems during the nesting season, and small lakes will form because the water will not drain without the pika burrows

Data Base 1575  
File Number:

Regents Date June2023-35.bmp  
June2023  
35 6/14/2023 S4K1

Answer 1



Source: <https://www.theguardian.com/environment/2016/aug/26>

## electrophoresis

584. Base your answer to this question on the information and diagram shown and on your knowledge of biology. DNA samples were collected from four children. The diagram shown represents the results of a procedure that separated the DNA in each sample. Identify the procedure used to obtain these results

- (1) staining (2) electrophoresis (3) electron microscopy (4) light microscopy

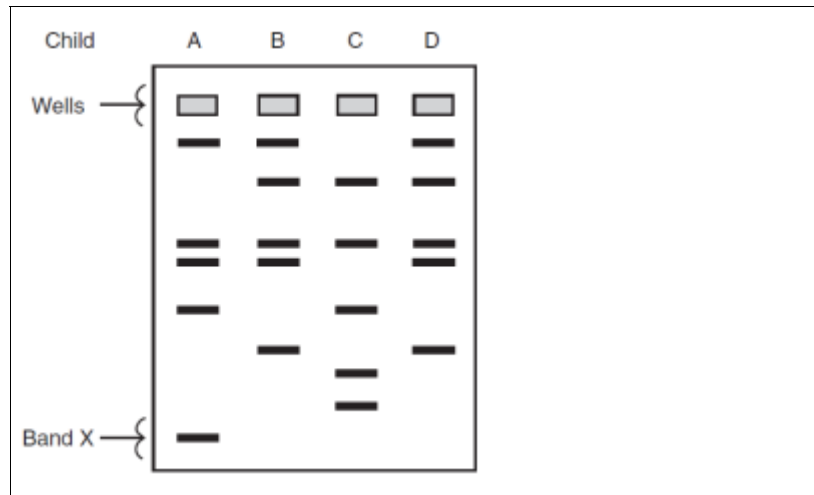
Data Base File Number: 297

Regents Date Aug2010-63.bmp

Aug2010

63 8/18/2010 LABS

Answer 2



## electrophoresis

585. Base your answer to this question on the diagram shown and on your knowledge of biology. Tests were performed to help identify the person who committed a crime. Lane D contained DNA from evidence found at the crime scene. Lanes A, B, and C contained DNA from each of the three suspects. What technique was used to obtain the results seen in the diagram?

- (1) electrophoresis (2) paper chromatography (3) Gram staining (4) simple staining

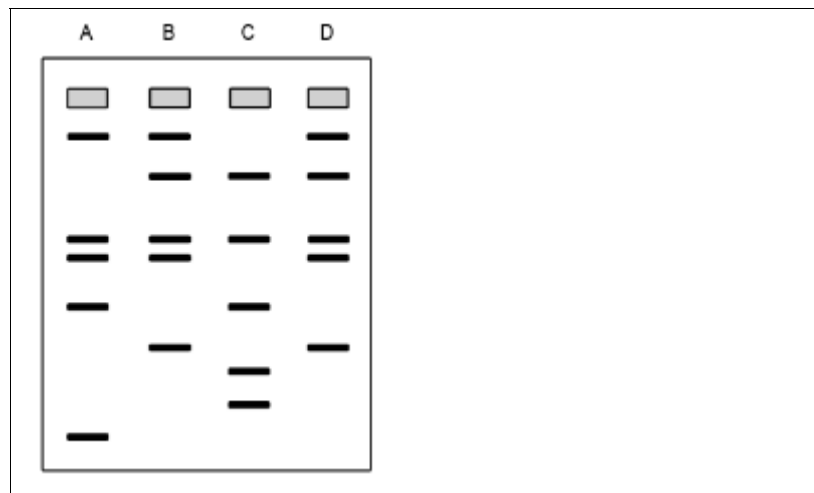
Data Base File Number: 1533

Regents Date Aug2022-83.bmp

Aug2022

83 8/17/2022 LAB1

Answer 1



## electrophoresis

586. Base your answer to this question on the information and diagram given and on your knowledge of biology. The DNA of three different species of birds was analyzed to help determine if there is an evolutionary relationship between these species. The diagram shows the results of this analysis. Which technique could be used to separate the DNA fragments to produce the patterns shown in the diagram?

- (1) electrophoresis, only  
 (2) gel electrophoresis, only  
 (3) electrophoresis or gel electrophoresis  
 (4) insufficient information is given

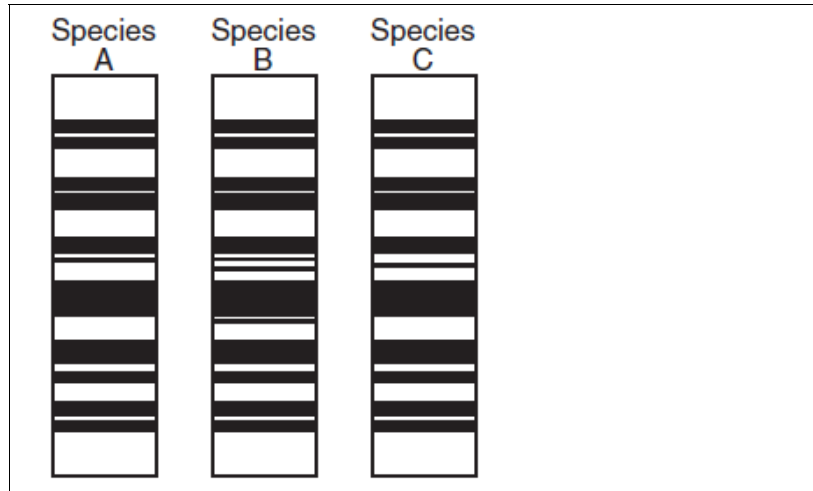
Data Base File Number: 528

Regents Date Aug2006-62.bmp

Aug2006

62 8/16/2006 LAB1

Answer 3



## electrophoresis

587. Base your answer to this question on the information and diagram shown and on your knowledge of biology. An unknown sample of DNA found at a crime scene was compared to DNA samples taken from three individuals. The results of the technique used to compare the samples are represented in the diagram. What factor causes the DNA fragments to move in this technique?

- (1) Attraction between opposite electrical charges.  
 (2) Attraction between similar DNA.  
 (3) Breakdown of DNA.  
 (4) Attraction between nitrogen bases A and T.

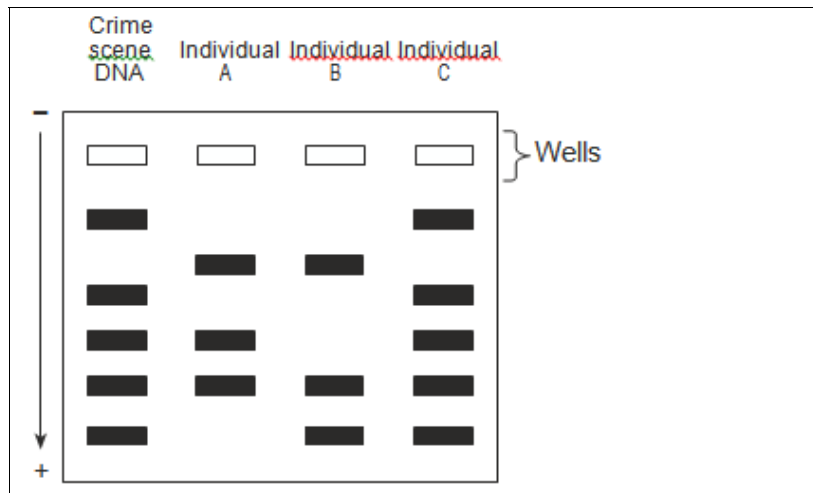
Data Base File Number: 1196

Regents Date June2017-85.bmp

June2017

85 6/14/2017 LAB1

Answer 1



**electrophoresis**

588. Base your answer to this question on the information given and on your knowledge of biology. Caretakers at a zoo are trying to determine which of two male tigers fathered the newest cub. They obtained DNA from the tiger cub, the mother tiger, and the two male tigers. The DNA was analyzed. The results of the analysis are shown in the chart given. Which male tiger is the father of the newborn cub?

- (1) Male 1
- (2) Male 2
- (3) Male 1 or Male 2
- (4) The father cannot be determined based on the data shown

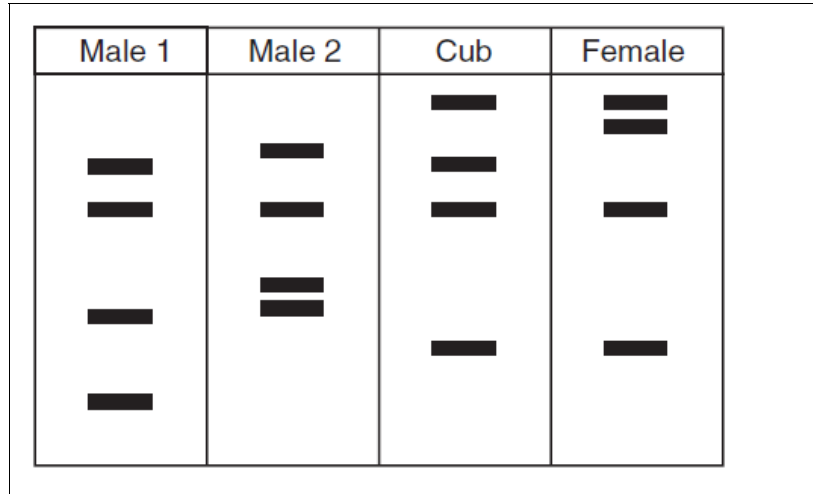
Data Base File Number: 1063

Regents Date August2015-76.b

Aug2015

76 8/12/2015 LAB1

Answer 1



**embryo**

589. The diagram shown represents the processes leading to the formation of a human embryo. The correct sequence for processes 1, 2, and 3 represented in the diagram is

- (1) 1
- (2) 2
- (3) 3
- (4) 4

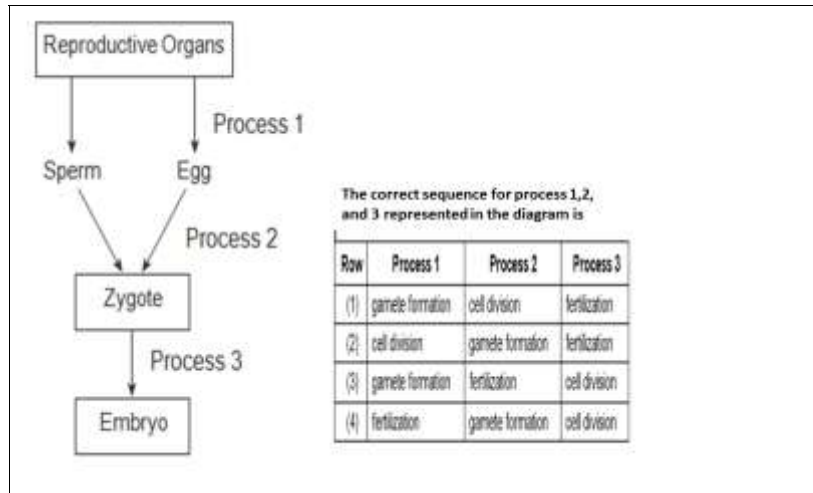
Data Base File Number: 1110

Regents Date June2016-43.bmp

June2016

43 6/15/2016 S4K4

Answer 3



## embryology

590. Base your answer to this question on the diagram shown, which represents some stages in the development of an embryo, and on your knowledge of biology. If cell A has 46 chromosomes, how many chromosomes will most likely be found in each cell of stage G?

(1) 23

(3) 69

(2) 46

(4) 92

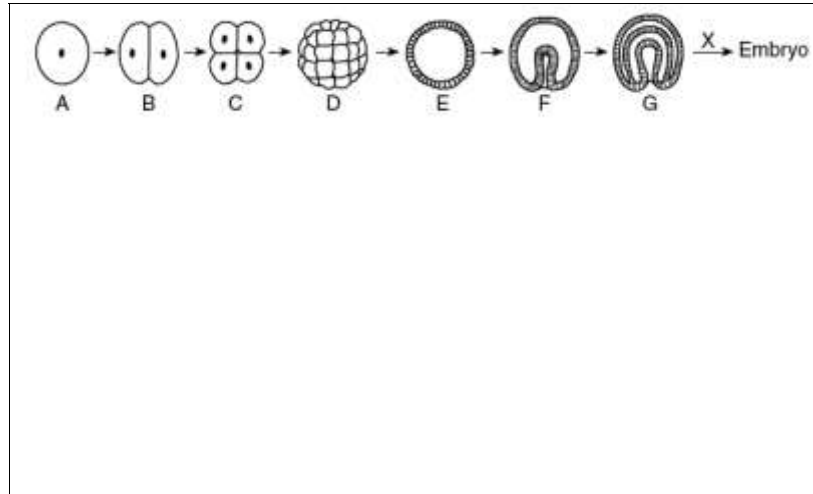
Data Base File Number: 158

Regents Date Jan09-33.bmp

Jan2009

1/27/2009 S4K4

Answer 2



## embryonic development

591. Base your answer to this question on the diagram and chart shown and on your knowledge of biology. The diagram represents events that occur during the early stages of embryonic development. The chart shows some of the genes (A-E) present in each of the three cell types shown in the diagram. The genes that are shaded in the chart represent genes that are expressed and used by that cell type. Different cell types can arise from genetically identical embryonic cells because

- (1) different cells in the embryo contain completely different genes
- (2) fertilization results in new gene combinations, which result in the different cell types
- (3) mutations in embryonic cells result in new genes, resulting in the different cell types
- (4) different cells have the same genes, but the same genes aren't expressed in all cells

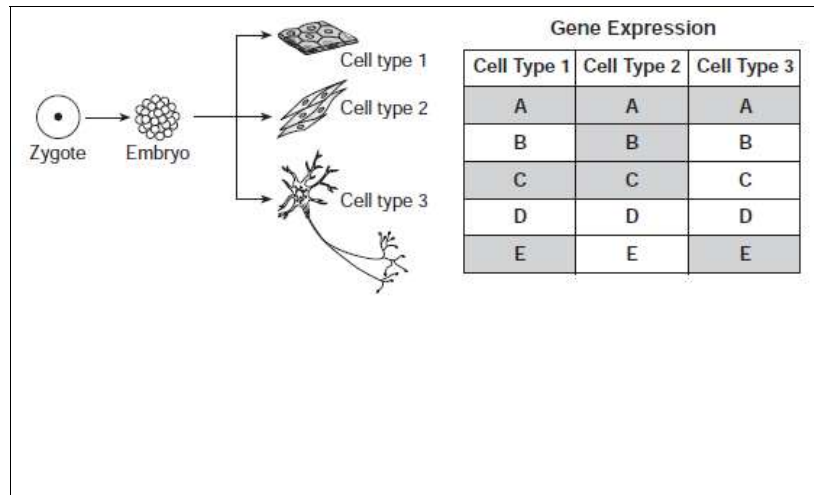
Data Base File Number: 1610

Regents Date Aug2023-36.bmp

Aug2023

36 8/17/2023 S4K2

Answer 4



## embryonic development

592. The diagram shown represents some stages of early embryonic development. Which process is represented by the arrows in the diagram?

- (1) meiosis
- (2) fertilization
- (3) mitosis
- (4) evolution

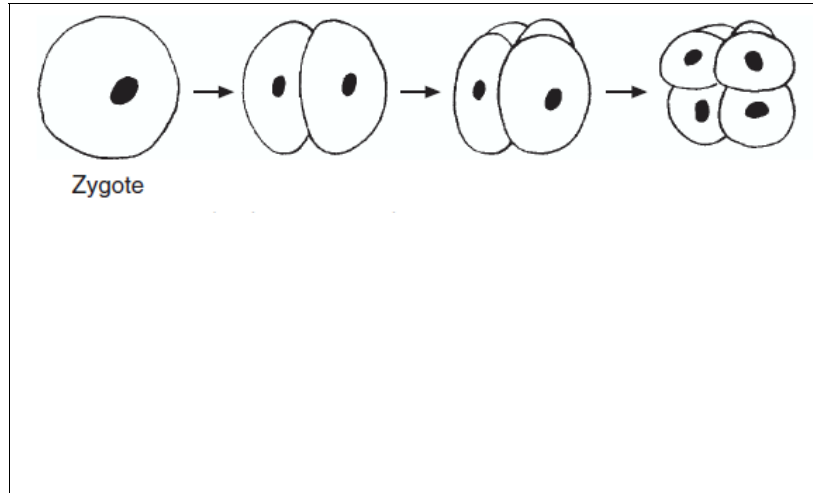
Data Base File Number: 711

Regents Date Jan2003-17.bmp

Jan2003

17 1/30/2003 S4K4

Answer 3



## embryonic development

593. Part of the embryonic development in a species is illustrated in the diagram shown. Which set of factors plays the most direct role in controlling the events shown in the diagram?

- (1) genes, hormones, and cell location
- (2) antibodies, insulin, and starch
- (3) abiotic resources, homeostasis, and selective breeding
- (4) ATP, amino acids, and inorganic compounds

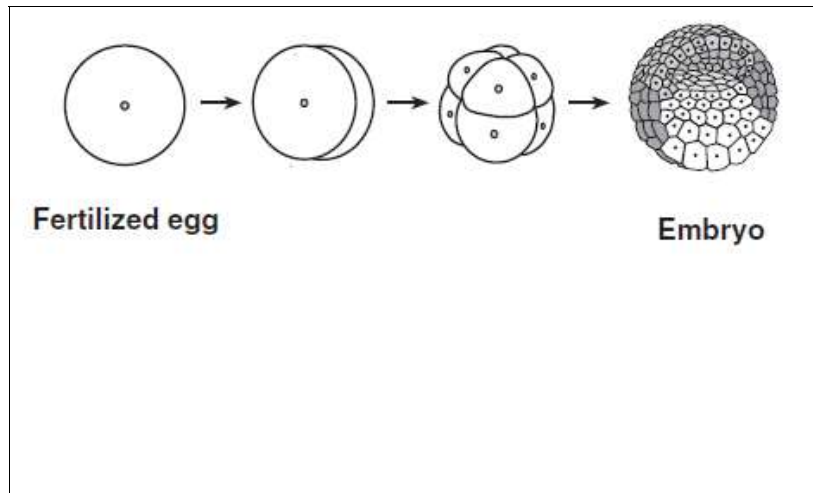
Data Base File Number: 539

Regents Date Jan2005-27.bmp

Jan2005

27 1/28/2005 S4K4

Answer 1



## embryonic development

594. Which row in the chart as shown contains the correct sequence of events involved in the formation of a human embryo?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1539

Regents Date Jan2023-21.bmp

Jan2023

21 1/24/2023 S4K4

Answer 4

Row	Sequence of Events
(1)	meiosis, differentiation, fertilization, mitosis
(2)	differentiation, meiosis, mitosis, fertilization
(3)	fertilization, mitosis, meiosis, differentiation
(4)	meiosis, fertilization, mitosis, differentiation

## embryonic development

595. The diagram shown represents a series of events in the development of a bird. Which series of terms best represents the sequence of processes shown?

(1) meiosis → growth → differentiation

(3) mitosis → meiosis → differentiation

(2) meiosis → differentiation → growth

(4) mitosis → differentiation → growth

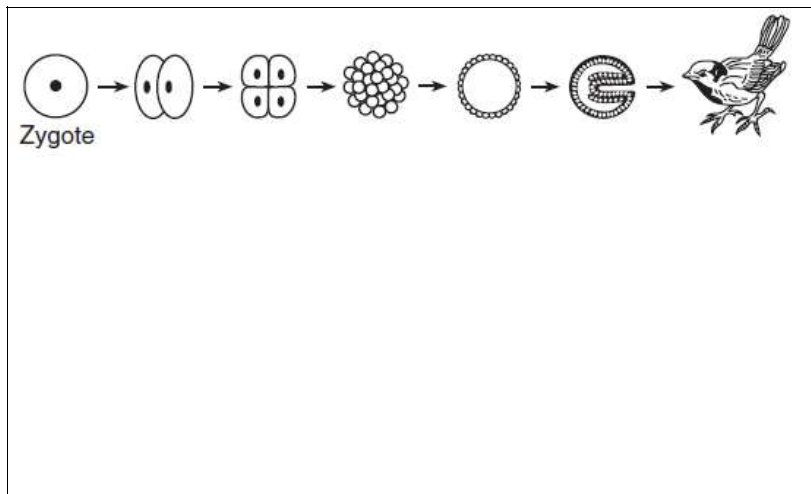
Data Base File Number: 509

Regents Date Aug2006-24.bmp

Aug2006

24 8/16/2006 S4K4

Answer 4





## embryonic development

596. Which row in the chart given shows the connection between processes, structures, and hormones involved in the formation of an embryo?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1472

Regents Date June2022-26-bmp

June2022

26 6/15/2022 S4K4

Answer 2

Row	Process	Structure Involved	Hormone Involved
(1)	differentiation	lungs	insulin
(2)	gamete formation	testes	testosterone
(3)	union of gametes	cell nuclei	insulin
(4)	respiration	lungs	estrogen

## embryonic development

597. The sequence of diagrams shown represent some events in a reproductive process. To regulate similar events in human reproduction, what adaptations are required?

(1) the presence of genes and chemicals in each cell in stages 1 to 7

(3) the removal of all enzymes from the cells in stage 7

(2) an increase in the number of genes in each cell in stages 3 to 5

(4) the elimination of mutations from cells after stage 5

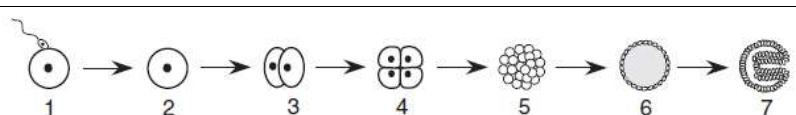
Data Base File Number: 735

Regents Date June2003-18.bmp

June2003

18 6/19/2003 S4K4

Answer 1



## energy consumption

598. Which statement is true for all of the organisms in the ecosystem represented in the diagram as shown?
- (1) They use energy to combine the inorganic molecules carbon dioxide and water into energy-rich organic compounds.
  - (2) Stored energy cannot be used by these organisms as a source of energy for life processes.
  - (3) Energy stored in inorganic molecules is released during cellular respiration in these organisms.
  - (4) Energy is used by the organisms to obtain and transport materials, and to eliminate wastes.

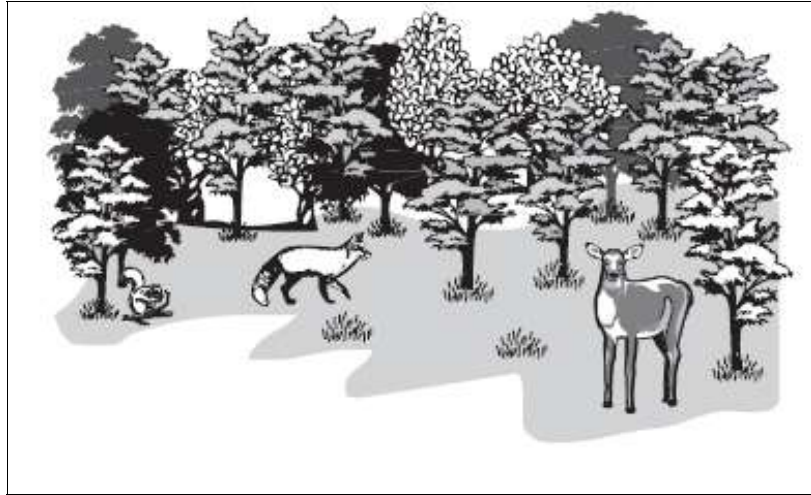
Data Base 1097  
File Number:

Regents Date June2016-21.bmp

June2016

21 6/15/2016 S4K5

Answer 4



## energy consumption

599. Base your answer to this question on the information and graph given and on your knowledge of biology. Federal legislation establishes and updates energy-efficiency standards for consumer products, including refrigerators. The graph shows the average annual energy consumption of similar types of refrigerators and the year they were manufactured. Which statement best represents an outcome of federal standards that require increasing the energy efficiency of appliances, such as refrigerators?

- (1) More technological improvements in appliances can help conserve finite resources.
- (2) Increased efficiency of appliances requires greater use of our energy resources.
- (3) Newer appliances are manufactured from a greater number of finite resources.
- (4) Manufacturing more efficient appliances will reduce the biodiversity of ecosystems.

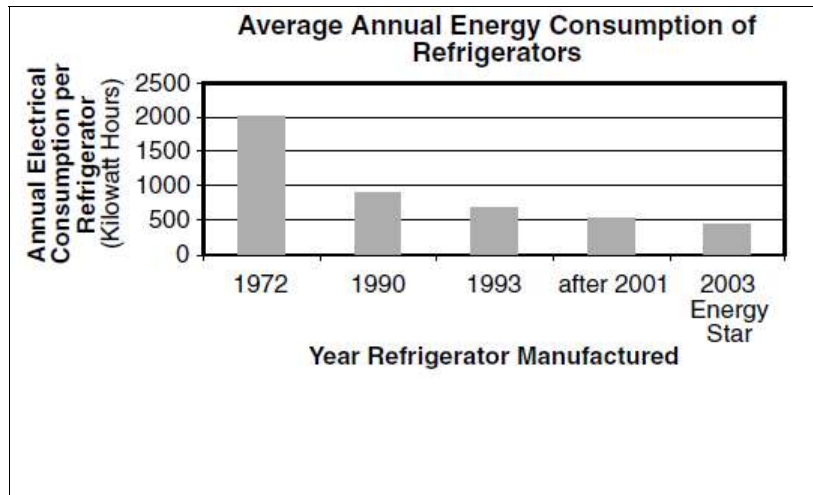
Data Base 1291  
File Number:

Regents Date Aug2018-41.bmp

Aug2018

42 8/17/2018 S4K7

Answer 1



## energy consumption

600. Base your answer to this question on the information and graph given and on your knowledge of biology. Federal legislation establishes and updates energy-efficiency standards for consumer products, including refrigerators. The graph shows the average annual energy consumption of similar types of refrigerators and the year they were manufactured. The 2003 Energy Star models of refrigerators use an average of about 450 kilowatt hours of electrical energy annually. Approximately how much energy is saved by these models annually when compared to the models produced in 1972?

- (1) 500 kilowatt hours  
(2) 550 kilowatt hours  
(3) 1500 kilowatt hours  
(4) 1550 kilowatt hours

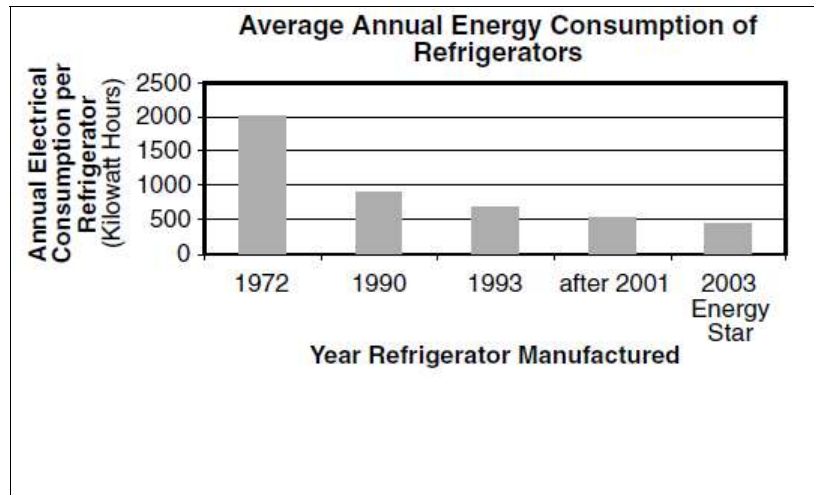
Data Base File Number: 1290

Regents Date Aug2018-41.bmp

Aug2018

41 8/17/2018 S1K3

Answer 4



## energy consumption

601. Base your answer to this question on the information given and the diagram shown, and on your knowledge of biology.

-----Warming Water Leaves Fish Gasping for Air and Shrinking in Size-----

As fish grow into adulthood, their body mass increases and so does their demand for oxygen. However, the gills, through which oxygen is obtained, do not increase in size at the same rate as the body. Scientists have observed that as the ocean waters become warmer, there is less dissolved oxygen in the water. The result is that the average size of many fish species becomes smaller. The most likely reason decreased levels of oxygen in the water result in a decrease in the body size of some fish species is

- (1) due to the presence of more plant species carrying out photosynthesis
- (2) the species producing more ATP molecules and less oxygen
- (3) due to an increase in the size of the gills bringing in more carbon dioxide
- (4) the species being unable to meet the energy requirements of a larger body size

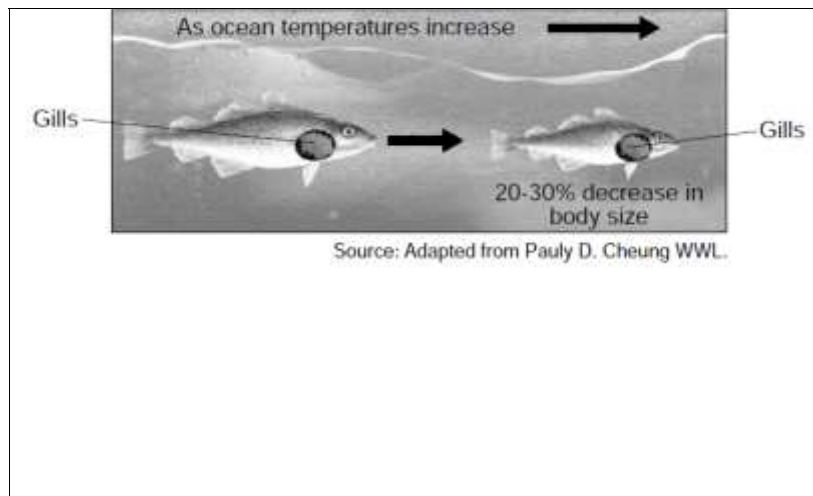
Data Base File Number: 1572

Regents Date June2023-31.bmp

June2023

31 6/14/2023 S4K7

Answer 4



## energy pyramid

602. An energy pyramid is shown in the diagram. Which of the following organisms could be found at level "X"?

- (1) hawks and eagles
- (2) trees and grass
- (3) snakes and foxes
- (4) mice and rats

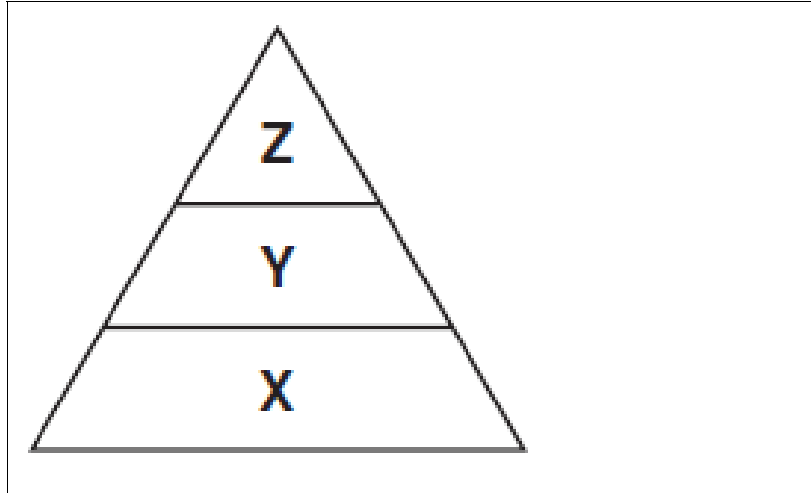
Data Base File Number: 678

Regents Date June2004-49.bmp

June2004

49 6/18/2004 S4K6

Answer 2



## energy pyramid

603. The diagram shown represents an energy pyramid. At each successive level from A to D, the amount of available energy

- (1) increases, only
- (2) decreases, only
- (3) increases, then decreases
- (4) remains the same

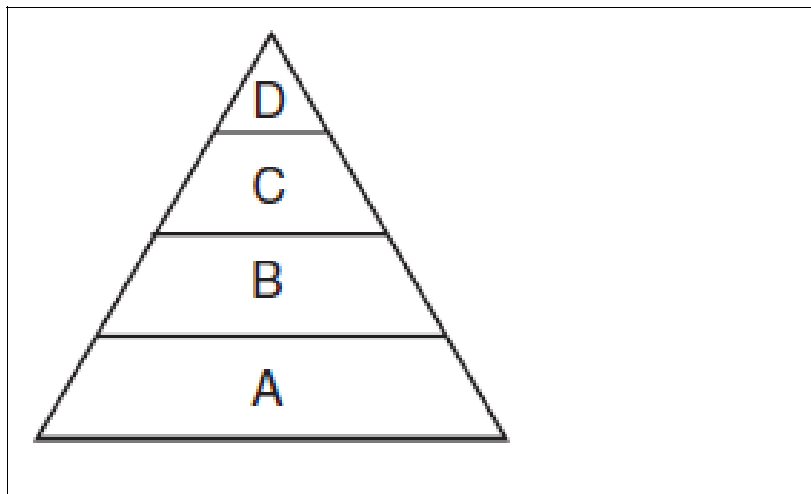
Data Base File Number: 584

Regents Date Aug2005-23.bmp

Aug2005

23 8/16/2005 S4K6

Answer 2



**energy pyramid**

604. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents an energy pyramid for an ecosystem in the Australian outback. Dingos are an introduced species in Australia that are outcompeting many native species. Which of the current environmental problems most likely resulted directly from the introduction of dingos to Australia?

- (1) vanishing of kangaroo grasses
- (2) near extinction of wallabies
- (3) forests overrun with koalas
- (4) increase in the kookaburra population

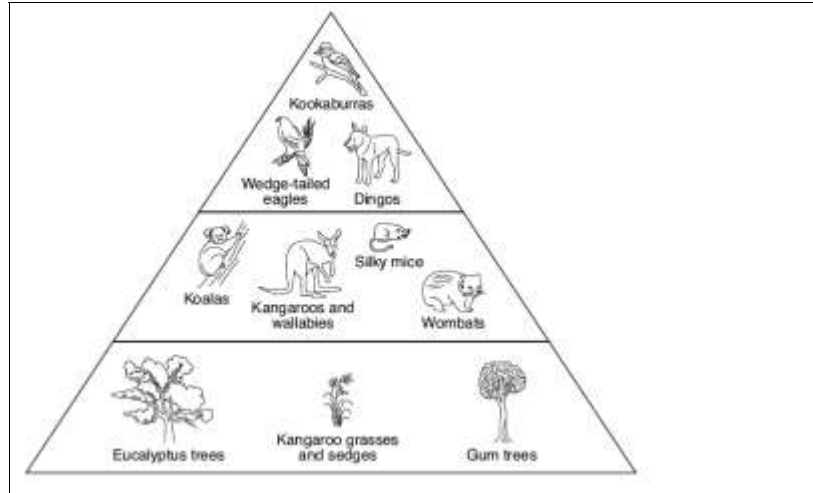
Data Base File Number: 420

Regents Date: June2012-43.bmp

June2012

43 6/19/2012 S4K7

Answer: 2



**energy pyramid**

605. Which diagram best represents the organisms arranged as an energy pyramid?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

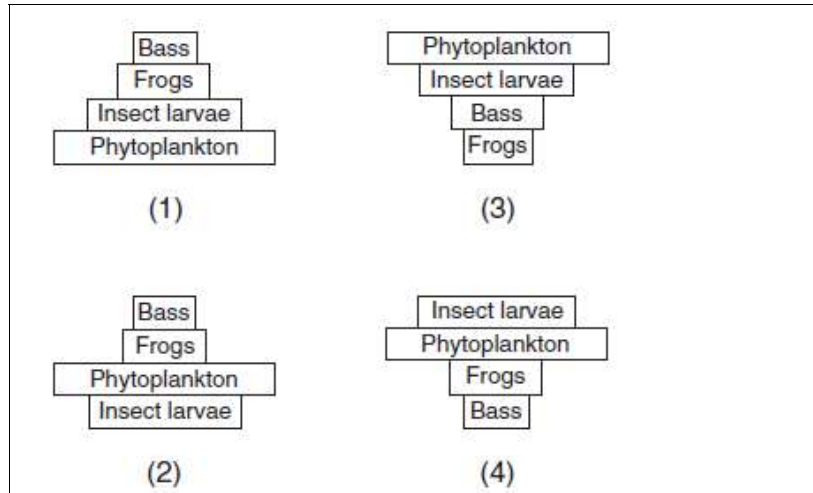
Data Base File Number: 464

Regents Date: Jan2006-35.bmp

Jan2006

34 1/27/2006 S4K6

Answer: 1



## energy pyramid

606. The diagram shown represents an energy pyramid. At which level do the organisms all carry on BOTH respiration and photosynthesis?

- (1) A (3) C  
(2) B (4) D

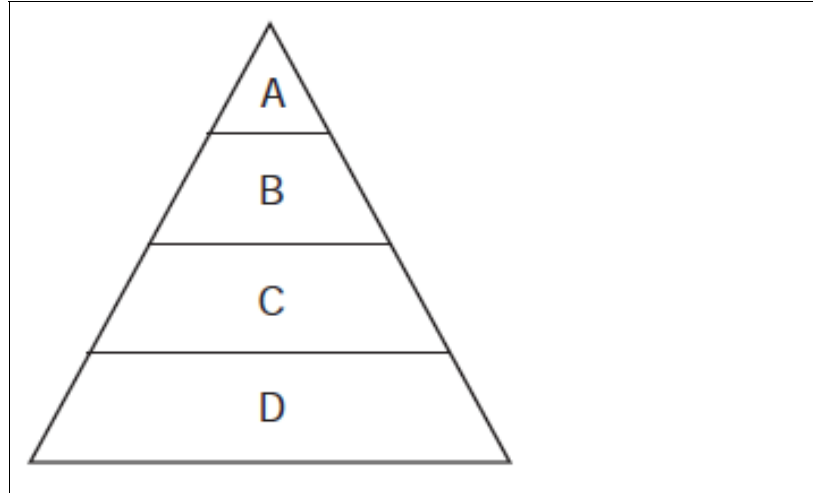
Data Base File Number: 1601

Regents Date Aug2023-26.bmp

Aug2023

26 8/17/2023 S4K5

Answer 4



## energy pyramid

607. An energy pyramid has four levels numbered from TOP to BOTTOM as levels 1,2,3,4. Examine the diagram shown and determine which graph represents the relative energy content of the pyramid

- (1) 1 (3) 3  
(2) 2 (4) 4

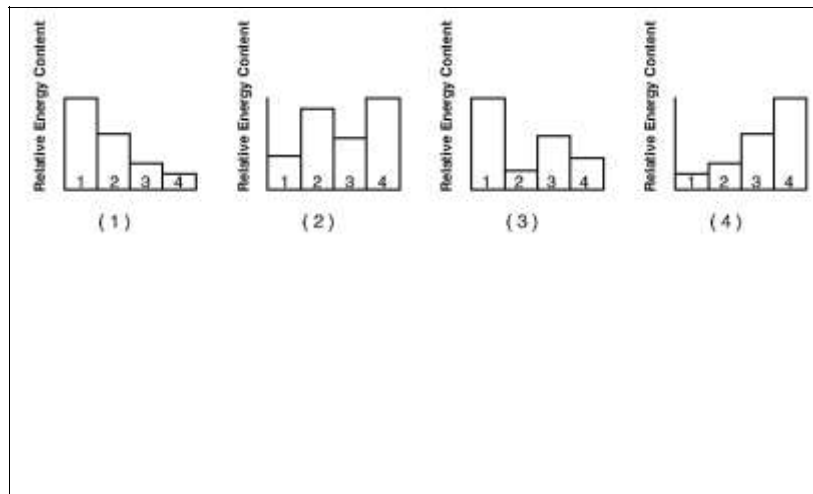
Data Base File Number: 104

Regents Date June08-39.bmp

June2008

39 6/24/2008 S1K3

Answer 4





## energy pyramid

608. Base your answer to question this question on the energy pyramid shown and on your knowledge of biology. Letter A in the pyramid represents

- (1) scavengers
- (2) producers
- (3) carnivores
- (4) herbivores

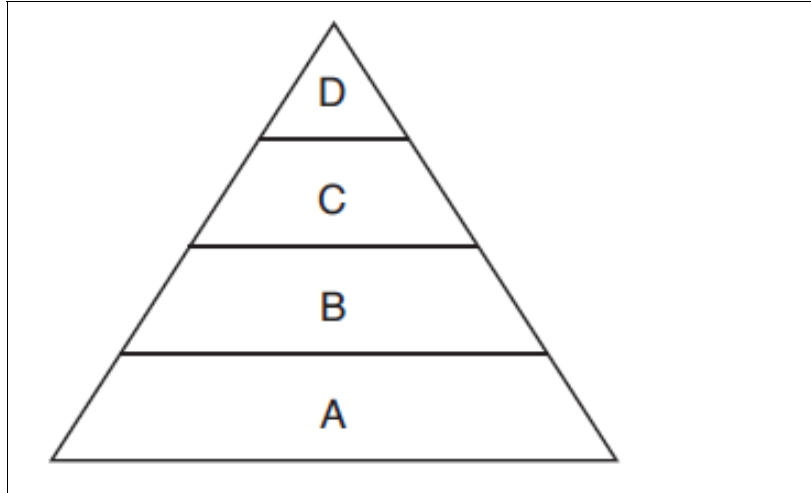
Data Base File Number: 965

Regents Date Aug2014-33.bmp

Aug2014

33 8/14/2014 S4K6

Answer 2



## energy pyramid

609. An energy pyramid is represented in the diagram shown. How much energy would be available to the organisms in level C?

- (1) all of the energy in level A, plus the energy in level B
- (2) all of the energy in level A, minus the energy in level B
- (3) a percentage of the energy contained in level B
- (4) a percentage of the energy synthesized in level B and level D

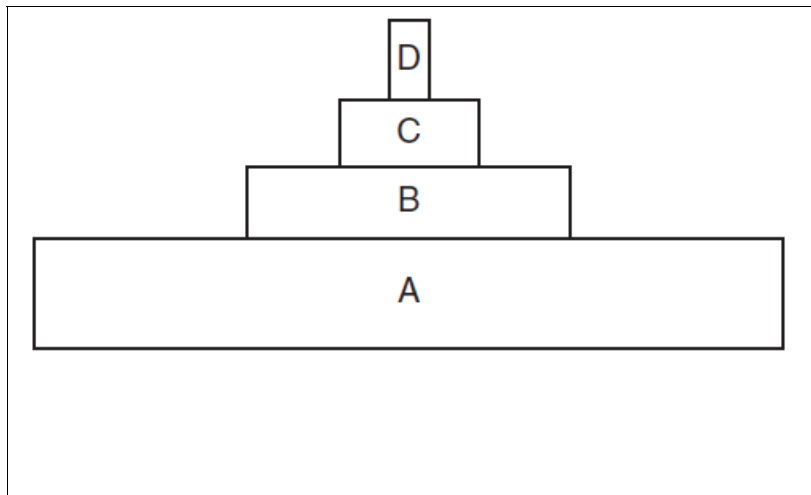
Data Base File Number: 511

Regents Date Aug2006-26.bmp

Aug2006

26 8/16/2006 S4K6

Answer 3



## energy pyramid

610. The diagram shown represents a pyramid of energy that includes both producers and consumers. The greatest amount of available energy is found at level

(1) 1

(3) 3

(2) 2

(4) 4

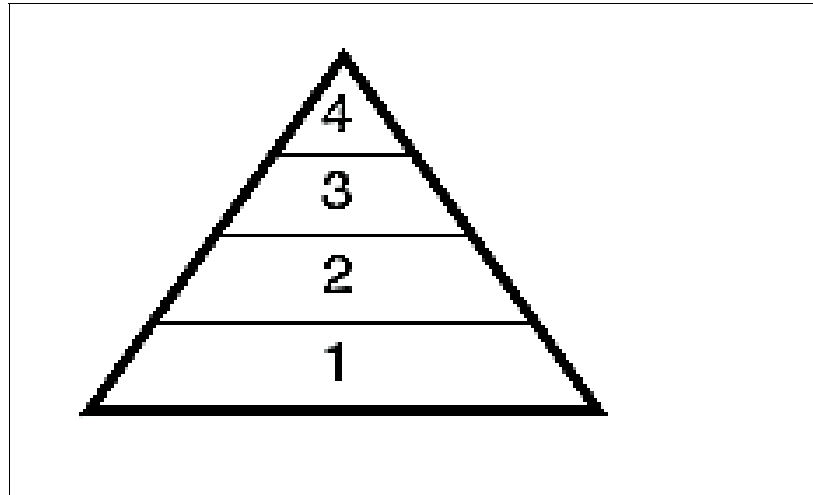
Data Base File Number: 55

Regents Date Jan07-34.bmp

Jan2007

34 1/26/2007 S4K6

Answer 1



## energy pyramid

611. Base your answer to this question on the diagram shown and on your knowledge of biology. The base of an energy pyramid for this ecosystem would include a

(1) frog

(3) plant

(2) snake

(4) grasshopper

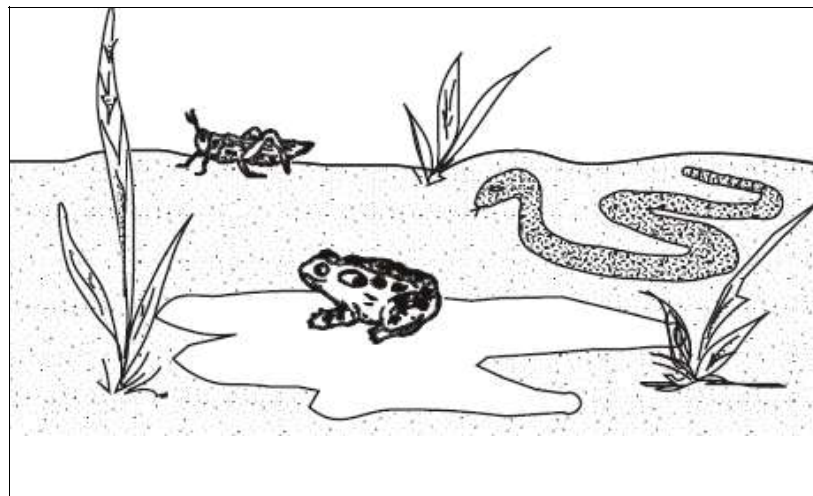
Data Base File Number: 787

Regents Date Aug2002-40.bmp

Aug2002

41 8/13/2002 S4K6

Answer 3



## energy pyramid

612. The diagram shown represents different feeding levels in an energy pyramid. The most likely explanation for showing fewer organisms at each feeding level going up the pyramid is that
- (1) some energy is lost to the environment as heat
  - (2) the larger the organism, the less energy it requires
  - (3) some energy is recycled within each level and remains there
  - (4) decomposers convert most of the energy into inorganic compounds

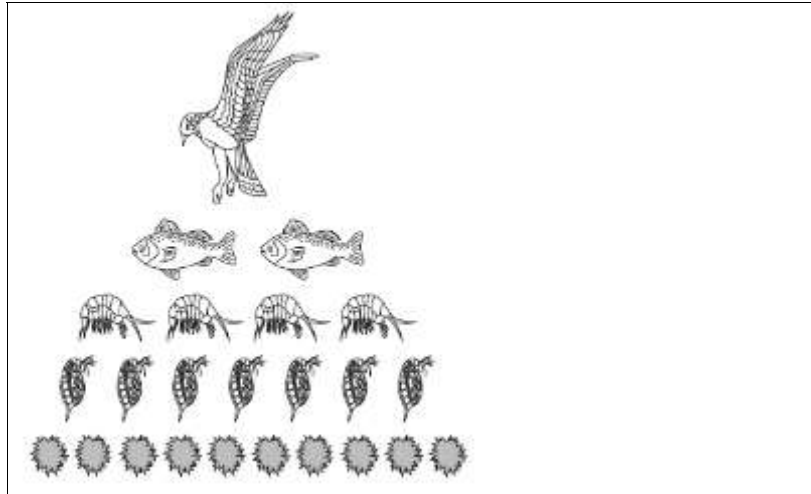
Data Base File Number: 992

Regents Date Jan2015-26.bmp

Jan2015

26 2/26/2015 S4K6

Answer 1



## energy pyramid

613. Which process provides the initial energy to support all the levels in the energy pyramid as shown in the diagram?
- (1) circulation
  - (2) photosynthesis
  - (3) active transport
  - (4) digestion

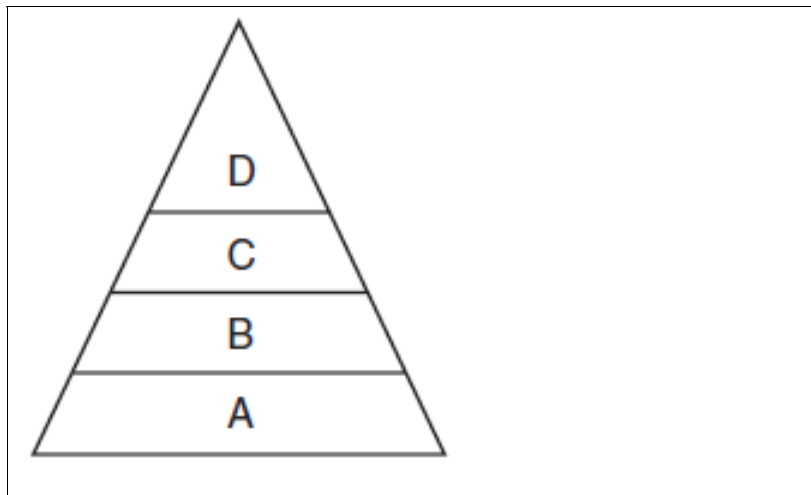
Data Base File Number: 557

Regents Date June2005-19.bmp

June2005

19 6/22/2005 S4K5

Answer 2



## energy pyramid

614. Base your answer to this question on the information and diagram as shown and on your knowledge of biology. The diagram represents the energy relationships in a forest ecosystem. The best explanation for the DECREASE in the amount of energy available as one moves up the pyramid is that

- (1) producers require more energy than consumers to survive
- (2) decomposers recycle nutrients at each level
- (3) much of the energy at each level is lost as heat
- (4) animals use less energy than plants

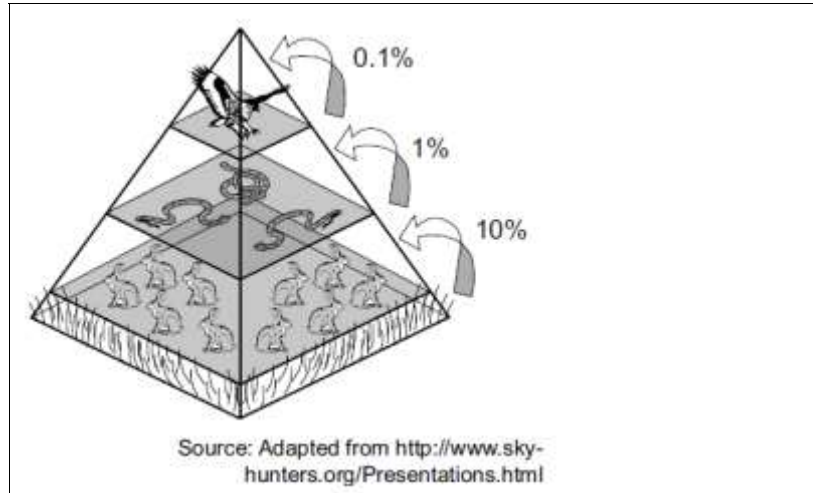
Data Base File Number: 1549

Regents Date Jan2023-35.bmp

Jan2023

35 1/24/2023 S4K6

Answer 3



## energy pyramid

615. Which level of the energy pyramid shown would contain the green plant species of a marsh?

- (1) A
- (2) B
- (3) C
- (4) D

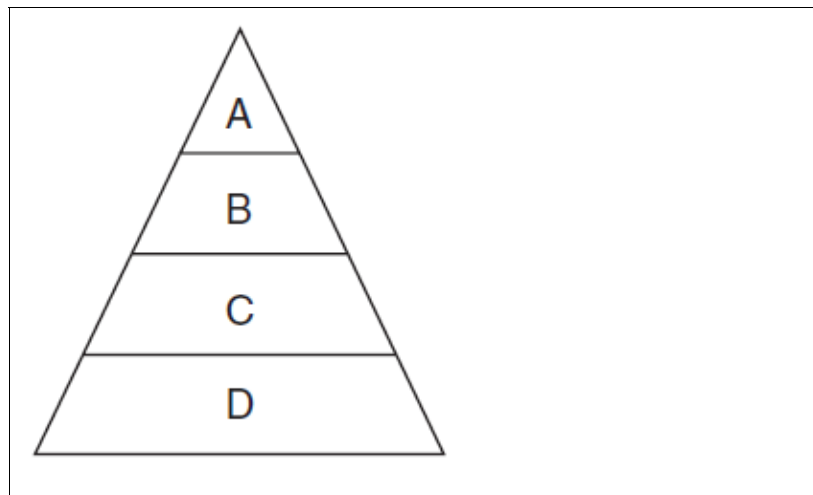
Data Base File Number: 526

Regents Date Aug2006-55.bmp

Aug2006

55 8/16/2006 S4K6

Answer 4



## energy pyramid

616. An energy pyramid containing green plants and other organisms from a food chain is represented in the diagram as shown. Herbivores would most likely be located in

- (1) level I, only
- (2) level II, only
- (3) level III, only
- (4) level I and level II

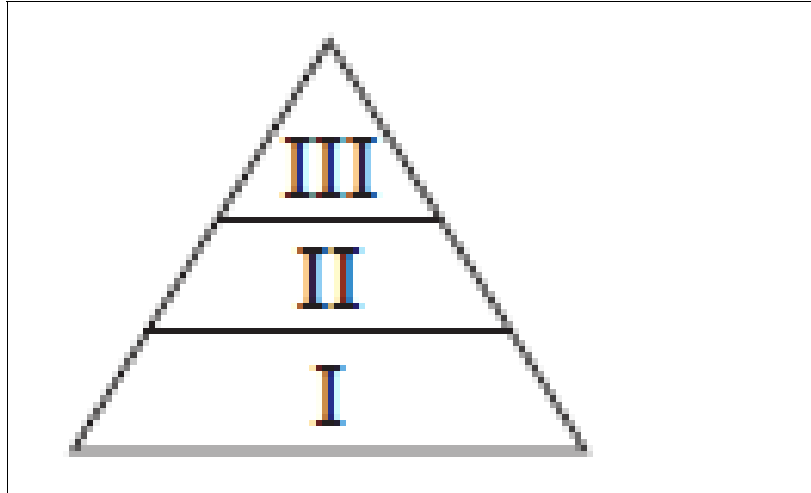
Data Base File Number: 1645

Regents Date Jan2024-16.bmp

Jan2024

16 1/23/2024 S4K6

Answer 2



## energy pyramid

617. The diagram shown represents two energy pyramids. Each pyramid represents the productivity of one acre of land. Based on the concept of energy transfer, why does one acre of land produce more vegetables for human consumption than beef for human consumption?

- (1) Energy is gained at each feeding level.
- (2) Pyramid B is larger than Pyramid A.
- (3) Energy is lost as heat at each feeding level, and Pyramid B has fewer levels.
- (4) There are more Humans in Pyramid B than in Pyramid A.

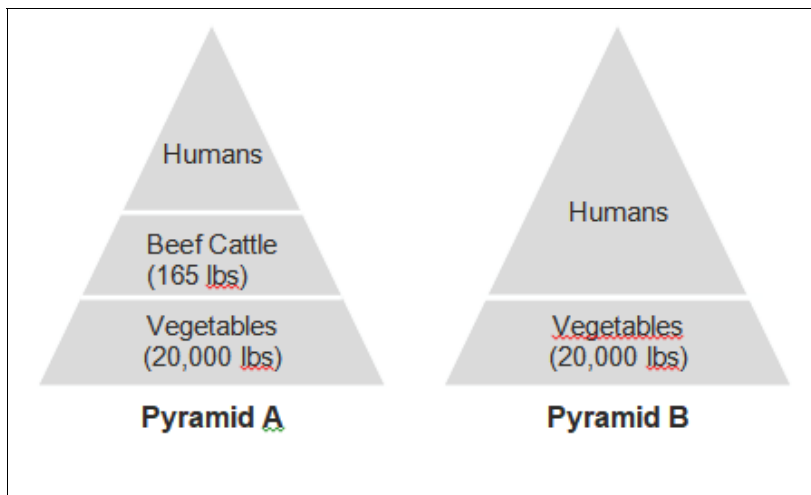
Data Base File Number: 1193

Regents Date June2017-67.bmp

June2017

67 6/14/2017 S4K6

Answer 3



## energy pyramid

618. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents an energy pyramid for an ecosystem in the Australian outback. Which two organisms could have a predator-prey relationship?

- (1) kookaburras and gum trees
- (2) kangaroos and silky mice
- (3) dingos and kangaroo grasses
- (4) wedge-tailed eagles and wombats

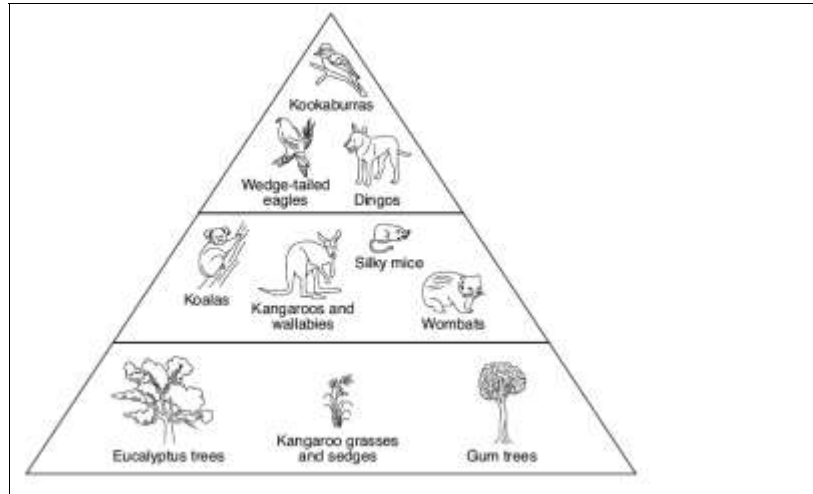
Data Base File Number: 419

Regents Date: June2012-41.bmp

June2012

42 6/19/2012 S4K6

Answer: 4



## energy pyramid

619. The diagram shown represents an energy pyramid. In this pyramid, the greatest amount of stored energy is found at level

- (1) A
- (2) B
- (3) C
- (4) D

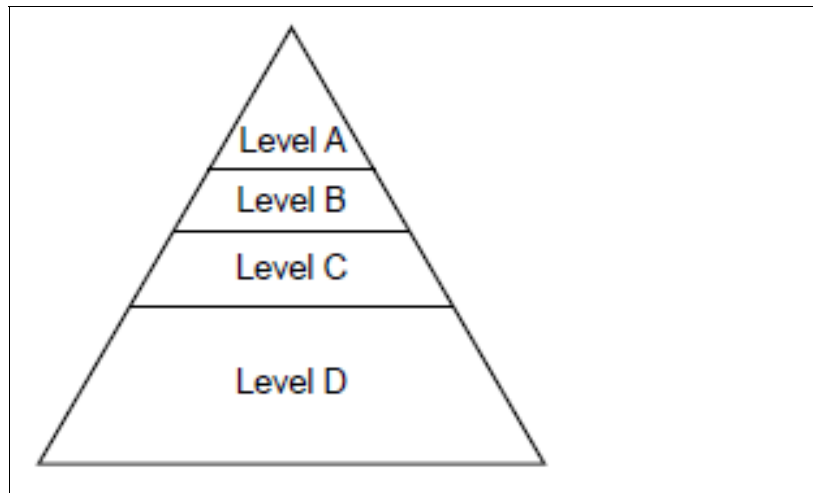
Data Base File Number: 1361

Regents Date: Aug2019-1.bmp

Aug2019

1 8/14/2019 S4K6

Answer: 4



## energy pyramid

620. Which statement about the pyramid of energy shown is correct?

- (1) The amount of energy needed to sustain the pyramid enters at level D.
- (2) The total amount of energy decreases with each successive feeding level from D to A.
- (3) The amount of energy is identical in each level of the pyramid.
- (4) The total amount of energy at level D is less than the total amount of energy at level B.

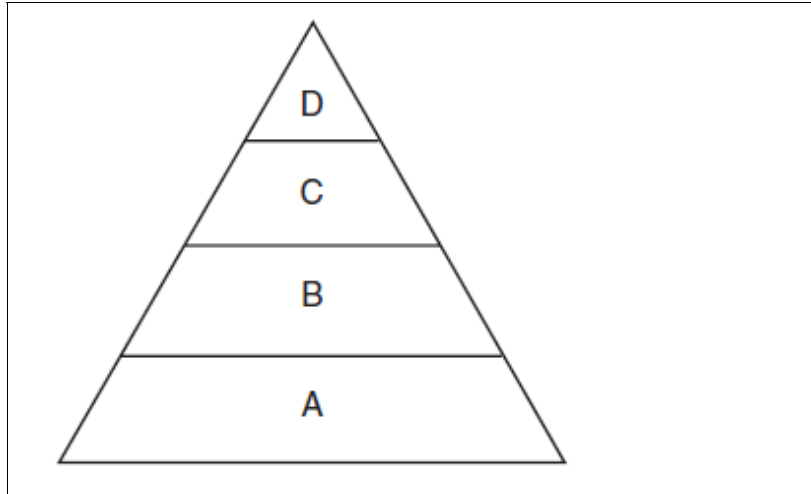
Data Base File Number: 537

Regents Date Jan2005-23.bmp

Jan2005

23 1/28/2005 S4K6

Answer 4



## energy pyramid

621. The diagram shown represents an energy pyramid. Which organisms would most likely be found at level A?

- (1) birds
- (2) worms
- (3) mammals
- (4) algae

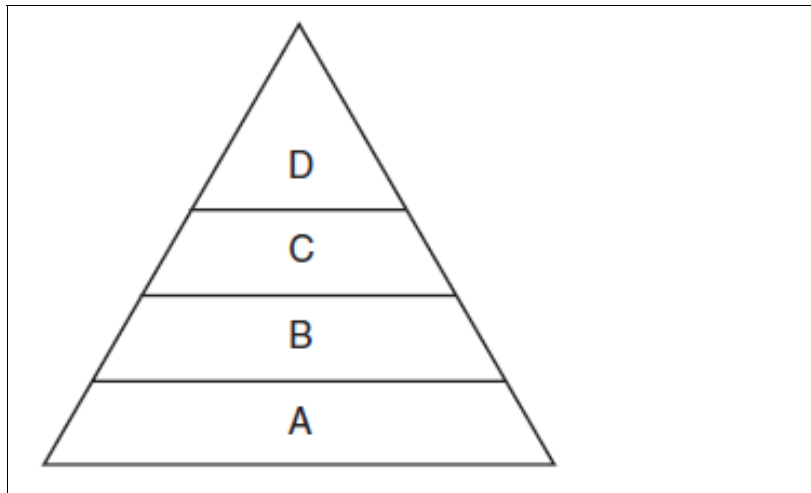
Data Base File Number: 810

Regents Date June2002-30.bmp

June2002

30 6/19/2002 S4K6

Answer 4



**energy pyramid**

622. Base your answers to this question on the energy pyramid shown and on your knowledge of biology. Which level includes organisms that receive their energy from level B?

- (1) A
- (2) B
- (3) C
- (4) D

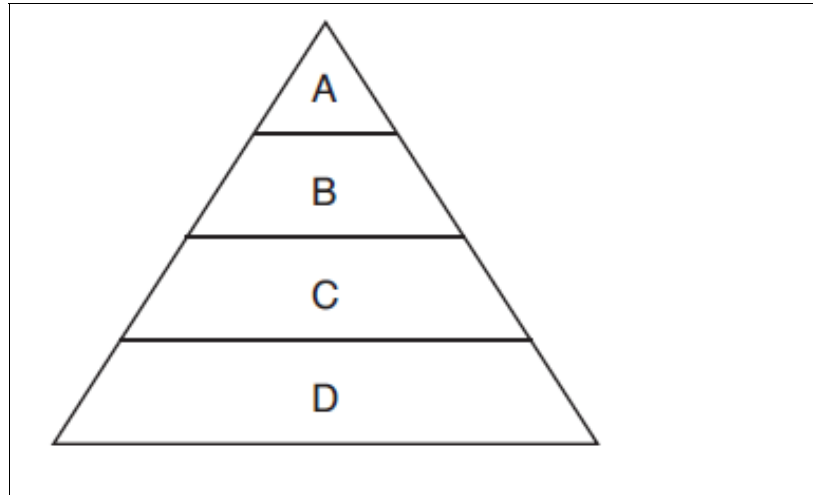
Data Base File Number: 263

Regents Date June2010-35.bmp

June2010

35 6/16/2010 S4K2

Answer 1



**energy pyramid**

623. A food web and an energy pyramid are shown in the diagram. A group of organisms from the food web that would be found at level X of the energy pyramid is the

- (1) owls
- (2) deer
- (3) trees
- (4) crickets

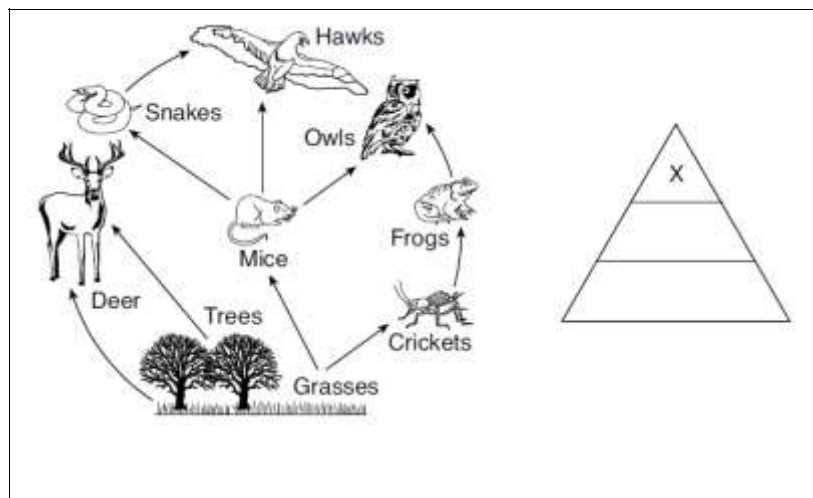
Data Base File Number: 1473

Regents Date June2022-27.bmp

June2022

27 6/15/2022 S4K1

Answer 1





## energy pyramid

624. An energy pyramid is represented in the diagram shown. The energy for use by organisms in level A originally comes from

- (1) producers
- (2) the sun
- (3) level B
- (4) level D

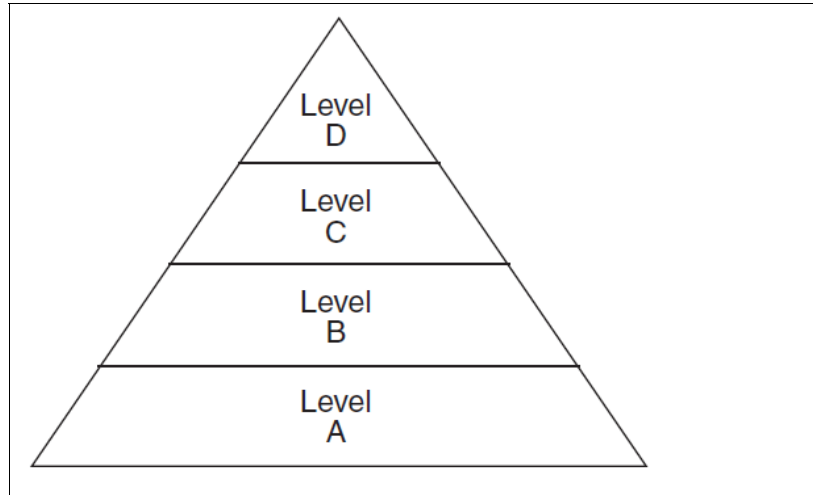
Data Base File Number: 235

Regents Date Jan2010-27.bmp

Jan2010

27 1/26/2010 S4K5

Answer 2



## energy pyramid

625. Some organisms in an ecosystem are represented in the pyramid shown. In the pyramid, the arrows labeled X represent

- (1) the loss of organisms due to predation
- (2) a decrease in photosynthetic organisms
- (3) the loss of energy in the form of heat
- (4) a decrease in available oxygen

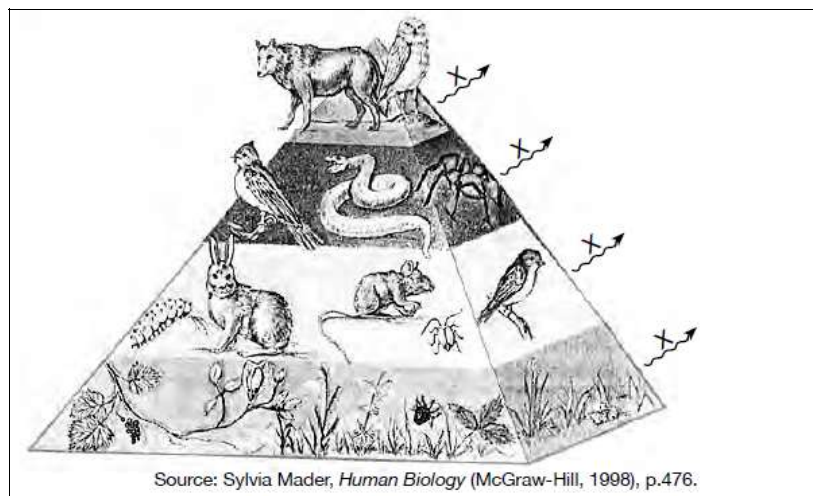
Data Base File Number: 1282

Regents Date Aug2018-30.bmp

Aug2018

30 8/17/2018 S4K6

Answer 3



## energy pyramid

626. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents trophic levels in an ocean environment. The organisms found at the second trophic level of this pyramid would be

- (1) producers
- (2) decomposers
- (3) carnivores
- (4) herbivores

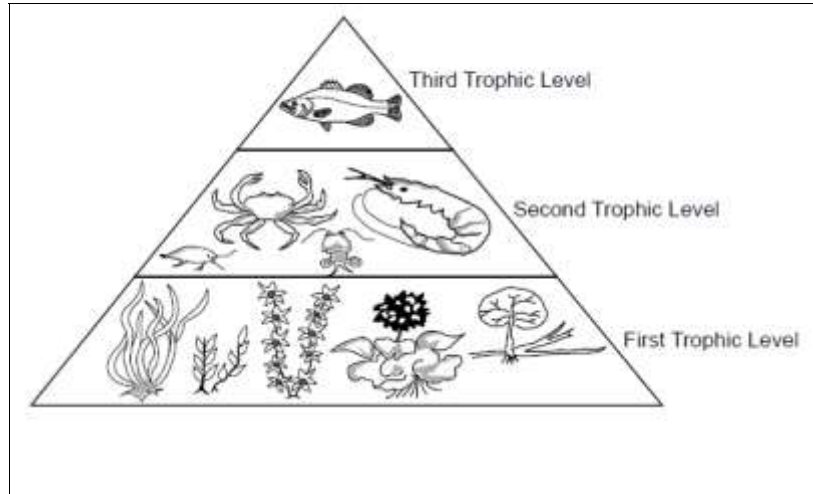
Data Base File Number: 1265

Regents Date June2018-50.bmp

June2018

50 6/13/2018 S4K6

Answer 4



## energy pyramid

627. Base your answer to this question on the energy pyramid shown and on your knowledge of biology. Energy from nutrients is transferred to ATP in

- (1) level A, only
- (2) levels B and C, only
- (3) levels B, C, and D, only
- (4) levels A, B, C, and D

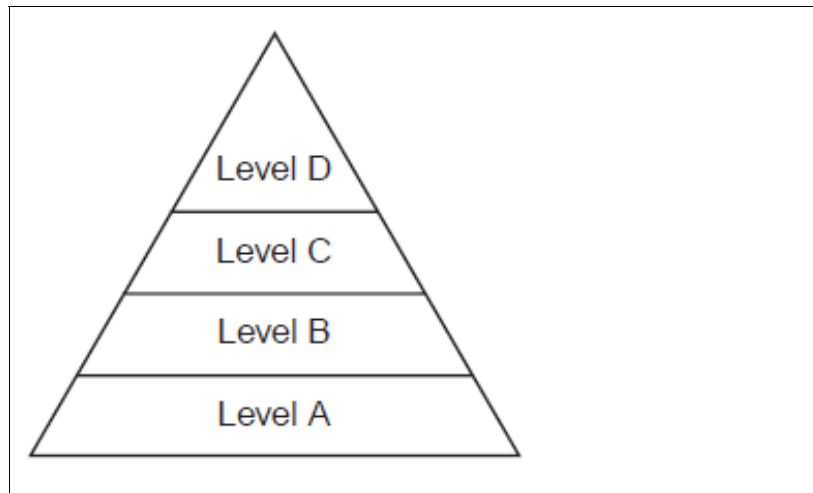
Data Base File Number: 837

Regents Date Jan2002-46.bmp

Jan2002

46 1/23/2002 S4K6

Answer 4



## energy pyramid

628. Four levels of an energy pyramid are shown in the diagram. Which statement about this energy pyramid is correct?

- (1) Organisms in level 4 receive their energy directly from the Sun.
- (2) Organisms in level 2 are carnivores.
- (3) Organisms in level 2 receive their energy from level 3.
- (4) Organisms in level 1 are autotrophic.

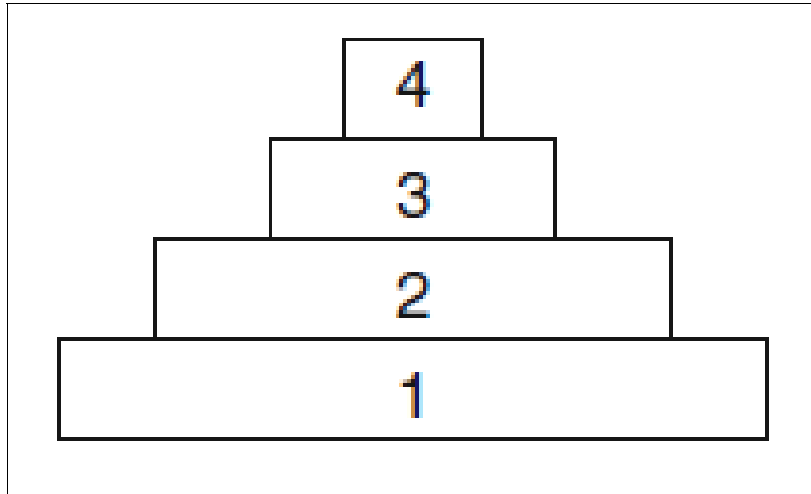
Data Base File Number: 610

Regents Date Jan2013-26.bmp

Jan2013

26 1/23/2013 S4K6

Answer 4



## energy pyramid

629. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the energy in kilocalories (kcal) available at different feeding levels in a food chain. In the energy pyramid shown at the bottom of the diagram, which level (1, 2 or 3 or none) represents green plants?

- (1) Level 1
- (2) Level 2
- (3) Level 3
- (4) No level as shown.

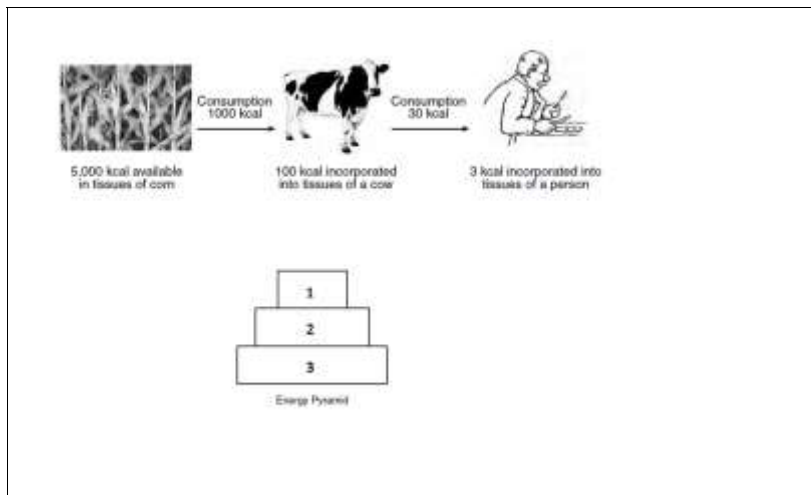
Data Base File Number: 1240

Regents Date Jan2018-54C-bm

Jan2018

54 1/22/2018 S4K6

Answer 3



## energy pyramid

630. Base your answers to this questions on the diagram shown that represents an energy pyramid in a meadow ecosystem and on your knowledge of biology. Which species would have the largest amount of available energy in this ecosystem?

(1) A

(3) C

(2) B

(4) E

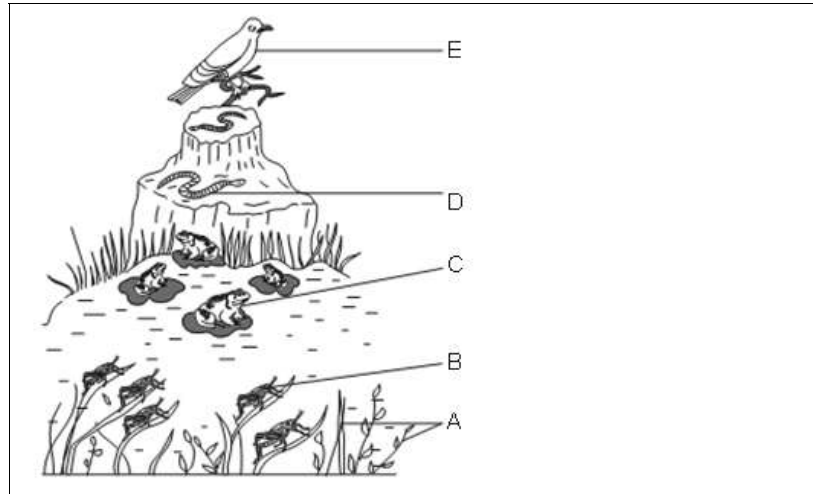
Data Base File Number: 194

Regents Date June09-38.bmp

June2009

38 6/18/2009 S4K6

Answer 1



## energy pyramid

631. The diagram shown does NOT represent a sustainable energy pyramid in an ecosystem because

(1) energy is never transferred between levels in ecosystems

(3) more energy must be available in the producer level than in the consumer levels

(2) ecosystems never have more than three levels of energy transfer

(4) producers feed on herbivores in most ecosystems

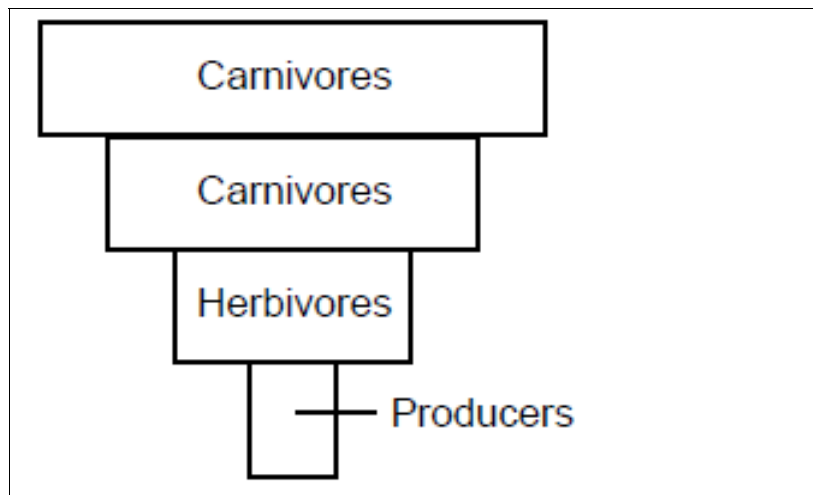
Data Base File Number: 1338

Regents Date June2019-29.bmp

June2019

29 6/18/2019 S4K1

Answer 3



## energy pyramid

632. Look at the diagrams shown. Which diagram best represents the direction that energy flows through an energy pyramid?

(1) 1

(3) 3

(2) 2

(4) 4

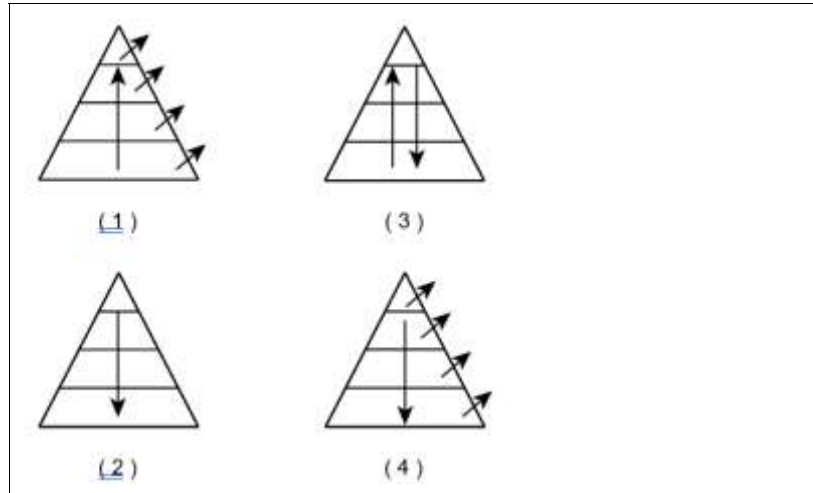
Data Base File Number: 1512

Regents Date Aug2022-35.bmp

Aug2022

35 8/17/2022 S4K6

Answer 1



## energy pyramid

633. The diagram shown represents a typical energy pyramid. Which level in the pyramid includes autotrophs?

(1) A

(3) C

(2) B

(4) D

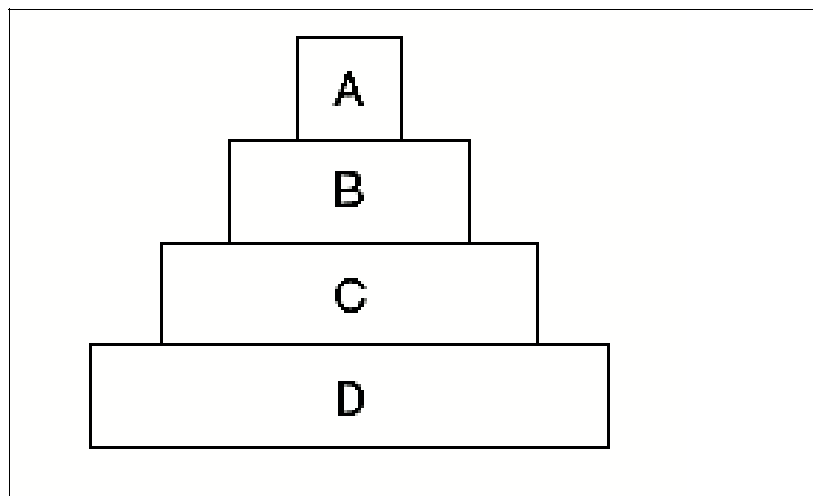
Data Base File Number: 148

Regents Date Jan09-7.bmp

Jan2009

7 1/27/2009 S4K1

Answer 4



## energy pyramod

634. The chart as shown lists some organisms found in a New York ecosystem and their sources of energy. When constructing an energy pyramid of this ecosystem, which of these organisms would be placed at the top of the pyramid?

- (1) grasses  
 (2) carp  
 (3) heron  
 (4) leopard frog

Data Base File Number: 1696

Regents Date Aug2024-35.bmp

Aug2024

35 8/20/2024 S4K6

Answer 3

Organism	Source of Energy
grasses	sunlight
leopard frog	insects, algae
carp	plants, insect larvae
heron	carp, frogs, salamanders
turtle	fish, plants, tadpoles, insects

## energy transfer

635. The flow of energy through an ecosystem involves many energy transfers. The diagram shown summarizes the transfer of energy that eventually powers muscle activity. The process of cellular respiration is represented by

- (1) arrow A, only  
 (2) arrow B, only  
 (3) arrow C, only  
 (4) arrows A, B, and C

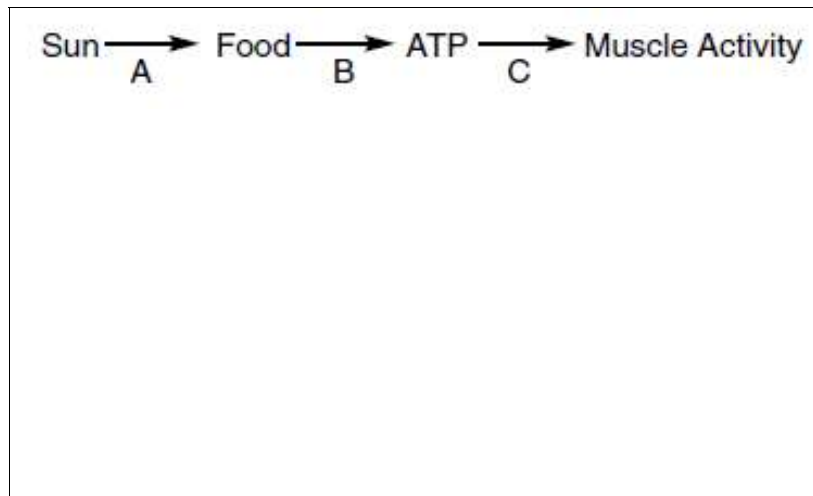
Data Base File Number: 715

Regents Date Jan2003-24.bmp

Jan2003

24 1/30/2003 S4K5

Answer 2



energy transfer

636. The diagram shown at the LEFT represents events involved as energy is ultimately released from food. Which row in the table shown at the RIGHT best represents the chain of Xs and letters A and B in the diagram?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 706

Regents Date Jan2003-10C.bm

Jan2003

10 1/30/2003 S4K1

Answer 2

X-X-X-X-X-X-X	A and B
(1) nutrient	antibodies
(2) nutrient	enzymes
(3) hemoglobin	wastes
(4) hemoglobin	hormones

energy transfer

637. The diagram shown represents various factors in an area. The diagram best represents

- (1) the recycling of energy in a forest community
- (2) ecological succession after climatic changes
- (3) competition for limited resources in a population
- (4) the flow of materials in a forest community

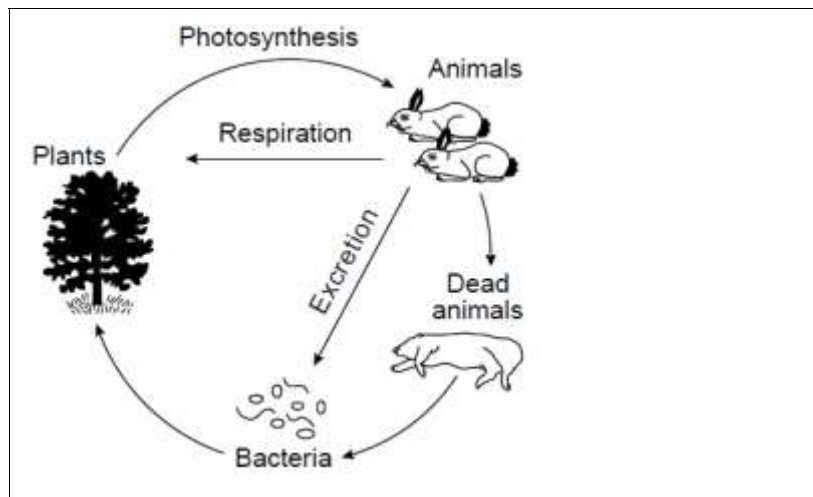
Data Base File Number: 1388

Regents Date Jan2020-5.bmp

Jan2020

5 1/21/2020 S4K1

Answer 4



**energy transfer**

638. Base your answer to this question on the summary equations of two processes as shown and on your knowledge of biology. What is the original source of energy for the processes shown?

- (1) water
- (2) soil
- (3) air
- (4) sun

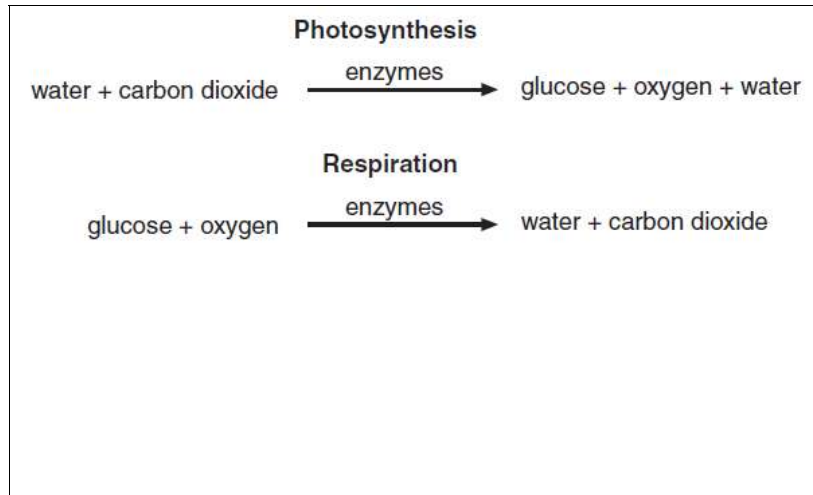
Data Base File Number: 800

Regents Date Aug2002-77.bmp

Aug2002

77 8/13/2002 S4K6

Answer 4



**energy transfer**

639. Certain organisms living deep in the ocean can obtain energy from inorganic compounds that flow out of volcanic vents. They can use this energy to synthesize energy-rich organic compounds. Which row in the chart as shown correctly pairs an organism that performs a similar function in land environments with the process involved?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1667

Regents Date June2024-34.bmp

June2024

34 6/14/2024 S4K5

Answer 2

Row	Organism	Process
(1)	small mammal	respiration
(2)	grasses	photosynthesis
(3)	small mammal	photosynthesis
(4)	grasses	respiration



## energy transfer

640. Arrows A, B, and C in the diagram shown represent the processes necessary to make the energy stored in food available for muscle activity. The correct sequence of processes represented by A, B, and C is

- (1) diffusion → synthesis → active transport
- (2) digestion → diffusion → cellular respiration
- (3) digestion → excretion → cellular respiration
- (4) synthesis → active transport → excretion

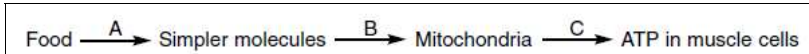
Data Base File Number: 666

Regents Date June2004-21.bmp

June2004

21 6/18/2004 S4K5

Answer 2



## energy transfer

641. Which sequence best represents the flow of energy in the cartoon as shown?

- (1) prey → predator
- (2) host → parasite
- (3) producer → herbivore
- (4) autotroph → carnivore

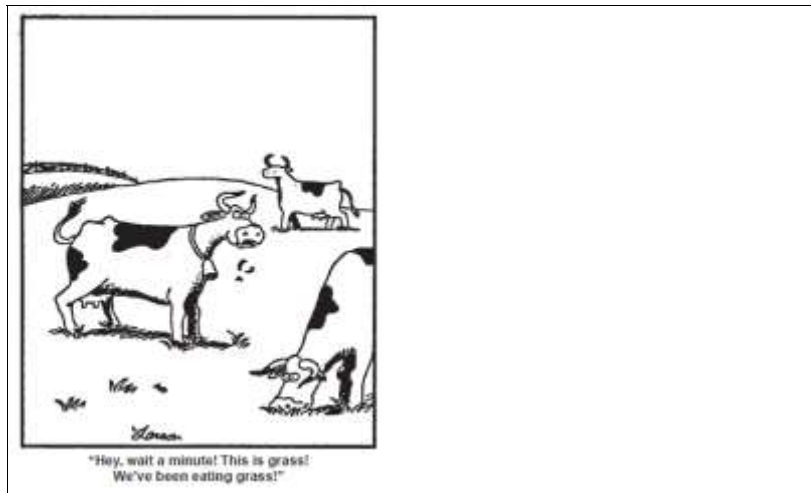
Data Base File Number: 834

Regents Date Jan2002-30.bmp

Jan2002

30 1/23/2002 S4K6

Answer 3



energy transfer

642. NOTE-- ROTATE the test paper to the LEFT to properly view the diagram. -- Four students each drew an illustration to show the flow of energy in a field ecosystem. Which illustration is MOST accurate?

(1) 1

(3) 3

(2) 2

(4) 4

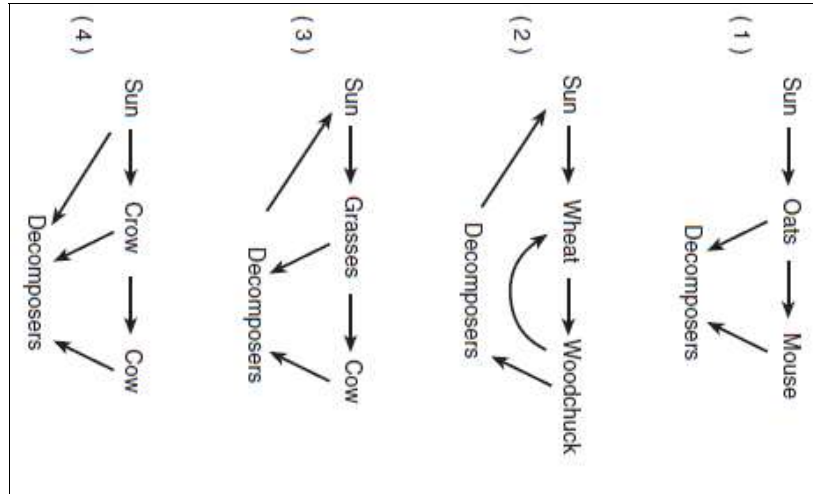
Data Base 508  
File Number:

Regents Date Aug2006-22.bmp

Aug2006

22 8/16/2006 S4K6

Answer 1



environment / stability

643. Base your answers to this question on the information given and on your knowledge of biology.  
**Monarch Butterfly Decline**

Monarch butterfly populations have fallen by 90% in less than 20 years. Monarchs west of the Rocky Mountains overwinter on the central coast of California. Their numbers have dropped from 1.2 million to only 200,000. East of the Rocky Mountains, monarchs overwinter in Mexico. In 2002, their numbers were down by about 500 million.

One reason for the decrease in monarch numbers is the increased planting of corn, cotton, and soybeans that are genetically modified (GM) to be resistant to weed killers containing glyphosate. With the increased use of these GM plants, increased amounts of the weed killers are being sprayed on fields where these crops are grown. These weed killers do not kill monarchs and other insects. They kill only plants such as milkweed that do not contain the resistance gene.

Mature adult monarch butterflies lay their eggs on milkweed plants. The larvae (caterpillars) eat only milkweed. Adults seek out flower nectar from a variety of plants. Stages of the monarch life cycle are represented in the diagram. How is the use of weed killers containing glyphosate responsible for a decrease in the size of monarch populations, since monarchs do not feed on genetically modified corn or soybeans during any stage of their life cycle?

- (1) The weed killers kill milkweed.
- (2) The weed killers kill the Monarch Butterflies
- (3) The weed killers kill all plants
- (4) The weed killers cause the Monarch Butterfly to mutate

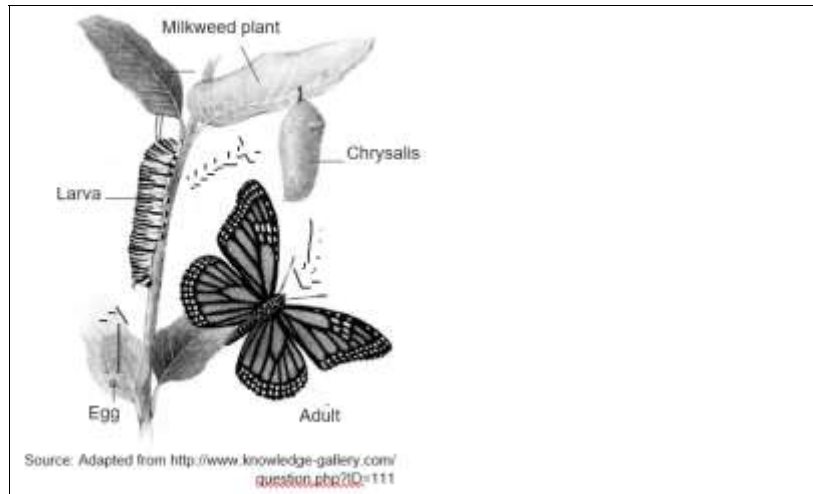
Data Base 1647  
File Number:

Regents Date Jan2024-59.bmp

Jan2024

59 1/23/2024 S4K7

Answer 1



environment / stability

644. The amounts of all the organisms present in four different aquariums are shown in the data tables. Which aquarium would be the most stable?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base 240  
File Number:

Regents Date Jan2010-39.bmp

Jan2010

39 1/26/2010 S4K6

Answer 1

Organism	Amount
aquatic plants	300 g
fish that eat plants	30 g
fish that eat fish	3 g
bacteria	.001 g

(1)

Organism	Amount
aquatic plants	.1 g
fish that eat plants	3 g
fish that eat fish	30 g

(3)

Organism	Amount
aquatic plants	.1 g
fish that eat plants	3 g
fish that eat fish	30 g
bacteria	300 g

(2)

Organism	Amount
aquatic plants	300 g
fish that eat plants	30 g
fish that eat fish	3 g

(4)

## environmental factor

645. Base your answer to this question on the information and photograph shown and on your knowledge of biology.

### Scientists Investigate Sex Determination in Alligators

The sex of some reptiles, including the American alligator, is determined by the temperature at which the eggs are incubated. For example, incubating them at 33°C produces mostly males, while incubation at 30°C produces mostly females. Scientists recently discovered a thermosensor protein, TRPV4, that is associated with this process in American alligators. TRPV4 is activated by temperatures near the mid-30s, and increases the movement of calcium ions into certain cells involved with sex determination. The results of this scientific investigation will most likely lead other scientists to hypothesize that

- (1) human sex cells also contain the TRPV4 protein
- (2) other reptiles may have the TRPV4 protein in their eggs
- (3) the TRPV4 protein affects the growth of plants
- (4) the TRPV4 protein is present in all of the foods eaten by alligators

Data Base 1373  
File Number:

Regents Date Aug2019-36.bmp

Aug2019

36 8/14/2019 S4K2

Answer 2

A baby alligator emerges from its egg shell during hatching



Source: <http://www.dailymail.co.uk/news/article-2190839/>

**environmental factor**

646. The graph shows how the level of carbon dioxide in the atmosphere has changed over the last 150,000 years. Which environmental factor has been most recently affected by these changes in carbon dioxide level?

- (1) light intensity
- (2) types of decomposers
- (3) size of consumers
- (4) atmospheric temperature

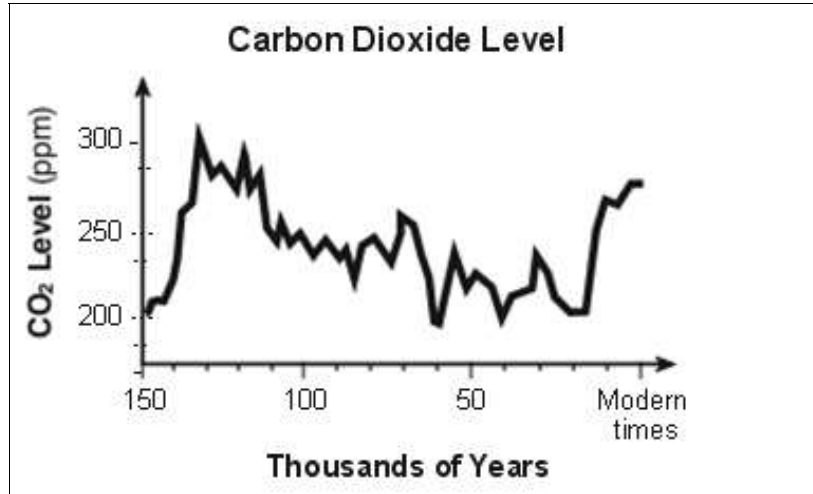
Data Base 186  
File Number:

Regents Date June09-29.bmp

June2009

29 6/18/2009 S4K7

Answer 4



## environmental influence

647. Base your answer to this question on the information given and on your knowledge of biology.

### Frogsicles: Frozen but Still Alive

The wood frog has the amazing ability to survive winter in a frozen state. Ice crystals touching the frog can trigger the freezing of its body fluids. Most of the water moves out of their cells and into body cavities, where it turns into solid ice. Their cells are protected from dehydration and frostbite by the antifreezing effect of their cells absorbing extremely high concentrations of sugar. When these frogs freeze, they stop breathing, their heart stops beating, and they enter a state of dormancy that can last several months. In spring, the frogs thaw, and the excess sugar moves out of their cells.

The frogs resume normal activities in less

than 24 hours. A wood frog's body systems' responses to ice crystals touching it in winter and to the conditions in the spring can best be explained by

- (1) the differentiation of mature body cells during development
- (2) a response of their cells to changing environmental conditions
- (3) the enzymatic breakdown of water as the frog freezes
- (4) a response of the immune system to excess sugar levels

Data Base 1673  
File Number:

Regents Date June2024-49.bmp

June2024

49 6/14/2024 S4K5

Answer 2



Source: <https://www.anchoragepress.com/>

## environmental influence

648. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The field of EPIGENETICS is the study of changes in gene expression due to factors other than a change in the DNA sequence. One factor that can change gene expression is the attachment of a chemical, called a methyl group, to the DNA molecule. This attachment prevents that gene from being expressed, thereby altering that trait. Due to epigenetic effects, even identical twins may not be as identical as was once thought. The diagram shows the DNA sequence of a gene present in a pair of identical twins. Twin B's gene shows an epigenetic effect. Researchers have shown that environmental factors, such as exposure to toxins, can bring about epigenetic effects. This research suggests that an organism's traits

- (1) are always determined by its DNA sequences
- (2) are only determined by environmental effects
- (3) can be influenced by environmental factors
- (4) alter half of the DNA they inherited from their parents

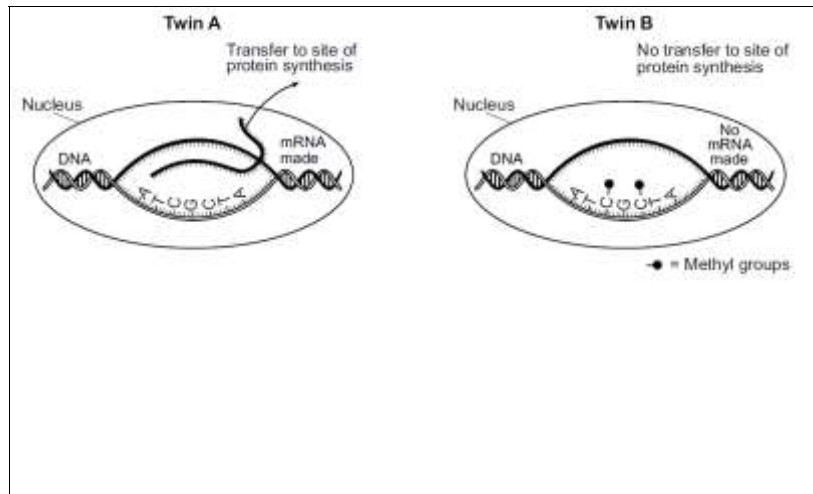
Data Base File Number: 1550

Regents Date Jan2023-36.bmp

Jan2023

36 1/24/2023 S4K2

Answer 3





## environmental influence

649. Each female housefly can lay approximately 500 eggs in a lifetime. She does this in several batches of about 75 to 150 eggs. Within a day, larvae (maggots) hatch from the eggs. They live and feed on organic material, such as garbage and feces. Scientists have calculated that a pair of flies beginning reproduction in April could be the ancestors of 191,010,000,000,000,000 flies by August. Which statement best explains why this does not happen?

- (1) Mutations develop in the young flies
- (2) Environmental factors keep the population in check.
- (3) Flies continue to reproduce in large numbers.
- (4) More female flies survive than male flies.

Data Base File Number: 1306

Regents Date Jan2019-27.bmp

Jan2019

27 1/22/2019 S4K6

Answer 2



Source: <http://www.publicdomainpictures.net/download-picture.php?adresar=10000&subor+1-1220978631q1uO.jpg&id=1137>

**environmental influence**

650. Base your answer to this question on the information in the chart shown and on your knowledge of biology. One explanation for the timing and length of the leopard frog breeding season is that it occurs

- (1) when environmental conditions are most favorable
- (2) 365 days after the eggs have hatched the year before
- (3) 2 to 3 weeks after female frogs have reached sexual maturity
- (4) when there is a greater chance of mutation producing favorable variations

Data Base File Number: 1401

Regents Date Jan2020-35.bmp

Jan2020

36 1/21/2020 S4K3

Answer 1

Where in New York State do leopard frogs live?	Marshes, ponds, swamps, and slow-moving water	
How often do they breed?	Once each year	
When is their breeding season?	March until June	
How many eggs does one frog produce?	3000 to 6500	
How long until the fertilized eggs hatch?	2 to 3 weeks	
When do they reach sexual maturity?	Males: 365 days	Females: 730 days

**environmental influence**

651. The data table shown summarizes the results of an investigation in which seeds from the same plant were grown under different conditions of temperature and relative humidity. Which conclusion can be drawn from the information in the data table?

- (1) Color in this species is determined by genes, only.
- (2) Many characteristics are not inherited.
- (3) Mutations occur only when plants are grown at low temperatures
- (4) There is an interaction between environment and heredity.

Data Base File Number: 844

Regents Date June2001-10.bmp

June2001

10 6/15/2001 S1K3

Answer 4

Temperature: 20°C Relative Humidity: 20%		Temperature: 31°C Relative Humidity: 95%	
Genes Present in Cells of Organism	Appearance of Organism	Genes Present in Cells of Organism	Appearance of Organism
AA	red	AA	white
Aa	red	Aa	white
aa	white	aa	white

## environmental influence

652. Hydrangea, a commonly used landscaping flower, can have dramatically different colors, depending on the pH of the soil in which it is grown. (REFER TO THE CHART GIVEN OF SOIL pH RANGES). The differences in color demonstrate that

- (1) traits can be expressed differently if the environment changes
- (2) flower color is controlled only by genetic information
- (3) abiotic factors do not have an effect on flower production
- (4) pH is the only factor that affects flower growth

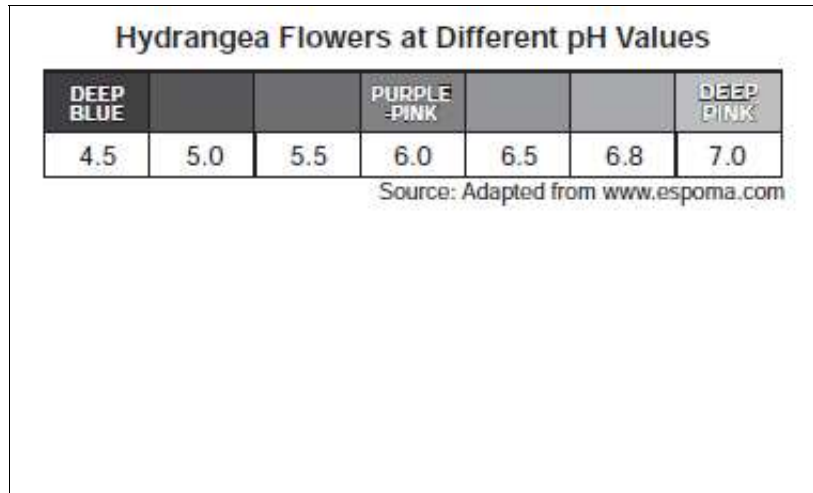
Data Base File Number: 1598

Regents Date Aug2023-9.bmp

Aug2023

9 8/17/2023 S4K2

Answer 1



## environmental influence

653. Which concept does the cartoon shown illustrate?

- (1) Fish require certain environmental conditions for survival.
- (2) Fish can adapt to any environment.
- (3) Fish alter the ecosystems to improve their ability to survive.
- (4) Fish can survive abrupt climate changes.

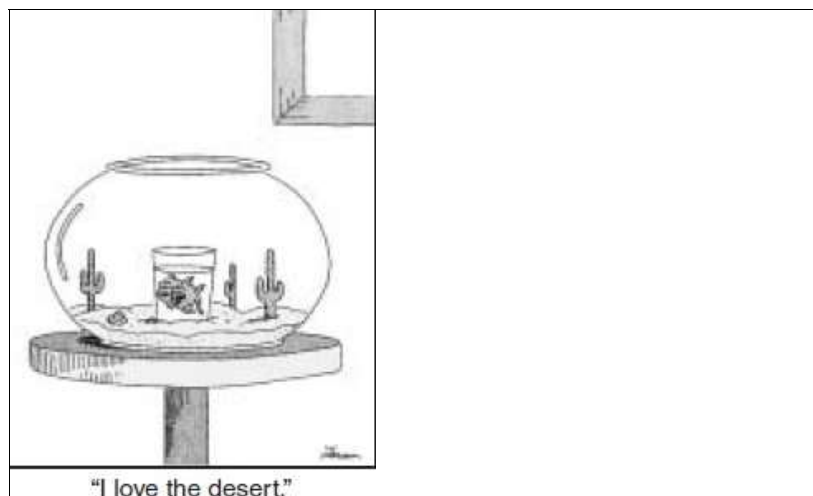
Data Base File Number: 812

Regents Date June2002-33.bmp

June2002

33 6/19/2002 S4K6

Answer 1



**environmental influence**

654. Base your answer to this questions on the information and data table below and on your knowledge of biology. Fertilized eggs containing embryos from the same species of alligator were incubated at different temperatures. The sex of the hatched offspring is shown in the table. A review of this data could lead to the conclusion that

- (1) the most alligator eggs hatched if incubated at 26°C
- (2) the sex of the offspring depends on the incubation temperature
- (3) female alligators develop at higher temperatures
- (4) temperature doesn't affect the survival of alligator embryos

Data Base  
File Number:

945

Regents Date

June2014-38.bmp

June2014

38

6/17/2014

S1K3

Answer

2

**Sex of Offspring Incubated at Different Temperatures**

	Temperature of Egg Incubation					
	26°C	28°C	30°C	32°C	34°C	36°C
Number of Eggs Used	100	100	100	100	100	100
Number of Embryos that Died	80	4	3	2	6	86
Number of Females Hatched	20	96	97	85	0	0
Number of Males Hatched	0	0	0	13	94	14

## environmental influence

655. The series of fossil snail shells as shown represents 10 samples that were collected from deposits laid down from 10 million years ago to 3 million years ago. The shells are arranged in order by age. The shells shown represent how they looked at various times over a 7-million-year period. It would be most accurate to conclude that the snails of this species

- (1) changed in size due to environmental changes that affected the survival of different-sized snails
- (2) grew smaller, then larger over time as the environment changed from a wetter to a drier climate
- (3) changed in size at different times, because they needed better protection from predators
- (4) grew larger because, as organisms evolve, they always become larger and more complex

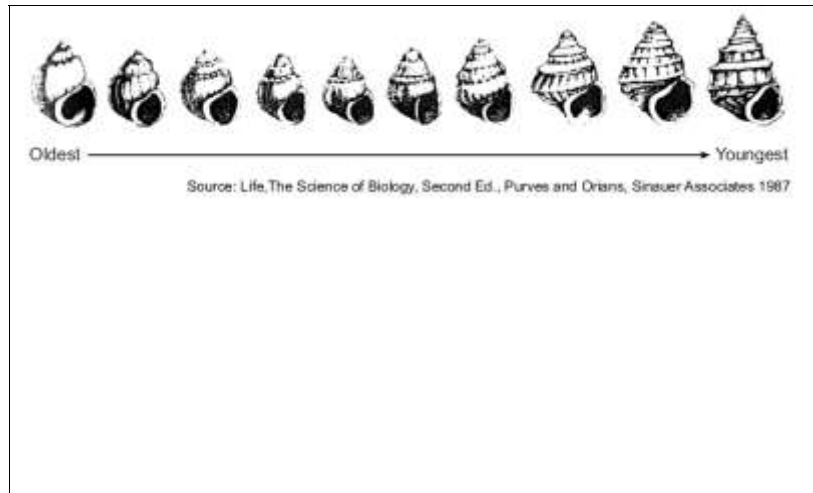
Data Base File Number: 1543

Regents Date Jan2023-27.bmp

Jan2023

27 1/24/2023 S4K3

Answer 1



## enzyme

656. Base your answers to this question on the diagram shown, which represents stages in the digestion of a starch, and on your knowledge of biology. The structure labeled X most likely represents

- (1) an antibody
- (2) a receptor molecule
- (3) an enzyme
- (4) a hormone

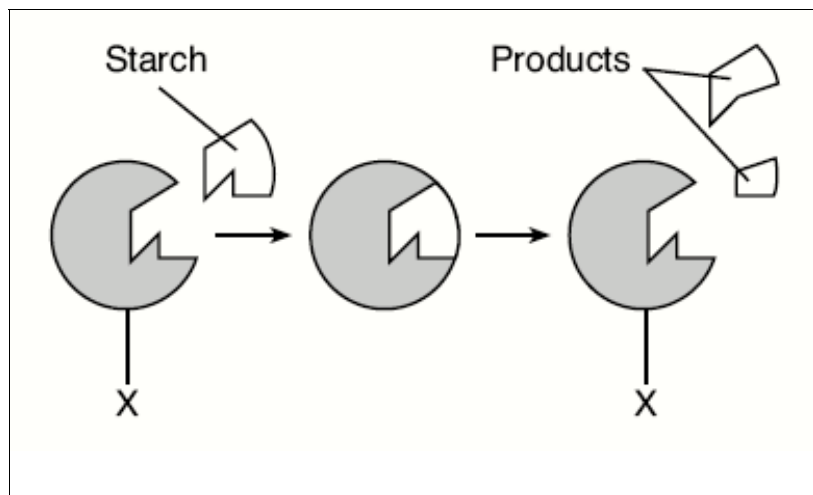
Data Base File Number: 132

Regents Date Aug08-36.bmp

Aug2008

36 8/13/2008 S4K5

Answer 3



enzyme

657. Base your answer to this question on the information given and on your knowledge of biology. Hydrogen peroxide is a toxic substance produced in an organism as a result of certain metabolic processes. Catalase, a biological catalyst produced by cells, speeds the breakdown of hydrogen peroxide into less harmful substances. In an investigation, 2-gram pieces of liver (which contains catalase) were added to separate dishes. Each dish contained the same amount of a 3% solution of hydrogen peroxide, but at different temperatures. The relative activity of the catalase was determined. The results were recorded and are shown in the data table. What kind of organic substance is catalase?

- (1) enzyme
- (2) lipid
- (3) carbohydrate
- (4) amino acid

Data Base File Number: 224

Regents Date August2009-47.b

Aug2009

47 8/13/2009 S1K3

Answer 1

The Effect of Temperature on Catalase Activity

Temperature (°C)	Relative Catalase Activity
20	17
25	22
30	33
35	43
40	37
45	24
50	12

enzyme

658. Base your answer to this question on the information shown in the chart and on your knowledge of biology. Cytochrome c is an enzyme located in the mitochondria of many types of cells. The number of differences in the amino acid sequences of Cytochrome c from different species are compared to human Cytochrome c in the data table shown. Of the organisms listed below, which one has a DNA code for Cytochrome c that is most similar to that of a human?

- (1) tuna
- (2) chicken
- (3) moth
- (4) dog

Data Base File Number: 84

Regents Date Jan08-68.bmp

Jan2008

68 1/25/2008 LABS

Answer 4

Organism	Number of Differences in Cytochrome c Compared to Humans
tuna	21
mold	48
moth	31
dog	11
horse	12
chicken	13
monkey	1

enzyme

659. Base your answer to this question on the information given and the diagram shown, and on your knowledge of biology. The diagram provides information about some of the digestive enzymes produced by the human pancreas. The activity of nuclease enzymes would most likely result in the release of

- (1) four different kinds of molecular bases
- (2) glucose
- (3) a variety of different amino acids
- (4) hormones

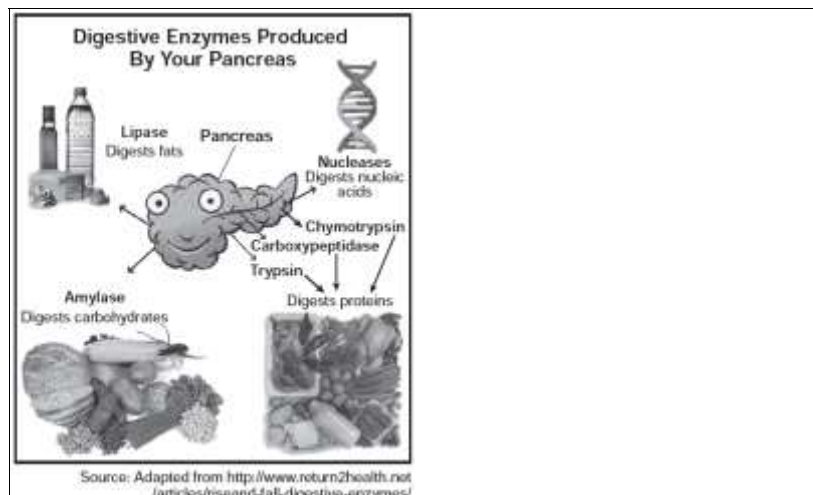
Data Base File Number: 1576

Regents Date June2023-37.bmp

June2023

37 6/14/2023 S4K2

Answer 1



## enzyme

660. The Venus flytrap is a plant that has a unique system by which it traps and breaks down its prey. Unsuspecting insects land on the leaf and touch tiny hairs located on the leaf, triggering the leaf to close around the prey. The substance responsible for breaking down the Venus flytrap's prey most likely contains

- (1) chlorophyll molecules
- (2) glucose molecules
- (3) hormone molecules
- (4) enzyme molecules

Data Base File Number: 1392

Regents Date Jan2020-23.bmp

Jan2020

23 1/21/2020 S4K5

Answer 4



Source: <https://gardenofeaden.blogspot.co.uk/2010/02/why-do-carnivorous-plants-eat-animals.html>

## enzyme

661. The graph shown illustrates the relative amounts of product formed by the action of an enzyme in a solution with a pH of 6 at seven different temperatures. Which statement best expresses the amount of product that will be formed at each temperature if the experiment is repeated at a pH of 4?

- (1) The amount of product formed will be equal to that produced at pH 6.
- (2) The amount of product formed will be greater than that produced at pH 6
- (3) The amount of product formed will be less than that produced at pH 6.
- (4) The amount of product formed can not be accurately predicted.

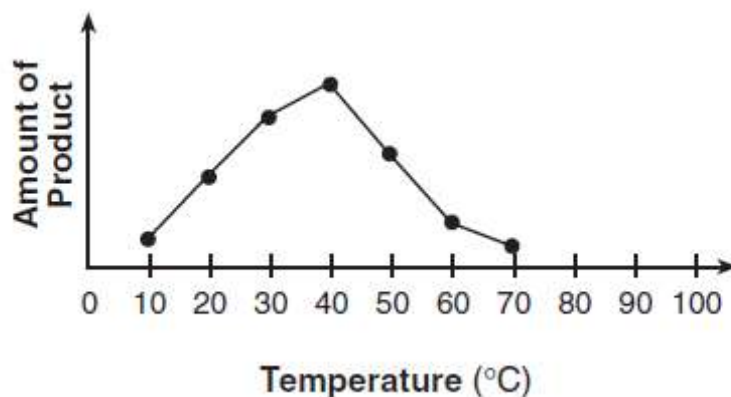
Data Base File Number: 453

Regents Date Jan2006-5.bmp

Jan2006

5 1/27/2006 S4K3

Answer 4





enzyme

662. Base your answer to this question on the information given and on your knowledge of biology. A student has a sandwich for lunch. The bread contains starch molecules and various other molecules. After chewing and swallowing some of the sandwich, the starch moves along the digestive system and is digested. The sequence shown represents what takes place. Which molecules are used to digest the starch?

- (1) enzymes
- (2) simple sugars
- (3) monosaccharides
- (4) disaccharides

Data Base 930  
File Number:

Regents Date Jan2014-56.bmp

Jan2014

56 1/27/2014 S4K1

Answer 1

digested starch → bloodstream → cell → cell structure → ATP

## enzyme

663. Base your answer to this question on the information given and on your knowledge of biology. Pepsin is a protein-digesting enzyme. It is produced inside cells that line the stomach and then secreted into the stomach cavity, where it begins to work. When first produced, the pepsin exists in an inactive form called pepsinogen. Pepsinogen cannot work because it has an extra segment that keeps it from interacting with the proteins it would normally digest. When it is secreted into the stomach cavity, the acid there causes the pepsinogen molecule to lose this extra segment, which changes it into the active pepsin that can begin to digest food proteins. Which statement most accurately summarizes the function of pepsin?

- (1) It prevents harmful substances from entering the stomach.
- (2) It regulates the transport of starch across the cell membrane.
- (3) It controls the rate at which certain chemical reactions occur.
- (4) It prevents the production of harmful by-products in stomach cells.

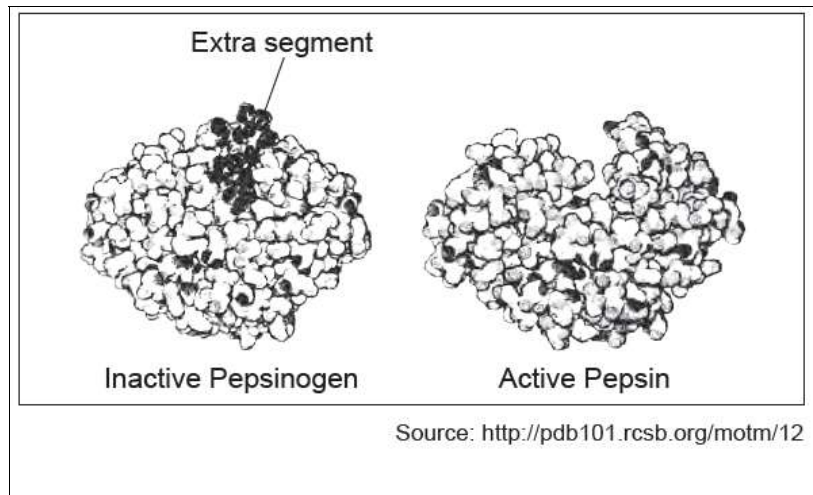
Data Base File Number: 1582

Regents Date June2023-50.bmp

June2023

50 6/14/2023 S4K5

Answer 3



enzyme

664. Base your answer to this question on the information shown and on your knowledge of biology. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is a toxic compound that is produced by plant and animal cells. These cells also produce the enzyme catalase, which converts H<sub>2</sub>O<sub>2</sub> into water and oxygen gas, preventing the buildup of H<sub>2</sub>O<sub>2</sub>. A student designed an experiment to test the effect of an acidic pH on the rate of the reaction of H<sub>2</sub>O<sub>2</sub> with catalase. The data table summarizes the outcome of the experiment. The best explanation for the change in catalase activity as the pH changed from 7 to 3 is that

- (1) strong acid digests the catalase, causing the reaction rate to increase
- (2) the student most likely cooled the H<sub>2</sub>O<sub>2</sub> solution, causing the reaction rate to increase
- (3) in acidic solutions, the shape of catalase changes, causing the reaction rate to decrease
- (4) decreased oxygen production causes catalase to increase the rate of reaction

Data Base File Number: 1288

Regents Date Aug2018-38.bmp

Aug2018

39 8/17/2018 S4K5

Answer 3

pH Level	7 (neutral)	6	5	3
Reaction Rate (mL of oxygen/minute)	1.5	1.3	1.0	.55

enzyme

665. While the changing climate endangers some species, a little global warming suits many shallow-water squid just fine. Slightly higher ocean temperatures have been shown to boost the growth of these squid, whose digestive enzymes speed up when warm. Which graph most accurately shows the interaction between water temperature and digestive enzyme action in the shallow-water squid?

- (1) 1
- (2) 2
- (3) 3
- (4) 5

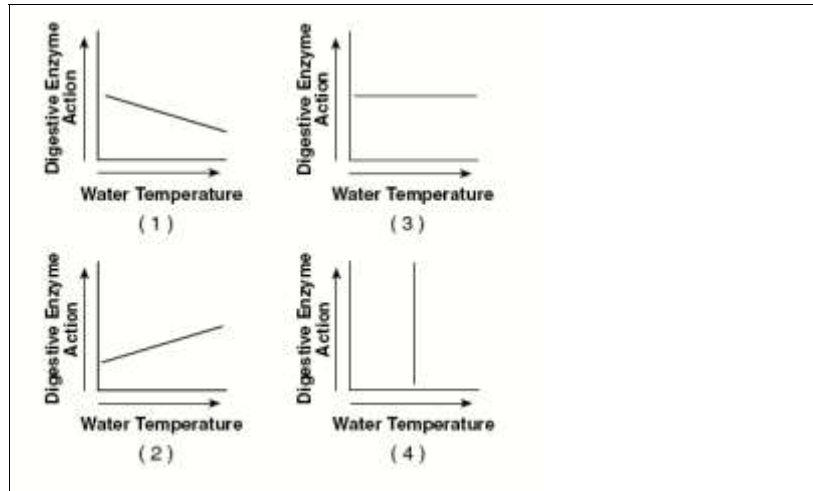
Data Base File Number: 164

Regents Date Jan09-48.bmp

Jan2009

48 1/27/2009 S4K5

Answer 2



enzyme

666. An incomplete graph is shown below (NO value for "Z"). What label could appropriately be used to replace letter Z on the axis?

- (1) date
- (2) oxygen level
- (3) temperature
- (4) carbon dioxide level

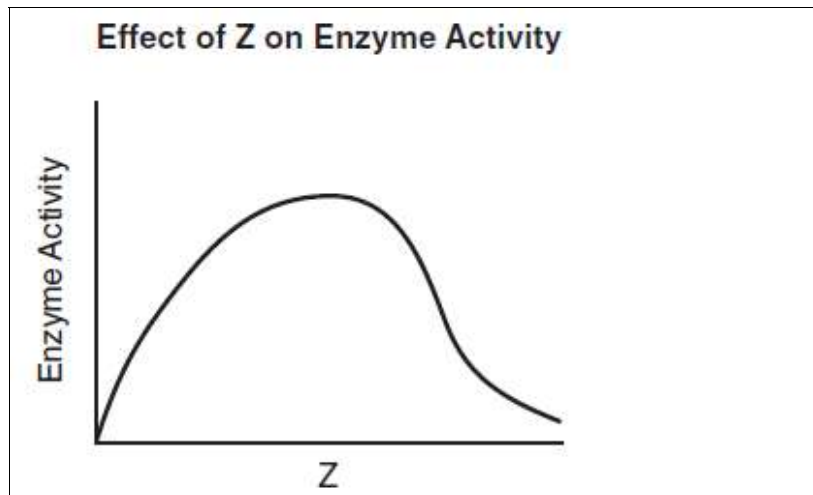
Data Base File Number: 680

Regents Date June2004-53.bmp

June2004

53 6/18/2004 S4K6

Answer 3



enzyme

667. Base your answer to this question on the information given and on your knowledge of biology. A student completed a series of experiments and found that a protein digesting enzyme (intestinal protease) functions best when the pH is 8.0 and the temperature is 37°C. During an experiment, the student used some of the procedures listed. Which procedure would have the least effect on the rate of protein digestion?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 841

Regents Date Jan2002-57.bmp

Jan2002

57 1/23/2002 S4K5

Answer 2

*Procedures*

- (A) Adding more protease
- (B) Adding more protein
- (C) Decreasing the pH to 6.0
- (D) Increasing the temperature to 45°C
- (E) Decreasing the amount of light

enzyme

668. Enzymes have an optimum temperature at which they work best. Temperatures above and below this optimum will decrease enzyme activity. Which graph best illustrates the effect of temperature on enzyme activity?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

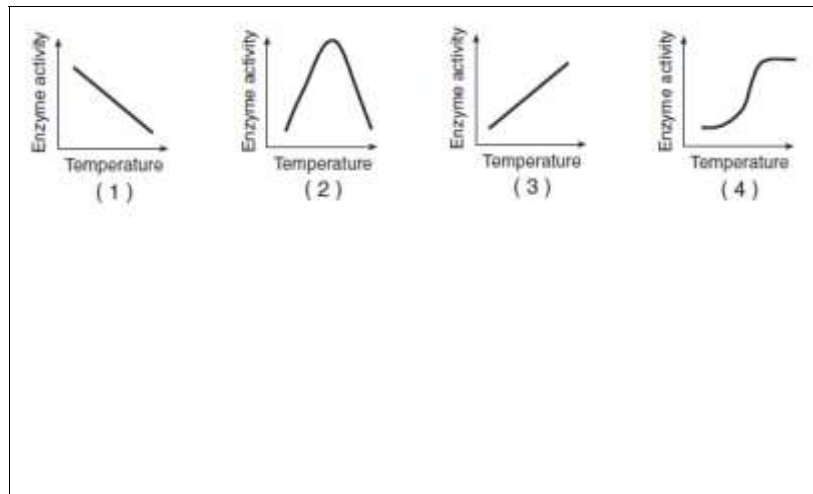
Data Base File Number: 692

Regents Date Aug2004-35.bmp

Aug2004

35 8/17/2004 S4K5

Answer 2



## enzyme / substrate

669. The diagram shown represents stages in the digestion of an organic compound. Why would substance X not be likely to digest a different organic compound?

- (1) Substance X can only be used once.
- (2) The active site of substance X does not fit a different substrate.
- (3) Substance X cannot be reproduced.
- (4) Substance X is unstable.

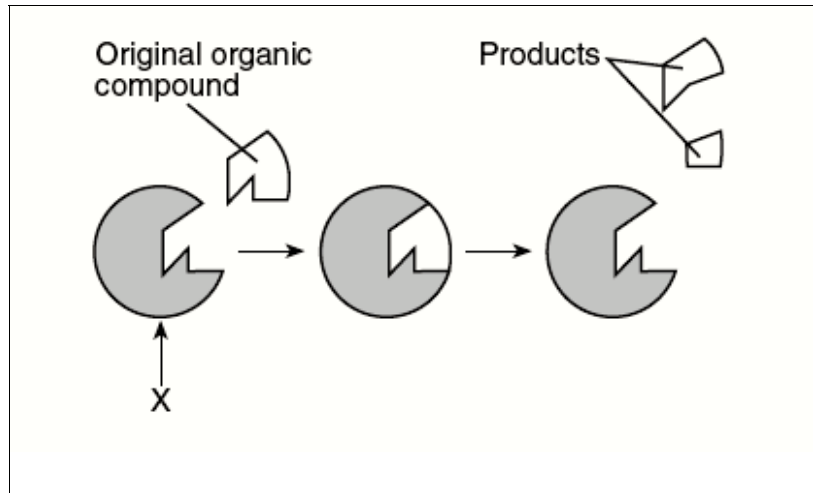
Data Base File Number: 163

Regents Date Jan09-44.bmp

Jan2009

44 1/27/2009 S4K5

Answer 2



## enzyme / substrate

670. Base your answer to this question on the diagrams shown and on your knowledge of biology. The diagram labeled (A) is a human enzyme. The diagrams labeled (1), (2), (3), and (4) are possible substrates for enzyme (A). Drawings are NOT to scale. Which substrate is enzyme (A) most likely to react with?

- (1) 1, only
- (2) 1 or 2
- (3) 3
- (4) 4

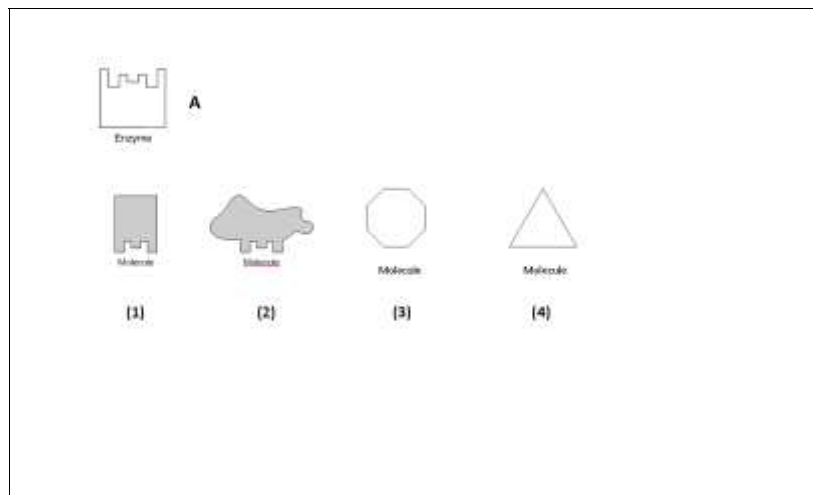
Data Base File Number: 1320

Regents Date Jan2019-59C.bm

Jan2019

59 1/22/2019 S4K5

Answer 2



## enzyme / substrate

671. Base your answer to this question on the diagram shown that represents a human enzyme and four types of molecules present in a solution in a flask. Which molecule would most likely react with the enzyme?

(1) A

(3) C

(2) B

(4) D

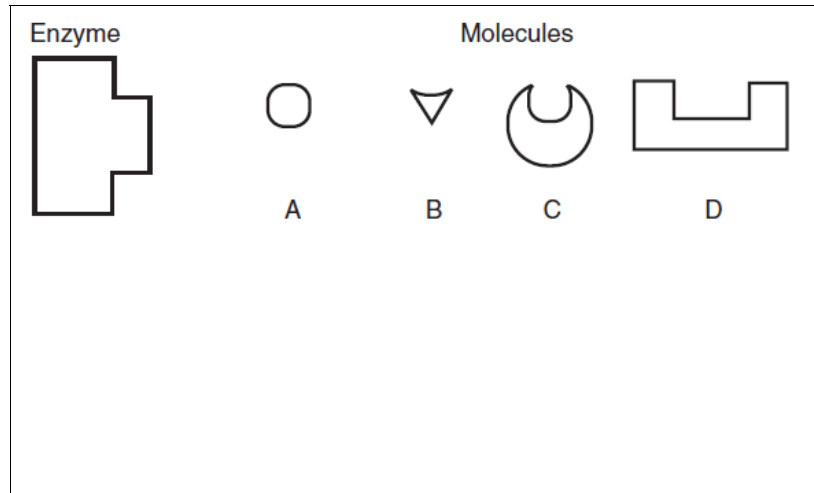
Data Base File Number: 796

Regents Date Aug2002-66.bmp

Aug2002

66 8/13/2002 S4K5

Answer 4



## enzyme / substrate

672. The graph shows the effect of temperature on the relative rate of action of enzyme X on a protein. Which change would NOT affect the relative rate of action of enzyme X?

(1) the addition of cold water when the reaction is at 50°C

(3) the removal of the protein when the reaction is at 30°C

(2) an increase in temperature from 70°C to 80°C

(4) a decrease in temperature from 40°C to 10°C

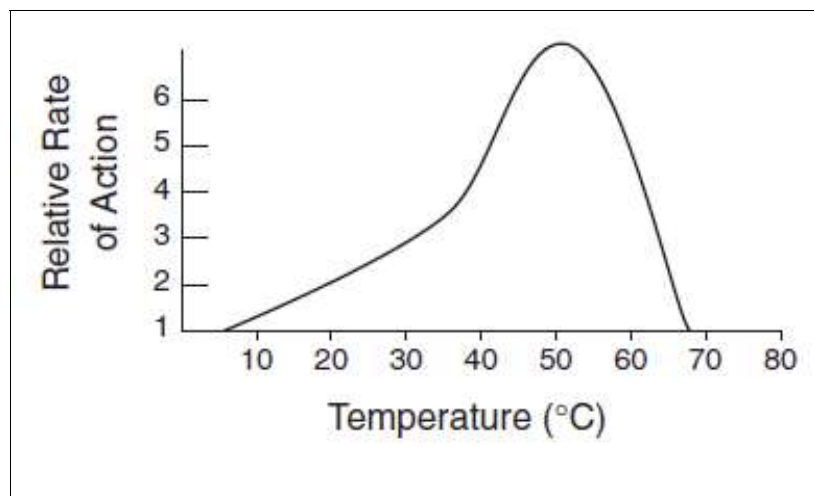
Data Base File Number: 536

Regents Date Jan2005-21.bmp

Jan2005

21 1/28/2005 S4K5

Answer 2



## enzyme / substrate

673. Base your answer to this question on the information given and on your knowledge of biology. The graph shows the effect of substrate concentration on the action of enzyme X. This enzyme is functioning at its optimal temperature, 36°C, and at its optimal pH, 5.5. When the substrate concentration increases from 0.4% to 0.5%, the rate of the reaction

- (1) decreases  
(2) increases  
(3) remains the same  
(4) increases, then decreases

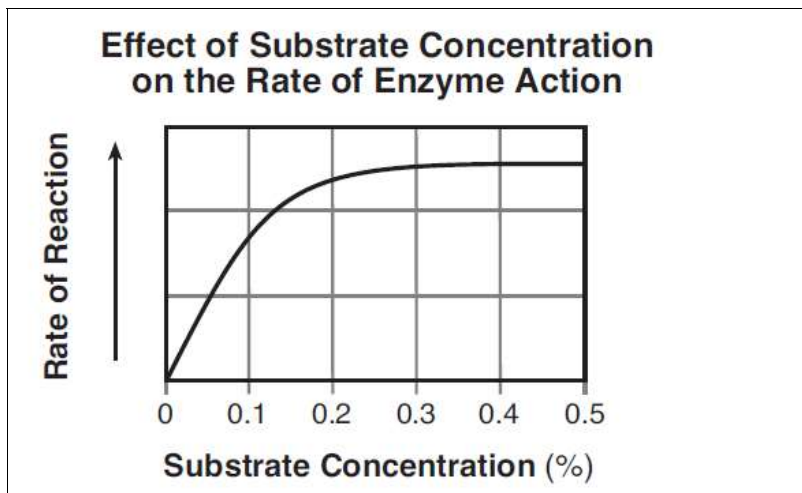
Data Base 326  
File Number:

Regents Date Jan2011-54.bmp

Jan2011

54 1/25/2011 S4K1

Answer 3





enzyme / substrate

674. Base your answer to this question on the information given and on your knowledge of biology. A student placed four different test tubes in a water bath at 37°C, human body temperature. The contents of the test tubes are listed in the table as shown. Two of them contain a human enzyme. After 15 minutes, the student tested the contents of each tube for the presence of both amino acids and glucose. He obtained the results shown in the table in the BOTTOM section of the diagram. What results would the student most likely obtain if he ran the same experiment again but placed the test tubes in a hot water bath at 65°C for 15 minutes.

- (1) There would be no positive results.
- (2) All results would be positive.
- (3) The results would be the same as in the first experiment.
- (4) The results would be unpredictable.

Data Base File Number: 1676

Regents Date: June2024-54.bmp

June2024

54 6/14/2024 S4K5

Answer: 1

Test Tube	Contents
1	ground meat, water, protein-digesting enzyme
2	bread, water, starch-digesting enzyme
3	ground meat, water
4	bread, water

After 15 minutes, the student tested the contents of each tube for the presence of both amino acids and glucose. He obtained the results shown in the table below.

Test Tube Number	Indicator for Amino Acids	Indicator for Glucose
1	positive	negative
2	negative	positive
3	negative	negative
4	negative	negative

enzyme / substrate

675. An enzyme and four different molecules are shown in the diagram. The enzyme would most likely affect reactions involving

- (1) molecule A, only
- (2) molecule C, only
- (3) molecules B and D
- (4) molecules A and C

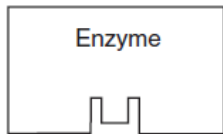
Data Base File Number: 724

Regents Date: Jan2003-62.bmp

Jan2003


62 1/30/2003 S4K5

Answer: 2




Enzyme


Molecules:




(A)



(B)



(C)



(D)

## enzyme / substrate

676. The graph shown represents data obtained from an experiment on starch digestion. Which statement best describes point A and point B on the graph?

- (1) The concentration of sugars is greater at point A than it is at point B.
- (2) The concentration of sugars is greater at point B than it is at point A.
- (3) The starch concentration is the same at point A as it is at point B.
- (4) The starch concentration is greater at point B than it is at point A.

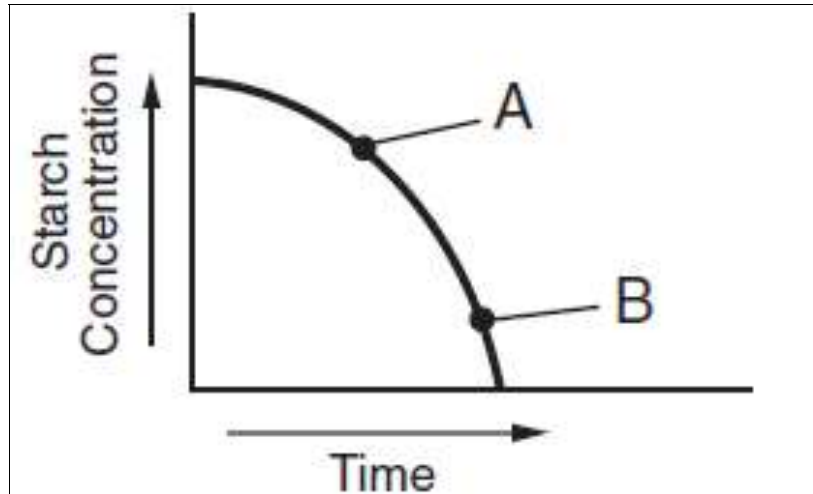
Data Base File Number: 754

Regents Date Aug2003-5.bmp

Aug2003

5 8/13/2003 S1K3

Answer 2



## enzyme / substrate

677. The diagram shown illustrates a biochemical process that occurs in organisms. The substance labeled "catalyst" is also known as

- (1) a hormone
- (2) an enzyme
- (3) an antibody
- (4) an inorganic compound

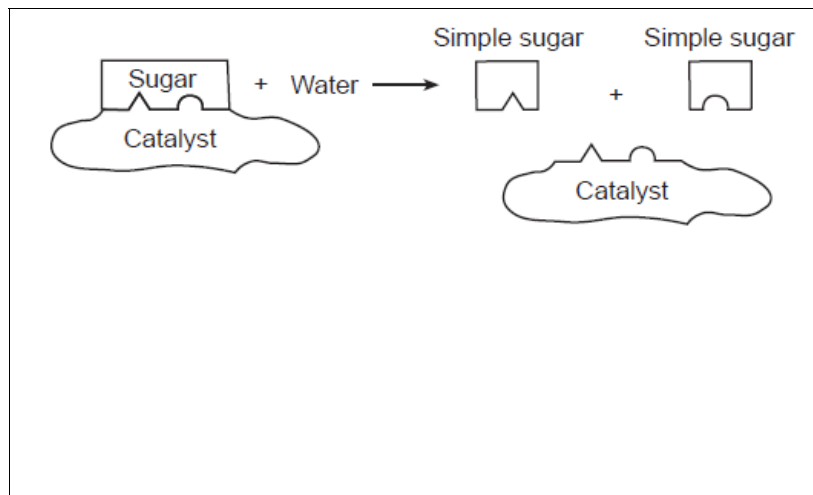
Data Base File Number: 847

Regents Date June2001-22.bmp

June2001

22 6/15/2001 S4K5

Answer 2



## enzyme activity / pH

678. Base your answer to this question on the graph shown and on your knowledge of biology. Pepsin works best in which type of environment?

- (1) acidic, only
- (2) basic, only
- (3) neutral
- (4) sometimes acidic, sometimes basic

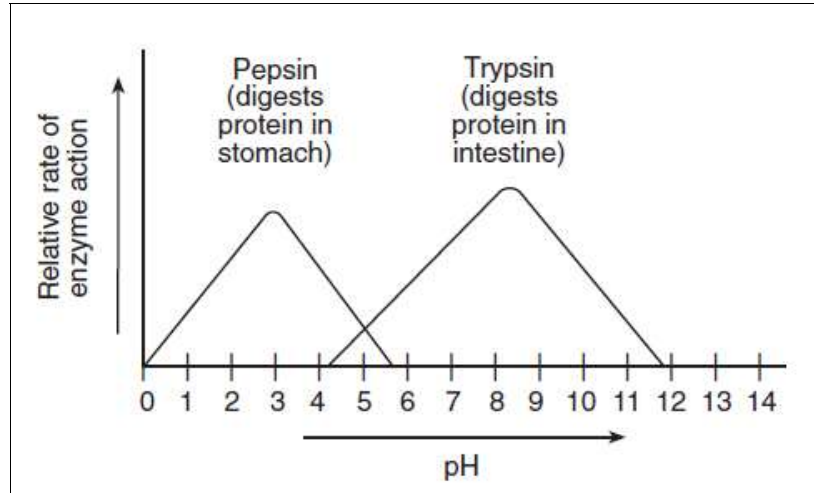
Data Base File Number: 647

Regents Date Jan2004-40.bmp

Jan2004

40 1/29/2004 S4K5

Answer 1



## enzyme activity / pH

679. The table shown lists enzymes that function in different locations in the human body, and the temperature and pH ranges of these locations. Different enzymes are secreted in each of the three locations. Ptyalin digests carbohydrates. Pepsin and trypsin both digest proteins. Use the data in the chart and your knowledge of biology to answer this question. What will most likely happen to the activity of pepsin after it moves with the food from the stomach to the small intestine?

- (1) Pepsin will either stop functioning or slow down.
- (2) Pepsin will continue to function with the same activity as in the stomach.
- (3) Pepsin activity will increase.
- (4) Pepsin will be destroyed.

Data Base File Number: 296

Regents Date Aug2010-57.bmp

Aug2010

57 8/18/2010 S4K5

Answer 1

Enzyme	Location	Temperature (°C)	pH
ptyalin	mouth	36.7–37.0	6.5–7.0
pepsin	stomach	37.3–37.6	1.0–3.0
trypsin	small intestine	37.3–37.6	7.5–9.0

## enzyme activity / pH

680. Students did an experiment comparing the activity of four different enzymes, A, B, C, and D. The results are represented in the graph shown. A valid conclusion based on the information in the graph is that

- (1) the pH of some enzymes changes as the temperature changes
- (2) enzymes change color in proportion to the rate of activity
- (3) a difference in the pH of an environment changes enzyme activity
- (4) enzyme activity causes acids to change into bases over time

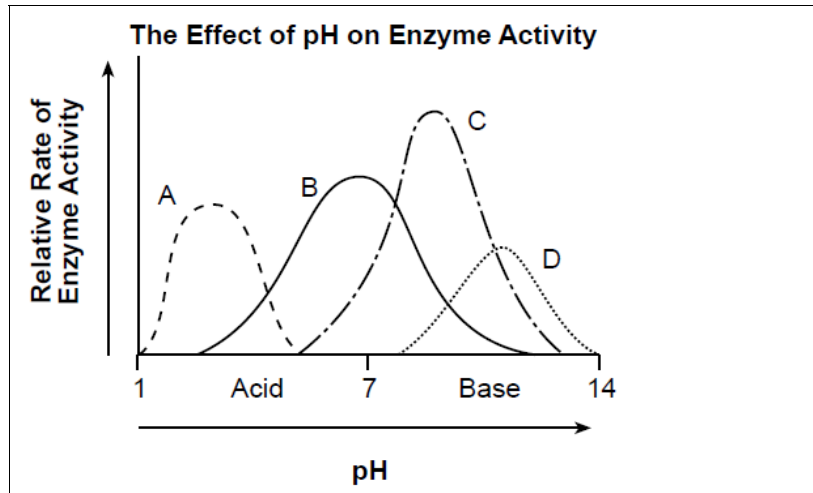
Data Base File Number: 1393

Regents Date Jan2020-25.bmp

Jan2020

25 1/21/2020 S4K5

Answer 3



## enzyme activity / pH

681. The graph shown represents the effect of pH on three different enzymes at normal body temperature. The graph illustrates that enzymes 1, 2, and 3

- (1) are not affected by pH
- (2) work best at different pH levels
- (3) work best in an acidic environment
- (4) work best in a basic environment

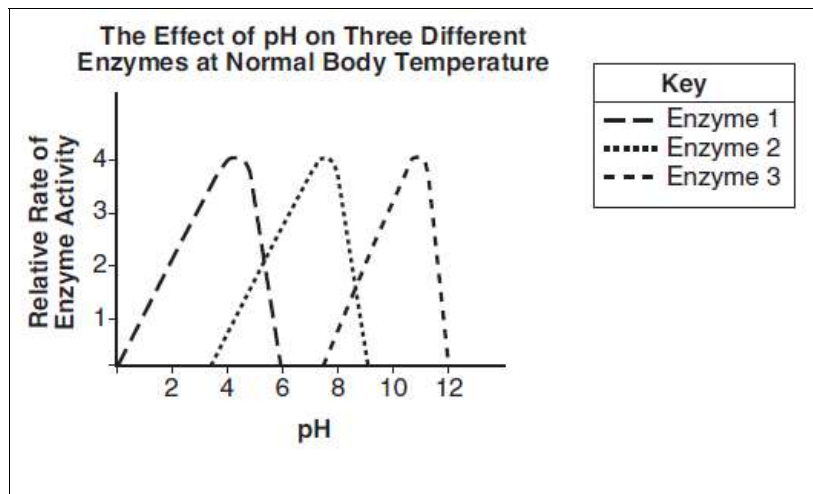
Data Base File Number: 1026

Regents Date June2015-38.bmp

June2015

38 6/16/2015 S4K5

Answer 2



## enzyme activity / pH

682. Base your answer to this question on the graph shown and on your knowledge of biology. Neither enzyme works at a pH of

- (1) 1 (3) 3  
 (2) 5 (4) 13

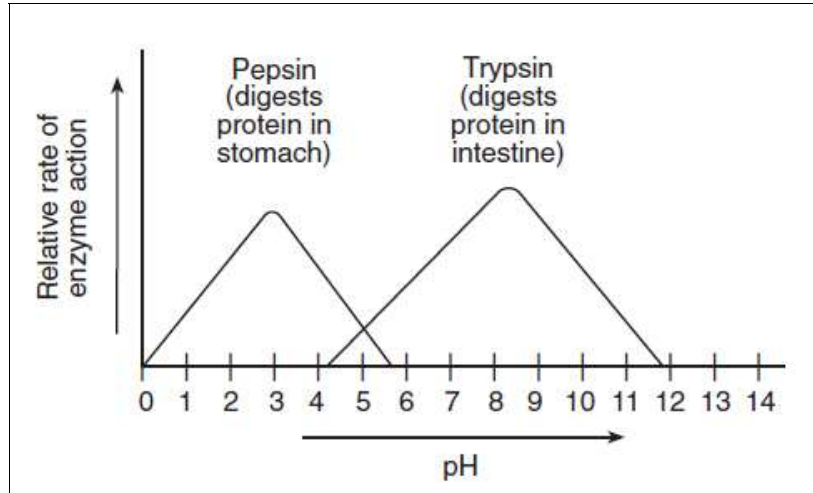
Data Base File Number: 648

Regents Date Jan2004-40.bmp

Jan2004

41 1/29/2004 S4K5

Answer 4



## enzyme activity / pH

683. The pH of the internal environment of lysosomes (organelles that contain digestive enzymes) is approximately 4.5, while the pH of the surrounding cytoplasm is approximately 7. The average pH of the human stomach during digestion is approximately 2.5, while the average pH of the small intestine during digestion is about 8. The graph shows how pH affects the enzyme activity of four different enzymes, A, B, C, and D. Which enzyme functions best in a pH environment most similar to that of human stomach enzymes?

- (1) A (3) C  
 (2) B (4) D

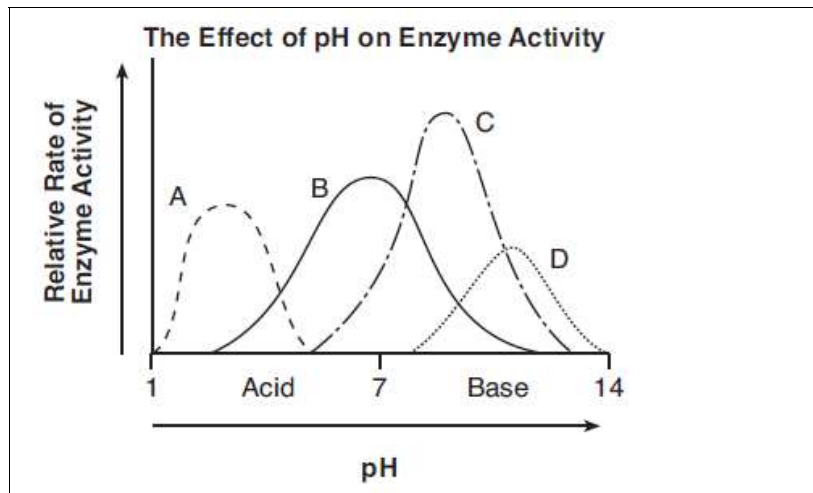
Data Base File Number: 909

Regents Date Aug2013-37.bmp

Aug2013

37 8/14/2013 S4K5

Answer 1



## enzyme activity / pH

684. The effect of pH on a certain enzyme is shown in the graph. At what pH would the enzyme be most effective?

- (1) above 10
- (2) between 8 and 10
- (3) between 5 and 7
- (4) below 5

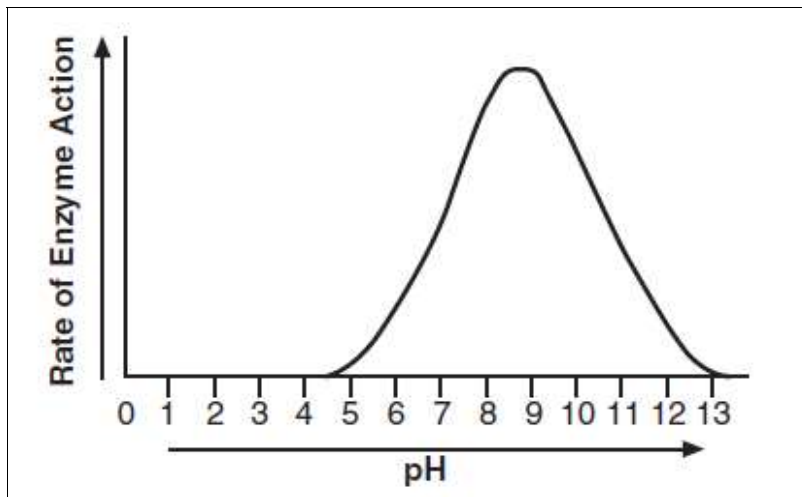
Data Base File Number: 814

Regents Date June2002-37.bmp

June2002

37 6/19/2002 S4K5

Answer 2



## enzyme activity / pH

685. The word equation shown represents a chemical reaction that occurs in humans. What data should be collected to support the hypothesis that enzyme C works best in an environment that is slightly basic?

- (1) the amino acid sequence of enzyme C
- (2) the amount of substance W produced in five minutes at various pH levels
- (3) the shapes of substances X and Y after the reaction occurs
- (4) the temperature before the reaction occurs

Data Base File Number: 752

Regents Date Aug2003-3.bmp

Aug2003

3 8/13/2003 S1K2

Answer 2



enzyme reaction

686. Which statement is supported by the information in the graph shown?

- (1) The enzymes respond in a similar way to changes in temperature
- (2) The enzymes in bacteria function best at 40°C.
- (3) The enzymes function best at the same temperature.
- (4) The enzymes break down the same substances.

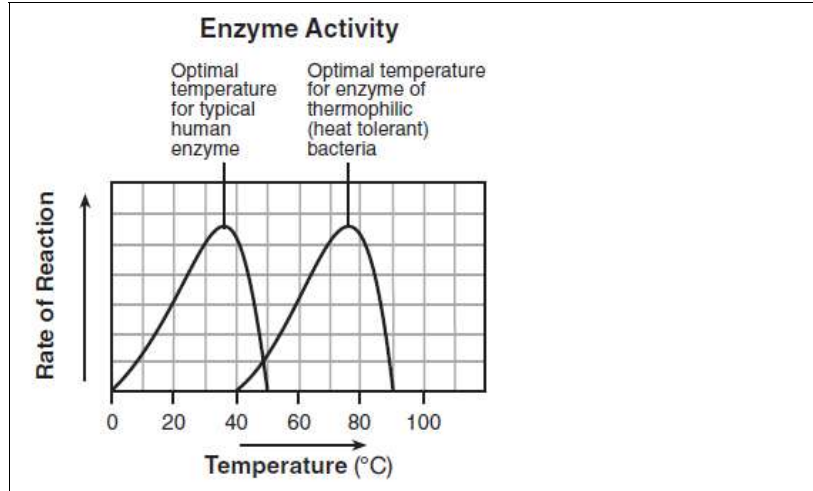
Data Base File Number: 995

Regents Date Jan2015-38.bmp

Jan2015

38 2/26/2015 S4K5

Answer 1



enzyme reaction

687. The diagram shown represents a model of a biological process that occurs in humans at normal body temperature, 37°C. Increasing body temperature to 40°C would interfere most directly with the rate of function of structure

- (1) A
- (2) B
- (3) C
- (4) D

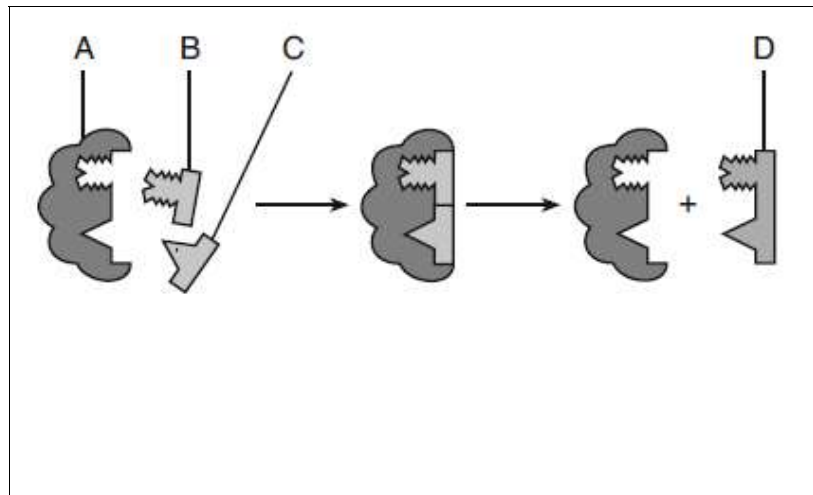
Data Base File Number: 414

Regents Date June2012-37.bmp

June2012

37 6/19/2012 S4K5

Answer 1



## enzyme structure

688. The graph, as shown, represents the rate of a chemical reaction involving a particular human enzyme that breaks down starch. The most likely reason the action of the enzyme DECREASES after 40°C is that

- (1) the DNA in the enzyme mutates and can no longer break down the starch
- (2) enzymes die after working for a long period of constant activity in the body
- (3) the shape of the enzyme changes due to environmental conditions
- (4) as the temperature of the enzyme rises, the pH of the environment changes, deactivating the enzyme

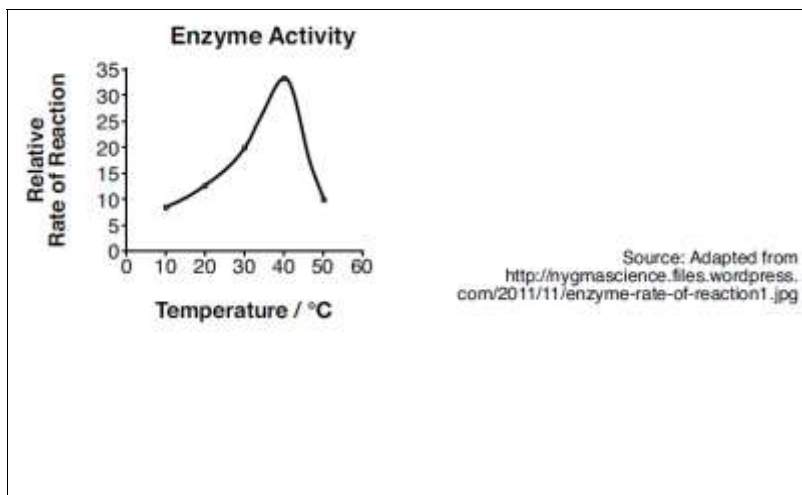
Data Base File Number: 1479

Regents Date June2022-33.bmp

June2022

33 6/15/2022 S4K5

Answer 3



## enzyme structure

689. The diagram shown represents two molecules that are involved in metabolic activities in some living cells. The shape of each of the molecules is important because

- (1) molecules having different shapes are always found in different organisms
- (2) the shape of a molecule determines how it functions in chemical reactions
- (3) the shape of a molecule determines the age of an organism
- (4) if the shape of any molecule in an organism changes, the DNA in that organism will also change

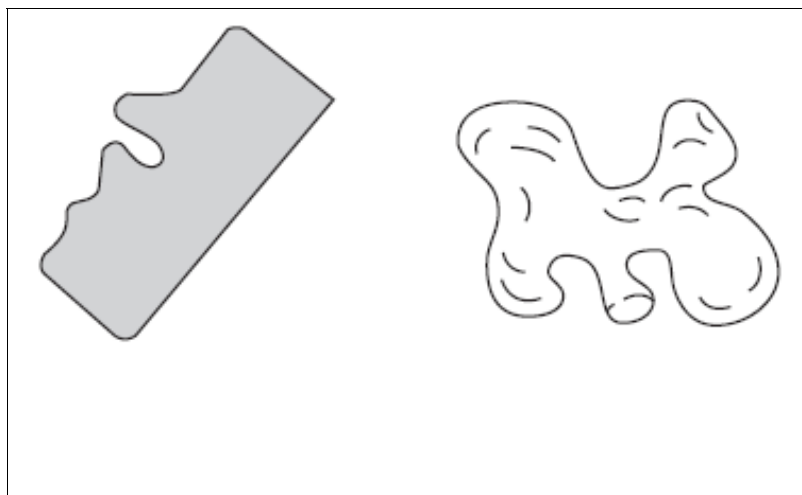
Data Base File Number: 1017

Regents Date June2015-23.bmp

June2015

23 6/16/2015 S4K5

Answer 2





## enzyme structure

690. Catalase is an enzyme produced by organisms that breaks down hydrogen peroxide, releasing oxygen and water. The relative enzyme activity, when tested at different temperatures, is shown in the graph. Which statement best explains the DECREASE in activity of catalase after 35°C shown in the graph? .

- (1) The structure of the enzyme changes, which slows down the reaction.
- (2) There is no hydrogen peroxide left for the activity to continue, so it stops.
- (3) The raw materials permanently bind to the catalase, preventing the reaction.
- (4) The reaction is no longer needed for survival of the individual.

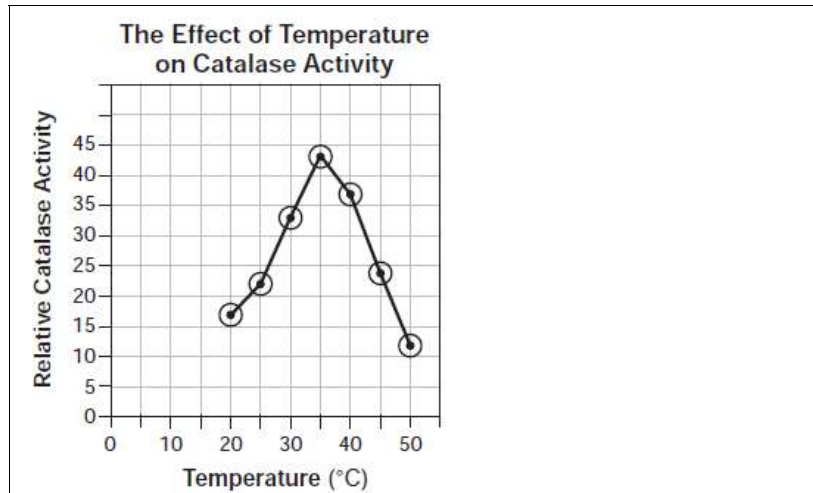
Data Base File Number: 1693

Regents Date Aug2024-31.bmp

Aug2024

31 8/20/2024 S4K5

Answer 1



## enzyme structure

691. Base your answer to this question on the diagram shown, which represents a chemical reaction that occurs in the human body, and on your knowledge of biology. Substances X and Y are examples of which kind of molecule?

- (1) simple sugar
- (2) amino acid
- (3) fat
- (4) hormone

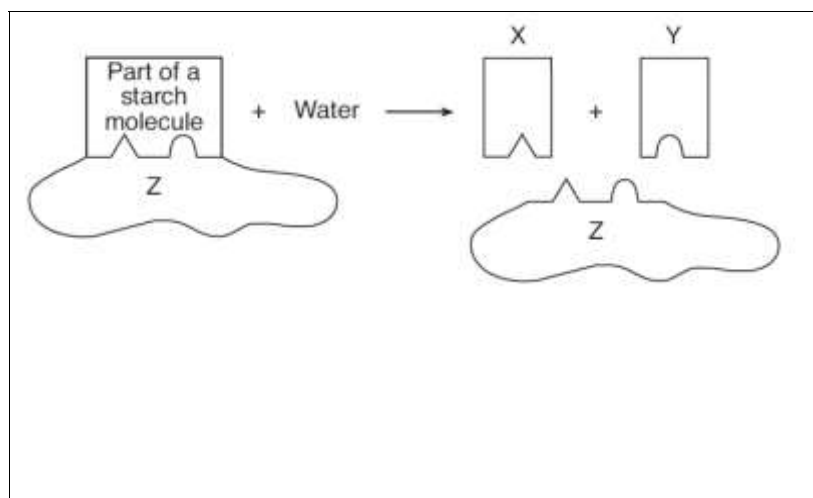
Data Base File Number: 223

Regents Date August2009-43.b

Aug2009

42 8/13/2009 S4K5

Answer 1



epigenetics

692. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The field of EPIGENETICS is the study of changes in gene expression due to factors other than a change in the DNA sequence. One factor that can change gene expression is the attachment of a chemical, called a methyl group, to the DNA molecule. This attachment prevents that gene from being expressed, thereby altering that trait. Due to epigenetic effects, even identical twins may not be as identical as was once thought. The diagram shows the DNA sequence of a gene present in a pair of identical twins. Twin B's gene shows an epigenetic effect. Based on the diagram, an explanation for why these identical twins are NOT identical in all traits is that

- (1) twin A can synthesize a protein resulting in a particular trait and twin B cannot
- (2) twin B can express a gene that twin A cannot
- (3) they have different DNA sequences for this particular gene
- (4) they were formed from the fertilization of two different eggs by two different sperm

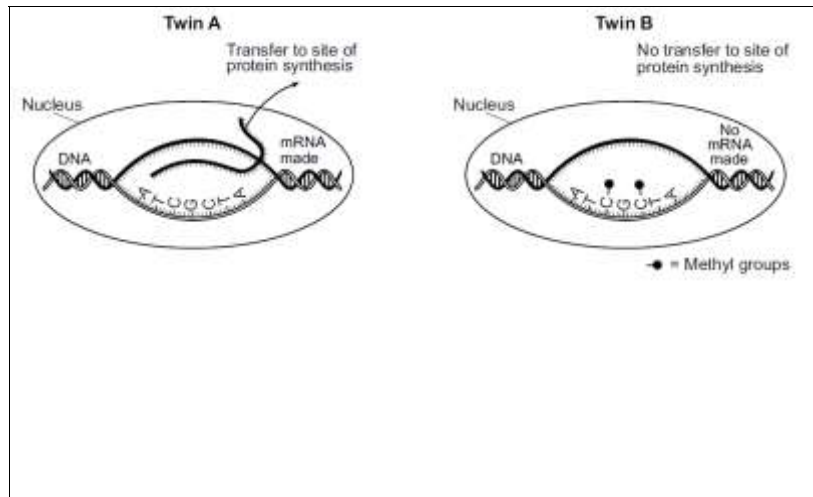
Data Base File Number: 1551

Regents Date Jan2023-36.bmp

Jan2023

37 1/24/2023 S4K2

Answer 1



## evolution

693. Base your answers to this question on the graph shown and on your knowledge of biology. The graph shows the number of species that became extinct from 1800 to 2000. It also shows estimates of the number of species that will become extinct between 2000 and 2020. The number of species that became extinct between the years 1950 and 2000 is approximately

- (1) 5,000  
 (2) 12,000  
 (3) 22,000  
 (4) 37,000

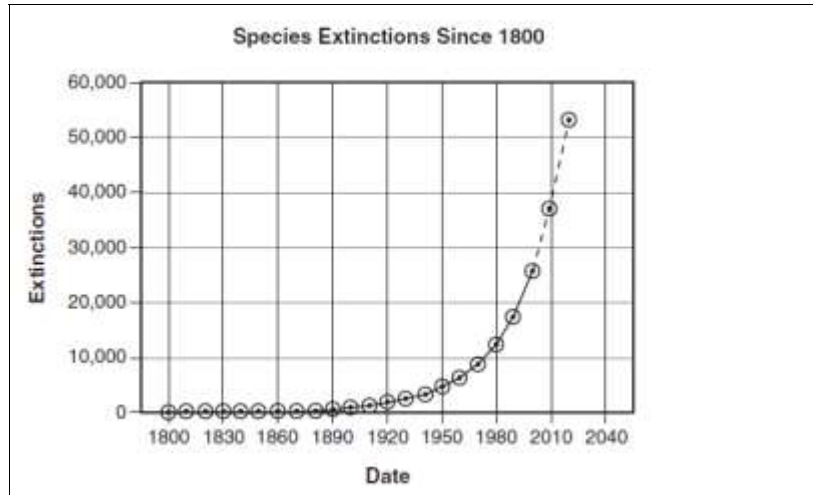
Data Base File Number: 373

Regents Date: Aug2011-48.bmp

Aug2011

49 8/18/2011 S4K7

Answer: 3



## evolution

694. The diagram shown represents four different species of bacteria. Which statement is correct concerning the chances of survival for these species if there is a change in the environment?

- (1) Species A has the best chance of survival because it has the most genetic diversity.  
 (2) Species C has the best chance of survival because it has no gene mutations.  
 (3) Neither species B nor species D will survive because they compete for the same resources.  
 (4) None of the species will survive because bacteria reproduce asexually.

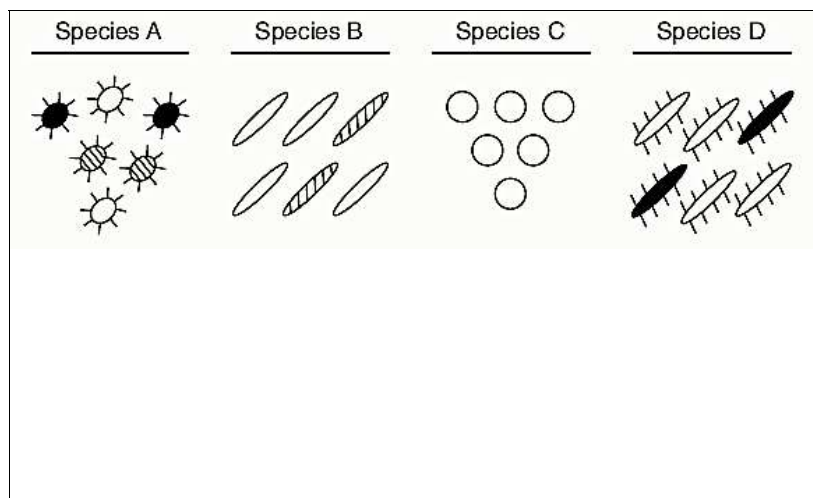
Data Base File Number: 105

Regents Date: June08-40.bmp

June2008

40 6/24/2008 S4K3

Answer: 1



## evolution

695. Some evolutionary pathways are represented in the diagram shown. An inference that can be made from information in the diagram is that

- (1) many of the descendants of organism B became extinct
- (2) organism B was probably much larger than any of the other organisms represented
- (3) most of the descendants of organism B successfully adapted to their environment and have survived to the present time
- (4) the letters above organism B represent members of a single large population with much biodiversity

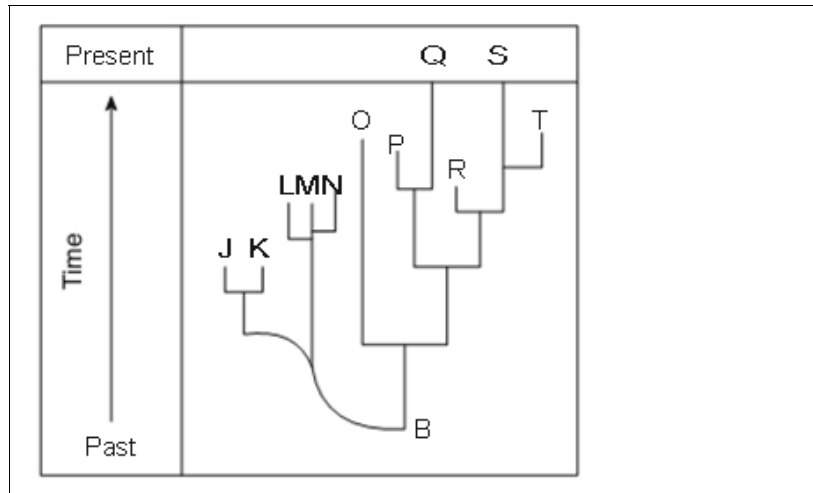
Data Base File Number: 192

Regents Date June09-36.bmp

June2009

36 6/18/2009 S4K3

Answer 1



## evolution

696. The kit fox and red fox species are closely related. The kit fox lives in the desert, while the red fox inhabits forests. Ear size and fur color are two differences that can be observed between the species. An illustration of these two species is shown in the diagram. Which statement best explains how the differences between these two species came about?

- (1) Different adaptations developed because the kit fox preferred hotter environments than the red fox.
- (2) As the foxes adapted to different environments, differences in appearance evolved.
- (3) The foxes evolved differently to prevent overpopulation of the forest habitat.
- (4) The foxes evolved differently because their ancestors were trying to avoid competition.

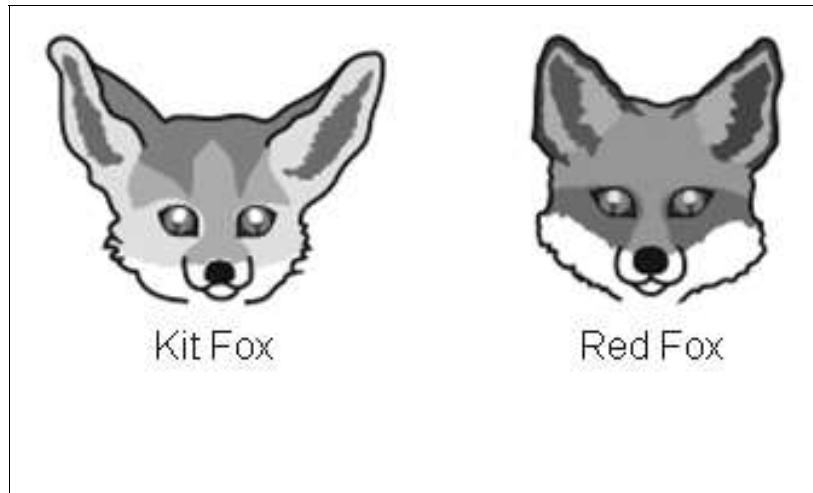
Data Base 195  
File Number:

Regents Date June09-40.bmp

June2009

40 6/18/2009 S4K3

Answer 2



## evolution

697. Base your answer to this question on the information given and the diagram shown and on your knowledge of biology. The diagram represents a biological process. Fossil evidence has demonstrated that birds evolved from a group of small carnivorous dinosaurs. Scientists have hypothesized that some evolved into birds as they filled available niches. The most recent fossil discoveries have filled in many of the gaps in the evolution of birds from dinosaurs. Before the latest fossils were found, there were some scientists who questioned this idea that birds evolved from dinosaurs. In general, scientists constantly work to

- (1) clarify scientific explanations so they can be made into a law that never changes
- (2) develop theories based on the data and evidence from a few experiments with inconclusive results
- (3) provide enough evidence and accurate predictions to allow for widespread acceptance
- (4) develop explanations that are permanent and do not change over time

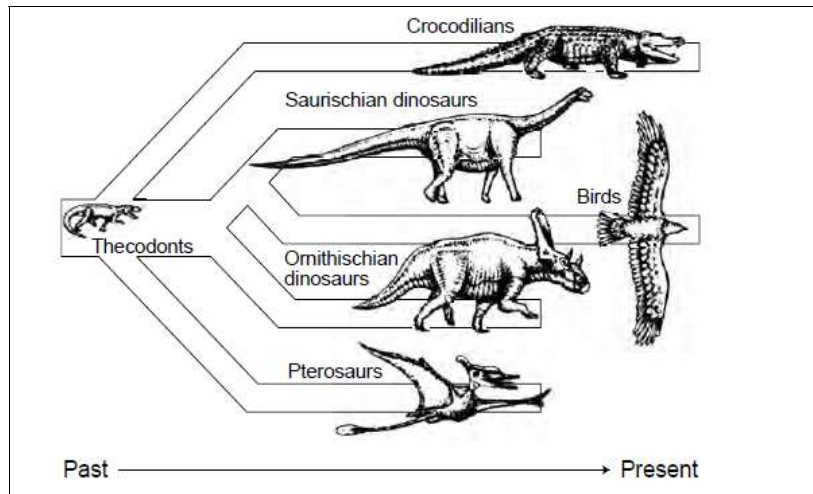
Data Base File Number: 1349

Regents Date June2019-48.bmp

June2019

49 6/18/2019 S1K1

Answer 3



evolution

698. The evolutionary pathways of five species are represented in the diagram shown. Which statement is supported by the diagram?

- (1) Species C is the ancestor of species B.
- (2) Species D and E evolved from species B.
- (3) Species X evolved later than species D but before species B.
- (4) Both species C and species D are related to species X.

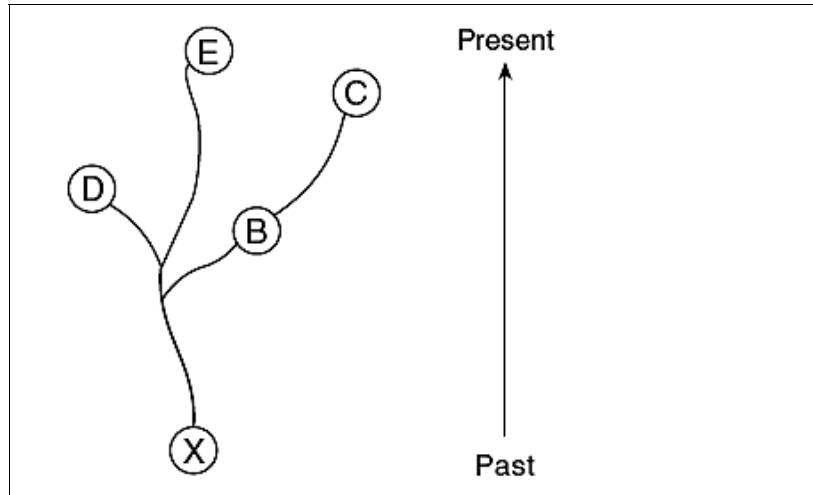
Data Base File Number: 5

Regents Date Aug07-18.bmp

Aug2007

18 8/16/2007 S4K3

Answer 4



evolution

699. A student was using an evolutionary tree as shown in the diagram. If the four top lines of the tree were filled in and contained correct evolutionary relationships, the tree would show

- (1) a dichotomous key
- (2) a monolophous key
- (3) common ancestry
- (4) no relationship between animals

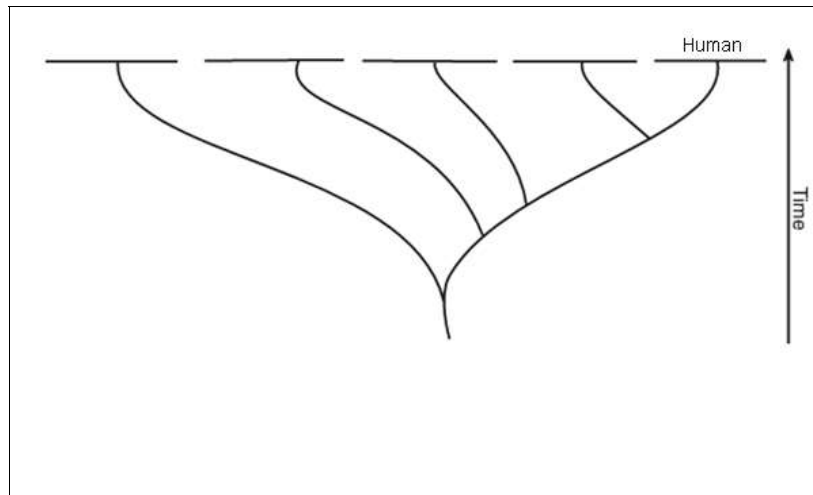
Data Base File Number: 203

Regents Date June09-61.bmp

June2009

61 6/18/2009 LABS

Answer 3



evolution

700. The data table shows the number of amino acid differences in the hemoglobin molecules of several species compared with amino acids in the hemoglobin of humans. Based on the information in the data table, what would be the evolutionary relationship between the animals shown from LEAST related to MOST related to the human?

- (1) gorilla - pig - horse - frog
- (2) frog - horse - pig - gorilla
- (3) horse - pig - frog - gorilla
- (4) pig - frog - horse - gorilla

Data Base File Number: 202

Regents Date June09-51.bmp

June2009

60 6/18/2009 LABS

Answer 2

Species	Number of Amino Acid Differences
human	0
frog	67
pig	10
gorilla	1
horse	26

evolution

701. Which species in the chart shown is most likely to have the fastest rate of evolution?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 193

Regents Date June09-37.bmp

June2009

37 6/18/2009 S4K3

Answer 4

Species	Reproductive Rate	Environment
A	slow	stable
B	slow	changing
C	fast	stable
D	fast	changing



## evolution

702. Base your answers to this question on the diagram that shows variations in the beaks of finches in the Galapagos Islands and on your knowledge of biology. The diversity of species seen on the Galapagos Islands is mostly due to

- (1) gene manipulation by scientists
- (2) gene changes resulting from mitotic cell division
- (3) natural selection
- (4) selective breeding

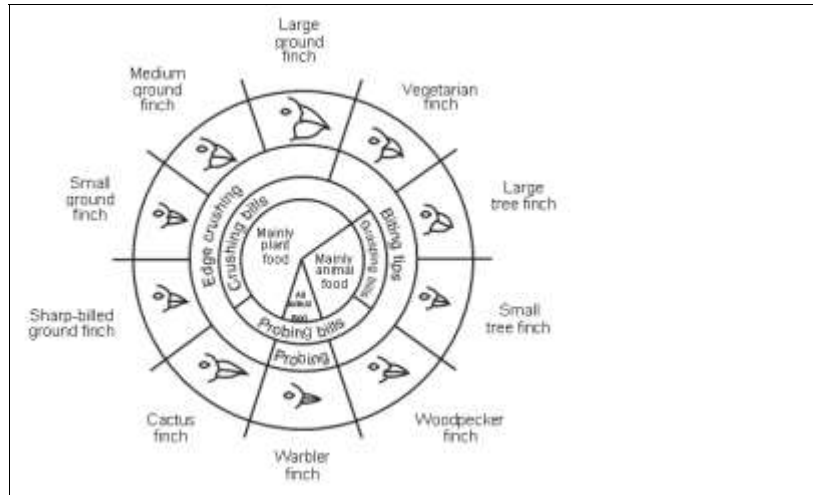
Data Base File Number: 210

Regents Date: June09-71.bmp

June2009

71 6/18/2009 LABS

Answer: 3



## evolution

703. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents possible evolutionary pathways of certain organisms. Which species is most closely related to species L?

- (1) E
- (2) F
- (3) G
- (4) I

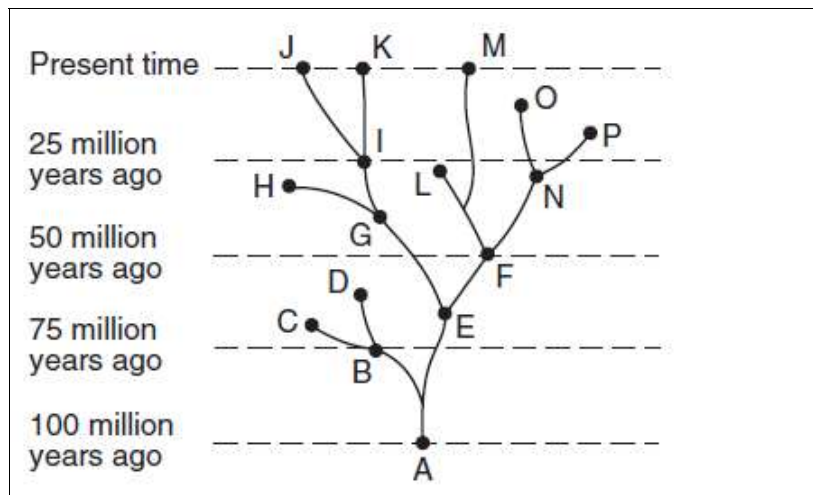
Data Base File Number: 368

Regents Date: Aug2011-39.bmp

Aug2011

39 8/18/2011 S4K3

Answer: 2



evolution

704. The diagrams shown represents the bones of the forelimbs of two animals alive today that most likely evolved from a common ancestor. Members of the original ancestral population were isolated into two groups by natural events. If these two animals did have a common ancestor, which statement would best explain why there are differences in the bones?.

- (1) Changes occurred to help the animals return to their original environment.
- (2) Changes contributed to the survival of the organisms in their new environment.
- (3) Changes helped reduce competition within each group.
- (4) Changes indicate the species are evolving to be more like the ancestral species.

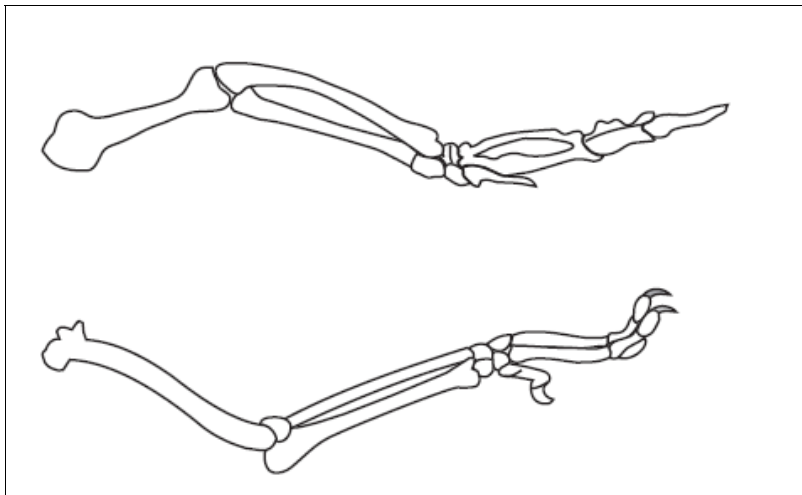
Data Base File Number: 219

Regents Date August2009-38.b

Aug2009

38 8/13/2009 S4K3

Answer 2



evolution / finches

705. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the VARIATIONS in Beaks of Galapagos Islands Finches. The only finch that is completely carnivorous has a beak adapted for

- (1) probing, only
- (2) probing and edge crushing
- (3) probing and biting
- (4) biting and edge crushing

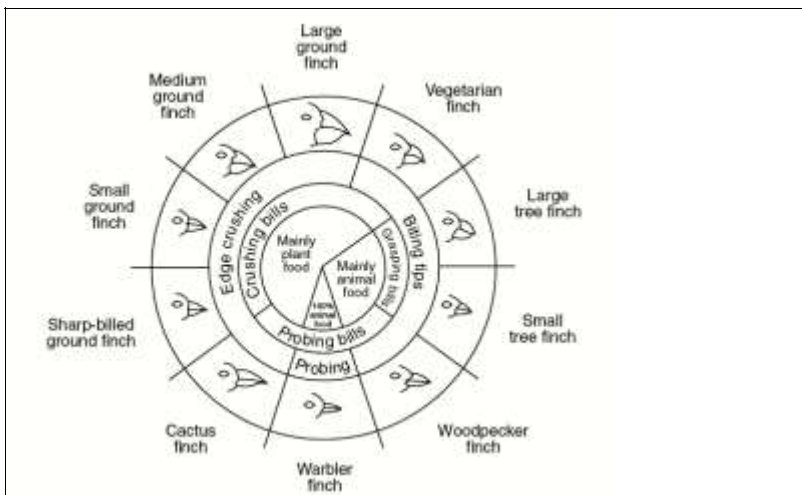
Data Base File Number: 169

Regents Date Jan09-74.bmp

Jan2009

74 1/27/2009 LABS

Answer 1



evolution / similarities

706. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the evolutionary relationships of some organisms. Which two organisms would most likely synthesize the most similar enzymes?

- (1) monkey and mouse
- (2) cow and horse
- (3) chimp and rat
- (4) horse and dog

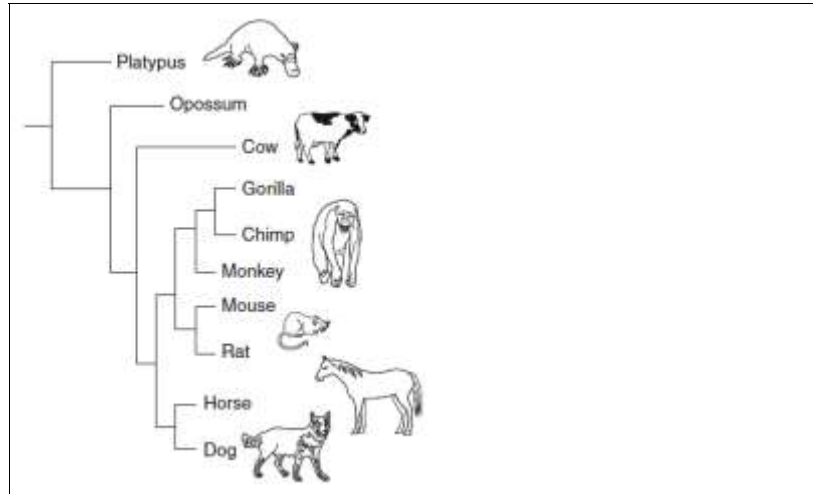
Data Base File Number: 450

Regents Date Aug2012-76.bmp

Aug2012

76 8/17/2012 LAB1

Answer 4



evolution / similarities

707. The diagram shows the bones in the forelimbs of two different vertebrate species. The position and structure of these bones could best be used to make inferences about the

- (1) food preferences of these vertebrate species
- (2) intelligence of these vertebrate species
- (3) history of these vertebrate species
- (4) reproductive behavior of these vertebrate species

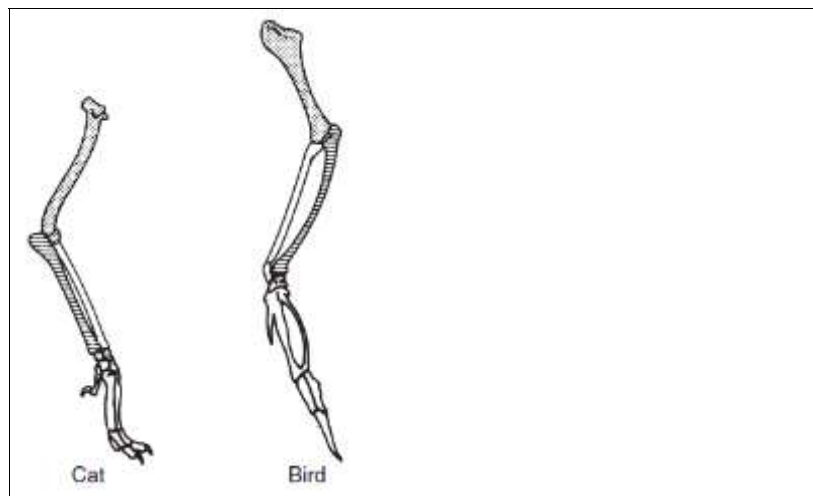
Data Base File Number: 781

Regents Date Aug2002-18.bmp

Aug2002

18 8/13/2002 S4K3

Answer 3



evolution / similarities

708. Base your answer to this question on the diagram shown and on your knowledge of biology. Letters A through E represent different species of organisms. The arrows represent long periods of geologic time. Which species would most likely show the greatest similarities in their amino acid sequences?

- (1) A and E
- (2) A and B
- (3) B and D
- (4) C and E

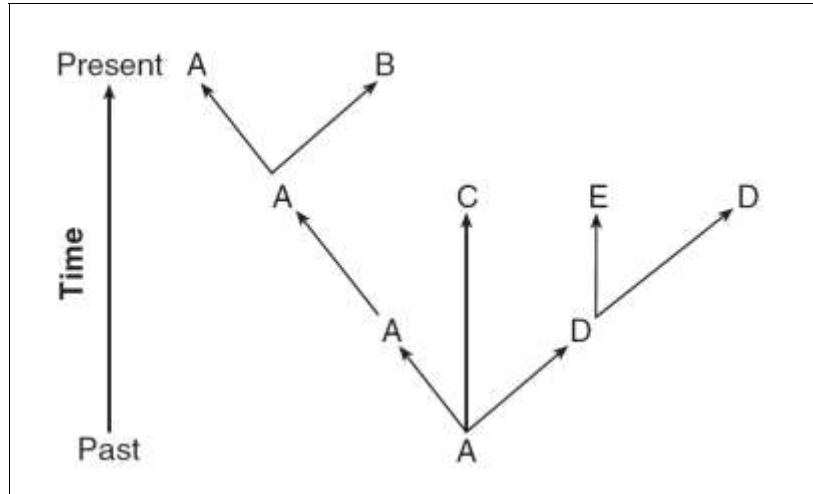
Data Base File Number: 354

Regents Date June2011-76.bmp

June2011

76 6/21/2011 LAB1

Answer 2



evolution / similarities

709. Base your answer to this question the diagram shown and on your knowledge of biology. The diagram represents evolutionary relationships between different species. Which species would LEAST likely have a protein similar to species H?

- (1) A
- (2) B
- (3) C
- (4) D

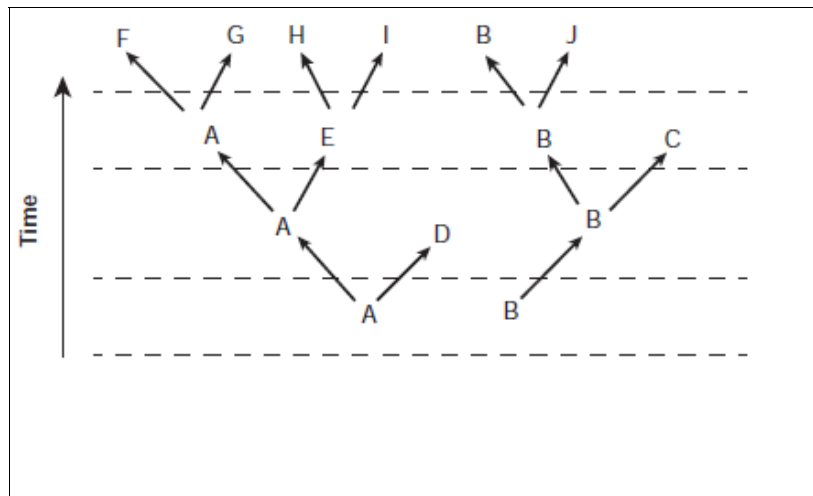
Data Base File Number: 1654

Regents Date Jan2024-82.bmp

Jan2024

82 1/23/2024 LAB1

Answer 2



**evolution / similarities**

710. Which branching tree diagram shows that species W and Z are most closely related?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

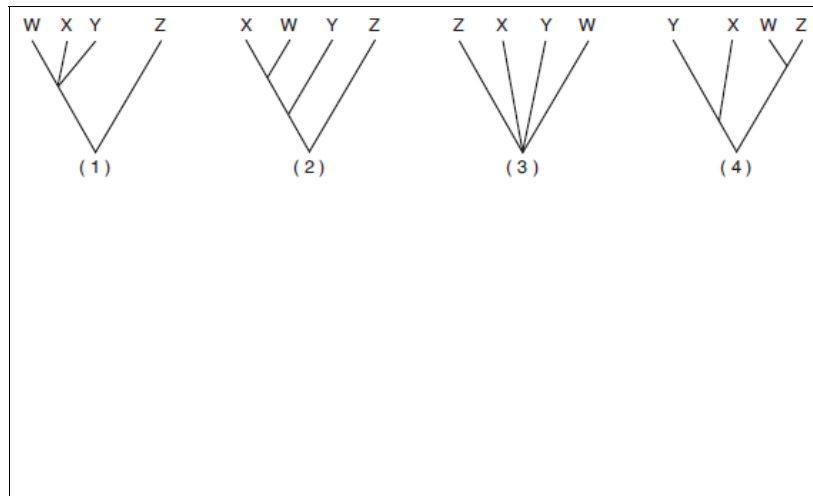
Data Base File Number: 978

Regents Date Aug2014-73.bmp

Aug2014

73 8/14/2014 LAB1

Answer 4



**evolution mechanism**

711. The diagram shown represents a process involved in reproduction in some organisms. This process is considered a mechanism of evolution because

- (1) mitosis produces new combinations of inheritable traits
- (2) it increases the chances of DNA alterations in the parent
- (3) it is a source of variation in the offspring produced
- (4) meiosis prevents recombination of lethal mutations

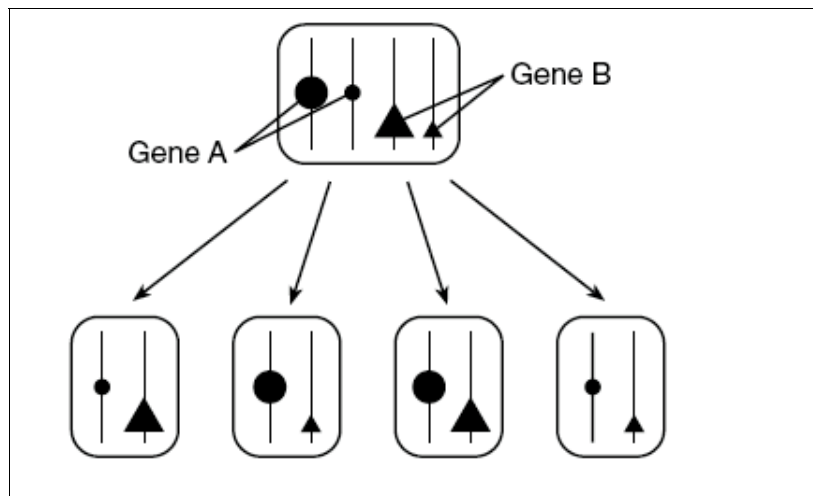
Data Base File Number: 161

Regents Date Jan09-42.bmp

Jan2009

41 1/27/2009 S4K2

Answer 3



evolution pathway

712. One possible pathway for the evolution of elephants is represented in the diagram shown. Which statement concerning this pattern of evolution is correct?

- (1) Evolution always results in favorable traits.
- (2) Evolution does not always result in a species that will survive to present time.
- (3) Evolution leads to less complex organisms.
- (4) Evolution results in the same changes in all species.

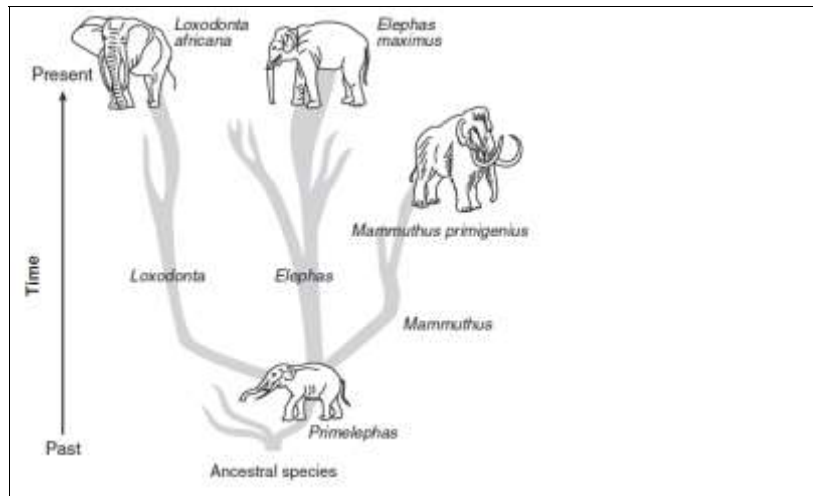
Data Base File Number: 239

Regents Date Jan2010-36.bmp

Jan2010

36 1/26/2010 S4K3

Answer 2



evolution pathway

713. Some evolutionary pathways are represented in the diagram shown. An inference that can be made from information in the diagram is that

- (1) species E evolved from species G
- (2) species A was probably much larger than all the other species
- (3) species C is a direct descendant of species I
- (4) species J is adapted to the existing environment

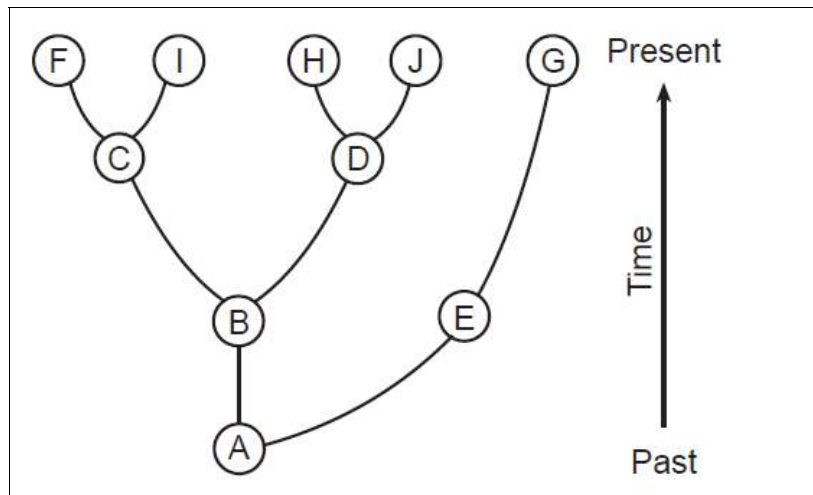
Data Base File Number: 923

Regents Date Jan2014-37.bmp

Jan2014

37 1/27/2014 S4K3

Answer 4



**evolution pathway**

714. A diagram of evolutionary pathways of various animal species is shown in the diagram. The pattern of these evolutionary pathways is most likely the result of alterations within which structure?

- (1) vacuole
- (2) cell membrane
- (3) nucleus
- (4) ribosome

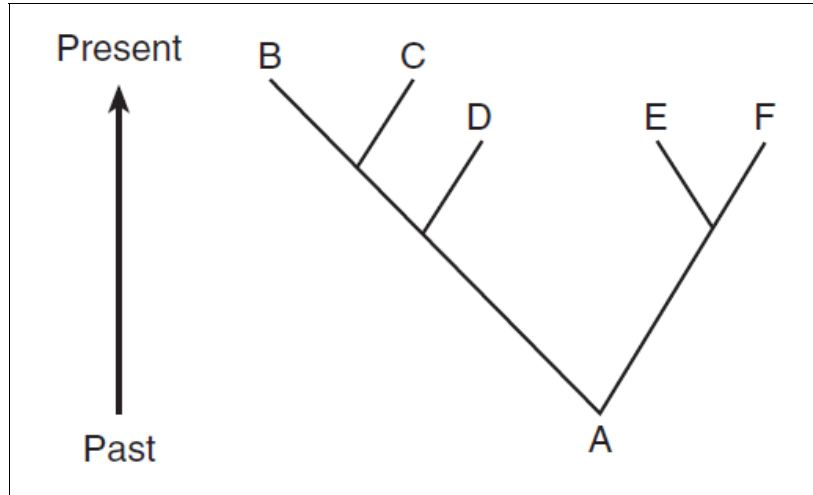
Data Base File Number: 307

Regents Date Jan2011-16.bmp

Jan2011

16 1/25/2011 S4K3

Answer 3



**evolution pathway**

715. Base your answer to this question on the diagram that shows some evolutionary pathways. Each letter represents a different species. Which two organisms are most closely related?

- (1) F and I
- (2) F and H
- (3) A and G
- (4) G and J

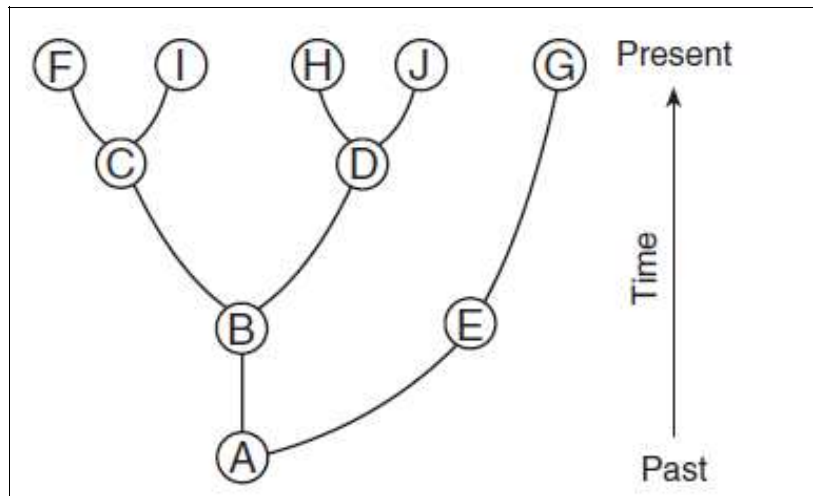
Data Base File Number: 518

Regents Date Aug2006-35.bmp

Aug2006

35 8/16/2006 S4K3

Answer 1



evolution pathway

716. Base your answer to this question on the diagram that shows some evolutionary pathways. Each letter represents a different species. The most recent ancestor of organisms D and F is

- (1) A
- (2) B
- (3) C
- (4) I

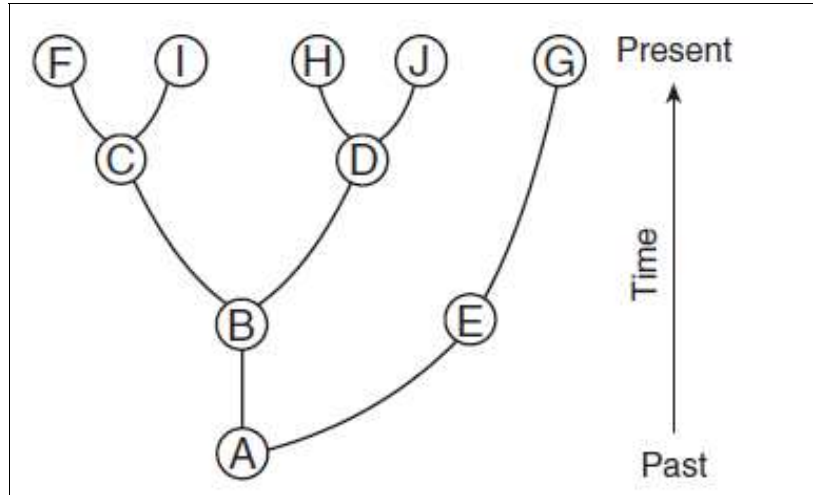
Data Base File Number: 519

Regents Date Aug2006-35.bmp

Aug2006

36 8/16/2006 S4K3

Answer 1



evolution pathway

717. A current proposal in the field of classification divides life into three broad categories called domains. This idea is illustrated in the diagram shown. Which concept is best supported by this diagram?

- (1) Evolutionary pathways proceed only in one set direction over a short period of time.
- (2) All evolutionary pathways will eventually lead to present-day organisms.
- (3) All evolutionary pathways are the same length and they all lead to present-day organisms.
- (4) Evolutionary pathways can proceed in several directions with only some pathways leading to present-day organisms.

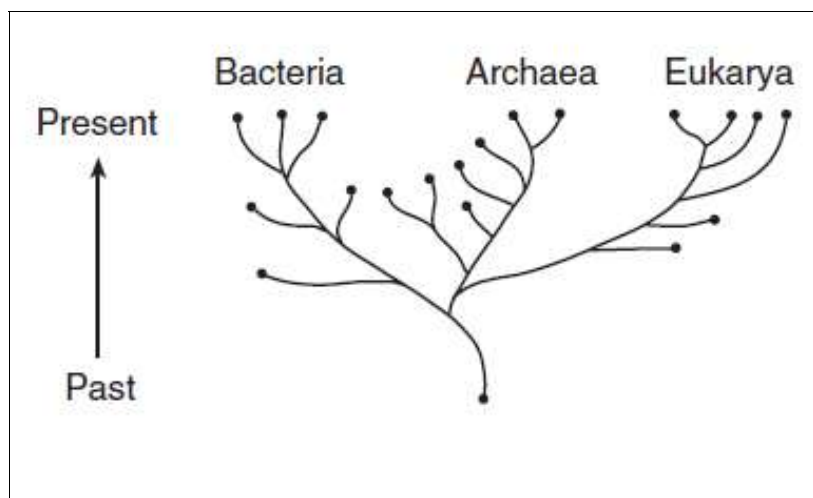
Data Base File Number: 457

Regents Date Jan2006-13.bmp

Jan2006

13 1/27/2006 S4K3

Answer 4





evolution pathway

718. Base your answer to this question on the diagram shown and on your knowledge of biology. Letters A through J represent different species of organisms. The vertical distances between the dotted lines represent long periods of time in which major environmental changes occurred. Which species was the first to become extinct?

- (1) E
- (2) J
- (3) C
- (4) D

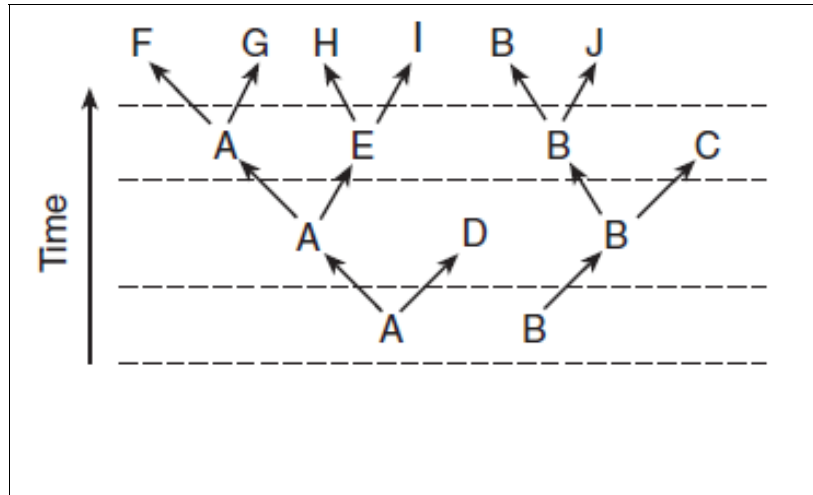
Data Base File Number: 742

Regents Date June2003-43.bmp

June2003

43 6/19/2003 S4K3

Answer 4



evolution pathway

719. The evolutionary pathways of several species are represented in the diagram shown. Which species was best adapted for survival in changing environmental conditions?

- (1) A
- (2) E
- (3) K
- (4) L

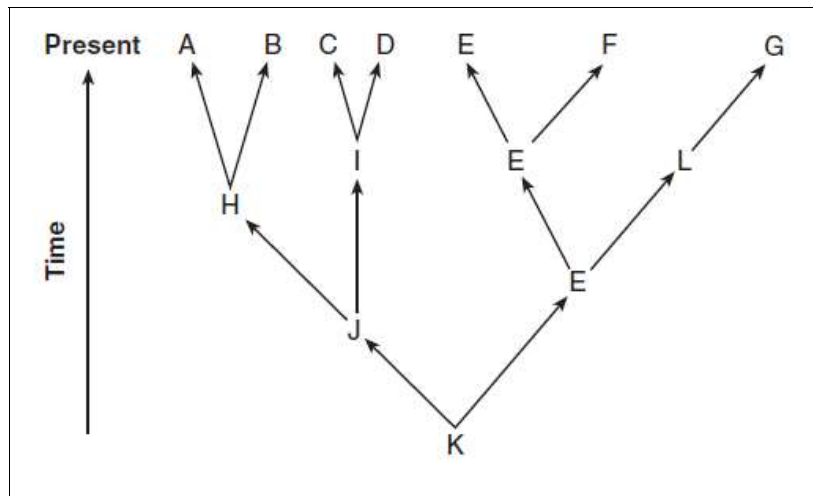
Data Base File Number: 380

Regents Date Jan2012-20.bmp

Jan2012

20 1/25/2012 S4K3

Answer 2



evolution pathway

720. Base your answer to this question on the diagram shown and on your knowledge of biology. Letters A through J represent different species of organisms. The vertical distances between the dotted lines represent long periods of time in which major environmental changes occurred. Which species appears to have been most successful in surviving changes in the environment over time?

- (1) A
- (2) B
- (3) C
- (4) H

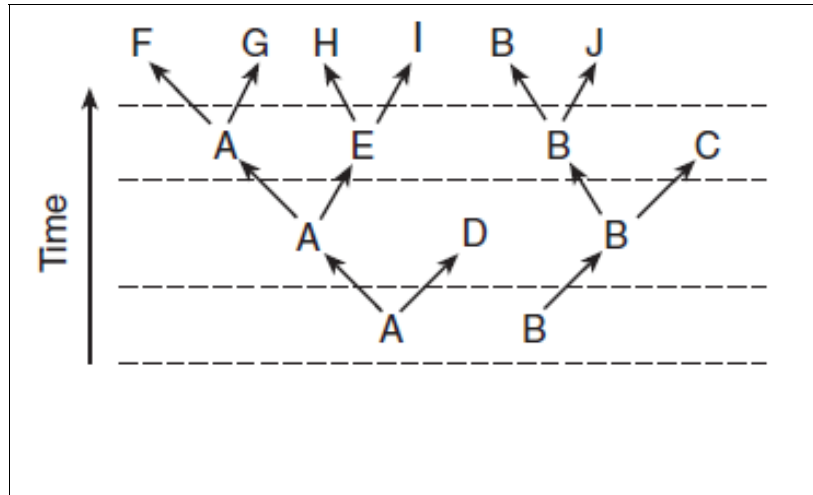
Data Base File Number: 743

Regents Date June2003-43.bmp

June2003

44 6/19/2003 S4K3

Answer 2



evolution pathway

721. The diagram shown illustrates possible evolutionary pathways of some species. Which statement is a valid inference based on the information in the diagram?

- (1) Species A is the common ancestor of all life on Earth.
- (2) Species D is more closely related to species E than to species F.
- (3) Species B is the ancestor of species F.
- (4) Species C is the ancestor of species that exist at the present time.

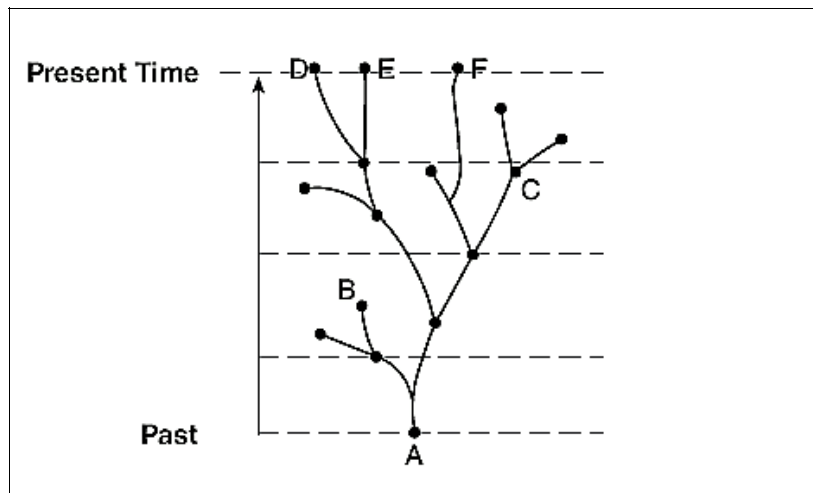
Data Base File Number: 66

Regents Date Jan08-17.bmp

Jan2008

17 1/25/2008 S4K3

Answer 2



## evolution pathway

722. Information related to the organisms found on Earth during various geological time periods is represented in the chart shown. Which statement concerning the first appearance of the organisms over the time period represented in this chart is most likely correct?

- (1) Life on Earth has remained the same.
- (2) Life on Earth has changed from primitive organisms to more complex organisms.
- (3) Life on Earth began with complex organisms and changed to more complex organisms.
- (4) Life on Earth has changed rapidly.

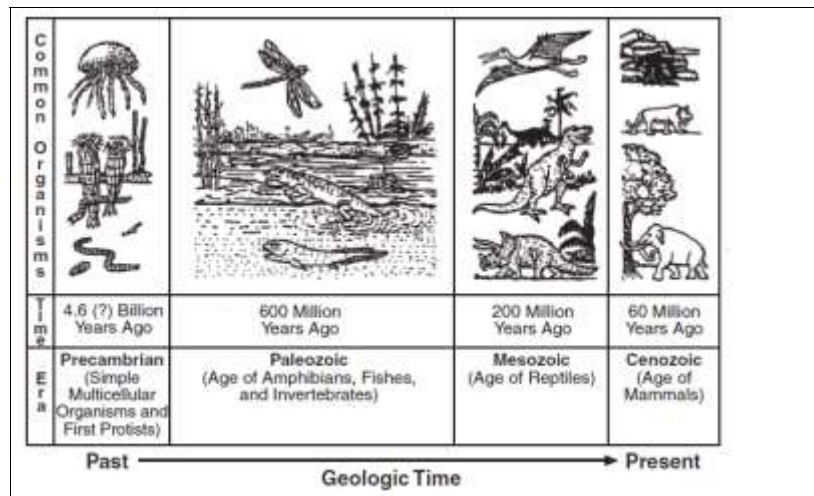
Data Base File Number: 778

Regents Date Aug2002-14.bmp

Aug2002

14 8/13/2002 S4K3

Answer 2



## evolution pathway

723. The diagram shown represents evolutionary pathways of seven groups of organisms alive today. Which two living species would be expected to have the most similar proteins?

- (1) A and C
- (2) B and C
- (3) E and F
- (4) H and M

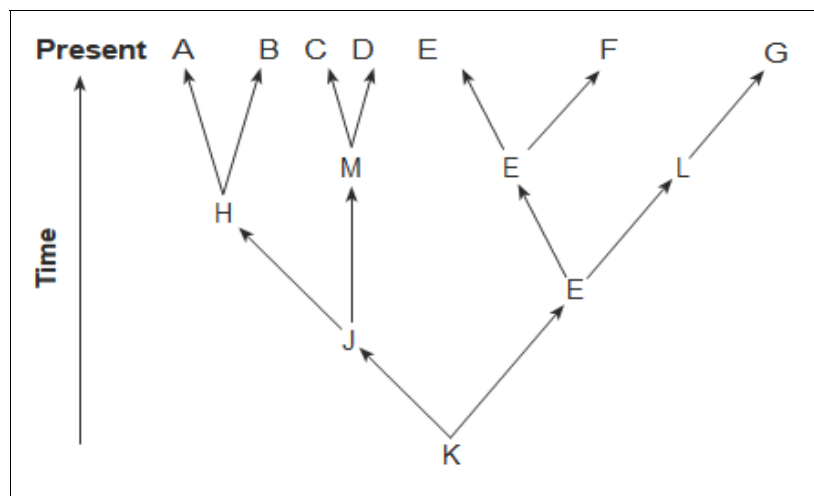
Data Base File Number: 1224

Regents Date Aug2017-73.bmp

Aug2017

73 8/17/2017 LAB1

Answer 3



evolution pathway

724. The evolutionary pathways of seven living species are shown in the diagram. Which two species are likely to have the most similar DNA base sequences?

- (1) B and G
- (2) E and G
- (3) B and C
- (4) C and D

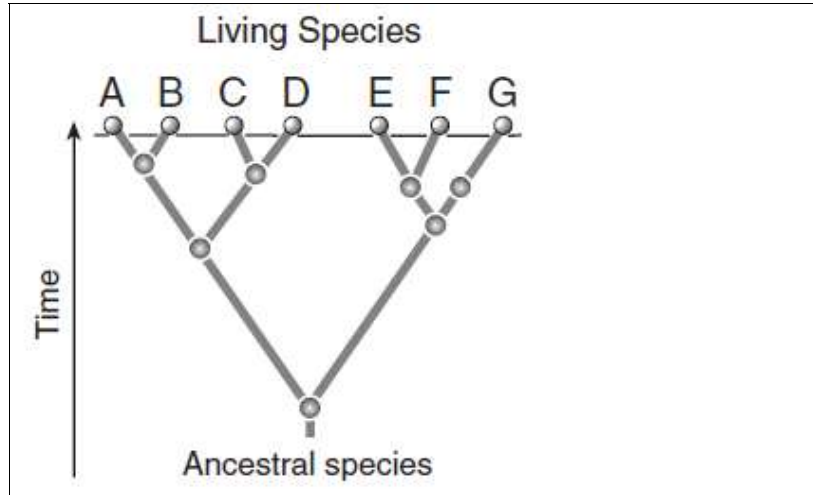
Data Base File Number: 582

Regents Date Aug2005-14.bmp

Aug2005

14 8/16/2005 S4K3

Answer 4



evolution pathway

725. According to the interpretation of the fossil record by many scientists, during which time interval shown on the time line, as shown, did increasingly complex multicellular organisms appear on Earth?

- (1) A to B
- (2) B to C
- (3) C to D
- (4) D to E

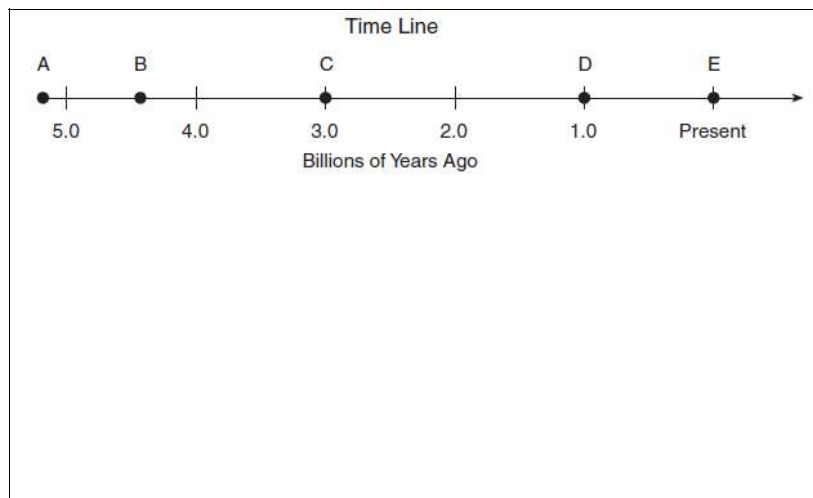
Data Base File Number: 864

Regents Date Aug2001-21.bmp

Aug2001

21 8/16/2001 S4K3

Answer 4



**evolution pathway**

726. Base your answer to this question chart shown and on your knowledge of biology. According to most scientists, which sequence best represents the order of biological evolution on Earth?

- (1) A → B → C
- (2) B → C → A
- (3) B → A → C
- (4) C → A → B

Data Base File Number: 664

Regents Date June2004-19.bmp

June2004

19 6/18/2004 S4K3

Answer 2

A	B	C
The diversity of multicellular organisms increases.	Simple, single-celled organisms appear.	Multicellular organisms begin to evolve.

**evolution pathway**

727. The evolutionary pathways of ten different species are represented in the diagram below. Which two species are the most closely related?

- (1) C and D
- (2) E and I
- (3) G and J
- (4) A and F

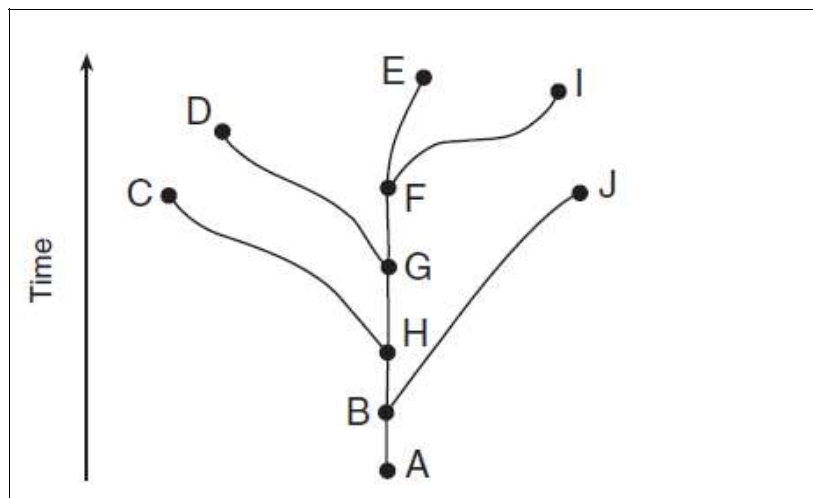
Data Base File Number: 474

Regents Date June2006-2.bmp

June2006

2 6/21/2006 S4K3

Answer 2



evolution pathway

728. The four evolutionary trees shown are some possible pathways for the pink land Iguana evolution in the Galapagos Islands. Three species of Iguanas evolved. Which diagram(s) of those shown have a common ancestor for the three species of Iguanas.

- (1) 1, only
- (2) 2, only
- (3) 3, only
- (4) 1, 2, 3, and 4

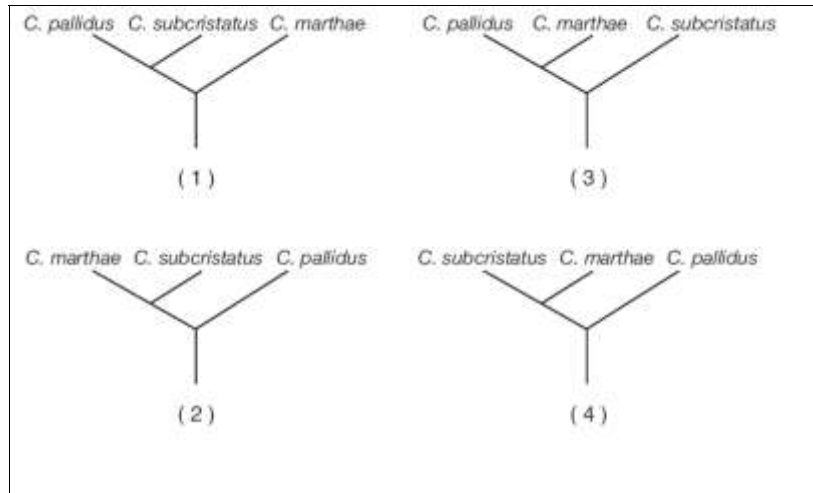
Data Base File Number: 890

Regents Date June2013-41.bmp

June2013

41 6/11/2013 S4K3

Answer 4



evolution pathway

729. The diagram shown illustrates a proposed evolutionary path of certain organisms, based on the theory of evolution. Which statement could best be inferred from the information in this diagram?

- (1) Evolution does not involve gradual change.
- (2) Evolutionary changes can result in extinction.
- (3) Evolution begins with plants.
- (4) Evolution produces organisms that all fill the same niche.

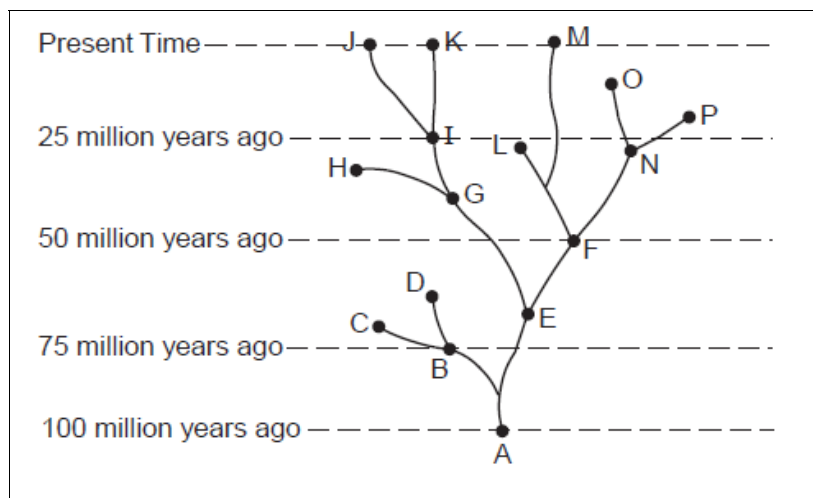
Data Base File Number: 832

Regents Date Jan2002-14.bmp

Jan2002

14 1/23/2002 S4K3

Answer 2



## evolution pathway

730. Base your answer to this question on the diagram that shows some evolutionary pathways. Each letter represents a different species. If A represents a simple multicellular heterotrophic organism, B would most likely represent

- (1) a single-celled photosynthetic organism
- (2) an autotrophic mammal
- (3) a complex multicellular virus
- (4) another type of simple multicellular heterotroph

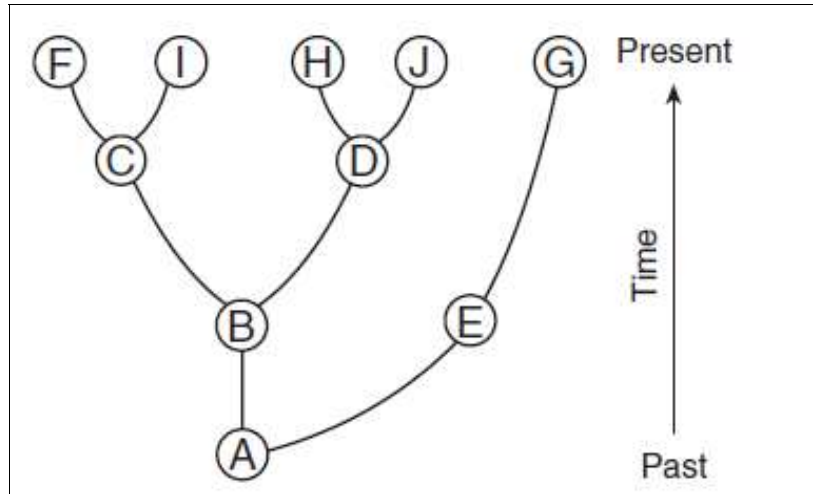
Data Base File Number: 520

Regents Date Aug2006-35.bmp

Aug2006

37 8/16/2006 S4K3

Answer 4



## evolution pathway

731. An evolutionary pathway is represented by the diagram shown. Which statement about evolutionary pathways is most accurate?

- (1) All evolutionary pathways show that life began with autotrophic organisms that soon evolved into heterotrophic organisms.
- (2) Two organisms on the same branch of an evolutionary pathway are more closely related to each other than to those on distant branches.
- (3) All the organisms shown at the ends of evolutionary pathway branch tips are alive today.
- (4) Evolutionary pathways show that evolution is a short-term process.

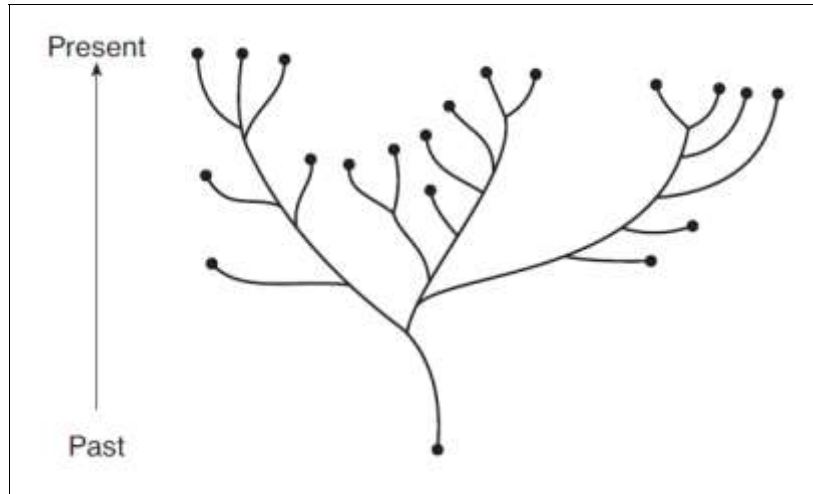
Data Base 213  
File Number:

Regents Date August2009-29.b

Aug2009

29 8/13/2009 S4K3

Answer 2





**evolutionary change**

732. After a lake dried up during a severe drought, a section of undisturbed rock layers was exposed. The layers are represented in the diagram shown. This sequence of rock layers best illustrates the concept that

- (1) the living and nonliving environment both change over time
- (2) it is important to preserve the diversity of species and habitats
- (3) new inheritable characteristics can result from the recombining of genes
- (4) living organisms have the capacity to produce populations of unlimited size

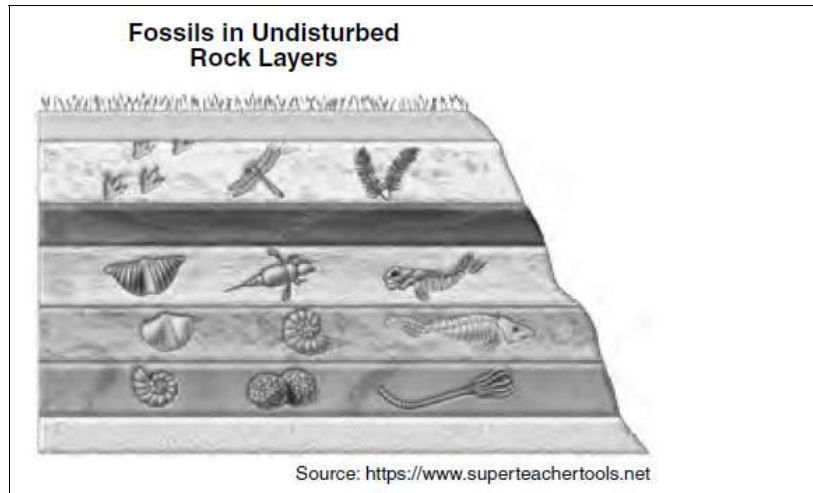
Data Base File Number: 1281

Regents Date Aug2018-29.bmp

Aug2018

29 8/17/2018 S4K6

Answer 1



**evolutionary change**

733. Organism X appeared on Earth much earlier than organism Y. Many scientists believe organism X appeared between 3 and 4 billion years ago, and organism Y appeared approximately 1 billion years ago. Which row in the chart shown most likely describes organisms X and Y?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 734

Regents Date June2003-17.bmp

June2003

17 6/19/2003 S4K3

Answer 3

Row	Organism X	Organism Y
(1)	simple multicellular	unicellular
(2)	complex multicellular	simple multicellular
(3)	unicellular	simple multicellular
(4)	complex multicellular	unicellular

## evolutionary change

734. According to some scientists, patterns of evolution can be illustrated by the diagrams shown. Which statement best explains the patterns seen in these diagrams?

- (1) The organisms at the end of each branch can be found in the environment today.
- (2) The organisms that are living today have all evolved at the same rate and have undergone the same kinds of changes.
- (3) Evolution involves changes that give rise to a variety of organisms, some of which continue to change through time while others die out.
- (4) These patterns cannot be used to illustrate the evolution of extinct organisms.

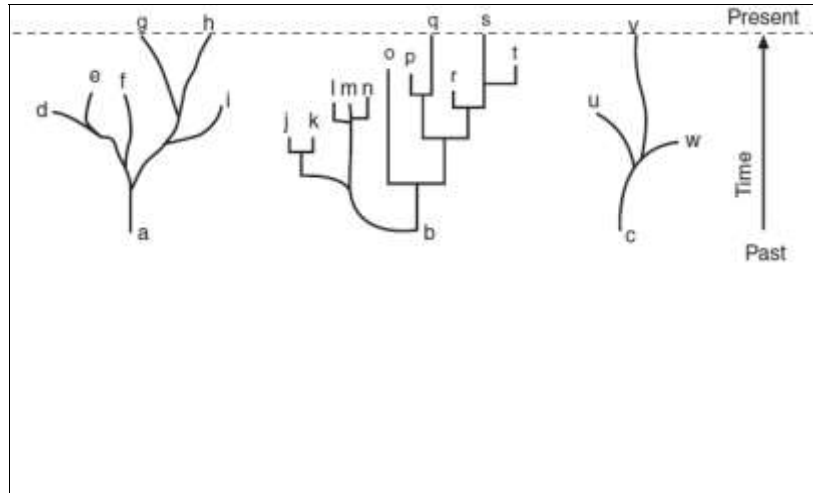
Data Base 709  
File Number:

Regents Date Jan2003-13.bmp

Jan2003

13 1/30/2003 S4K3

Answer 3



## evolutionary change

735. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram illustrates the evolution of tetrapods. A tetrapod is a four-footed animal. The changes observed over time occurred as the organisms

- (1) needed to change the habitat where they lived from land to water
- (2) needed to change the habitat where they lived from water to land
- (3) developed variations that made it possible for them to move from land to water
- (4) developed variations that made it possible for them to move from water to land

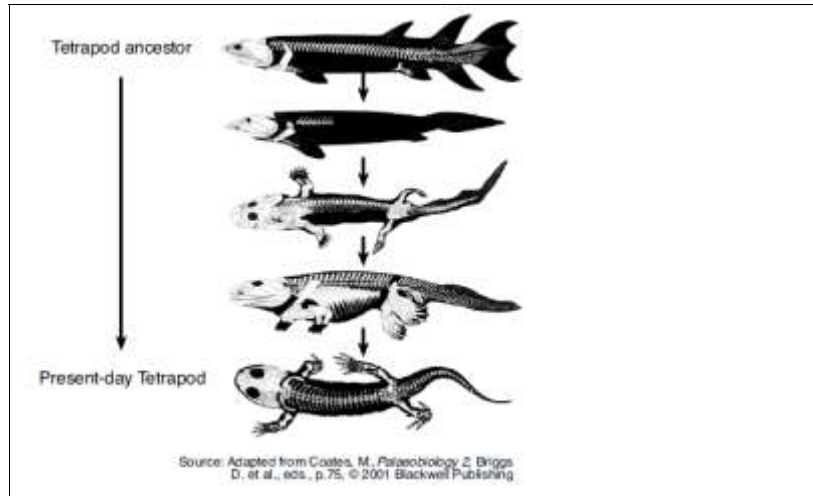
Data Base File Number: 1487

Regents Date June2022-50.bmp

June2022

50 6/15/2022 S4K3

Answer 4



## evolutionary relationship

736. The bones in the forelimbs of three mammals are shown in the diagram. For these mammals, the number, position, and shape of the bones most likely indicates that they may have

- (1) developed in a common environment
- (2) developed from the same earlier species
- (3) identical genetic makeup
- (4) identical methods of obtaining food species

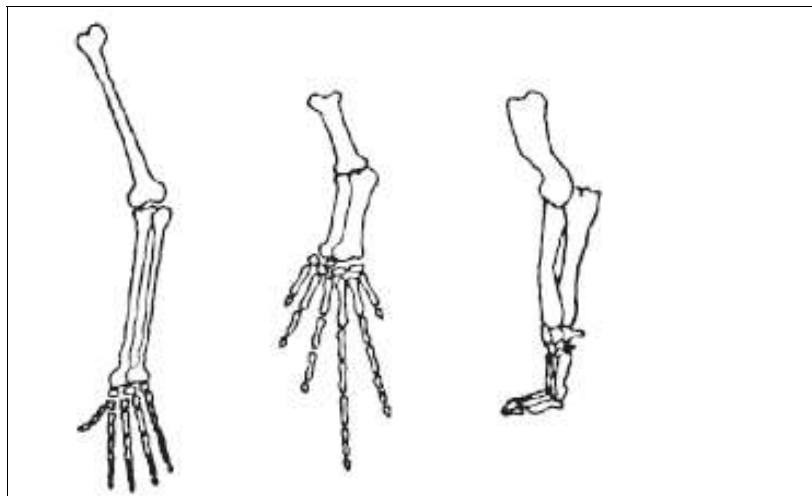
Data Base File Number: 637

Regents Date Jan2004-14.bmp

Jan2004

14 1/29/2004 S4K3

Answer 2



## evolutionary relationship

737. Base your answer to this question on the information given and on your knowledge of biology. To demonstrate some of the steps involved in the analysis of DNA, a student was given two paper strips with single-stranded DNA sequences recorded on them. The two strips are illustrated. The student cut between the C and G in each of the shaded CCGG sequences in strip 1 and between the As in the shaded TAAT sequences in strip 2. Both sets of DNA fragments were arranged on a paper model of a gel. The results of this type of DNA analysis are often used to help determine

- (1) if two organisms contain the same carbohydrate molecule
- (2) the number of DNA molecules in an organism
- (3) if the DNA codes for the synthesis of fat molecules in all cells of an organism
- (4) the evolutionary relationship between two organisms from different species

Data Base File Number: 1682

Regents Date June2024-76.bmp

June2024

76 6/14/2024 LAB1

Answer 4

Strip 1: TTACCGGATTACCCGATTACCGGATAATCTCCGGATATCCGTT

Strip 2: TTAGGCTTAAGCTAATGGCCTAATAGTTAATACGGTAATACAT

## evolutionary relationship

738. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the evolutionary history of several plant species. Which biological technique could be used to obtain some structural evidence that species A and B are closely related?

- (1) glucose testing
- (2) cloning
- (3) genetic engineering
- (4) dissection

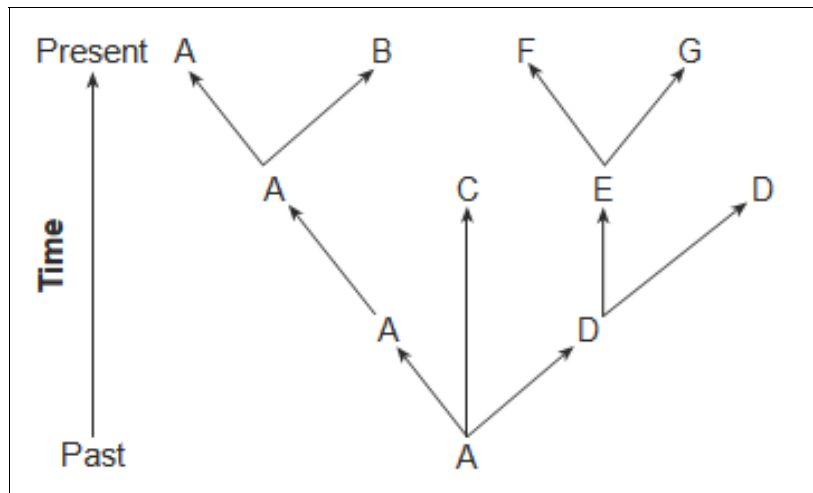
Data Base File Number: 1188

Regents Date June2017-48.bmp

June2017

49 6/14/2017 LABA

Answer 4



## evolutionary relationship

739. Scientists at Penn State have sequenced the DNA of the extinct woolly mammoth. The data suggested that the woolly mammoth was more closely related to present-day elephants than previously believed. Which statement could account for the similarities between the woolly mammoth and present-day elephants?

- (1) Common gene mutations were caused by agents such as industrial chemicals and radiation.
- (2) Present-day species developed from earlier, different species.
- (3) Selective breeding results in offspring better able to survive.
- (4) Both animals have identical genetic information.

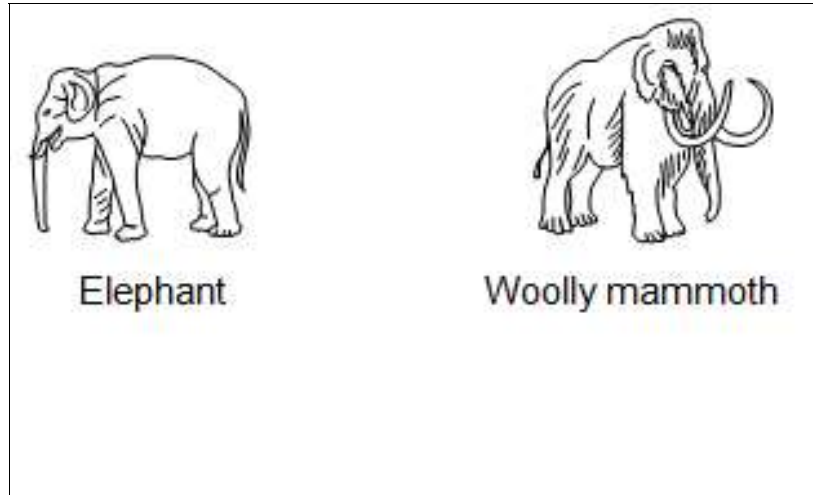
Data Base File Number: 1278

Regents Date Aug2018-20.bmp

Aug2018

20 8/17/2018 S4K3

Answer 2



## evolutionary relationship

740. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents the evolutionary relationships among many organisms. Three species with the most similar traits are most likely

- (1) F,I,G
- (2) D,H,J
- (3) B,D,G
- (4) F,A,J

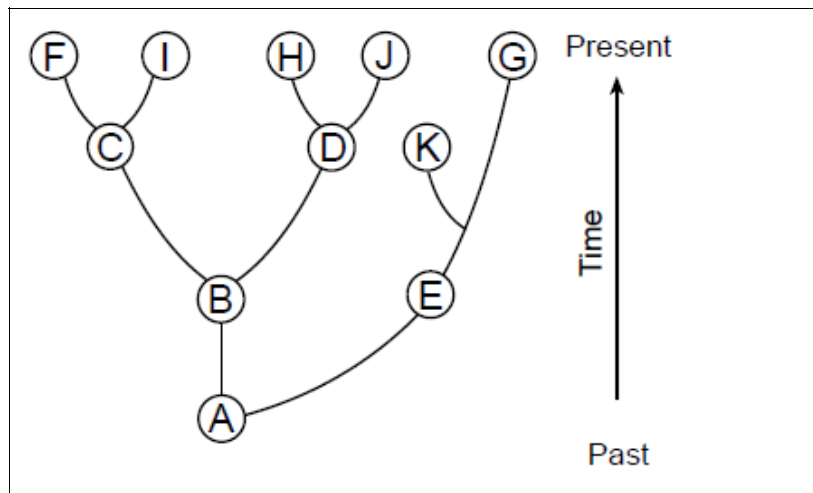
Data Base File Number: 1264

Regents Date June2018-48.bmp

June2018

49 6/13/2018 S4K3

Answer 2



**evolutionary relationship**

741. NOTE - Rotate paper to the LEFT to view the diagram. Base your answer to this question on the diagram shown, which represents the relationships between animals in a possible canine family tree, and on your knowledge of biology. According to the diagram, which group of organisms has the most closely related members?

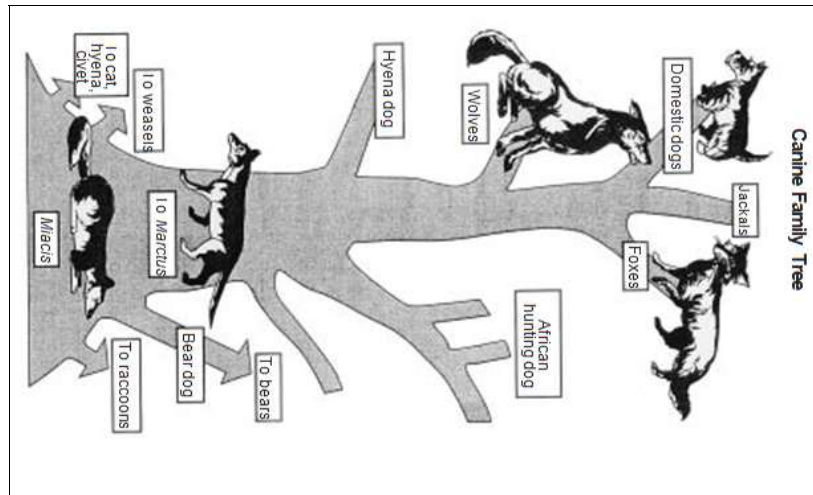
- (1) cats, weasels, and wolves
- (2) bears, raccoons, and hyena dogs
- (3) jackals, foxes, and domestic dogs
- (4) African hunting dogs, hyena dogs, and domestic dogs

Data Base File Number: 817

Regents Date June2002-40B.b

June2002  
40 6/19/2002 S4K3

Answer 3



**evolutionary relationship**

742. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents an evolutionary tree. Which species are most closely related in the diagram?

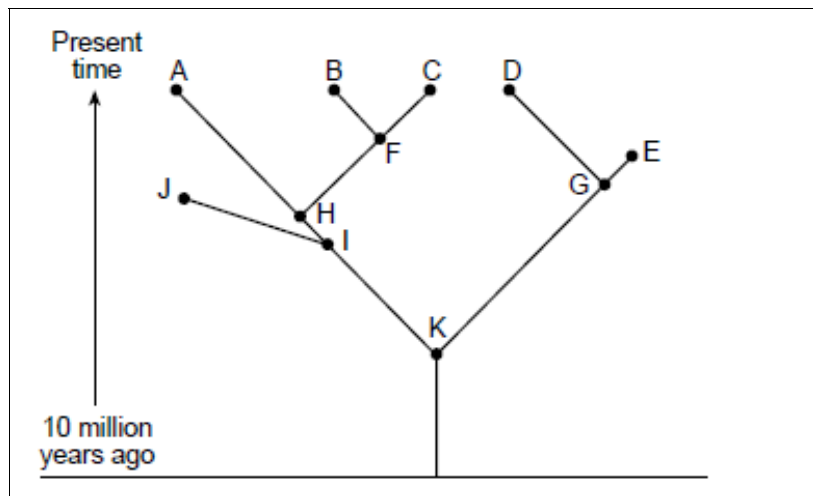
- (1) A and B
- (2) J and E
- (3) H and G
- (4) F and D

Data Base File Number: 1381

Regents Date Aug2019-71.bmp

Aug2019  
71 8/14/2019 S4K3

Answer 1



**evolutionary relationship**

743. Base your answer to this question on the information and diagram given and on your knowledge of biology. DNA samples were taken from four different species of animals labeled A, B, C, and D. DIAGRAM 1, as shown, represents the results of a procedure that separated the DNA fragments from each species. Based on the results shown in DIAGRAM 1, which of the evolutionary relationships between A,B,C,and D is correct in DIAGRAM 2?

- (1) 1, only
- (2) 2, only
- (3) both 1 and 2 are correct
- (4) insufficient data is given to make a conclusion.

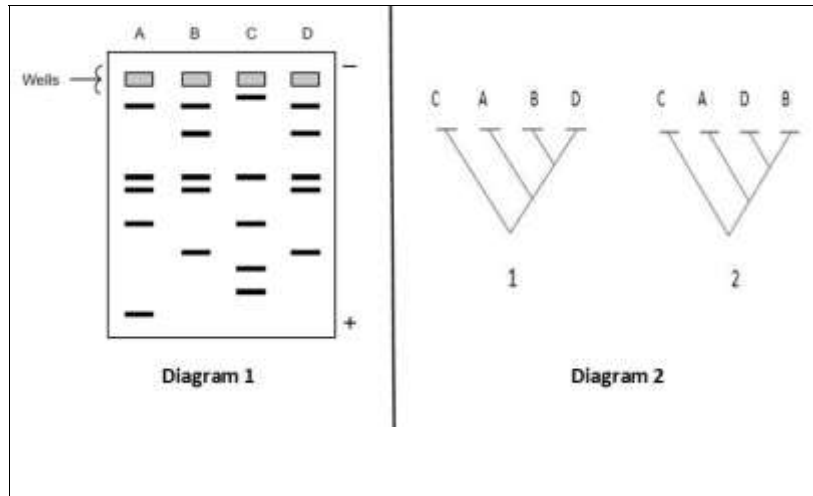
Data Base File Number: 1559

Regents Date Jan2023-77C.bm

Jan2023

77 1/24/2023 LAB1

Answer 3



**evolutionary relationship**

744. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows an interpretation of relationships based on evolutionary theory. The letters represent different species. The diagram indicates that a common ancestor for species C and E is species

- (1) F
- (2) G
- (3) H
- (4) K

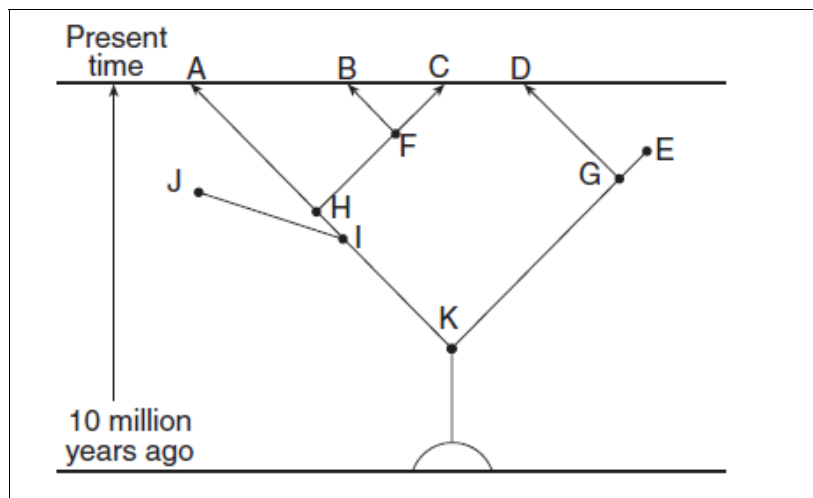
Data Base File Number: 871

Regents Date Aug2001-55.bmp

Aug2001

55 8/16/2001 S4K3

Answer 4



**evolutionary relationship**

745. Base your answer to this question on the diagram shown and on your knowledge of biology. Letters A through L represent different species of organisms. The arrows represent long periods of geologic time. Which two species are the most closely related?

- (1) J and L
- (2) G and L
- (3) F and H
- (4) F and G

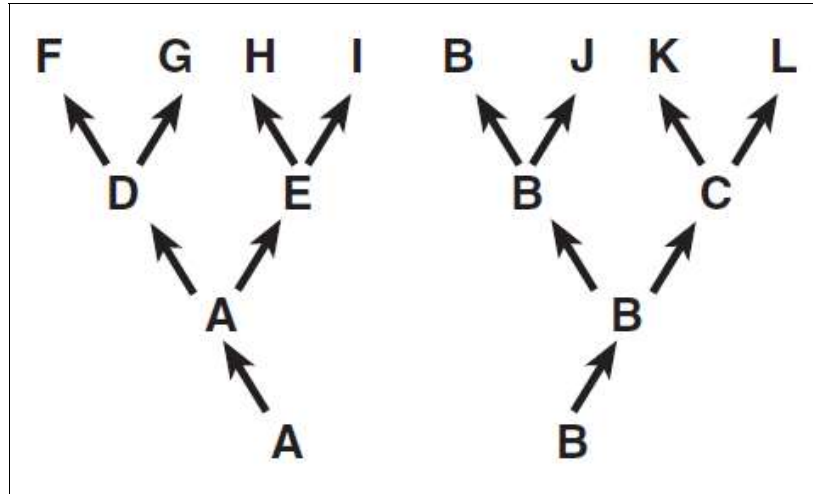
Data Base File Number: 577

Regents Date June2005-63.bmp

June2005

63 6/22/2005 LAB1

Answer 4



**evolutionary relationship**

746. The diagram shown represents a variety of fossil types, which can be found in many rocks. These fossils can be best used to provide information that could be used in a study of

- (1) evolutionary relationships
- (2) dynamic equilibrium
- (3) selective breeding
- (4) cell specialization

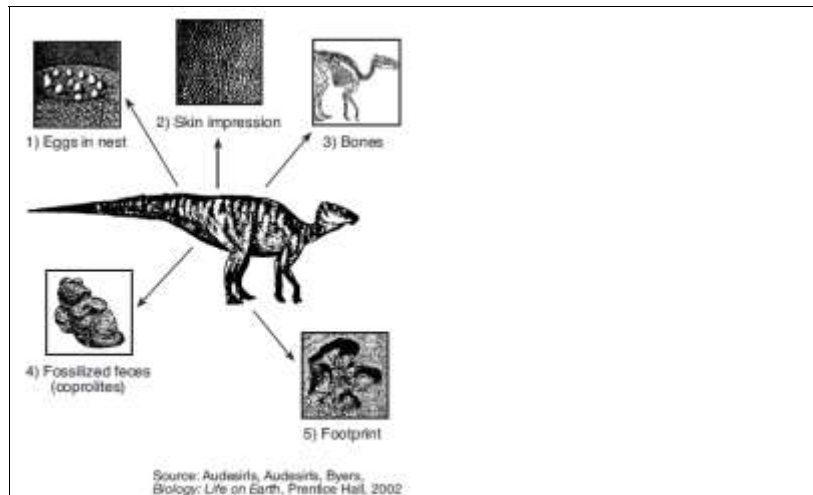
Data Base File Number: 962

Regents Date Aug2014-23.bmp

Aug2014

23 8/14/2014 S4K3

Answer 1





## evolutionary relationship

747. The relationship of some mammals is indicated in the diagram. Which statement about the African elephant is correct?

- (1) It is more closely related to the mammoth than it is to the West African manatee.  
 (2) It is more closely related to the West Indian manatee than it is to the mastodon.  
 (3) It is not related to the Brazilian manatee or the mammoth.  
 (4) It is the ancestor of Steller's sea cow.

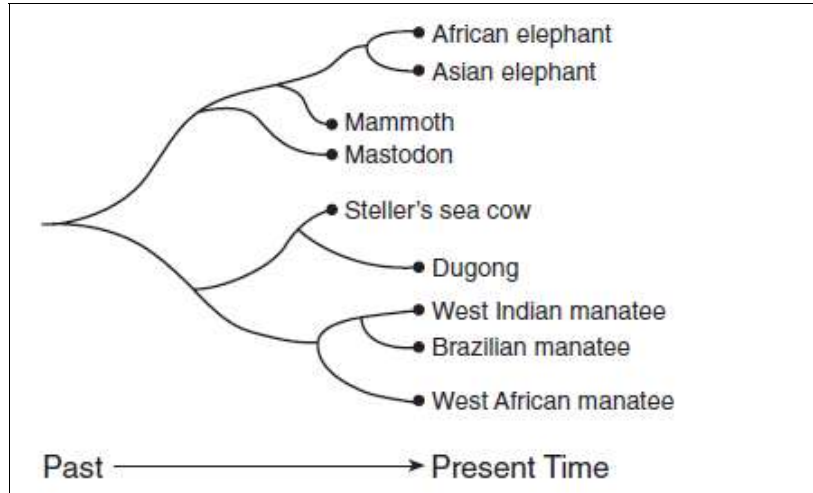
Data Base File Number: 736

Regents Date June2003-22.bmp

June2003

22 6/19/2003 S4K3

Answer 1



## evolutionary relationship

748. The diagram as shown represents three branching diagrams that show relationships between three different species, X, Y, and Z. Which letter of the diagram shows that X and Y are more closely related to each other than to species Z?

- (1) A  
 (2) B  
 (3) C  
 (4) D

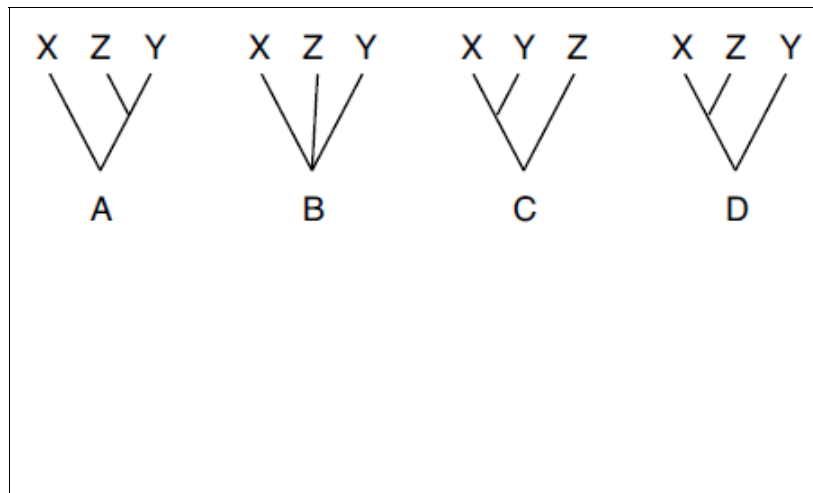
Data Base File Number: 1328

Regents Date Jan2019-83.bmp

Jan2019

83 1/22/2019 LAB1

Answer 3



## evolutionary tree

749. DNA studies have shown that bears and raccoons evolved from a common ancestor about 50 million years ago. Giant pandas evolved from a more recent ancestor that was related to bears. The red panda evolved from a more recent ancestor that was related to raccoons. Which evolutionary tree best represents these sequences of events?

(1) 1

(3) 3

(2) 2

(4) 4

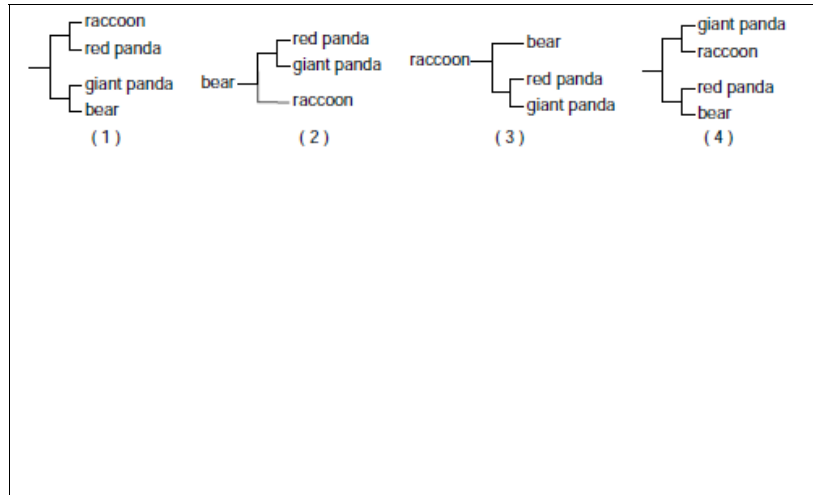
Data Base File Number: 1669

Regents Date June2024-36.bmp

June2024

36 6/14/2024 S4K3

Answer 1



## evolutionary tree

750. The diagram shown represents an evolutionary tree. Which statement best describes species E?

(1) Species D is an ancestor of species E.

(3) Species E had greater success due to patterns of behavior.

(2) Through natural selection, species E produced increased survival mechanisms

(4) Species E had insufficient adaptive characteristics for survival in a changing environment.

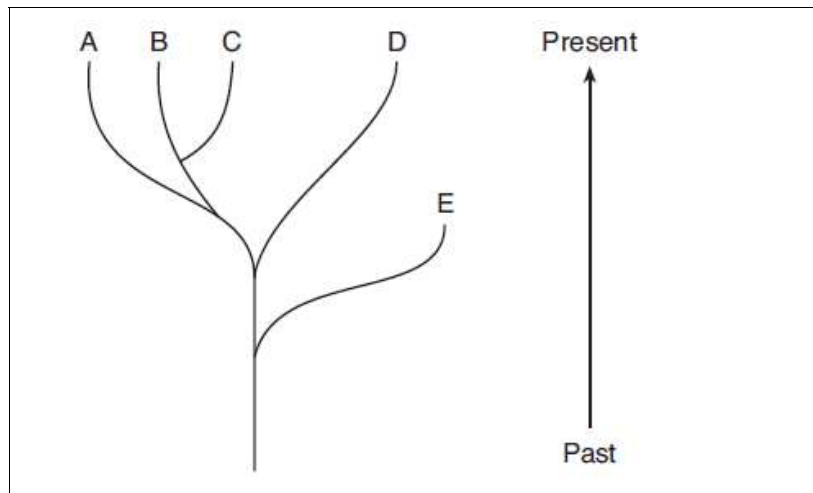
Data Base File Number: 905

Regents Date Aug2013-33.bmp

Aug2013

33 8/14/2013 S4K3

Answer 4



## evolutionary tree

751. A section of the mammalian evolutionary tree is shown in the diagram. Which number would indicate the most recent common ancestor of the elephant, and manatee on the section of this mammalian evolutionary tree?

- (1) 1 (3) 3  
 (2) 2 (4) 4

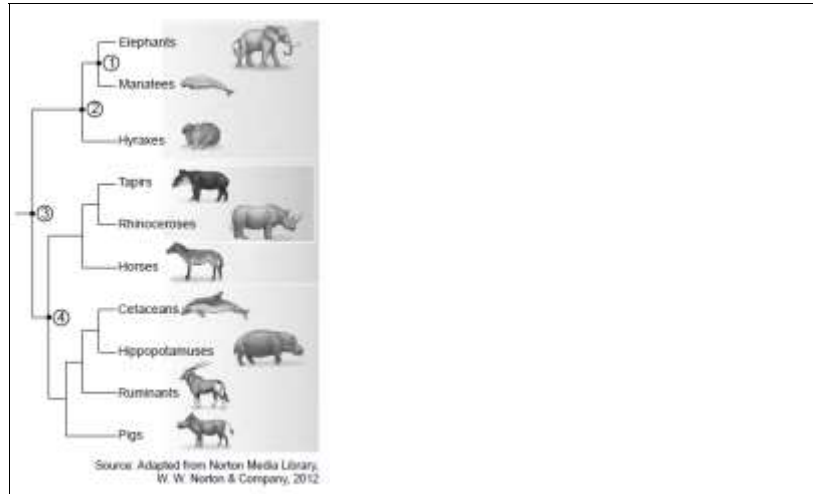
Data Base File Number: 1417

Regents Date Jan2020-82.bmp

Jan2020

82 1/21/2020 LAB1

Answer 2



## evolutionary tree

752. Base your answer to this question on the information given and on your knowledge of biology. ----- The Elephant Shrew ----- The elephant shrew spends its days searching the leaf litter on the forest floor for insect prey. When first discovered, due to structural similarities, the elephant shrew was classified with other shrews and their relatives. However, scientists recently reclassified the elephant shrew, as shown in the evolutionary tree. The new, more accepted classification of the elephant shrew is most probably based on an analysis of

- (1) the coloration of the elephant shrew's fur (3) a number of newly found shrew fossils  
 (2) the feeding habits of the elephant shrew compared to other shrews (4) the DNA present in the cells of the elephant shrews

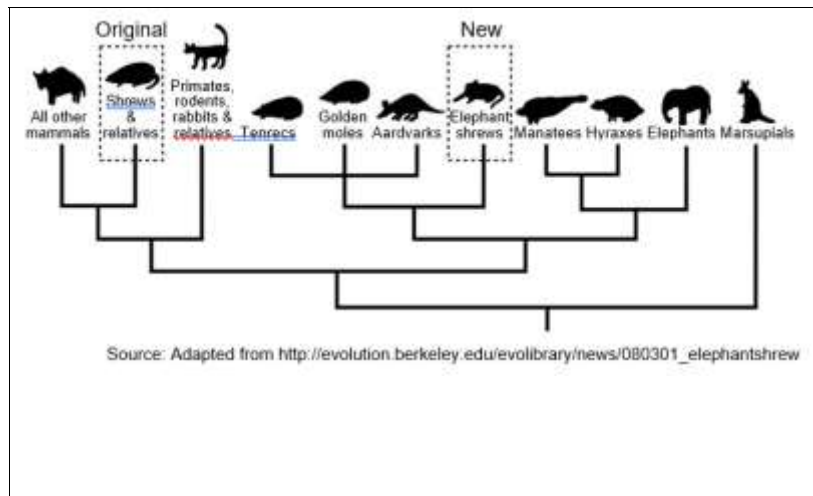
Data Base File Number: 1531

Regents Date Aug2022-75.bmp

Aug2022

75 8/17/2022 LAB1

Answer 4



## evolutionary tree

753. Base your answer to this question on the information given and on your knowledge of biology. The diagram as shown represents a recently developed evolutionary tree for some species of birds. The new tree diagram is based on the analysis of data collected from 169 bird species and includes a change in the placement of flamingos. The flamingos are now grouped with the grebes and pigeons instead of with egrets and penguins. What type of molecular evidence was most likely used to develop this new tree?

- (1) similar DNA sequence
- (2) similar RNA sequence
- (3) similar ribosome sequence
- (4) similar mitochondria sequence

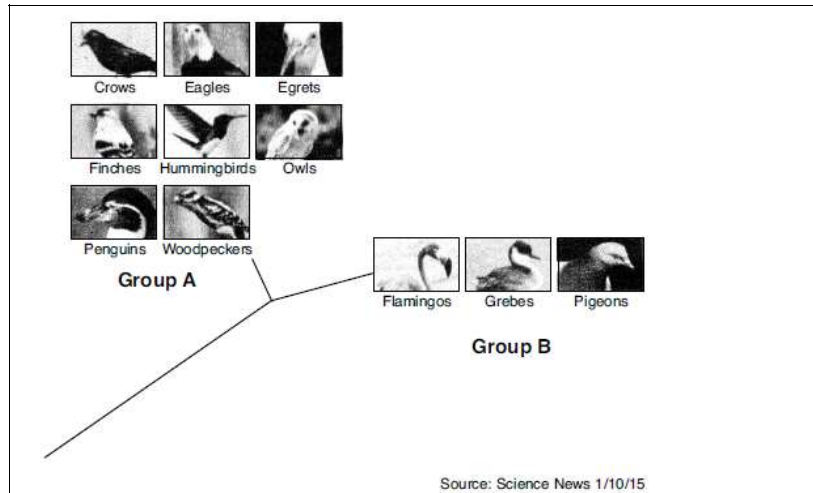
Data Base File Number: 1497

Regents Date June2022-84.bmp

June2022

84 6/15/2022 LAB1

Answer 1



## evolutionary tree

754. Which statement concerning the evolution of species A, B, C, D, and E is supported by the diagram shown?

- (1) Species B and C can be found in today's environments.
- (2) Species A and D evolved from E.
- (3) Species A and C can still interbreed.
- (4) Species A, B, and E all evolved from a common ancestor and all are successful today.

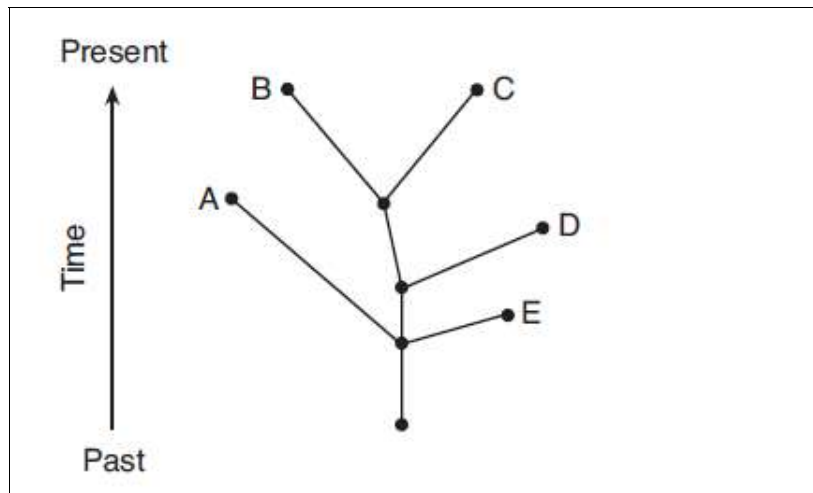
Data Base File Number: 256

Regents Date June2010-14.bmp

June2010

14 6/16/2010 S4K3

Answer 1



## evolutionary tree

755. The diagram shows a branching "tree" representing the evolution of ten different groups of organisms alive today. Which group of organisms is most closely related to the Arthropoda group?

- (1) Coelenterata
- (2) Chordata
- (3) Annelida
- (4) Nematoda

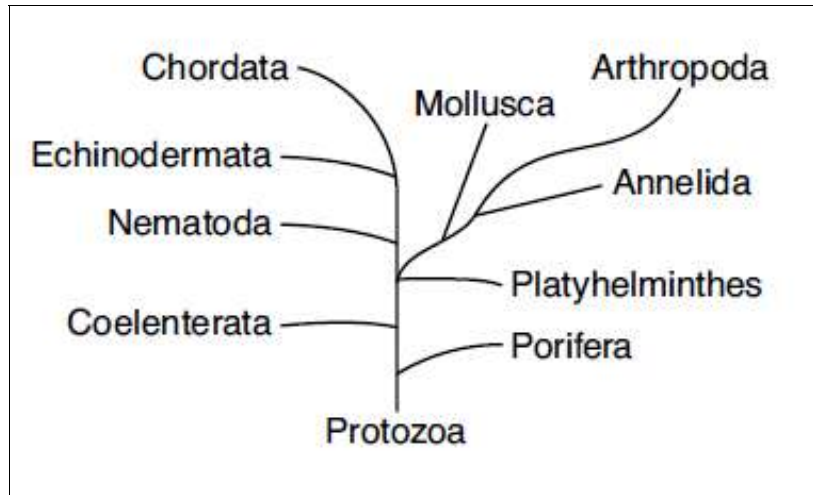
Data Base File Number: 424

Regents Date June2012-53.bmp

June2012

53 6/19/2012 S4K3

Answer 3



## evolutionary tree

756. The diagram shows the evolution of some different species of flowers. Which statement about the species is correct?

- (1) Species A, B, C, and D came from different ancestors.
- (2) Species C evolved from species B.
- (3) Species A, B, and C can interbreed successfully.
- (4) Species A became extinct.

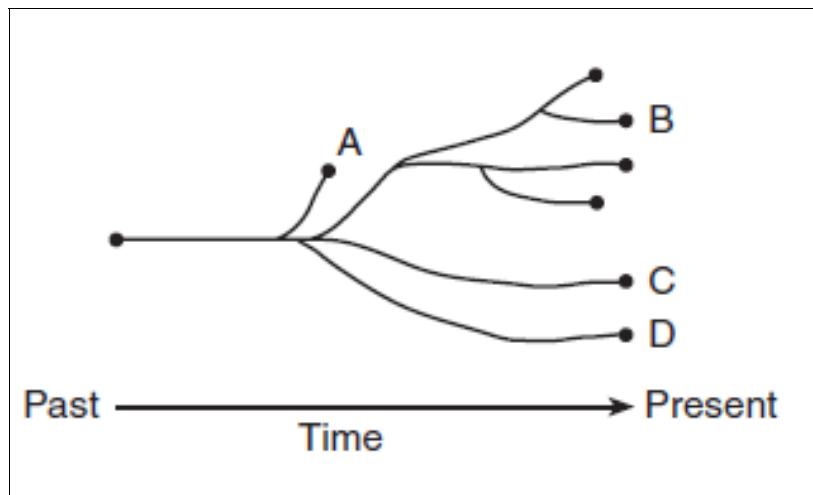
Data Base File Number: 661

Regents Date June2004-14.bmp

June2004

14 6/18/2004 S4K3

Answer 4



## evolutionary tree

757. Base your answer to this question on the information given and on your knowledge of biology. Based on their analysis of the differences in amino acid sequences of one kind of protein, scientists prepared the evolutionary tree shown. According to this diagram, the DNA of which pair of organisms would show the greatest similarity?

- (1) penguin and turtle
- (2) horse and donkey
- (3) snake and tuna
- (4) turtle and rabbit

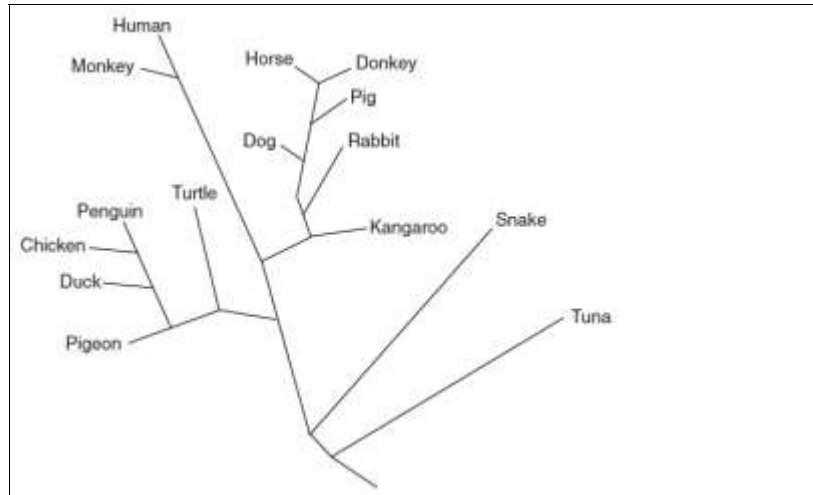
Data Base File Number: 551

Regents Date Jan2005-66.bmp

Jan2005

66 1/28/2005 LAB1

Answer 2



## evolutionary tree

758. An evolutionary tree is shown in the diagram. Which conclusion is correct, based on the evolutionary tree?

- (1) All of these species have certain DNA sequences in common.
- (2) Species "S" is the best adapted of all the species shown.
- (3) A common ancestor of species "L" and "M" is species "N".
- (4) Species "O" and "P" are more closely related than species "P" and "Q".

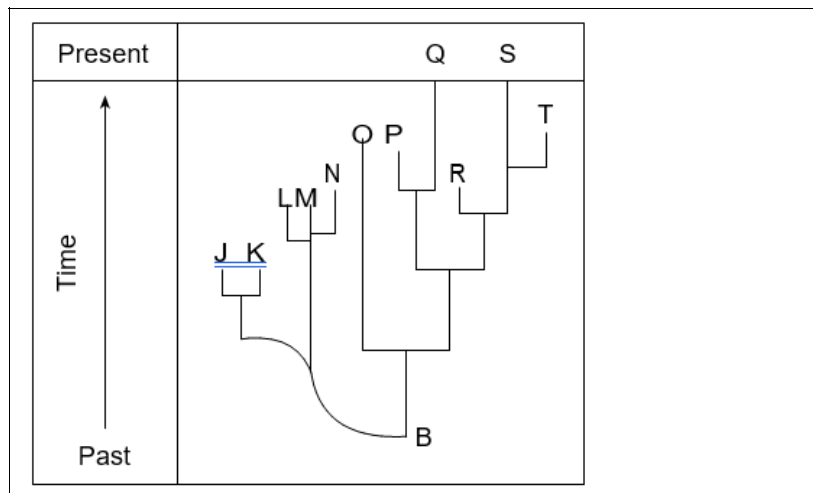
Data Base File Number: 1513

Regents Date Aug2022-36.bmp

Aug2022

36 8/17/2022 S4K3

Answer 1



**evolutionary tree**

759. According to the diagram shown, which three species lived on Earth during the same time period?

- (1) robustus, africanus, afarensis
- (2) habilis, erectus, afarensis
- (3) habilis, robustus, boisei
- (4) africanus, boisei, erectus

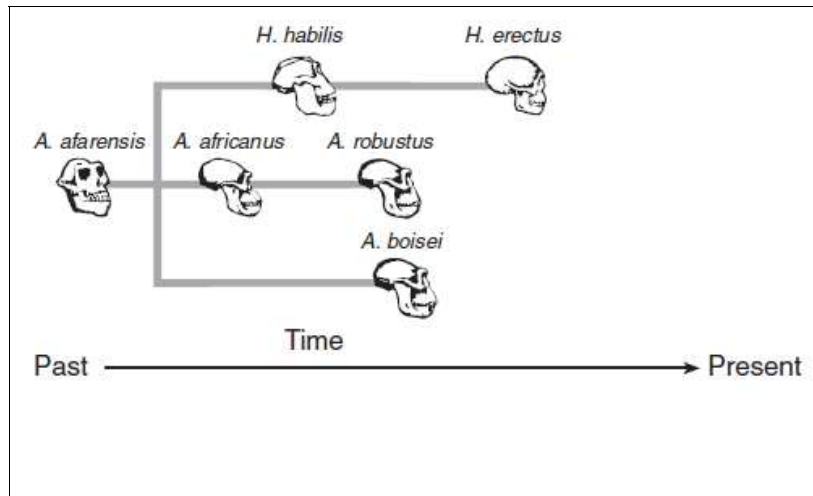
Data Base File Number: 569

Regents Date June2005-37.bmp

June2005

37 6/22/2005 S4K3

Answer 3



**experimental testing**

760. Base your answer to this question on the information given and on your knowledge of biology.

**A Clothespin Experiment**

A student in a Living Environment class designed an experiment to investigate if the number of times a student squeezes a clothespin varies with the hand used. Her hypothesis was that students could squeeze a clothespin more times in a minute when they used their dominant hand than when they used their nondominant hand.

During her investigation, she first squeezed and released a clothespin as often as possible for 20 seconds with her dominant hand. She recorded the number of squeezes in a chart.

She performed three trials before resting. After that, she repeated the entire procedure with her nondominant hand. Some of the data are shown in the table.

Calculate the AVERAGE clothespin-squeezing rate per minute for the DOMINANT HAND.

- (1) 53
- (2) 63
- (3) 73
- (4) 83

Data Base File Number: 1451

Regents Date June2021-84.bmp

June2021

84 6/22/2021 LAB2

Answer 4

Trial	20-Second Clothespin Squeezing (Dominant Hand)	Clothespin-Squeezing Rate Per Minute (Dominant Hand)	20-Second Clothespin Squeezing (Nondominant Hand)	Clothespin-Squeezing Rate Per Minute (Nondominant Hand)
Trial 1	26	_____	18	54
Trial 2	33	_____	28	84
Trial 3	24	_____	29	87
Average	_____	_____	_____	75

## experimental testing

761. Base your answer to this question on the information and diagram given and on your knowledge of biology. The presence of air is believed to be important for root growth in bean plants. The apparatus available to conduct an investigation is shown. There are enough bottles and other materials to have multiple setups. Air (for aeration) can be bubbled into the bottle through the rubber tube. Students designed an experiment with multiple setups and controls. What is the most likely hypothesis that students are testing for?

- (1) Air is important for root growth in bean plants.
- (2) Minerals are important for growth in bean plants.
- (3) Fertilizer is important for growth in bean plants.
- (4) Bean plants must have a period of darkness for growth.

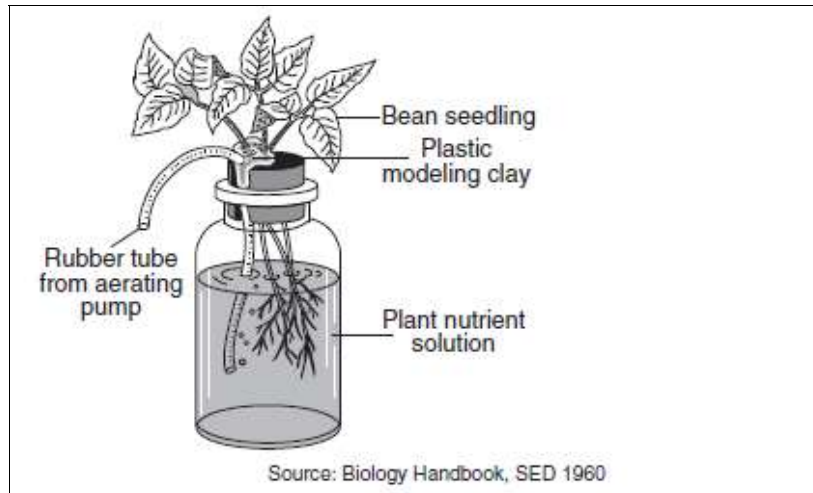
Data Base File Number: 1036

Regents Date June2015-68.bmp

June2015

68 6/16/2015 LABA

Answer 1





## experimental testing

762. Base your answer to this question on the information shown and on your knowledge of biology. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is a toxic compound that is produced by plant and animal cells. These cells also produce the enzyme catalase, which converts H<sub>2</sub>O<sub>2</sub> into water and oxygen gas, preventing the buildup of H<sub>2</sub>O<sub>2</sub>. A student designed an experiment to test the effect of an acidic pH on the rate of the reaction of H<sub>2</sub>O<sub>2</sub> with catalase. The data table summarizes the outcome of the experiment. Which conclusion is valid based upon the data collected by the student?

- (1) The change in pH prevents catalase from breaking down water.
- (2) Catalase has the greatest activity at a pH of 7
- (3) Oxygen production will increase if more water is added to the reaction.
- (4) Catalase caused the greatest production of oxygen at a pH of 3.

Data Base File Number: 1287

Regents Date Aug2018-38.bmp

Aug2018

38 8/17/2018 S1K1

Answer 2

pH Level	7 (neutral)	6	5	3
Reaction Rate (mL of oxygen/minute)	1.5	1.3	1.0	.55

**experimental testing**

763. Base your answer to this question on the information given and on your knowledge of biology. Students hypothesized that eating a candy bar a few minutes prior to exercising would increase the number of jumping jacks they could do in a given amount of time. Each participant ate one candy bar, waited 10 minutes, then did jumping jacks for one minute. After conducting the experiment, the students reported their data in the data table as shown. Can the data in the table be used to support the hypothesis the students proposed?

- (1) no
- (2) yes
- (3) no and yes
- (4) insufficient evidence to determine yes or no

Data Base File Number: 1715

Regents Date Aug2024-80.bmp

Aug2024

80 8/20/2024 LAB1

Answer 1

Student	Number of Jumping Jacks Done in One Minute
(1)	35
(2)	52
(3)	48
Average	45

**extinction**

764. Concern is rising that mass extinctions of many species may increase. In the graph as shown, the risk of extinctions is shown to have risen rapidly from 1850 to 2014. This loss of different species is a concern because it may

- (1) lead to an increase in diversity in the ecosystem
- (2) impact the energy flow and food supply within an ecosystem
- (3) produce increased nonrenewable resources
- (4) provide additional sources of potential medicines

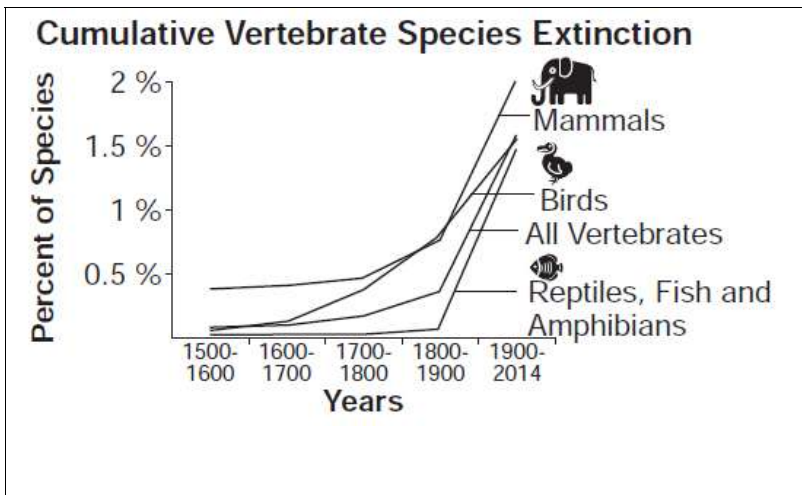
Data Base File Number: 1689

Regents Date Aug2024-18.bmp

Aug2024

18 8/20/2024 S4K6

Answer 2



**extinction**

765. Which process is correctly matched with its explanation?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 758

Regents Date Aug2003-16.bmp

Aug2003

16 8/13/2003 S4K3

Answer 1

	Process	Explanation
(1)	extinction	adaptive characteristics of a species are not adequate
(2)	natural selection	the most complex organisms survive
(3)	gene recombination	genes are copied as a part of mitosis
(4)	mutation	overproduction of offspring takes place within a certain population

**extinction**

766. Base your answer to this question on the information given and on your knowledge of biology.  
-----Dinosaur Extinction -----

The hypothesis that an asteroid strike led to the mass extinction of dinosaurs is widely accepted. It is understood that the asteroid strike caused a massive and quick shift in Earth's temperature and blocked much of the sunlight. While devastating for the dinosaurs, this dramatic event provided opportunities for other species. For example, surviving birds and mammals underwent a time of rapid evolution, which led to the thousands of birds and mammal species present on Earth today. How could the temporary blocking of the sunlight have impacted the survival of the dinosaurs?

- (1) Less sunlight would reduce plant growth, so the dinosaurs would have less food.
- (2) Less sunlight would increase bird populations
- (3) Less sunlight would increase small mammal populations.
- (4) Less sunlight would increase green plant populations.

Data Base 1589  
File Number:

Regents Date June2023-71.bmp

June2023

71 6/14/2023 S4K3

Answer 1



## extinction

767. The bobolink is a small blackbird that nests in fields of tall grass. It breeds in the summer across much of southern Canada and the northern United States. It migrates long distances, wintering in southern South America. The numbers of these birds are declining due to disruption of the areas where they live. In order to save these birds from extinction, the best course of action would be to

- (1) prevent the birds from migrating to South America
- (2) encourage farmers to let their hay fields undergo succession
- (3) work to protect bobolink habitats in South and North America
- (4) capture all the bobolinks and keep them safe in zoos

Data Base File Number: 1198

Regents Date Aug2017-8.bmp

Aug2017

8 8/17/2017 S4K7

Answer 3



## feedback

768. What is represented by the sequence shown in the diagram?

- (1) a feedback mechanism in multicellular organisms
- (2) an immune response by cells of the pancreas
- (3) differentiation of organic molecules
- (4) the disruption of cellular communication

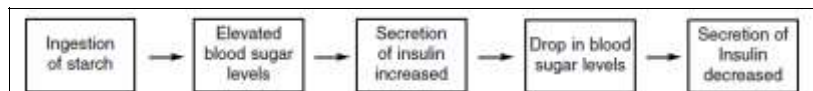
Data Base File Number: 716

Regents Date Jan2003-27.bmp

Jan2003

27 1/30/2003 S4K5

Answer 1



feedback

769. Blood sugar levels increase after a meal and eventually return to normal. This is represented in the diagram as shown. This constant correcting of blood sugar levels within the body is accomplished by

- (1) a feedback mechanism
- (2) an immune response
- (3) an allergic reaction
- (4) manipulating a gene

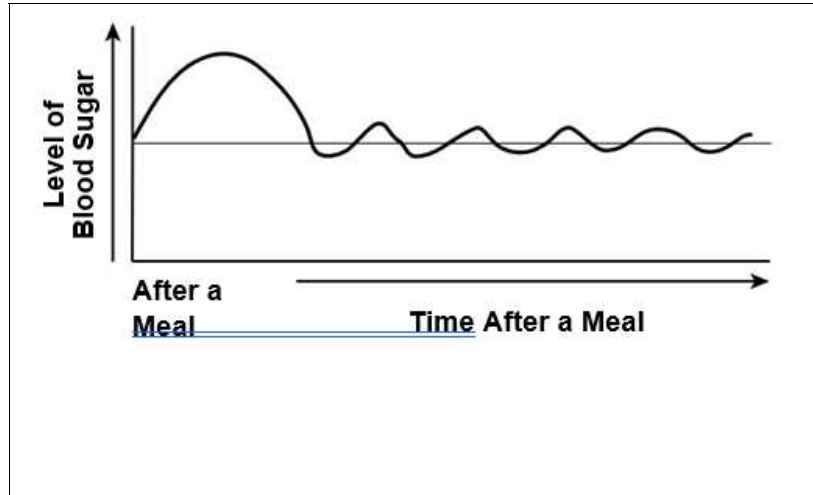
Data Base File Number: 1505

Regents Date Aug2022-26.bmp

Aug2022

26 8/17/2022 S4K5

Answer 1



feedback

770. The dashed line in the drawing represents.

- (1) a digestive process
- (2) a feedback mechanism
- (3) cellular differentiation
- (4) recycling of organic chemicals

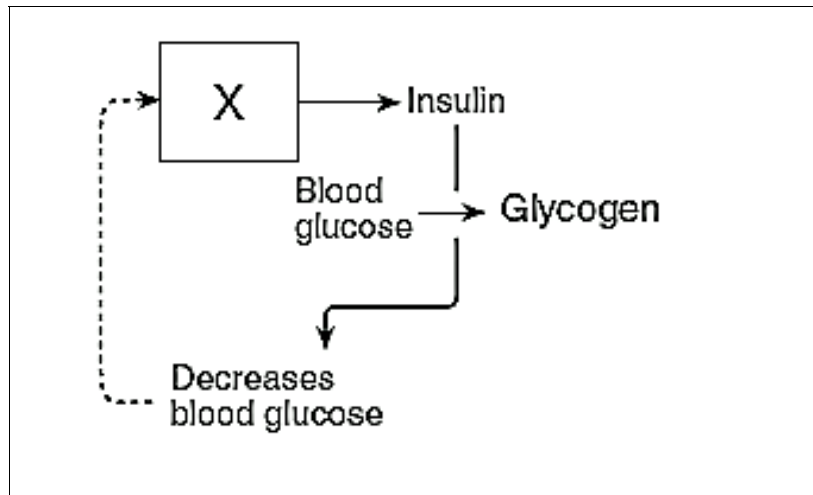
Data Base File Number: 45

Regents Date June07-55.bmp

June2007

55 6/20/2007 S4K5

Answer 2



feedback

771. The diagram shows information about human body temperature regulation. These events can be best described as an example of

- (1) a feedback mechanism that maintains homeostasis
- (2) a cycle that regulates cellular communication
- (3) an immune system response to increasing heart rate
- (4) a body system regulating hormone production

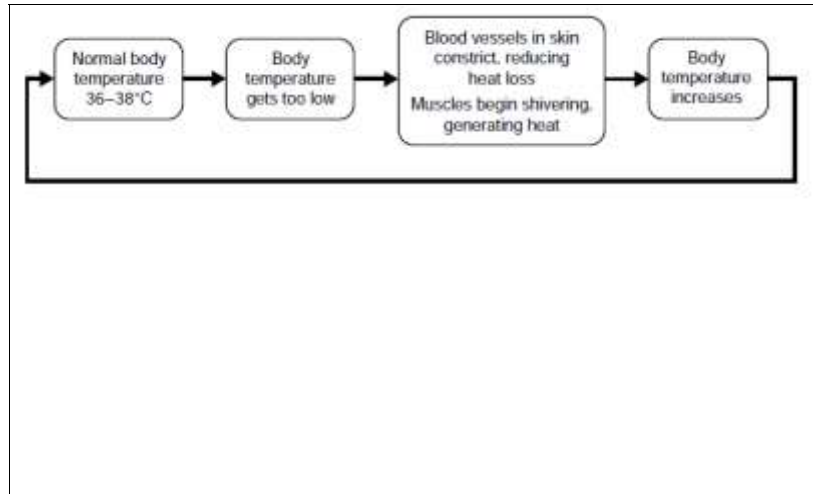
Data Base File Number: 1662

Regents Date June2024-20.bmp

June2024

20 6/14/2024 S4K5

Answer 1



feedback

772. Activities in the human body are represented in the diagram shown. Which title would be appropriate for the diagram? ROTATE (Turn) the diagram to the RIGHT to properly view the diagram.

- (1) Rate of Excretion Varies in Response to Amount of Water Taken In
- (2) Feedback Mechanisms Help to Maintain Homeostasis
- (3) Respiratory Rate Responds to an Increase in Muscle Activity
- (4) The Nervous System Responds to Changes in Blood Sugar Levels

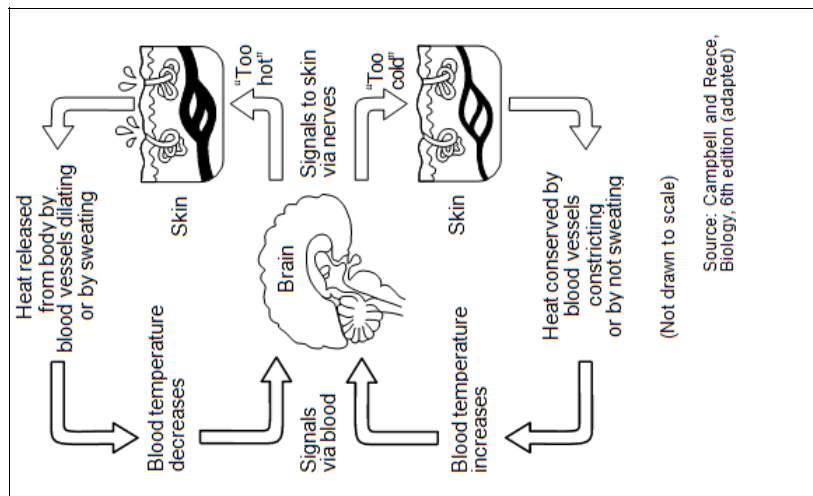
Data Base File Number: 312

Regents Date Jan2011-31.bmp

Jan2011

31 1/25/2011 S4K5

Answer 2



feedback

773. The diagram shows the interaction between blood sugar levels and pancreatic activity. This process is an example of

- (1) a feedback mechanism maintaining homeostasis
- (2) an immune system responding to prevent disease
- (3) the digestion of sugar by insulin
- (4) the hormonal regulation of gamete production

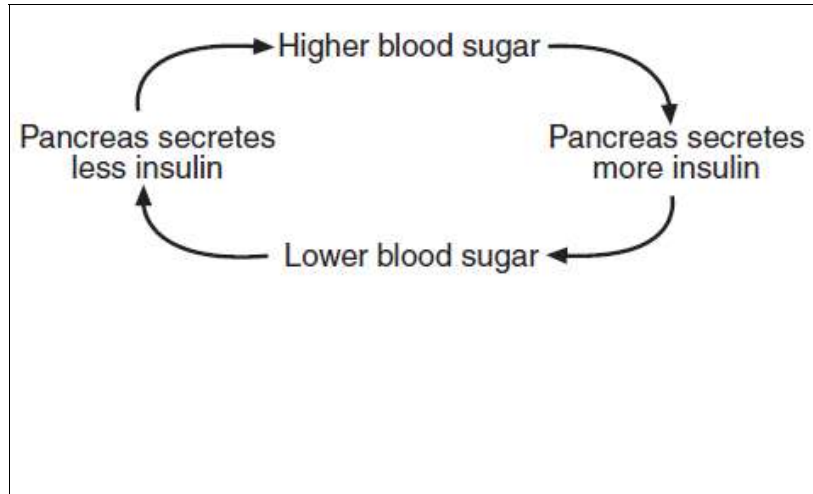
Data Base File Number: 809

Regents Date June2002-29.bmp

June2002

29 6/19/2002 S4K5

Answer 1



feedback

774. Base your answers to this question on the diagram shown and on your knowledge of biology. Each arrow in the diagram represents a different hormone released by the pituitary gland that stimulates the gland indicated in the diagram. All structures are present in the same organism. The pituitary gland may release hormone 2 when blood pressure drops. Hormone 2 causes gland B to release a different hormone that raises blood pressure which, in turn, stops the secretion of hormone 2. The interaction of these hormones is an example of

- (1) DNA base substitution
- (2) manipulation of genetic instructions
- (3) a feedback mechanism
- (4) an antigen-antibody reaction

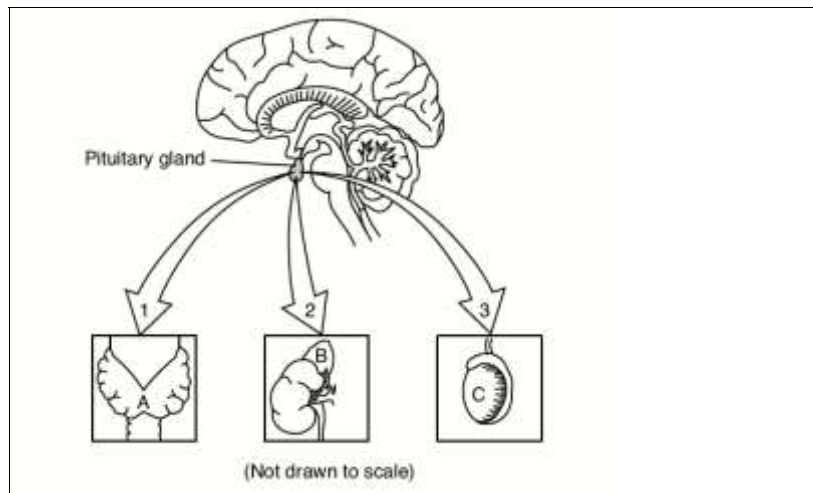
Data Base File Number: 133

Regents Date Aug08-38.bmp

Aug2008

38 8/13/2008 S4K5

Answer 3





feedback

775. Base your answer to this question on the included diagram showing activities in the human body. This diagram illustrates part of

- (1) a feedback mechanism
- (2) an enzyme pathway
- (3) a digestive mechanism
- (4) a pattern of learned behavior

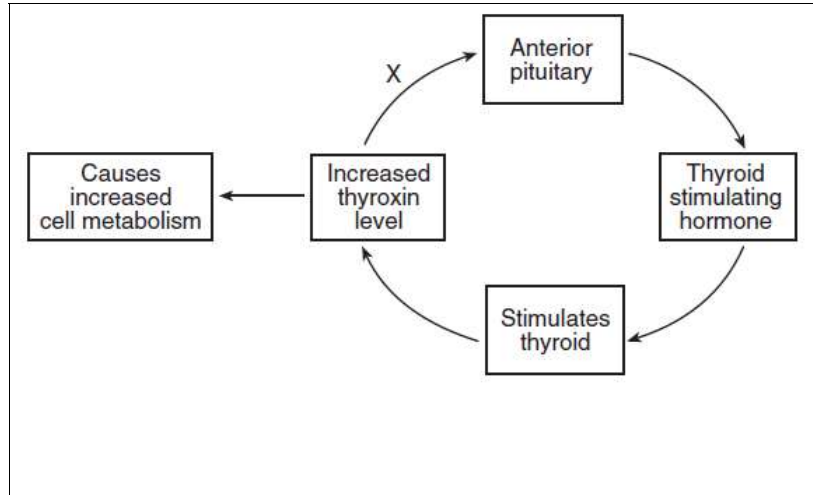
Data Base File Number: 653

Regents Date Jan2004-60.bmp

Jan2004

60 1/29/2004 S4K5

Answer 1



feedback

776. The diagrams shown represent a response that occurs in the guard cells of a plant. The changes in the guard cells' activity illustrate

- (1) an immune response intended to limit water use
- (2) passive transport in response to the Sun shining
- (3) a feedback mechanism to control water loss
- (4) genetic manipulation caused by the presence or absence of water

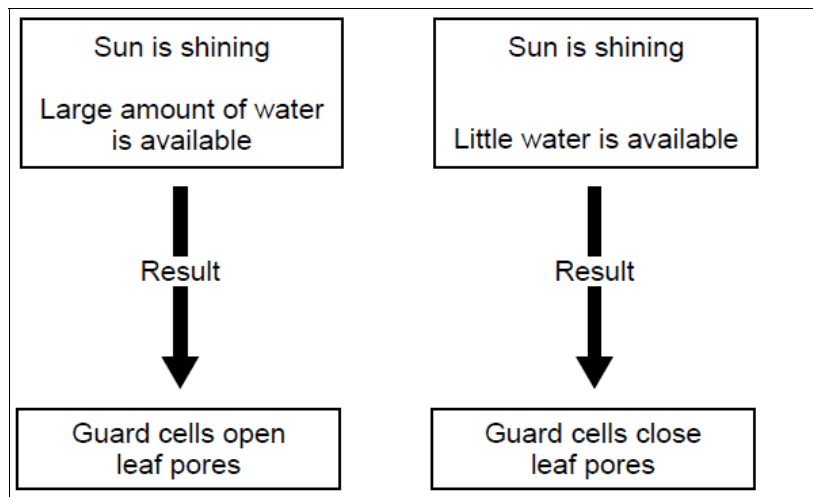
Data Base File Number: 1570

Regents Date June2023-29.bmp

June2023

29 6/14/2023 S4K5

Answer 3



feedback

777. The diagram shown represents levels of glucose and insulin found within the bloodstream of a healthy person throughout the course of the day. The increase in insulin levels following an increase in glucose levels in the blood can best be explained by

- (1) insulin being released into the blood to digest glucose
- (2) a feedback mechanism that regulates blood glucose levels
- (3) an excess of glucose-stimulating guard cells
- (4) a response of the immune system to lower excess blood glucose levels

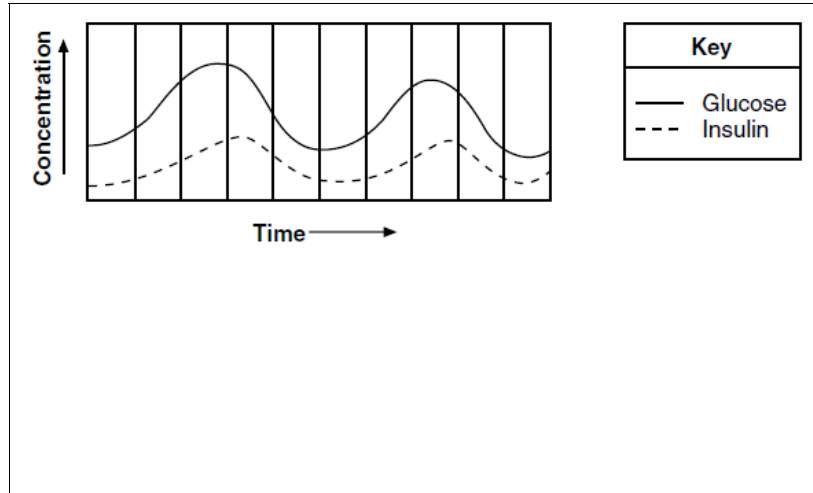
Data Base File Number: 1160

Regents Date Jan2017-30.bmp

Jan2017

30 1/25/2017 S4K5

Answer 2



feedback

778. The diagram shown represents the actions of two hormones in the human body. This diagram best illustrates

- (1) recombination
- (2) feedback
- (3) insertion
- (4) deletion

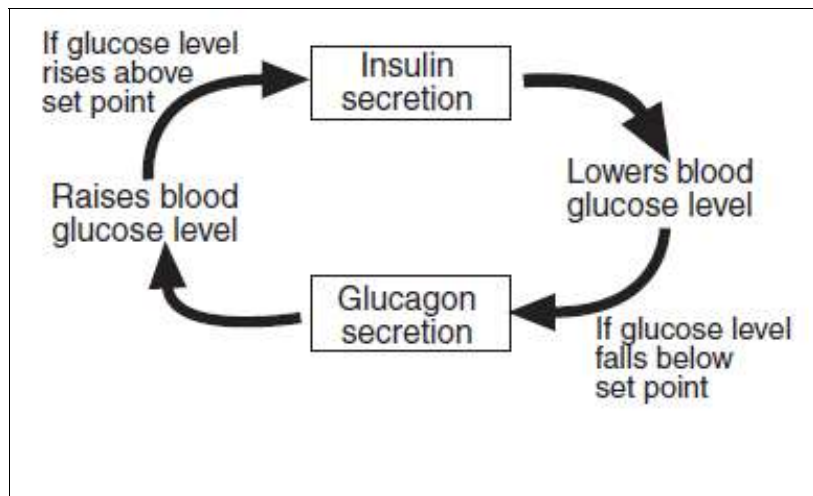
Data Base File Number: 775

Regents Date Aug2002-6.bmp

Aug2002

6 8/13/2002 S4K5

Answer 2



feedback

779. The diagram shown represents a sequence of events that occurs in the human body throughout the day. These events can best be described as an example of

- (1) an energy cycle
- (2) recycling of inorganic materials
- (3) a feedback mechanism
- (4) a learned behavior

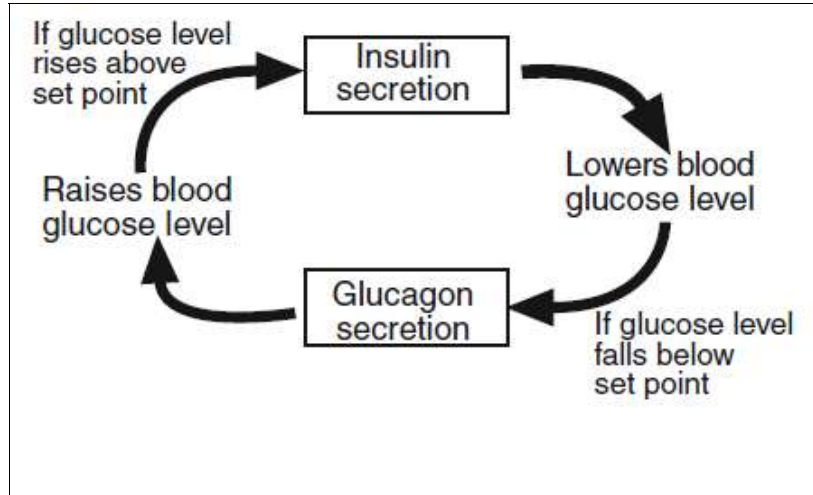
Data Base File Number: 621

Regents Date Jan2013-42.bmp

Jan2013

42 1/23/2013 S4K5

Answer 3



feedback

780. The diagram shown represents a feedback mechanism. The hormone referred to in this feedback mechanism is

- (1) estrogen
- (2) insulin
- (3) progesterone
- (4) testosterone

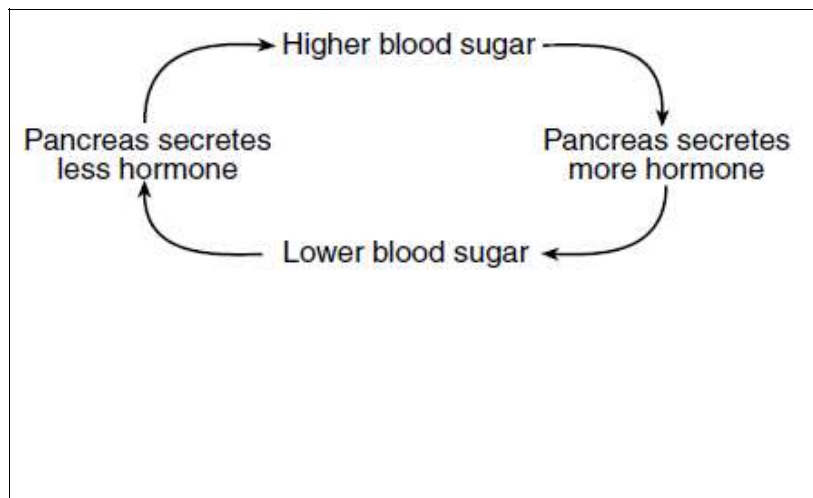
Data Base File Number: 1280

Regents Date Aug2018-28.bmp

Aug2018

28 8/17/2018 S4K5

Answer 2



fermentation

781. Base your answer to this questions on the information and data table given and on your knowledge of biology. The diagram shown represents a setup used in an experiment to determine the effect of temperature on fermentation. Fermentation is a type of respiration in yeast that produces alcohol and a gas. Five setups were used. Each was kept at a different temperature. The number of gas bubbles released in each tube was counted and recorded in the data table as shown. The number of bubbles produced at 27°C would be approximately

- (1) 30
- (2) 60
- (3) 80
- (4) 110

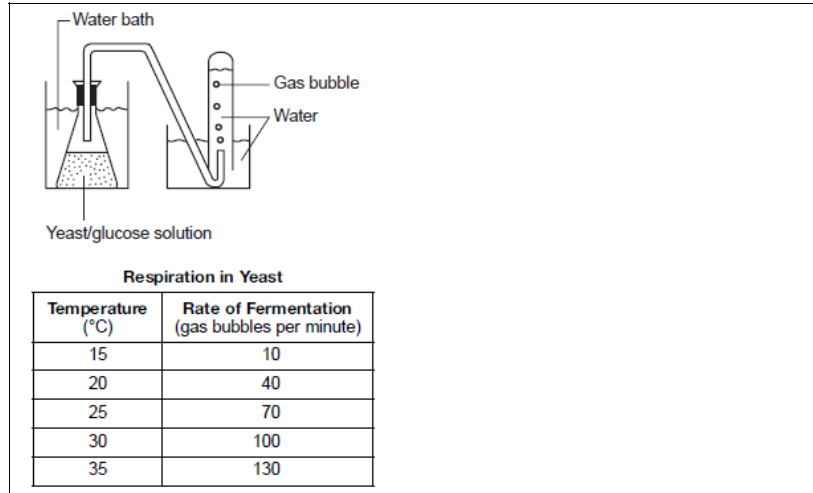
Data Base File Number: 1080

Regents Date Jan2016-44.bmp

Jan2016

47 1/27/2016 S1K3

Answer 3



fermentation

782. A student placed a solution of glucose and yeast in a vacuum bottle and sealed it with a two-hole stopper as shown in the diagram. The temperature of the yeast-glucose solution increased gradually with time, and the color of the indicator was observed and recorded throughout a 2-day period. The purpose of the investigation was most likely to

- (1) study the relationship between temperature and pressure
- (2) demonstrate the release of energy by a chemical process
- (3) show that proteins are produced by yeast
- (4) study autotrophic nutrition in yeast

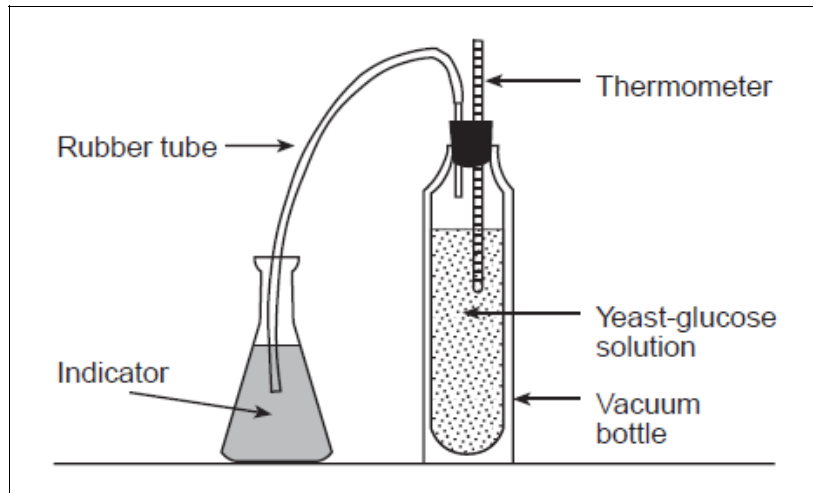
Data Base File Number: 856

Regents Date June2001-59.bmp

June2001

59 6/15/2001 S1K2

Answer 2



## fermentation

783. Base your answers to this question on the information given and on your knowledge of biology. - A biology class conducted an experiment to determine the rate of respiration of yeast in bread dough at various temperatures. Bread dough will rise due to the production of carbon dioxide by the yeast present in the dough.

An equal amount of dough was placed in the bottom of each of five graduated cylinders. Each cylinder was then placed in a different water bath to maintain a particular temperature. A diagram of the setup is shown. The amount of expansion of the dough in each cylinder was measured after 15 minutes. The results are shown in the data table. At which temperature (degrees C) did yeast cells produce the least amount of gas in 15 minutes?

(1) 25

(3) 75

(2) 50

(4) 90

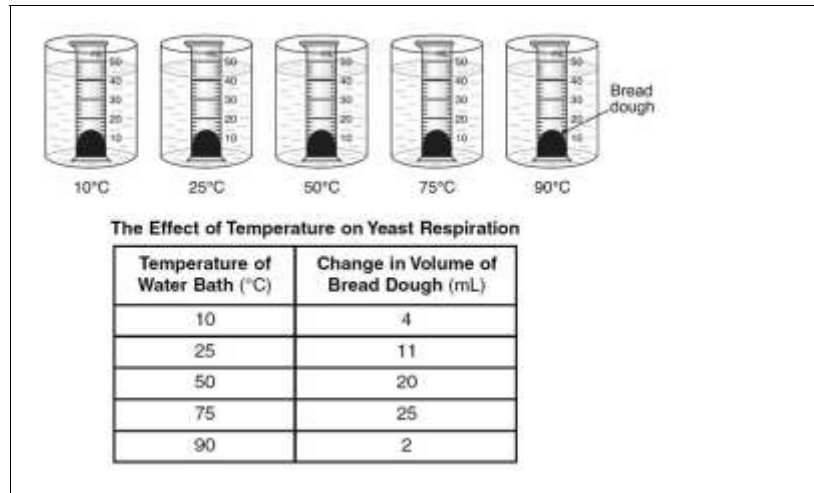
Data Base  
File Number: 350

Regents Date June2011-52-55.b

June2011

52 6/21/2011 S1K1

Answer 4



## fermentation

784. An investigation was carried out and the results are shown in the diagram. Substance X resulted from a metabolic process that produces ATP in yeast (a single-celled fungus). Which statement best describes substance X?

- (1) It is oxygen released by protein synthesis.
- (2) It is glucose that was produced in photosynthesis.
- (3) It is starch that was produced during digestion.
- (4) It is carbon dioxide released by respiration.

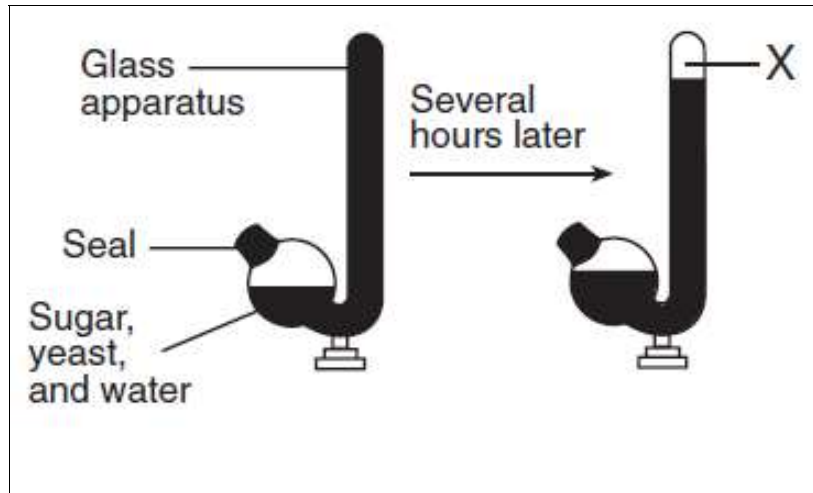
Data Base File Number: 565

Regents Date June2005-32.bmp

June2005

32 6/22/2005 S4K5

Answer 4



## fertilization

785. The diagram shown represents events that occur during sexual reproduction. The stages labeled A, B, and C are necessary to ensure that the offspring will inherit

- (1) half of their chromosomes from each parent
- (2) double the amount of chromosomes from each parent
- (3) pairs of chromosomes from each parent
- (4) double the amount of chromosomes from one parent

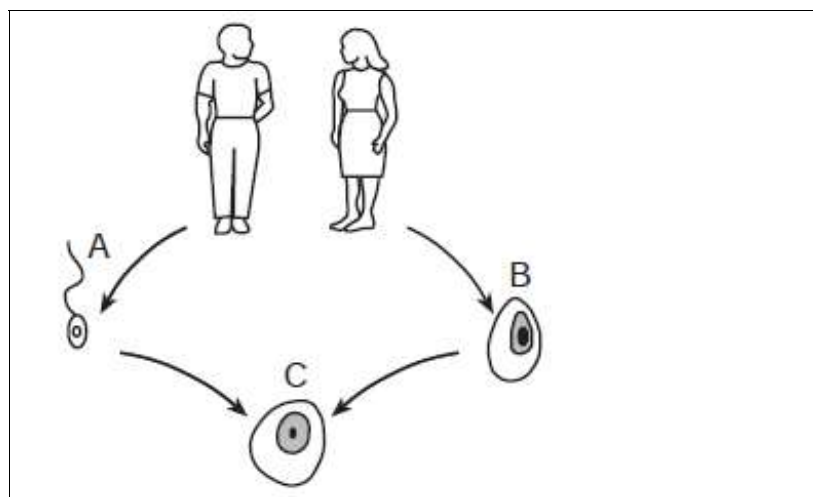
Data Base File Number: 1238

Regents Date Jan2018-42.bmp

Jan2018

42 1/22/2018 S4K4

Answer 1



**fertilization**

786. Which diagram best illustrates an event in sexual reproduction that would most directly lead to the formation of a human embryo?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

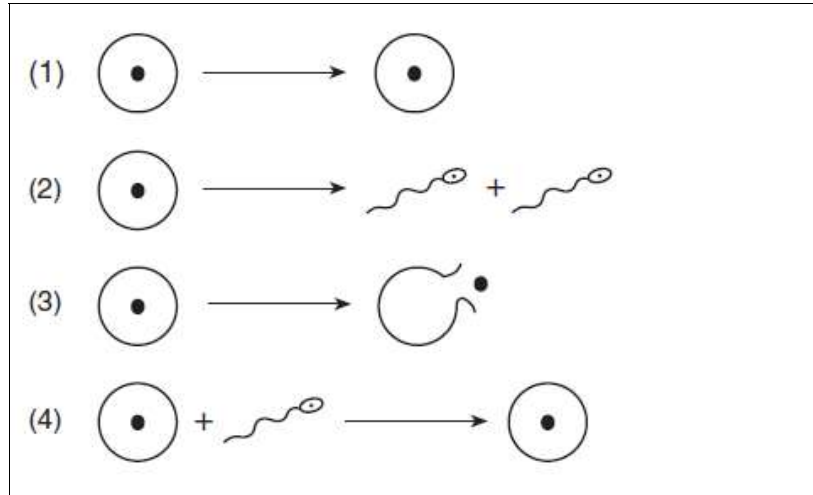
Data Base File Number: 479

Regents Date June2006-15.bmp

June2006

15 6/21/2006 S4K4

Answer 4



**fertilization**

787. Which diagram correctly represents a step in the normal process of human reproduction?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

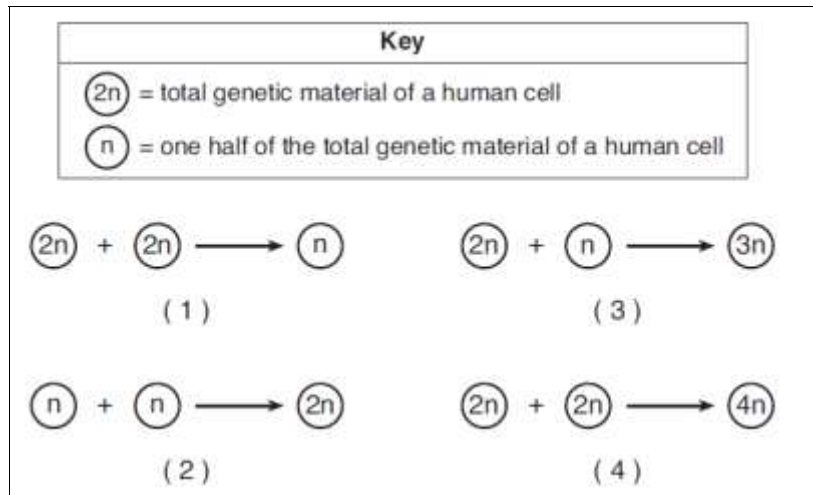
Data Base File Number: 884

Regents Date June2013-43.bmp

June2013

43 6/11/2013 S4K2

Answer 2



## fertilization

788. The diagram shown represents the human female reproductive system. How would a complete blockage at location X affect the reproductive process?

- (1) Fertilization of an egg will be prevented since the sperm will be blocked.
- (2) Fertilization of the egg will be possible.
- (3) A fertilized egg will reach the uterus.
- (4) A fertilized egg will die.

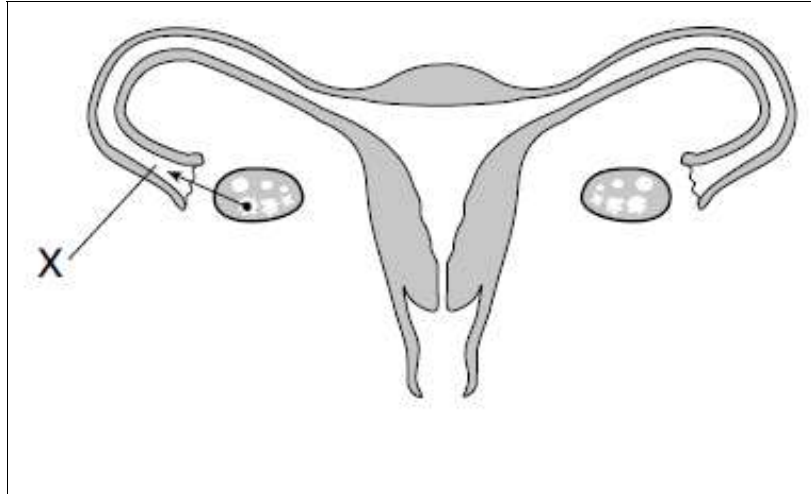
Data Base File Number: 1318

Regents Date Jan2019-55.bmp

Jan2019

55 1/22/2019 S4K4

Answer 1



## fertilization

789. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram indicates some parts of the human female reproductive system. The structure in which fertilization normally takes place is

- (1) A
- (2) B
- (3) C
- (4) D

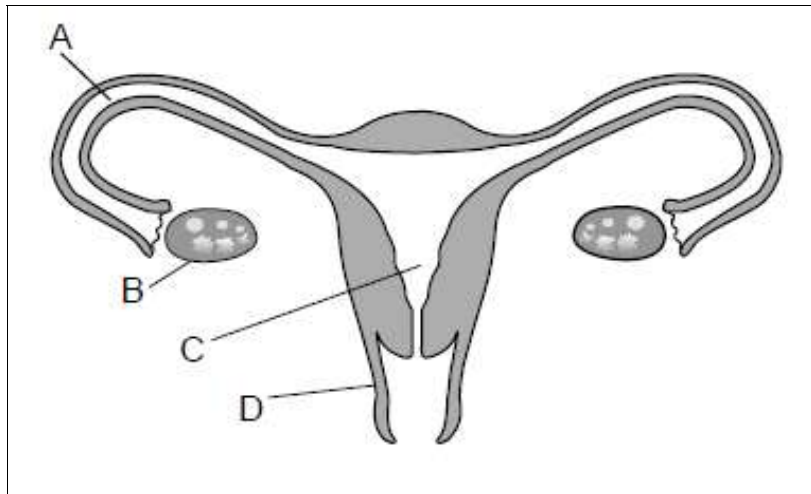
Data Base File Number: 1350

Regents Date June2019-50.bmp

June2019

50 6/18/2019 S4K4

Answer 1





**fertilization**

790. The diagram shows stages of human reproduction. The direct result of fertilization is represented at

- (1) A
- (2) B
- (3) C
- (4) D

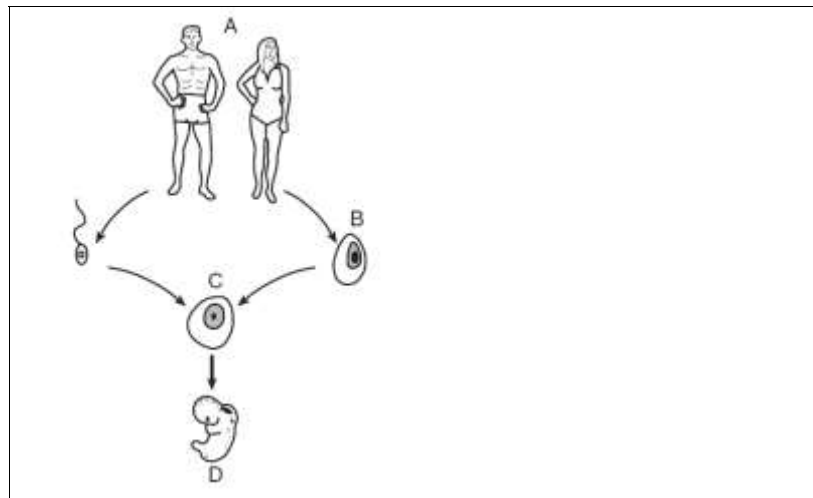
Data Base File Number: 301

Regents Date Jan2011-2.bmp

Jan2011

2 1/25/2011 S4K4

Answer 3



**fetal development**

791. The table shows some of the major milestones in fetal development. By what week should women have the optimal amount of folic acid in their diet?

- (1) 1
- (2) 3 or 4
- (3) 5 or 6
- (4) 8 or 10

Data Base File Number: 1642

Regents Date Jan2024-51.bmp

Jan2024

51 1/23/2024 LABA

Answer 2

Week	Milestones in Fetal Development
1	Embryo implants and continues to develop
3	Embryo has 3 distinct layers
4	Neural tube forms, limbs develop
5	Primitive lens, mouth and digits form
6	Primitive nose forms, neural tube closes, heartbeat can be detected
8	Internal organs can be distinguished
10	Lung buds appear

## fetal development

792. Base your answer to this question on the information given and on your knowledge of biology. After decades of research, scientists have developed a biobag system with the potential to save extremely premature babies. They have successfully removed eight lamb fetuses from their mothers and placed them into biobags. Eventually, the fetuses developed into healthy sheep. The biobag is a clear plastic bag filled with a solution of water containing various salts. A machine outside the bag is attached to the blood vessels in the lamb's umbilical cord. The lamb's umbilical cord brings in nutrients, and its heart pumps blood through an external oxygenator that removes carbon dioxide from the blood and adds oxygen. The biobag models early development in the reproduction of mammals. In the future, this system may be able to be used with human premature babies. The biobag system, as shown in the diagram, could allow them to continue to develop for a longer period of time. In the model shown, what does the PLASTIC BAG represent in the real mother sheep's body?

- (1) the amniotic sac  
(2) the womb  
(3) the uterus  
(4) the placenta

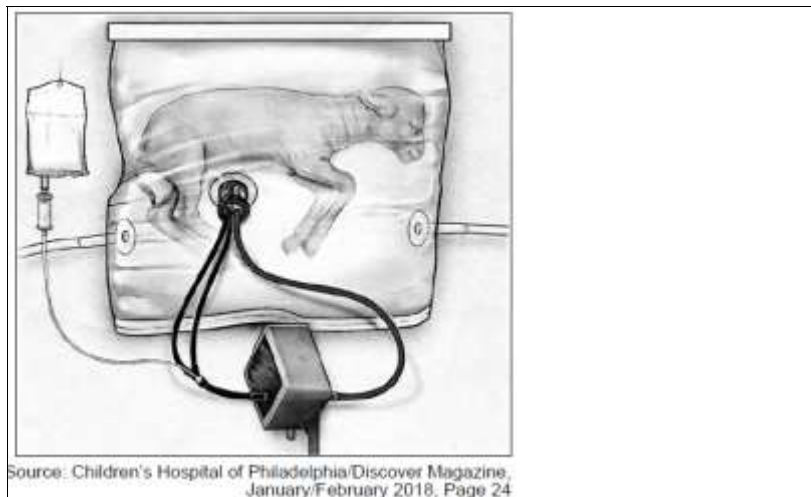
Data Base 1584  
File Number:

Regents Date June2023-54.bmp

June2023

54 6/14/2023 S4K4

Answer 1



**finite resources**

793. Base your answers to this question on the information given and on your knowledge of biology. The graph below shows the growth of *Paramecium aurelia* in the same culture dish for 14 days. If no additional materials were added to the culture dish, after day 14, the paramecium population would most probably

- (1) remain the same, since it has reached carrying capacity and has an unlimited food supply
- (2) begin to increase as they continue to reproduce
- (3) begin to increase, since they have not yet reached carrying capacity
- (4) begin to decrease as finite resources are used up

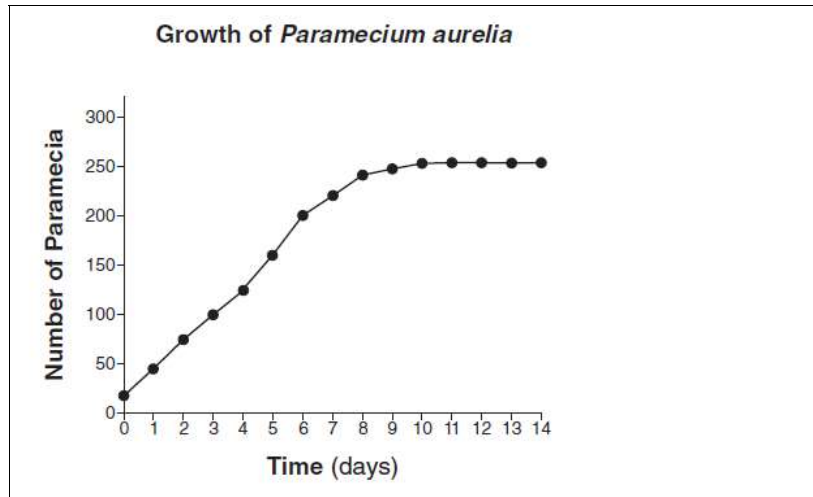
Data Base File Number: 1053

Regents Date August2015-39.b

Aug2015

39 8/12/2015 S4K6

Answer 4



**food chain**

794. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents part of a food web. Which population would be most immediately affected by the removal of the lizard population?

- (1) sedges
- (2) algae
- (3) ants
- (4) centipedes

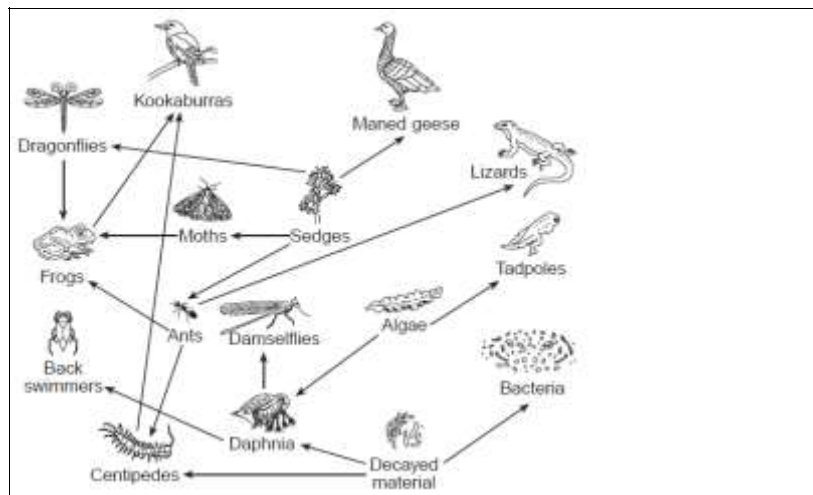
Data Base File Number: 1101

Regents Date June2016-31.bmp

June2016

32 6/15/2016 S4K1

Answer 3



## food chain

795. Base your answer to this question on the food chain shown and the information given. The food chain involves organisms in Yellowstone National Park. Wolves in the park were killed or driven off by humans in the 1920s and 1930s. In the winter of 1995, humans released 17 wolves from Canada into the park. A year later, 14 more wolves were released. One possible reason that the wolves were released into the park was to

- (1) eliminate unwanted autotrophs
- (2) reduce an overpopulation of elk
- (3) provide food for small predators
- (4) increase the number of herbivores

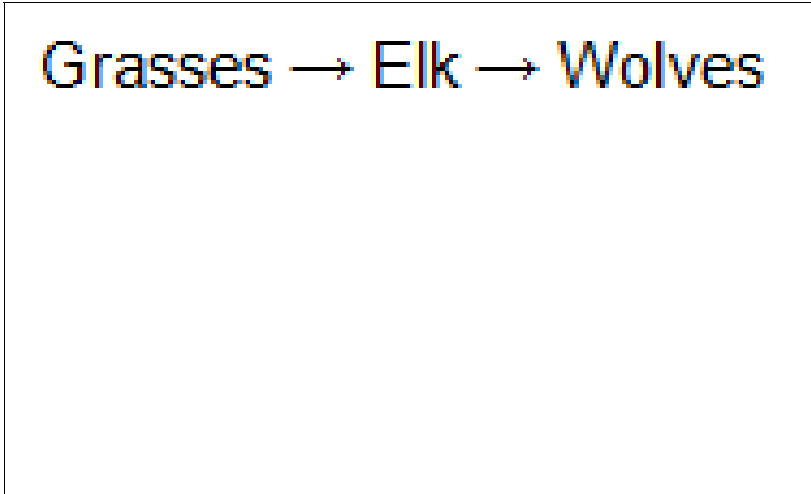
Data Base 393  
File Number:

Regents Date Jan2012-49.bmp

Jan2012

49 1/25/2012 S4K6

Answer 2



## food chain

796. The diagram shows a food chain. If the population of bobcats decreases, what will most likely be the long-term effect on the rabbit population?

- (1) It will increase, only.
- (2) It will decrease, only.
- (3) It will increase and then decrease.
- (4) It will decrease and then increase.

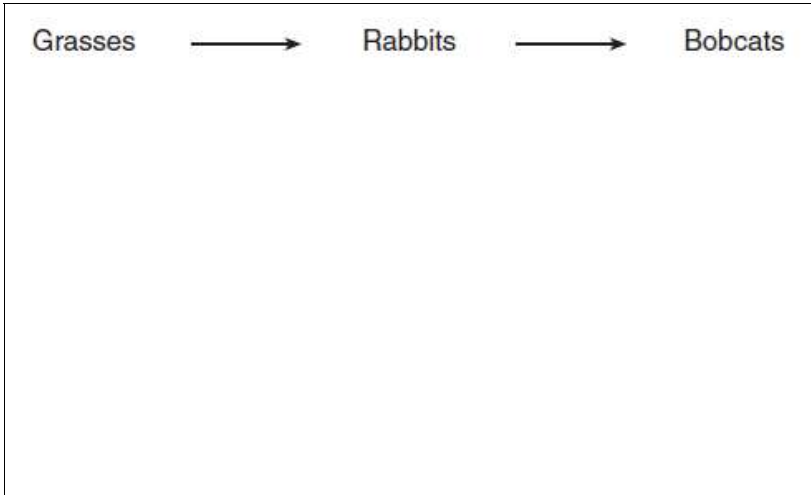
Data Base 866  
File Number:

Regents Date Aug2001-29.bmp

Aug2001

29 8/16/2001 S4K7

Answer 3



## food chain

797. Base your answer to this question on the table given and on your knowledge of biology. Species A, B, C, and D are all different heterotrophs involved in the same food chain in an ecosystem. The table shows the population of each of these species on one summer day. Which species is most likely an herbivore?

- (1) A  
(2) B  
(3) C  
(4) D

Data Base File Number: 626

Regents Date Jan2013-52.bmp

Jan2013

52 1/23/2013 S4K6

Answer 2

Heterotroph Population

Species	Population
A	85
B	847
C	6
D	116

## food chain

798. Species A, B, C, and D are all different heterotrophs involved in the same food chain in an ecosystem. The chart shows the population of each species at the same time on a summer day. Which statement best describes one of these species of heterotrophs?

- (1) Species A is the most numerous because it can make its own food.  
(2) Species B probably feeds on species D.  
(3) Species C and B interbred to produce species A.  
(4) Species D is most likely the top predator in the food chain.

Data Base File Number: 73

Regents Date Jan08-35.bmp

Jan2008

35 1/25/2008 S4K6

Answer 4

Species	Population
A	847
B	116
C	85
D	6

**food chain**

799. Pelagic red crabs living on the ocean floor have been found to eat small bits of plastic. When they are consumed, these small creatures are passing the plastics along the food chain to predators, including fish consumed by humans. This is of concern because it

- (1) decreases plastic recycling by primary consumers
- (2) increases the risk of harmful substances in our food supply
- (3) decreases the producers in the ecosystem
- (4) increases the biodiversity of the ocean

Data Base File Number: 1686

Regents Date Aug2024-7.bmp

Aug2024

7 8/20/2024 S4K1

Answer 2



**food chain**

800. The diagram shown represents a food chain made up of organisms found in a field. Which row in the chart correctly identifies characteristics that can be associated with the members of this food chain?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 370

Regents Date Aug2011-42C.bm

Aug2011

42 8/18/2011 S4K1

Answer 3

Row	Producer	Consumer	Autotroph	Heterotroph
(1)	corn	snake	mouse	owl
(2)	mouse	owl	snake	mouse
(3)	corn	owl	corn	snake
(4)	owl	corn	snake	corn

**food chain**

801. Two food chains are represented in the diagram. Decomposers are important for supplying energy for

- (1) food chain A, only
- (2) food chain B, only
- (3) both food chain A and food chain B
- (4) neither food chain A nor food chain B

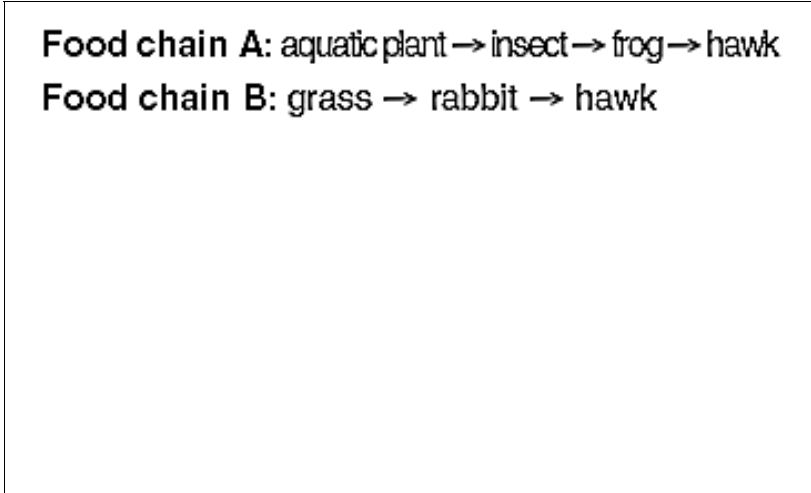
Data Base File Number: 42

Regents Date June-07.bmp

June2007

42 6/20/2007 S4K6

Answer 4



**food chain**

802. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents part of a food web. Which sequence of organisms represents a food chain within this food web?

- (1) tadpoles → algae → daphnia → back swimmers
- (2) sedges → ants → frogs → kookaburras
- (3) algae → daphnia → decayed material → bacteria
- (4) dragonflies → sedges → ants → centipedes

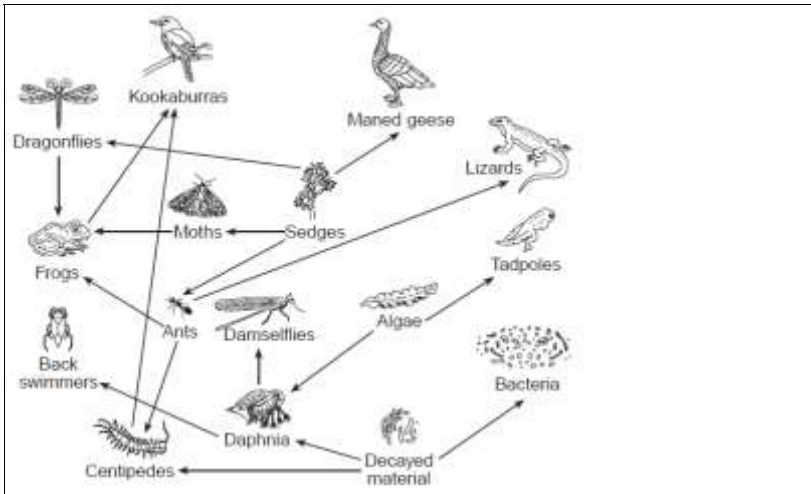
Data Base File Number: 1100

Regents Date June2016-31.bmp

June2016

31 6/15/2016 S4K1

Answer 2



food chain

803. Base your answer to this question on the information given and on your knowledge of biology. ----- The Cougars of Zion National Park -----

Researchers claim that the crowds of visitors at Utah's Zion National Park have led to the displacement of cougars, the area's top predator, resulting in a devastating series of changes to the region's biodiversity. The researchers compared Zion Canyon's ecosystem with a nearby habitat called North Creek, where human visits are infrequent and the cougars still thrive. In Zion Canyon, there are many more deer, the cougar's main prey, and fewer cottonwood trees than in North Creek. Zion also has a reduced number and diversity of butterflies, amphibians, and wetland plants. To measure the impact of the shrinking cougar population, researchers collected data on Zion Canyon's deer populations dating back to the 1930s, when tourism began to increase. Currently, with over three million visitors per year, the cougars, which usually avoid humans, are becoming increasingly rare. The researchers also estimated the age and abundance of cottonwoods, a favorite food of young deer, and found a healthy mix of old and young cottonwoods in North Creek, where cougars are common. Which food chain in Zion National Park is described in the information given?

- (1) Cottonwoods --> Deer --> Cougar
- (2) Deer --> Cottonwoods --> Cougar
- (3) Cougar --> Deer --> Cottonwoods
- (4) Amphibians --> Deer --> Cottonwoods

Data Base 1587  
File Number:

Regents Date June2023-65.bmp

June2023

65 6/14/2023 S4K6

Answer 1



Source: <https://www.smithsonian mag.com>



## food chain

804. A food chain is represented. Structures within the rabbit are formed using

- (1) solar energy from the grass
- (2) heat energy lost to the environment
- (3) chemical energy from the hawk
- (4) chemical energy from the grass

Data Base 921  
File Number:

Regents Date Jan2014-23.bmp

Jan2014

24 1/27/2014 S4K6

Answer 4

grass → rabbit → hawk

## food chain

805. A food chain is represented in the diagram. This food chain contains

- (1) 4 consumers and no producers
- (2) 1 predator, 1 parasite, and 2 producers
- (3) 2 carnivores and 2 herbivores
- (4) 2 predators, 1 herbivore, and 1 producer

Data Base 97  
File Number:

Regents Date June08-27.bmp

June2008

27 6/24/2008 S4K6

Answer 4

Grass → Cricket → Frog → Owl

## food chain

806. A food chain is illustrated in the diagram shown. The "wavy arrows" most likely indicate

- (1) energy released into the environment as heat
- (2) oxygen produced by respiration
- (3) the absorption of energy that has been synthesized
- (4) the transport of glucose away from the organism

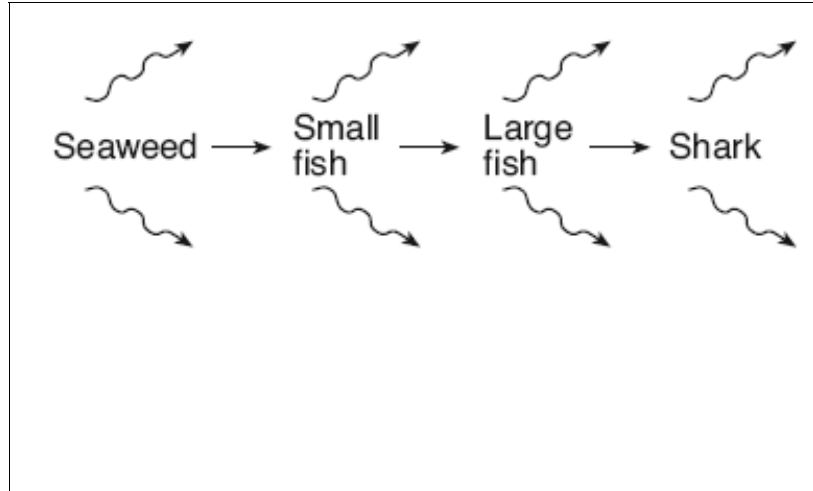
Data Base File Number: 185

Regents Date June09-25.bmp

June2009

25 6/18/2009 S4K6

Answer 1



## food chain

807. The diagram shown illustrates the relationships between organisms in an ecosystem. Which change would most likely reduce the population size of the carnivorous fish?

- (1) an increase in the autotroph populations
- (2) a decrease in the duck population
- (3) an increase in the raccoon population
- (4) a decrease in pathogens of carnivorous fish

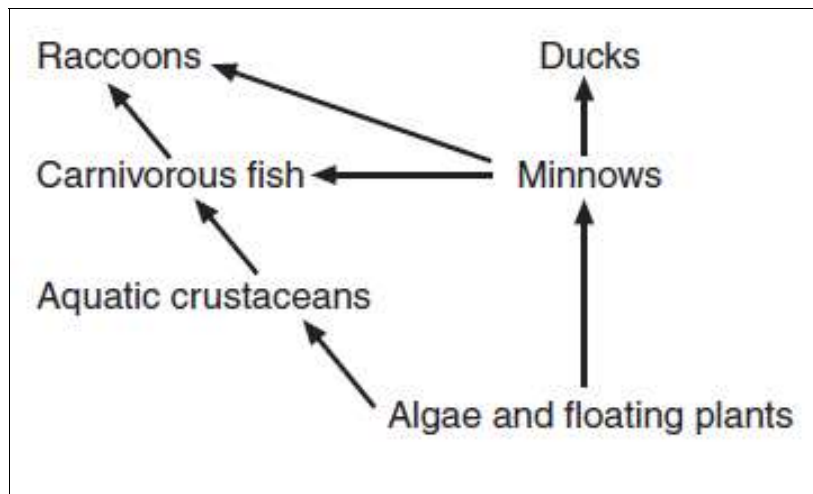
Data Base File Number: 784

Regents Date Aug2002-33.bmp

Aug2002

33 8/13/2002 S4K6

Answer 3



food chain

808. Base your answer to this question on the information shown and on your knowledge of biology. Mercury is a toxic chemical that accumulates in the tissues of animals in a food chain. The chart shows mercury levels found in various commercial fish and shellfish. Each species listed is a predator. If the prey organisms that each predator consumes were tested, they would most likely contain

- (1) the same amount of mercury as the predator species
- (2) less mercury than the predator species
- (3) more mercury than the predator species
- (4) no mercury, since the predators probably get it from the polluted water

Data Base File Number: 1346

Regents Date June2019-38.bmp

June2019

38 6/18/2019 S4K6

Answer 2

Species	Average Mercury Concentration (ppm)	Number of Samples
king mackerel	0.730	213
shark	0.979	356
swordfish	0.995	636
tilefish (Gulf of Mexico)	1.450	60
catfish	0.025	57
haddock	0.055	50
lobster (spiny)	0.093	13

Source: [www.fda.gov/food/foodborneillnesscontaminants/metals/ucm115644.html](http://www.fda.gov/food/foodborneillnesscontaminants/metals/ucm115644.html)

**food chain**

809. Which statement is best supported by the data in the chart?

- (1) Any fish caught in the Gulf of Mexico would have low levels of mercury.
- (2) Eating catfish or haddock would be most likely to cause deadly mercury poisoning.
- (3) Spiny lobsters may have more or less mercury than indicated because only a few were sampled
- (4) Tilefish are the most nutritious of all the species listed

Data Base File Number: 1347

Regents Date June2019-38.bmp

June2019

39 6/18/2019 LABA

Answer 3

Species	Average Mercury Concentration (ppm)	Number of Samples
king mackerel	0.730	213
shark	0.979	356
swordfish	0.995	636
tilefish (Gulf of Mexico)	1.450	60
catfish	0.025	57
haddock	0.055	50
lobster (spiny)	0.093	13

Source: [www.fda.gov/food/foodborneillnesscontaminants/metals/ucm115644.html](http://www.fda.gov/food/foodborneillnesscontaminants/metals/ucm115644.html)

**food pyramid**

810. The diagram shown represents a food pyramid in an ecosystem. The best explanation for the decrease in the amount of energy transferred to each succeeding level is that much of the energy is

- (1) consumed by predators
- (2) released as heat
- (3) stored within inorganic materials
- (4) used in photosynthesis

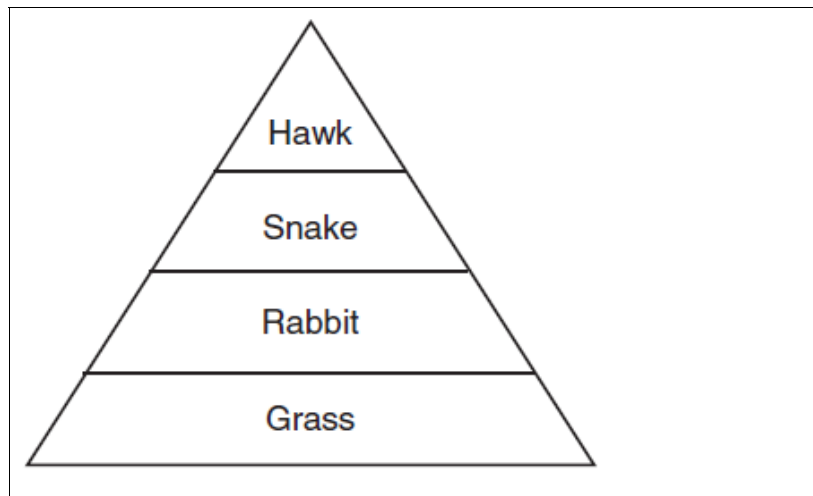
Data Base File Number: 1043

Regents Date August2015-4.bmp

Aug2015

4 8/12/2015 S4K6

Answer 2



## food pyramid

811. A food pyramid representing relationships in a pond community is shown in the diagram. The energy of the Sun is made available to the pond community through the activities of the organisms at level

(1) A

(3) C

(2) B

(4) D

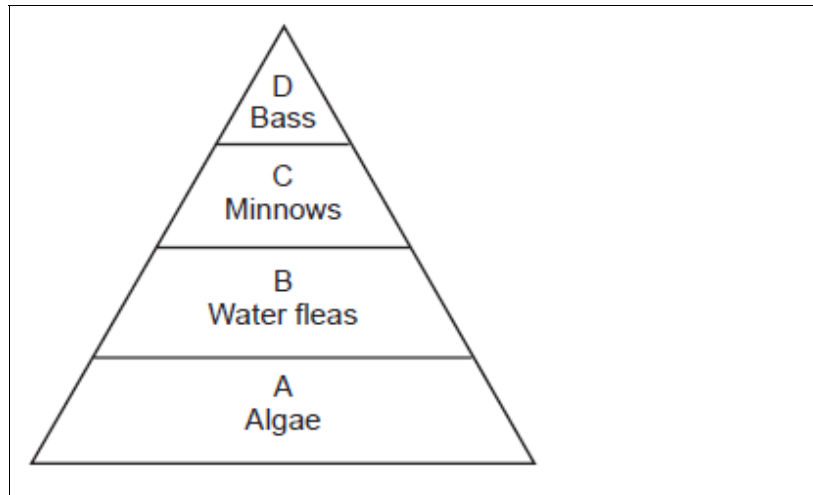
Data Base File Number: 848

Regents Date June2001-24.bmp

June2001

24 6/15/2001 S4K6

Answer 1



## food pyramid

812. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents the energy relationships in a forest ecosystem. Based on the information in the diagram, only some of the available energy is transferred from one energy level to the next. What happens to the rest of the energy?

(1) It is given off as light.

(3) It is given off as carbon dioxide.

(2) It is given off as water

(4) It is given off as heat.

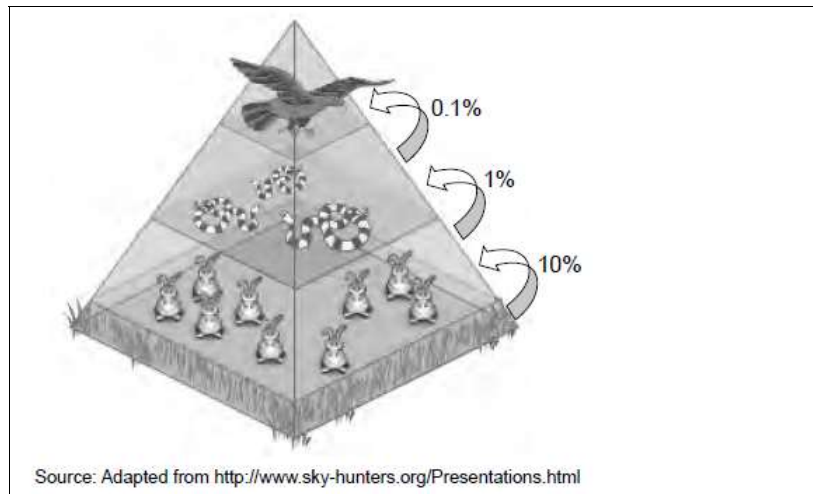
Data Base File Number: 1409

Regents Date Jan2020-52.bmp

Jan2020

52 1/21/2020 S4K6

Answer 4



## food pyramid

813. The diagram shown represents a pyramid of energy in an ecosystem. Which level in the pyramid would most likely contain members of the plant kingdom?

- (1) A
- (2) B
- (3) C
- (4) D

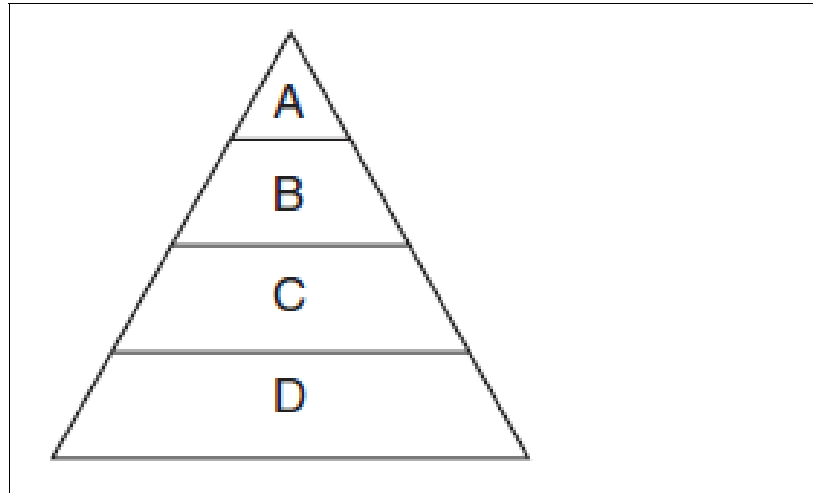
Data Base File Number: 704

Regents Date Jan2003-2.bmp

Jan2003

2 1/30/2003 S4K1

Answer 4



## food pyramid

814. Base your answer to this question on the information given and on your knowledge of biology. The process of photosynthesis is responsible for providing the energy necessary to sustain most ecosystems on Earth. The flow of energy in an ecosystem is represented in the diagram as shown. Which level in the diagram would contain the sun?

- (1) A
- (2) B
- (3) C
- (4) D

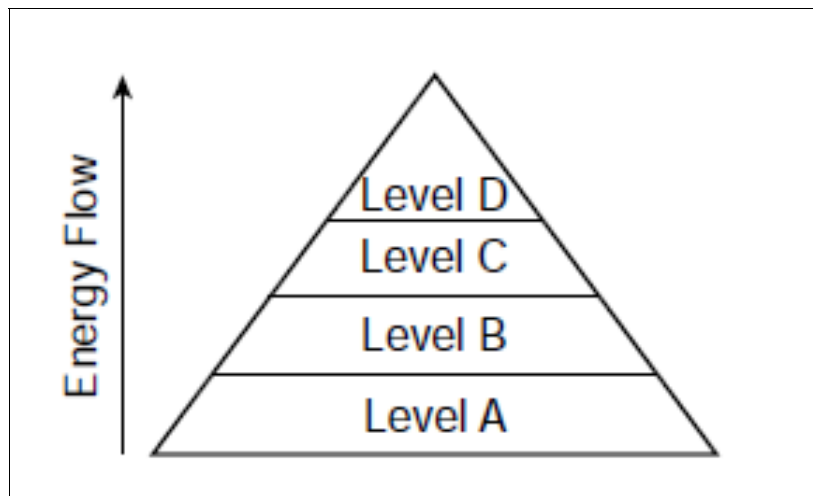
Data Base File Number: 1677

Regents Date June2024-56.bmp

June2024

56 6/14/2024 S4K6

Answer 1



**food pyramid**

815. An energy pyramid containing autotrophs and other organisms from a food chain is represented by the diagram. Carnivores would most likely be located in

- (1) level I, only
- (2) level I and level II
- (3) level III, only
- (4) level II and level III

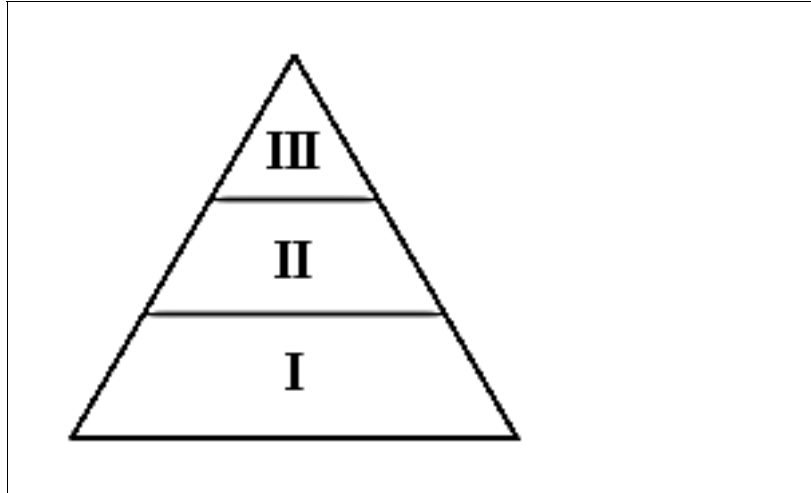
Data Base File Number: 10

Regents Date Aug07-24.bmp

Aug2007

24 8/16/2007 S4K6

Answer 3



**food pyramid**

816. An energy pyramid for a forest ecosystem is shown on the LEFT side of the diagram. . The four levels (A-D) represent different types of organisms in the ecosystem. Which numbered column in the chart in the RIGHT side of the diagram contains four terms that correctly identify the most likely types of organisms that could be found at each of the four levels in the pyramid?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1661

Regents Date June2024-19.bmp

June2024

19 6/14/2024 S4K6

Answer 2

Pyramid Levels	Types of Organisms			
	(1)	(2)	(3)	(4)
D	carnivores	carnivores	heterotrophs	producers
C	heterotrophs	carnivores	autotrophs	carnivores
B	producers	herbivores	herbivores	herbivores
A	herbivores	producers	producers	heterotrophs

The diagram shows a pyramid divided into four horizontal sections. The bottom section is labeled 'A', the second is 'B', the third is 'C', and the top is 'D'.

## food pyramid

817. The diagram shown represents a food pyramid. The concentration of the pesticide DDT in individual organisms at level D is higher than the concentration in individuals at level A because DDT is
- (1) synthesized by organisms at level D
  - (2) excreted by organisms at level A as a toxic waste
  - (3) produced by organisms at level C which are eaten by organisms at level D
  - (4) passed through levels A,B, and C to organisms at level D

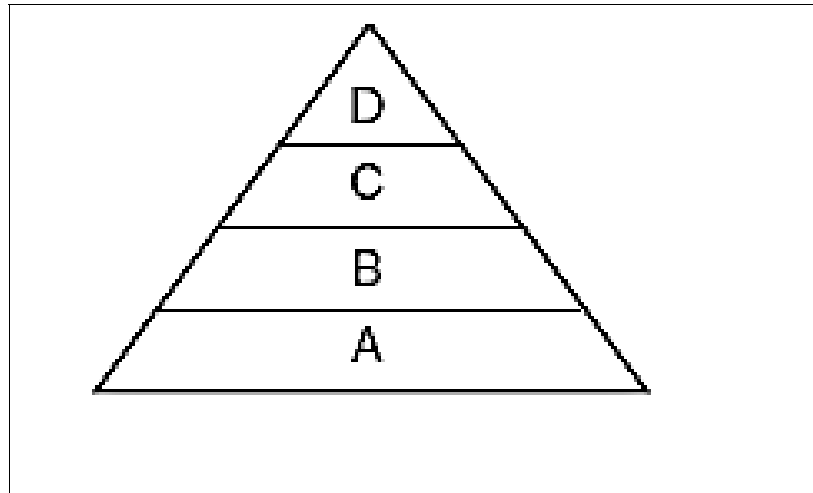
Data Base File Number: 12

Regents Date Aug07-31.bmp

Aug2007

31 8/16/2007 S4K6

Answer 4



## food pyramid

818. The diagram shown represents a model of a food pyramid. Which statement best describes what happens in this food pyramid?
- (1) More organisms die at higher levels than at lower levels, resulting in less mass at higher levels.
  - (2) Energy is lost to the environment at each level, so less mass can be supported at each higher level.
  - (3) When organisms die at higher levels, their remains sink to lower levels, increasing the mass of lower levels.
  - (4) Organisms decay at each level, and thus less mass can be supported at succeeding higher levels.

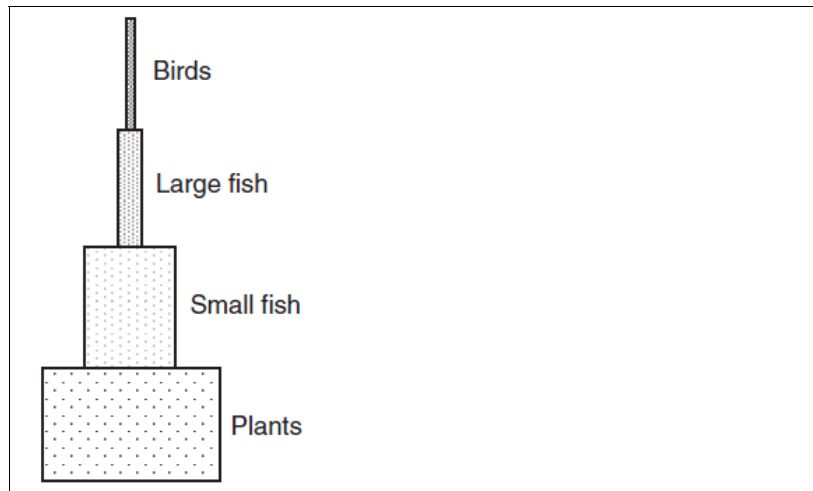
Data Base File Number: 782

Regents Date Aug2002-27.bmp

Aug2002

27 8/13/2002 S4K6

Answer 2





food pyramid

819. Base your answer to this question on the information shown and on your knowledge of biology. The graph represents the amount of energy stored in each level of an energy pyramid. Which level most likely represents the autotrophs in the energy pyramid?

- (1) level 1
- (2) level 2
- (3) level 3
- (4) level 4

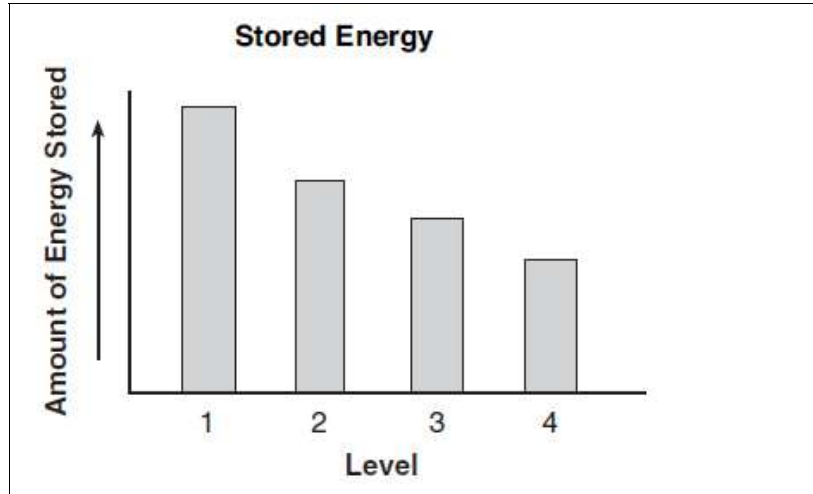
Data Base File Number: 246

Regents Date Jan2010-52.bmp

Jan2010

52 1/26/2010 S1K3

Answer 1



food pyramid

820. A diagram frequently used in ecological studies is shown. This diagram can be used to represent the

- (1) dependency of animal survival on physical conditions in an ecosystem
- (2) loss of energy from various groups of organisms in an ecosystem
- (3) competition among species in an ecosystem
- (4) mechanisms that maintain homeostasis in the plants in an ecosystem

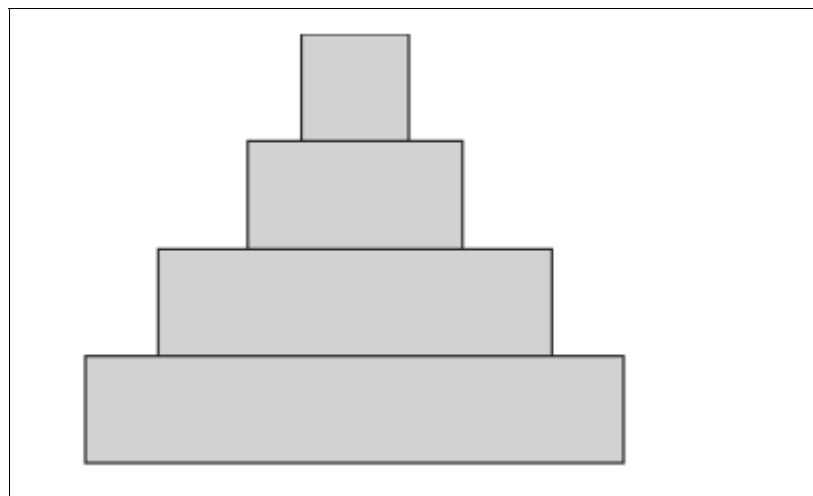
Data Base File Number: 340

Regents Date June2011-32.bmp

June2011

32 6/21/2011 S4K6

Answer 2



## food pyramid

821. Which level of the pyramid shown is correctly paired with the type of organism that would most likely be found at that level in an ecosystem?

- (1) Level A - producers
- (2) Level B - carnivores
- (3) Level C - herbivores
- (4) Level D - decomposers

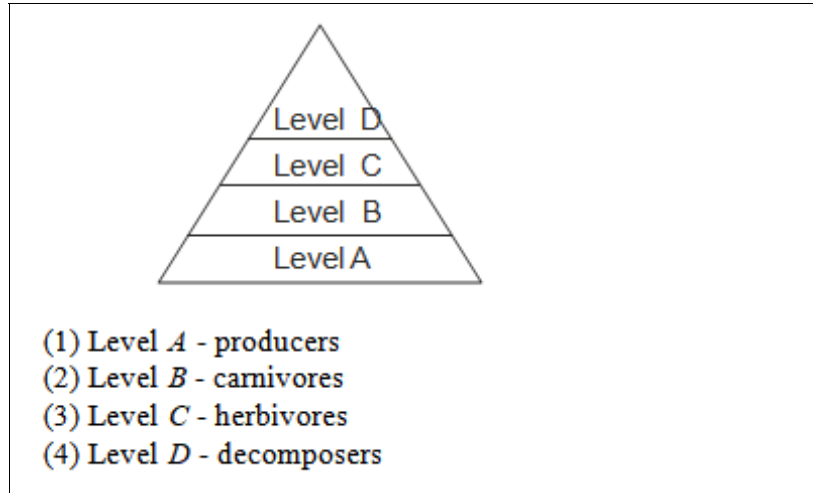
Data Base File Number: 1172

Regents Date June2017-10.bmp

June2017

10 6/14/2017 S4K6

Answer 1



## food web

822. Base your answer to this question on the diagram shown and on your knowledge of biology. A factor NOT shown in the diagram that provides energy for living organisms is

- (1) carbon dioxide
- (2) water
- (3) the Sun
- (4) oxygen

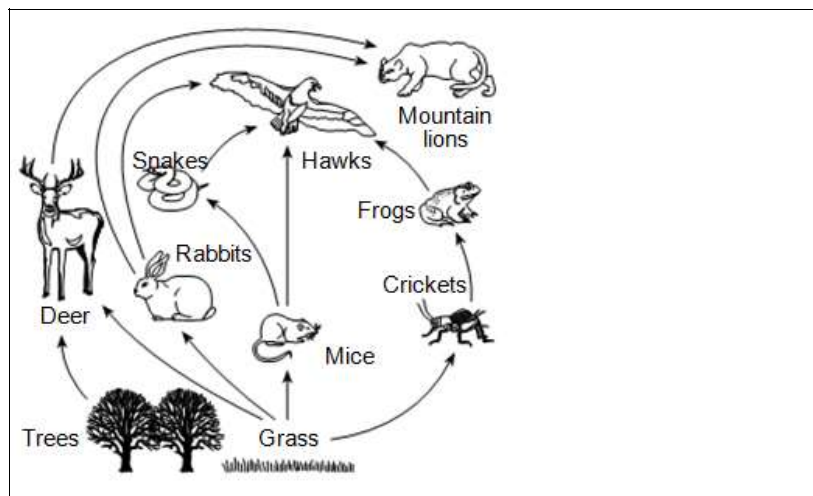
Data Base File Number: 1276

Regents Date Aug2018-5.bmp

Aug2018

6 8/17/2018 S4K5

Answer 3



food web

823. The diagram shown represents a food web. Two of the herbivores represented in this food web are

- (1) toads and snakes
- (2) deer and mice
- (3) wolves and raccoons
- (4) grasshoppers and toads

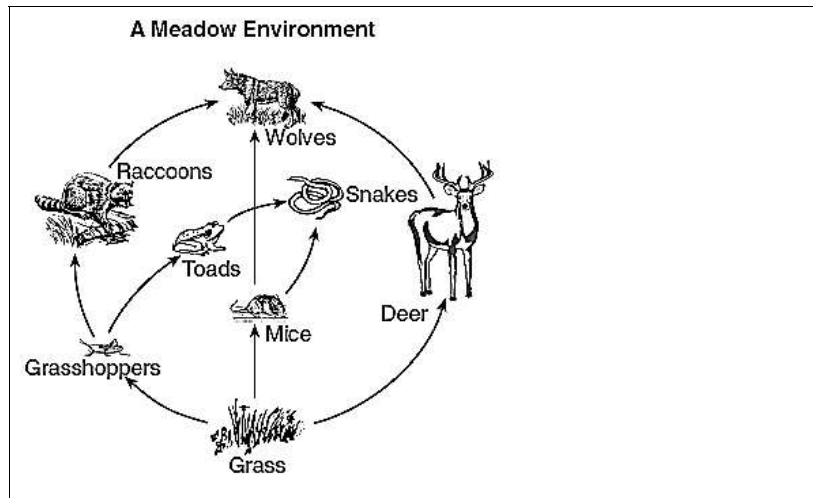
Data Base File Number: 57

Regents Date Jan07-36.bmp

Jan2007

36 1/26/2007 S4K6

Answer 2



food web

824. The diagram shown represents a food web in a pond ecosystem. Two carnivores in the food web are

- (1) bass and small invertebrates
- (2) small invertebrates and crabs
- (3) water plants and clams
- (4) crabs and crayfish

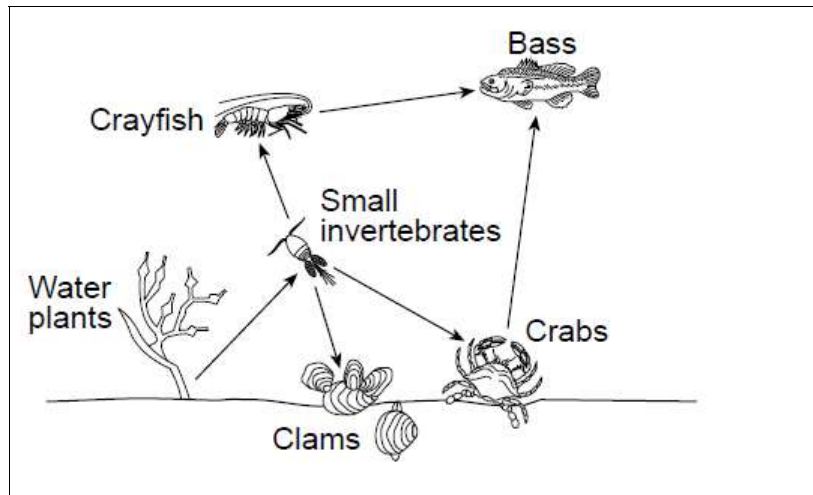
Data Base File Number: 1389

Regents Date Jan2020-8.bmp

Jan2020

8 1/21/2020 S4K1

Answer 4



**food web**

825. A food web is represented by the diagram shown. A continuous DECREASE in the size of the rabbit population would most likely cause a DECREASE in which other population?

- (1) frog
- (2) cricket
- (3) grass
- (4) mountain lion

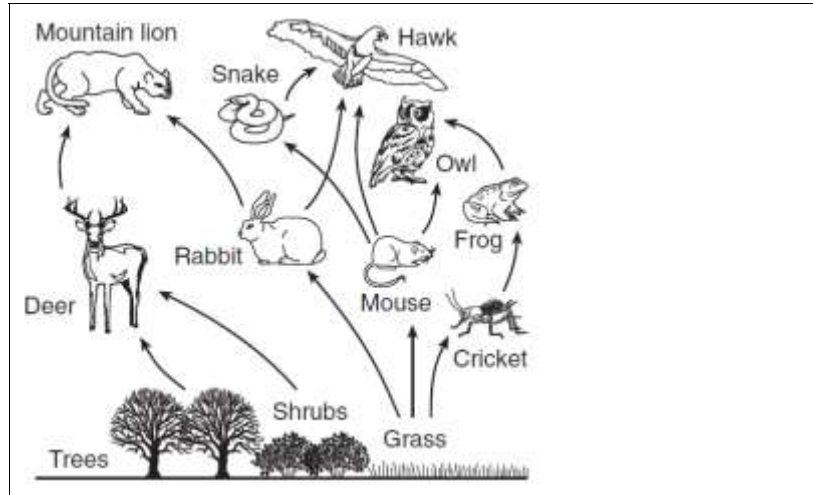
Data Base File Number: 236

Regents Date Jan2010-32.bmp

Jan2010

32 1/26/2010 S4K1

Answer 4



**food web**

826. Base your answers to this question on the diagram of a food web as shown and on your knowledge of biology. Which organism in this food web carries out autotrophic nutrition.

- (1) grasses
- (2) mushrooms
- (3) bacteria
- (4) grasshoppers

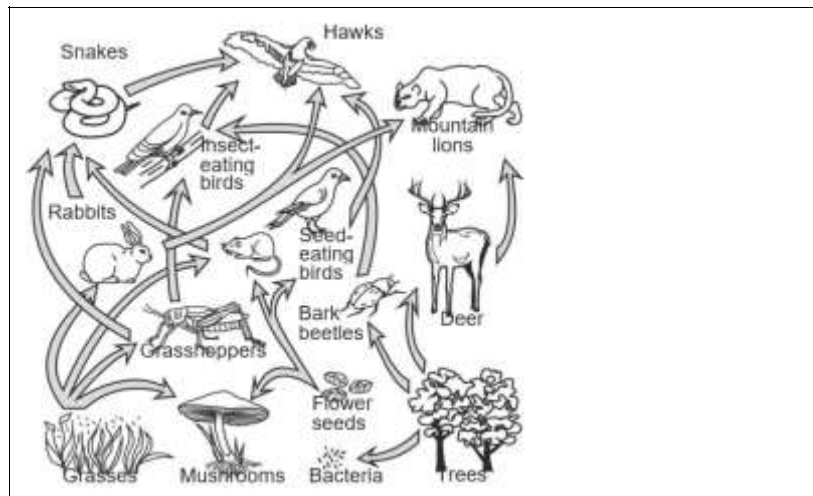
Data Base File Number: 1643

Regents Date Jan2024-52.bmp

Jan2024

52 1/23/2024 S4K1

Answer 1



**food web**

827. The diagram shown represents a food web. The arrows only point away from "Grasses, shrubs" and not toward them. One biological reason that this is that

- (1) Grasses and shrubs are consumers
- (2) Grasses and shrubs are heterotrophs
- (3) Grasses and shrubs are producers
- (4) Grasses and shrubs are dominant

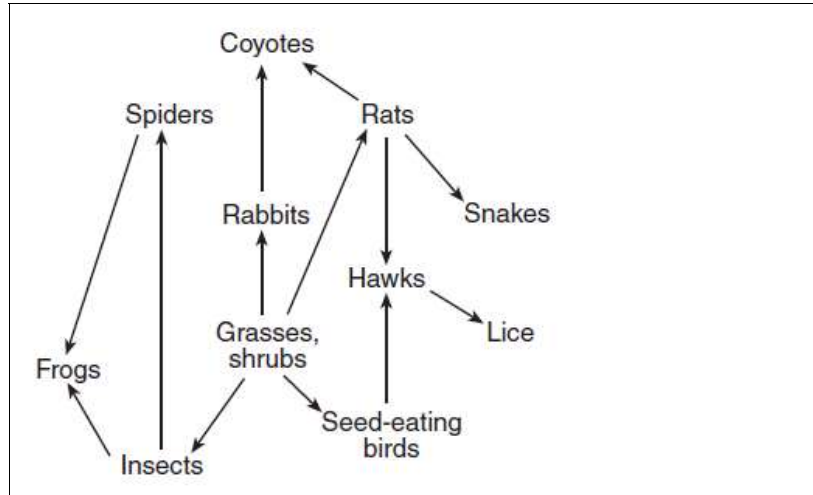
Data Base File Number: 544

Regents Date Jan2005-37.bmp

Jan2005

37 1/28/2005 S4K1

Answer 3



**food web**

828. Examine the Great Lakes food web as shown. Which statement is correct, based on the information in the diagram?

- (1) Salmon are predators of sea lampreys.
- (2) Plankton decompose salmon and sculpins.
- (3) Cormorants and sea lampreys compete for bacteria.
- (4) Lake trout and salmon compete for sculpins.

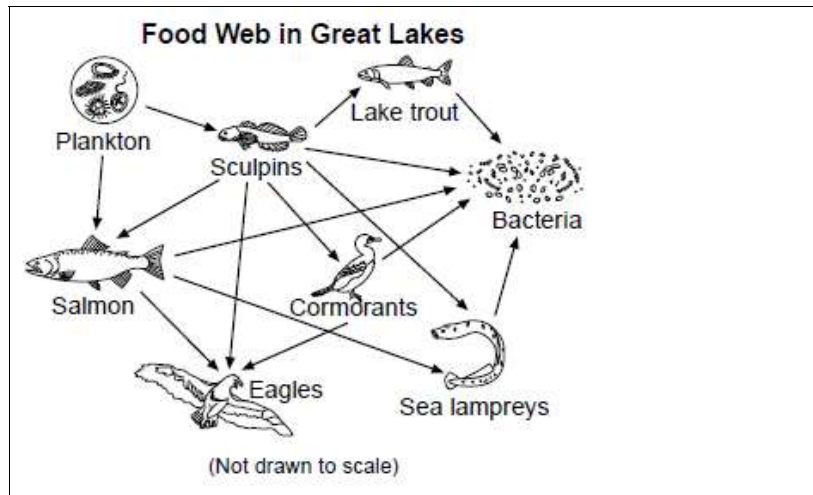
Data Base File Number: 1408

Regents Date Jan2020-49.bmp

Jan2020

49 1/21/2020 S4K1

Answer 4



**food web**

829. The diagram shown represents a food web. Two carnivores represented in this food web are

- (1) deer and mice
- (2) grasses and grasshoppers
- (3) deer and wolves
- (4) toads and snakes

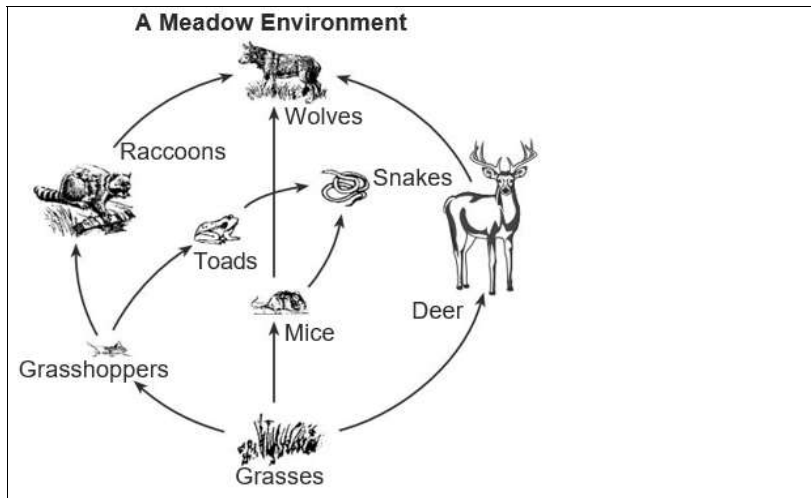
Data Base File Number: 1629

Regents Date Jan2024-27.bmp

Jan2024

27 1/23/2024 S4K6

Answer 4



**food web**

830. The graph shown represents the amount of available energy at successive nutrition levels in a particular food web. The X's in the diagram represent the amount of energy that was most likely

- (1) changed into inorganic compounds
- (2) retained indefinitely by the herbivores
- (3) recycled back to the producers
- (4) lost as heat to the environment

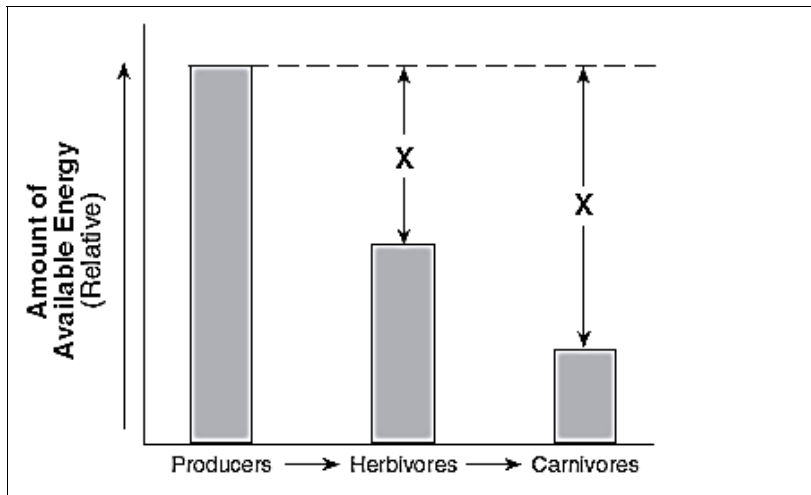
Data Base File Number: 30

Regents Date June07-27.bmp

June2007

27 6/20/2007 S4K6

Answer 4



**food web**

831. A food web is represented by the diagram shown, Which population in this food web would most likely be **NEGATIVELY** affected by an increase in the mouse population?

- (1) snake
- (2) rabbit
- (3) wolf
- (4) hawk

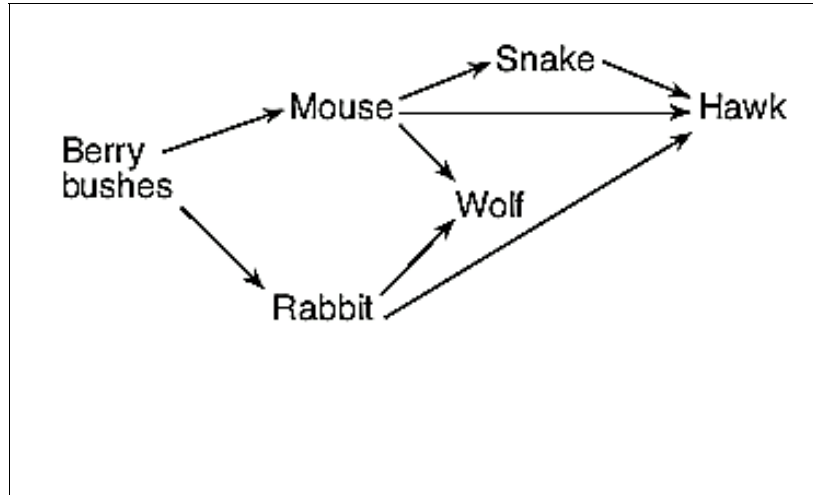
Data Base File Number: 69

Regents Date Jan08-25.bmp

Jan2008

25 1/25/2008 S4K6

Answer 2



**food web**

832. Base your answer to this question on the diagram shown and on your knowledge of biology Which statement most accurately predicts the result of interfering with populations in the web?

- (1) Removing the cricket population will have little effect on the balance of the food web.
- (2) Removing all the mountain lions from the food web will benefit the ecosystem.
- (3) Removing the cricket and rabbit populations would cause the number of trees to decrease.
- (4) Removing deer from the food web will affect the rabbit and grass populations.

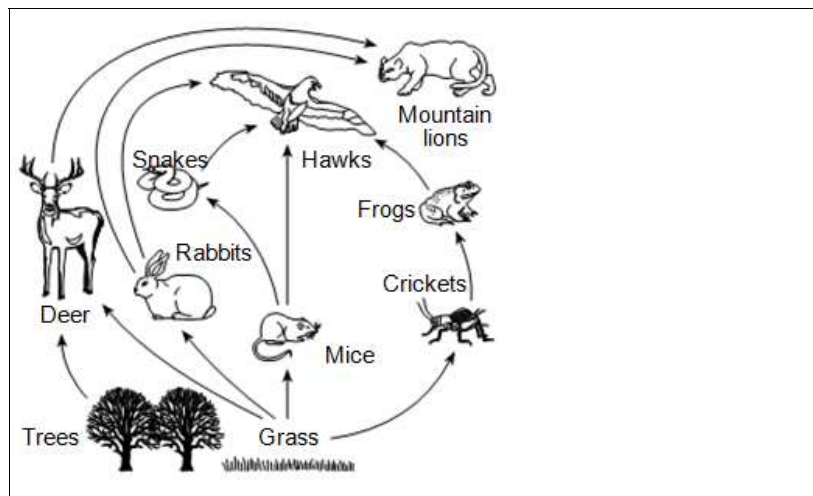
Data Base File Number: 1275

Regents Date Aug2018-5.bmp

Aug2018

5 8/17/2018 S4K1

Answer 4





**food web**

833. Base your answer to this question on the food web shown and on your knowledge of biology. A pesticide is sprayed to kill the crickets. What is one effect this spraying might have on the food web?

- (1) Frogs will be reduced.
- (2) Deer will increase.
- (3) Trees will decrease.
- (4) Mice will increase.

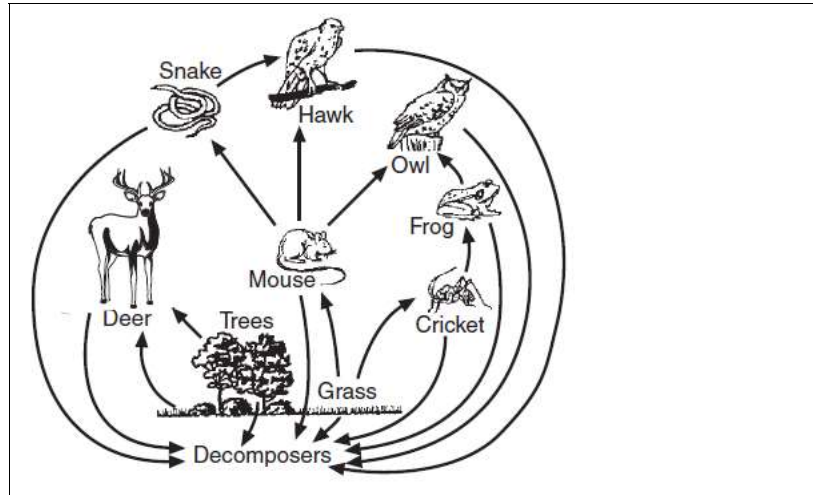
Data Base File Number: 798

Regents Date Aug2002-70.bmp

Aug2002

70 8/13/2002 S4K7

Answer 1



**food web**

834. The diagram shown represents a food web. Which organisms are producers?

- (1) decomposers
- (2) trees and grasses
- (3) hawks
- (4) deer

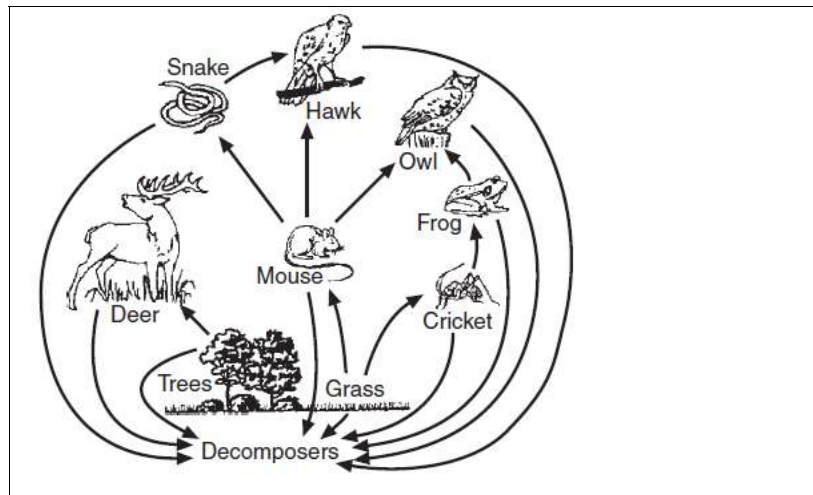
Data Base File Number: 824

Regents Date June2002-63.bmp

June2002

63 6/19/2002 S4K1

Answer 2





food web

835. A food web is represented in the diagram shown. Which organisms are correctly paired with their roles in this food web?

- (1) mountain lions, bark beetles -- producers; hawks, mice -- heterotrophs
- (2) snakes, grasshoppers -- consumers; mushrooms, rabbits -- autotrophs
- (3) all birds, deer -- consumers; grasses, trees -- producers
- (4) seeds, bacteria -- decomposers; mice, grasses -- heterotrophs

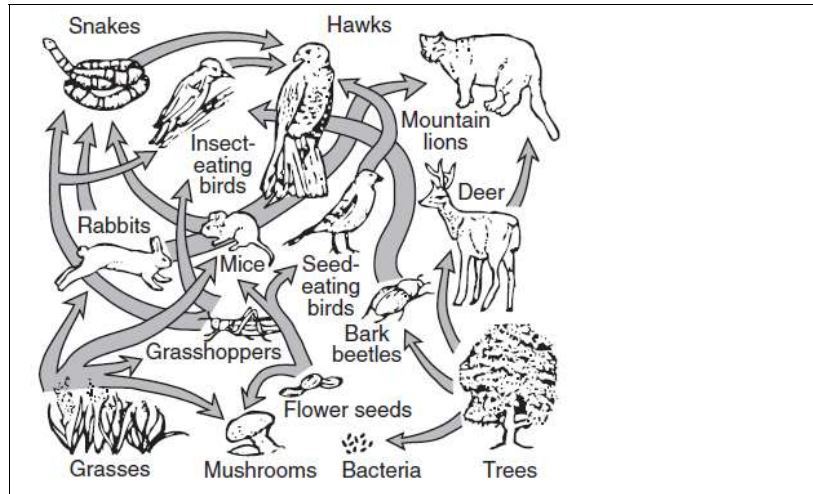
Data Base File Number: 642

Regents Date Jan2004-25.bmp

Jan2004

25 1/29/2004 S4K6

Answer 3



food web

836. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web in a forest ecosystem. Does this food web represent a stable ecosystem?

- (1) Yes, because the more diversity there is in an ecosystem, the more stable it is.
- (2) No, the ecosystem is not diversified enough to be stable.
- (3) There is insufficient data to make a conclusion.
- (4) There is no hypothesis.

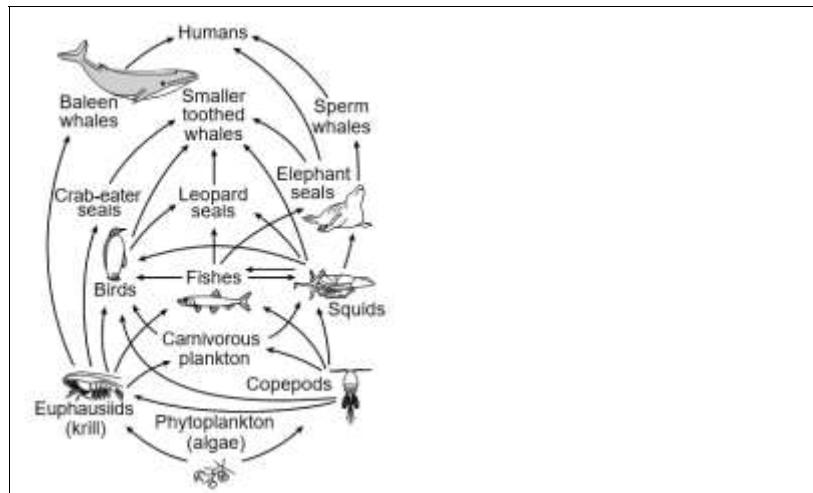
Data Base File Number: 1525

Regents Date Aug2022-53.bmp

Aug2022

53 8/17/2022 S4K6

Answer 1



**food web**

837. The diagram shown represents a food web. Which statement regarding organisms in this food web is correct?

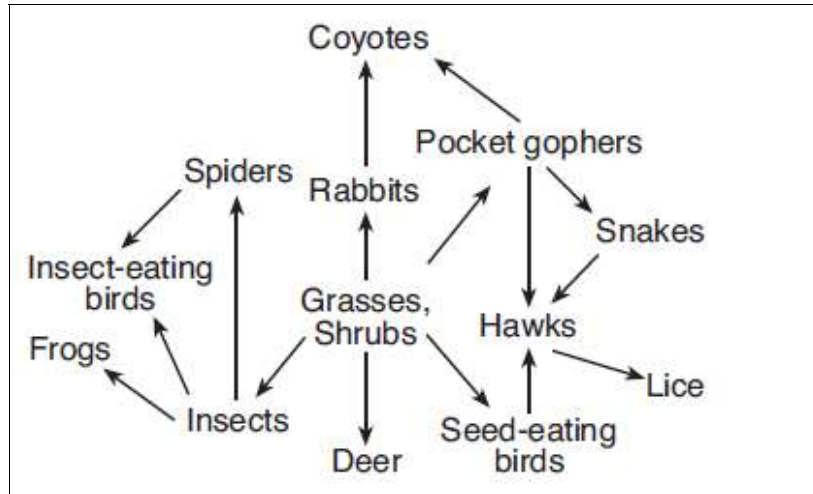
- (1) There would be more snakes than pocket gophers.
- (2) There would be more coyotes than rabbits.
- (3) There would be more insects than insect-eating birds.
- (4) There would be more hawks than seed-eating birds.

Data Base File Number: 908

Regents Date Aug2013--36.bmp

Aug2013  
36 8/14/2013 S4K1

Answer 3



**food web**

838. Base your answers to this questions on the food web shown and on your knowledge of biology. Which organisms are carnivores?

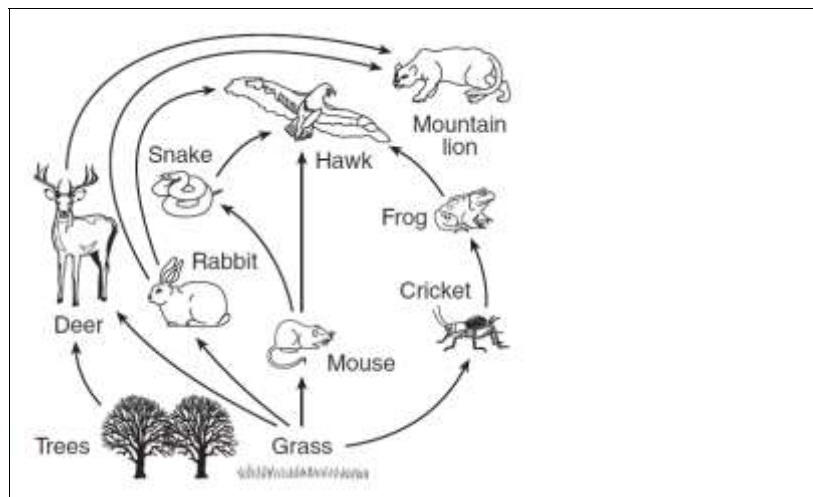
- (1) grass and trees
- (2) mouse, rabbit, and cricket
- (3) deer and mountain lion
- (4) frog, snake, and hawk

Data Base File Number: 321

Regents Date Jan2011-42.bmp

Jan2011  
42 1/25/2011 S4K6

Answer 4



**food web**

839. A food web is represented in the diagram shown. Which organism would receive the least amount of transferred solar energy?

- (1) grasses
- (2) owls
- (3) frogs
- (4) field mice

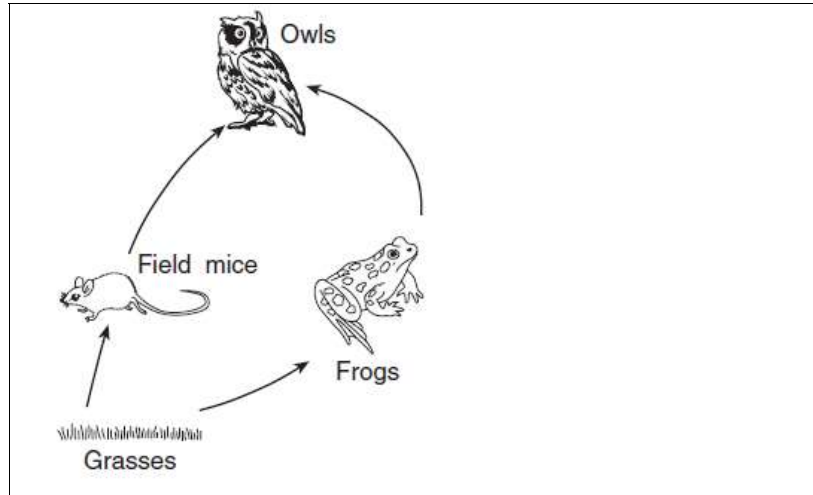
Data Base File Number: 1021

Regents Date June2015-32.bmp

June2015

32 6/16/2015 S4K6

Answer 2



**food web**

840. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents some organisms in a pond food web. Identify the population represented in this food web that has the greatest amount of stored energy

- (1) algae
- (2) crayfish
- (3) protozoa
- (4) bass

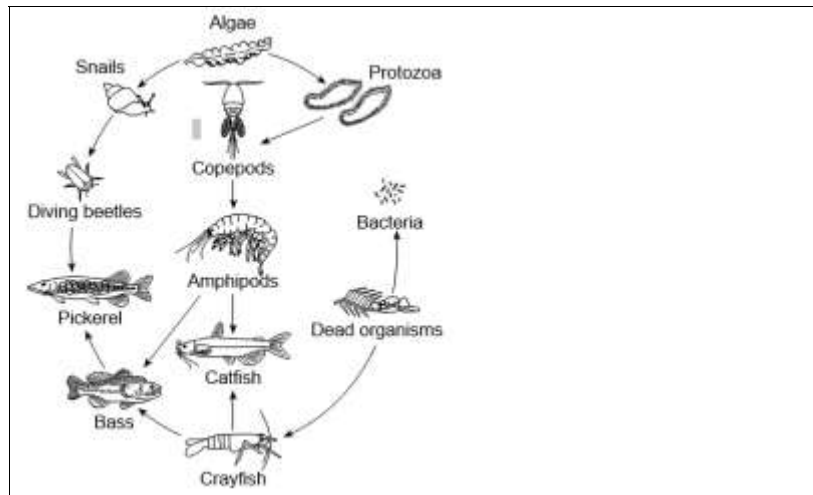
Data Base File Number: 1488

Regents Date June2022-52.bmp

June2022

52 6/15/2022 S4K1

Answer 1



**food web**

841. The diagram shown represents a food web. Which species would most likely be a decomposer?

- (1) A
- (2) B
- (3) C
- (4) D

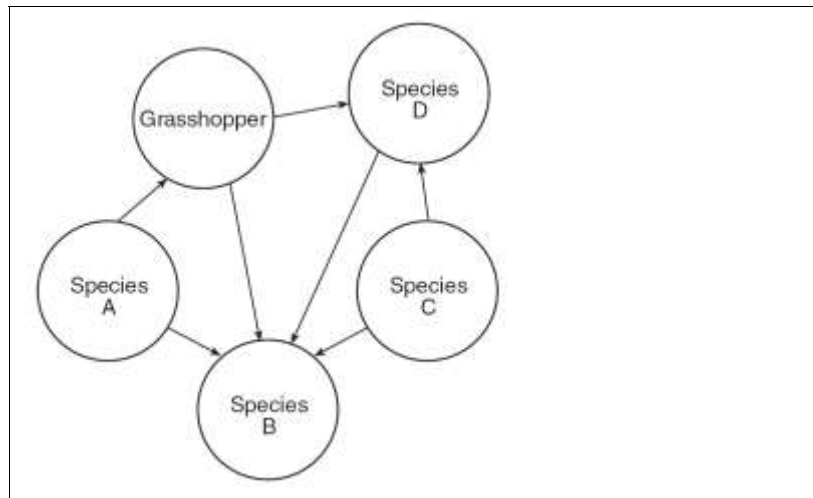
Data Base File Number: 348

Regents Date June2011-49.bmp

June2011

49 6/21/2011 S4K1

Answer 2



**food web**

842. Base your answers to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web. What do the arrows in the diagram represent?

- (1) an increase in population
- (2) the evolution of organisms
- (3) the flow of energy
- (4) ecological succession

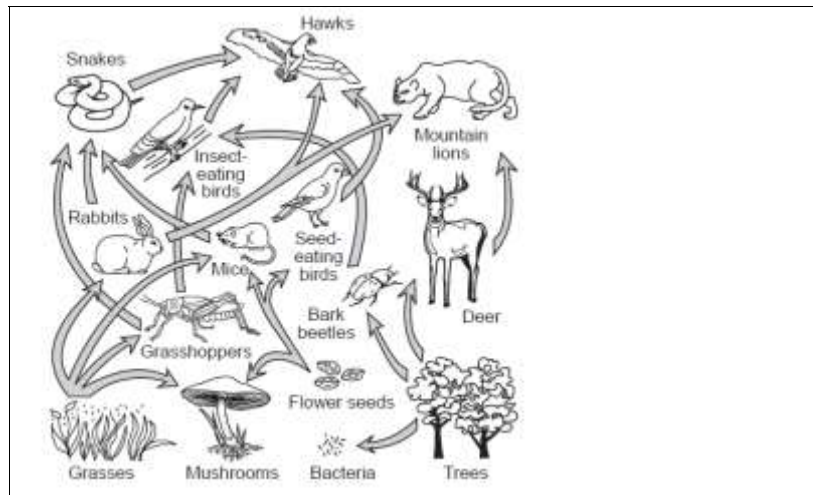
Data Base File Number: 941

Regents Date June2014-31.bmp

June2014

31 6/17/2014 S4K1

Answer 3



food web

843. Base your answer to this questions on the diagram shown and on your knowledge of biology. The diagram represents a food web. Which statement correctly describes interactions between organisms in this ecosystem?

- (1) Hawks are predators of insect-eating birds, but not of seed-eating birds.
- (2) Hawks and snakes prey on both rabbits and grasshoppers.
- (3) Rabbits and mice compete for both grasses and flower seeds.
- (4) Grasshoppers and mice compete for grasses, but not flower seeds.

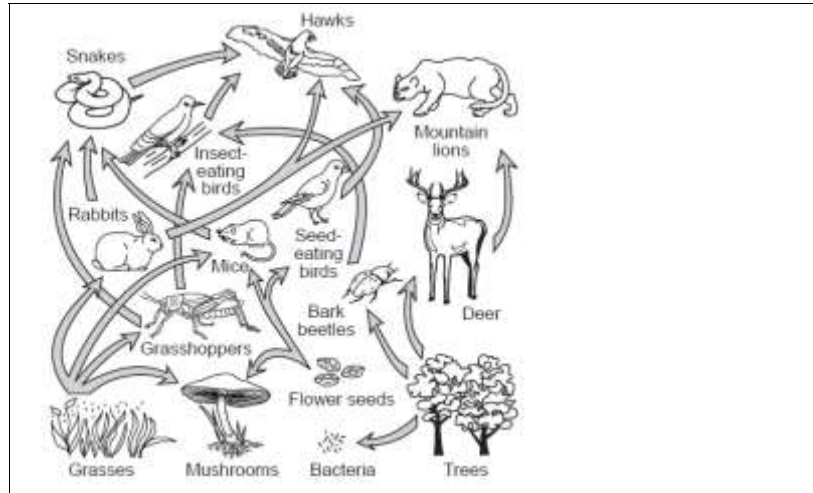
Data Base File Number: 942

Regents Date June2014-31.bmp

June2014

32 6/17/2014 S4K1

Answer 4



food web

844. Food webs representing two nearby locations are shown in the diagram. Which statement best describes what would most likely happen if some of the owls from location B moved to location A?

- (1) The mountain lion population in location B will move to location A.
- (2) The deer population in location A will decrease due to lack of resources.
- (3) The hawk population in location A will decrease due to competition for food.
- (4) The owl population in location B will increase due to a decrease in genetic variation.

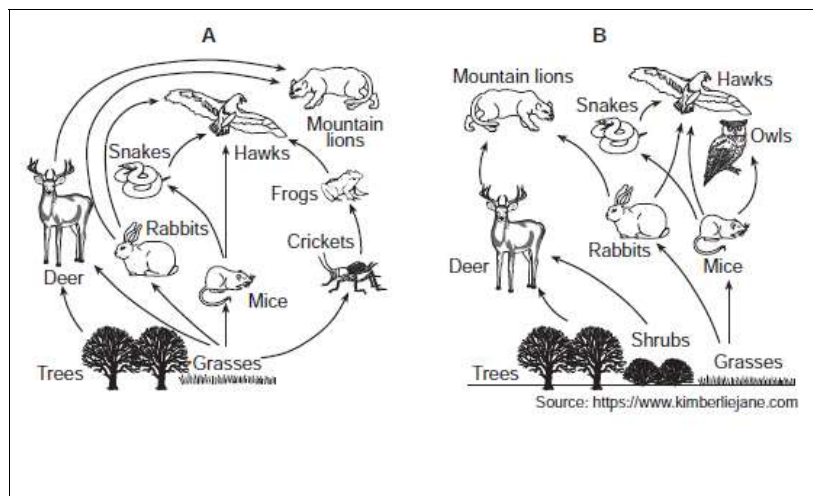
Data Base File Number: 1615

Regents Date Aug2023-41.bmp

Aug2023

41 8/17/2023 S4K1

Answer 3



**food web**

845. Which TWO herbivores compete for food in the food web shown.

- (1) mice and crickets
- (2) deer and mice
- (3) mice and frogs
- (4) mice and frogs

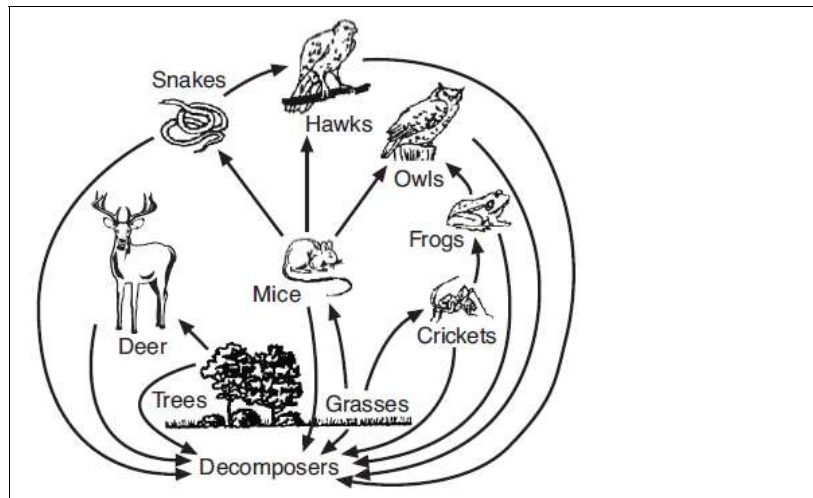
Data Base File Number: 977

Regents Date Aug2014-53.bmp

Aug2014

53 8/14/2014 S4K6

Answer 1



**food web**

846. Nutritional relationships between organisms are shown in the diagram given. The mouse population would most likely DECREASE if there were

- (1) an increase in the frog and tree populations
- (2) a decrease in the snake and hawk populations
- (3) an increase in the number of decomposers in the area
- (4) a decrease in the amount of available sunlight

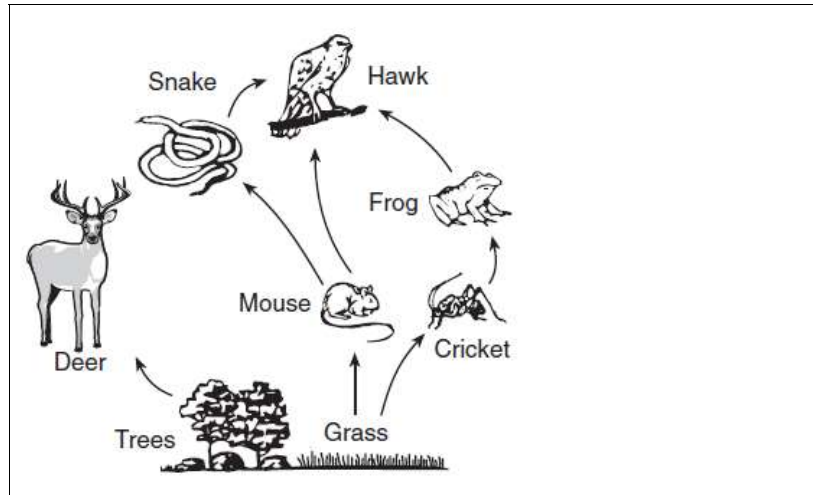
Data Base File Number: 459

Regents Date Jan2006-25.bmp

Jan2006

25 1/27/2006 S4K6

Answer 4





**food web**

847. A food web is shown in the diagram. Which organisms feed on BOTH producers and decomposers?

- (1) amphipods
- (2) catfish
- (3) crayfish
- (4) protozoa

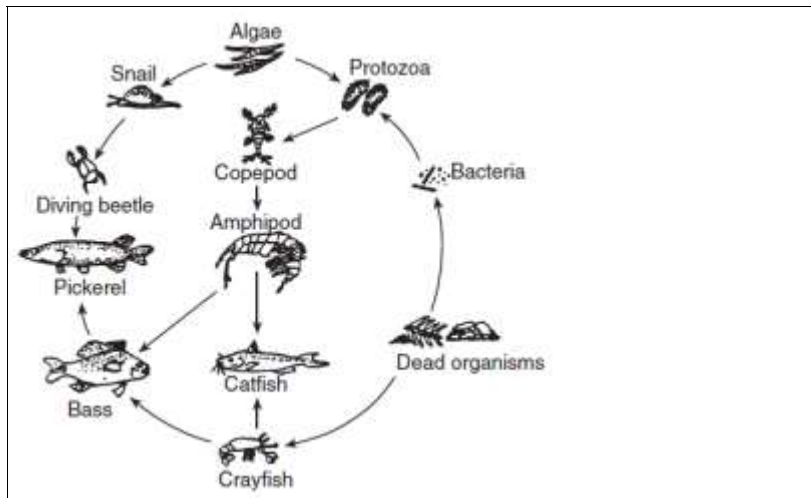
Data Base File Number: 594

Regents Date Aug2005-40.bmp

Aug2005

40 8/16/2005 S4K6

Answer 4



**food web**

848. The diagram shown represents a food web. Which statement best describes a relationship represented in the diagram?

- (1) Bushes are herbivores that feed on insects.
- (2) Rodents are consumers that feed on lizards.
- (3) Roadrunners are carnivores that feed on insects.
- (4) Grasses are producers that are eaten by lizards.

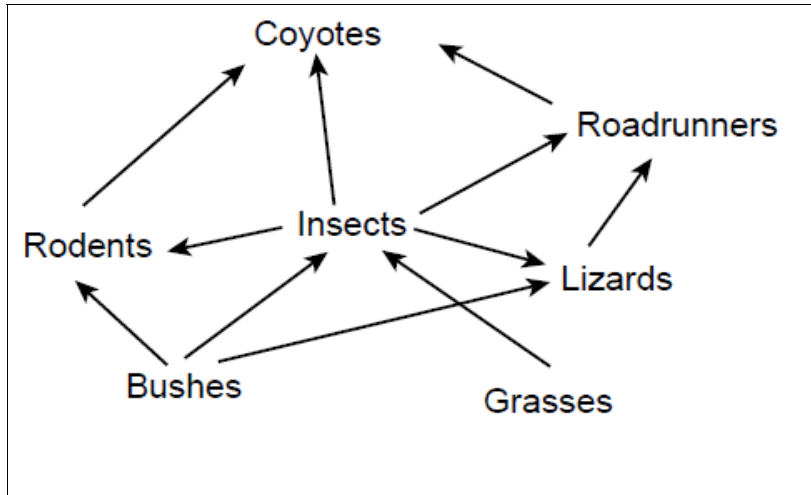
Data Base File Number: 1566

Regents Date June2023-12.bmp

June2023

12 6/14/2023 S4K1

Answer 3



**food web**

849. A partial food web is represented in the diagram. Letter "X" most likely represents

- (1) autotrophs
- (2) carnivores
- (3) decomposers
- (4) parasites

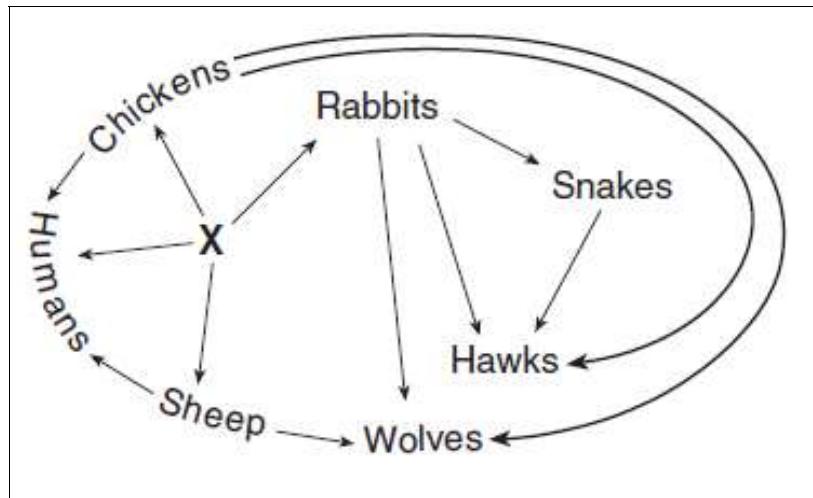
Data Base File Number: 685

Regents Date Aug2004-2.bmp

Aug2004

2 8/17/2004 S4K1

Answer 1



**food web**

850. A food web is represented in the diagram as shown. Which organism is correctly paired with its role in the ecosystem?

- (1) The grass is both a consumer and a decomposer.
- (2) The toads function as consumers and autotrophs.
- (3) The grasshoppers function as consumers and heterotrophs.
- (4) The snakes are both consumers and herbivores.

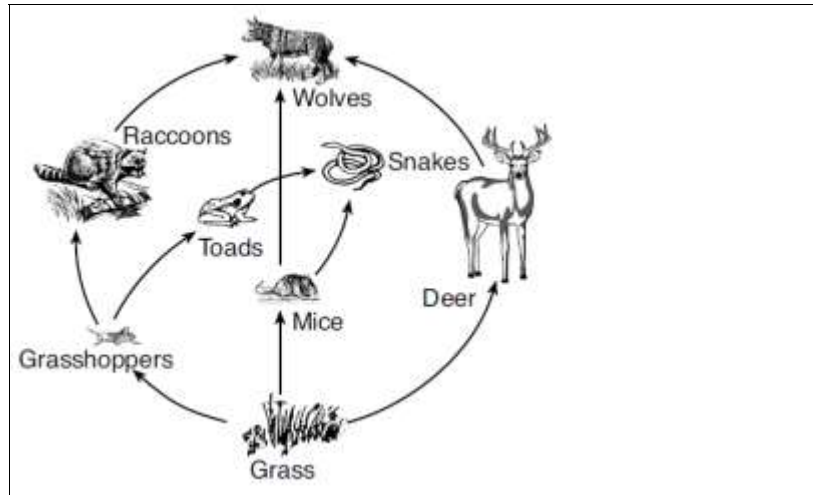
Data Base File Number: 1470

Regents Date June2022-16.bmp

June2022

16 6/15/2022 S4K1

Answer 3





**food web**

851. The diagram below represents a food web composed of producers, consumers, and decomposers. Which group would represent the decomposer organisms?

- (1) A
- (2) B
- (3) C
- (4) D

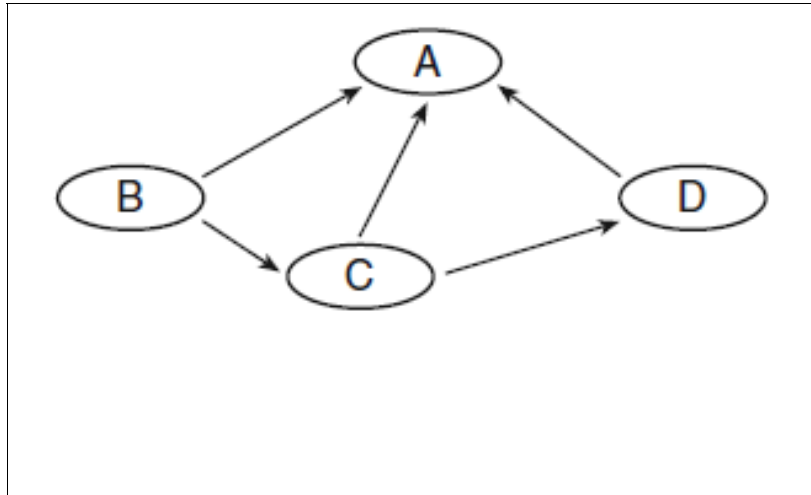
Data Base File Number: 436

Regents Date Aug2012-34.bmp

Aug2012

34 8/17/2012 S4K1

Answer 1



**food web**

852. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web illustrating some relationships in a tidal marsh ecosystem. Examples of autotrophs in this food web are

- (1) killer whales and grasses
- (2) sedges and bulrushes
- (3) mosquitoes and grasshoppers
- (4) snails and seals

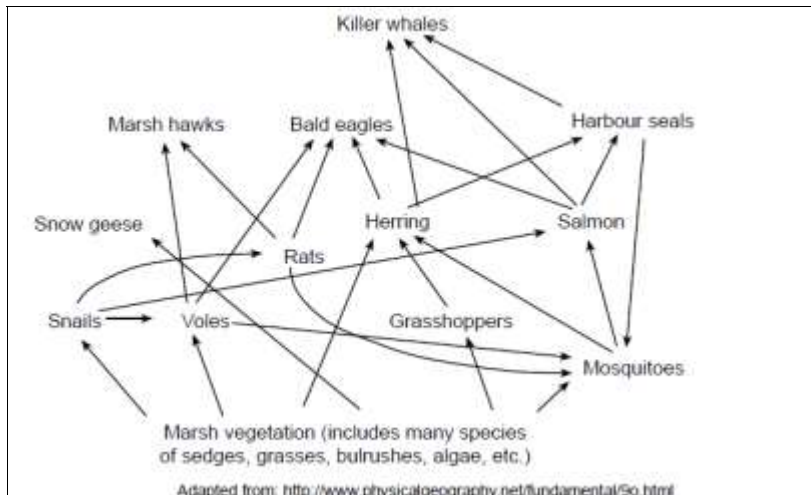
Data Base File Number: 1344

Regents Date June2019-36.bmp

June2019

36 6/18/2019 S4K1

Answer 2



food web

853. Base your answer to this question on the food web and graph shown and on your knowledge of biology. The graph represents the interaction of two different populations, A and B, in the food web. Population A is made up of living animals. The members of population B feed on these living animals. The members of population B are most likely

- (1) scavengers
- (2) autotrophs
- (3) predators
- (4) parasites

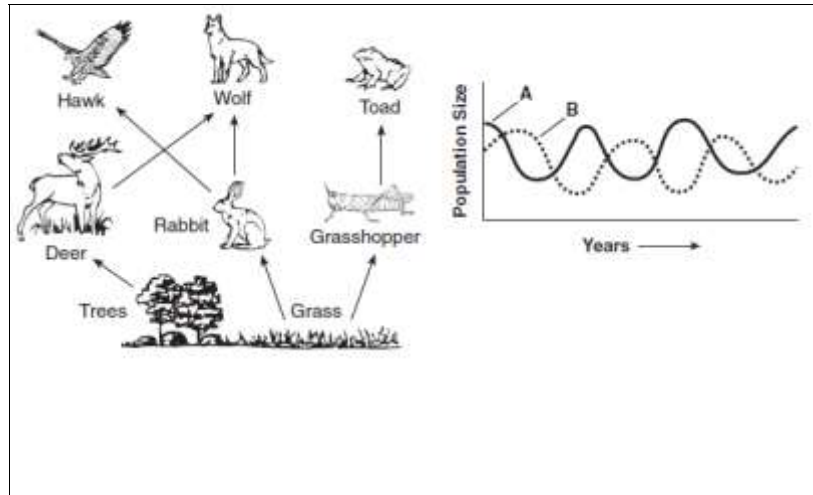
Data Base File Number: 677

Regents Date June2004-47.bmp

June2004

47 6/18/2004 S4K6

Answer 3



food web

854. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web illustrating some relationships in a tidal marsh ecosystem. In addition to grasshoppers, herring may also get energy from

- (1) algae
- (2) bald eagles
- (3) snails
- (4) voles

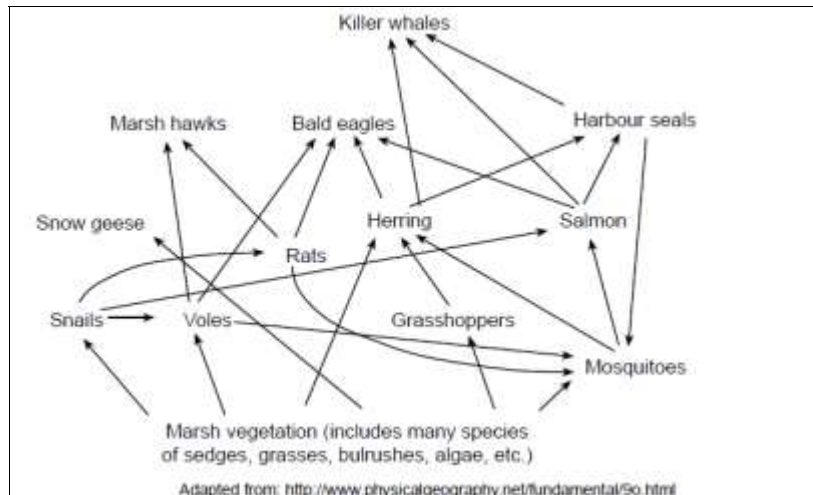
Data Base File Number: 1345

Regents Date June2019-36.bmp

June2019

37 6/18/2019 S4K1

Answer 1



## food web

855. Base your answer to this question on the information given and on your knowledge of biology. -----  
Kelp Forest Food Web ----- Kelp forest ecosystems are primarily located in the Pacific Ocean off the  
coasts of California and Alaska. The increased demand for sea urchins, whose roe (a mass of eggs)  
is a Japanese sushi ingredient, is causing them to be overharvested. A team of students is  
concerned that this decrease might affect the number of other organisms inhabiting a kelp forest  
ecosystem. The students studied the feeding relationships in the ecosystem and constructed the  
food web as shown. What is the role of the sea urchins in the ecosystem as shown?

- (1) It is preyed upon by sea otters and sea stars.  
(2) It consumes snails.  
(3) It is an autotroph  
(4) It is the food for large fish.

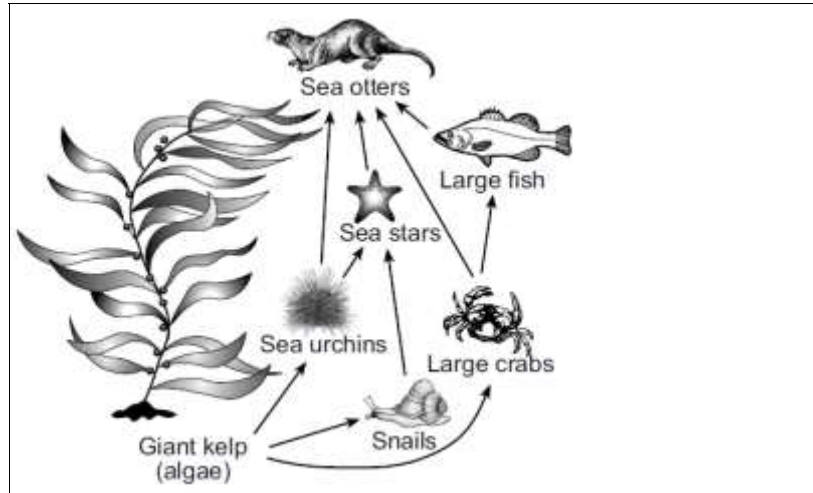
Data Base File Number: 1557

Regents Date Jan2023-69.bmp

Jan2023

69 1/24/2023 S4K1

Answer 1



**food web**

856. Base your answer to this question on the information given and on your knowledge of biology. Turn or ROTATE the diagram (to the LEFT) to orient it properly. The diagram of a generalized Antarctic food web illustrates the role of the penguins. Penguins feed on krill, small animals that grow and develop under ice masses. Why would a loss in the ice mass result in a decline of the penguin populations?

- (1) The penguins' food source grows on top of the ice mass.
- (2) All the krill will be consumed by phytoplankton.
- (3) The penguins' food source grows and develops under the ice mass.
- (4) Loss of ice will cause the temperature of the sea to rise.

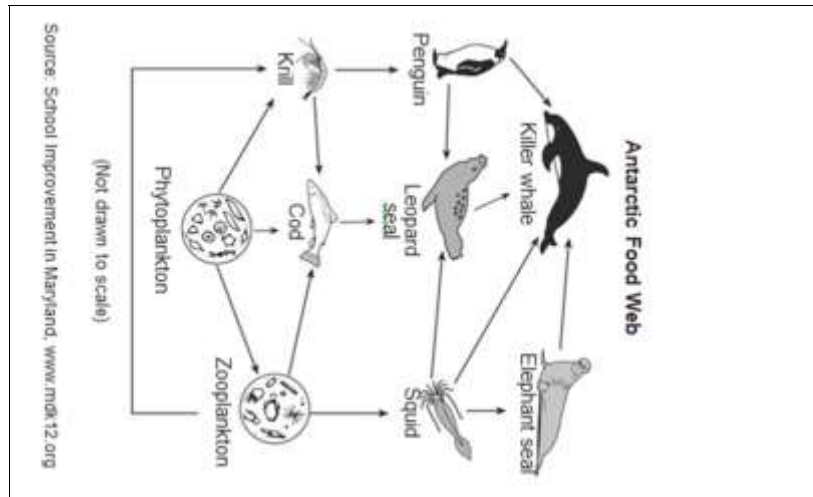
Data Base File Number: 1119

Regents Date June2016-71.bmp

June2016

71 6/15/2016 S4K7

Answer 3



**food web**

857. Base your answer to this question on the food web shown and on your knowledge of biology. Based on the food web, the population that contains the greatest amount of available energy would be

- (1) seals
- (2) fishes
- (3) phytoplankton
- (4) humans

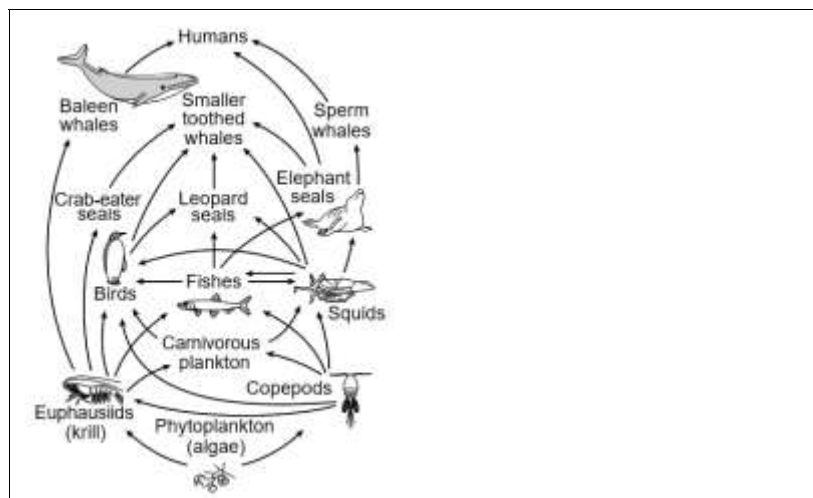
Data Base File Number: 1522

Regents Date Aug2022-49.bmp

Aug2022

49 8/17/2022 S4K6

Answer 3



**food web**

858. ROTATE YOUR PAPER SO THE DIAGRAM IS PROPERLY ORIENTED. STUDY THE DIAGRAM. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a food web typical of the Great Lakes area of New York State. If the cormorants were removed from the food web, what impact would occur on the fishing industry?

- (1) More forage fish would be available as a food supply for the salmon/lake trout to eat.
- (2) More plankton would be available to snapping turtles.
- (3) More mineral nutrients would be available to waterfowl.
- (4) More bacteria and fungi would be available to eagles.

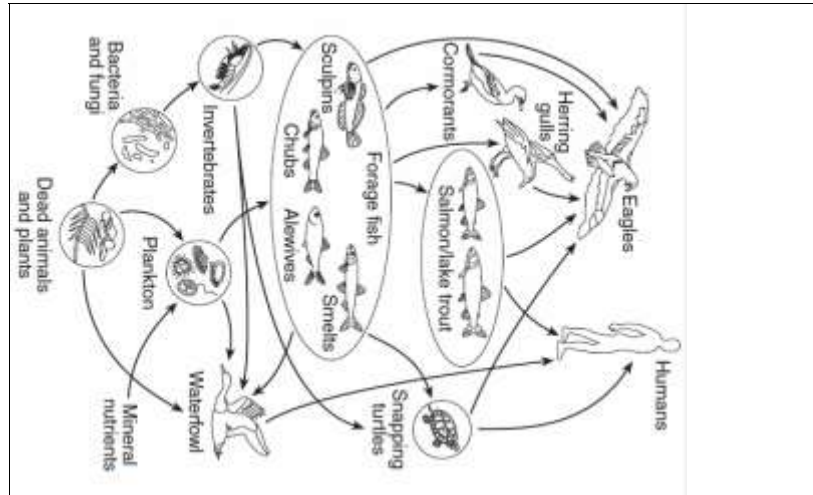
Data Base File Number: 1060

Regents Date August2015-64.b

Aug2015

64 8/12/2015 S4K6

Answer 1



**food web**

859. The diagram shown represents a food web. Which level contains organisms that carry out autotrophic nutrition?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

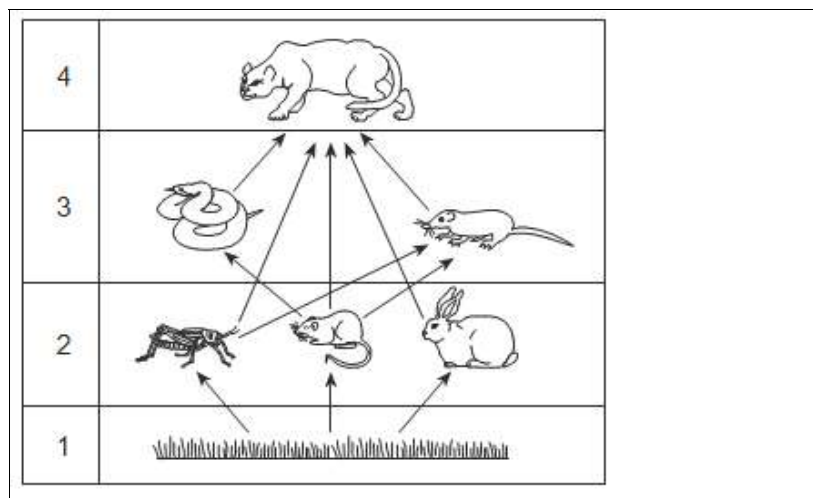
Data Base File Number: 1204

Regents Date Aug2017-22.bmp

Aug2017

22 8/17/2017 S4K1

Answer 1



food web

860. The diagram shown represents a food web. Which organisms are correctly paired with their nutritional roles?

- (1) hawk - decomposer; insect-eating bird - parasite
- (2) mouse - autotroph; flower seed - heterotroph
- (3) mountain lion - predator; bark beetle - herbivore
- (4) grasshopper - carnivore; grass - autotroph

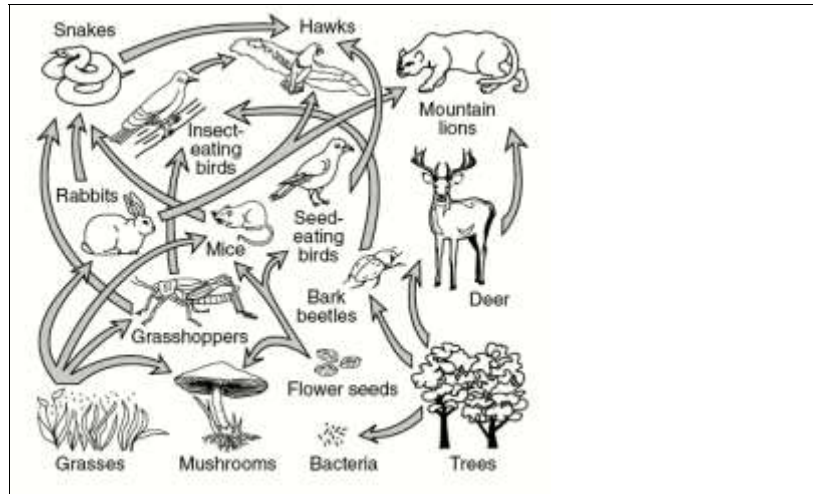
Data Base File Number: 149

Regents Date Jan09-9.bmp

Jan2009

9 1/27/2009 S4K1

Answer 3



food web

861. Base your answer to this question on the diagram shown, which represents a pond food web, and on your knowledge of biology. Which statement best describes what will most likely happen if the amphipod population is removed from this food web?

- (1) Population sizes of species at feeding levels both before and after amphipods will decrease.
- (2) Population sizes of species at feeding levels both before and after amphipods will increase.
- (3) Population sizes of species at feeding levels after amphipods will increase and before amphipods will decrease.
- (4) Population sizes of species at feeding levels after amphipods will decrease and before amphipods will increase.

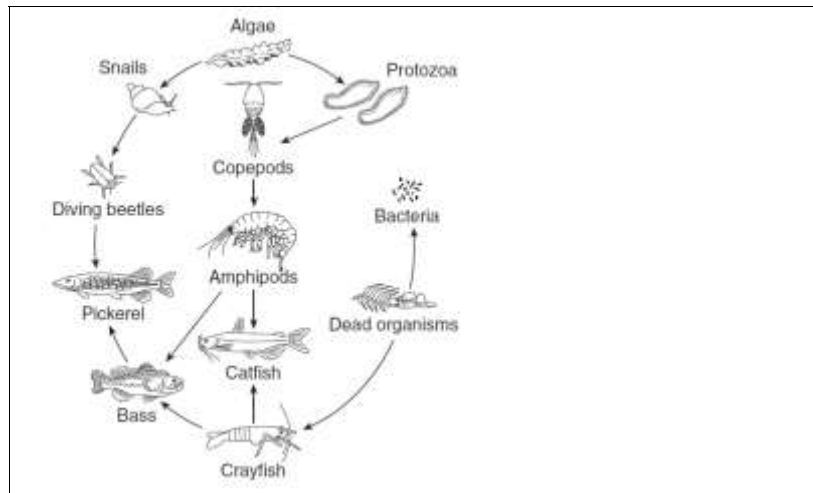
Data Base File Number: 289

Regents Date Aug2010-39.bmp

Aug2010

40 8/18/2010 S4K1

Answer 4





**food web**

862. A food web is represented in the diagram shown. When water used to cool machinery is returned to a river, it raises the river water temperature. This causes a sharp decline in small invertebrate populations. Based on the food web, a likely consequence of this change would be

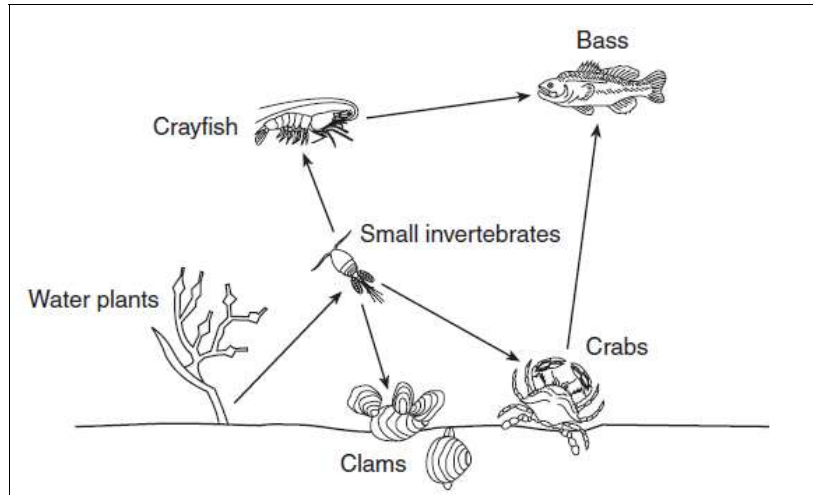
- (1) an increase in the number of clams
- (2) a decrease in the number of water plants
- (3) an increase in the number of crabs
- (4) a decrease in the number of crayfish

Data Base File Number: 371

Regents Date Aug2011-43.bmp

Aug2011  
43 8/18/2011 S4K1

Answer 4



**food web**

863. Examine the food web shown in the diagram. Which level, A, B, or C, in the food web contains the LEAST total available energy?

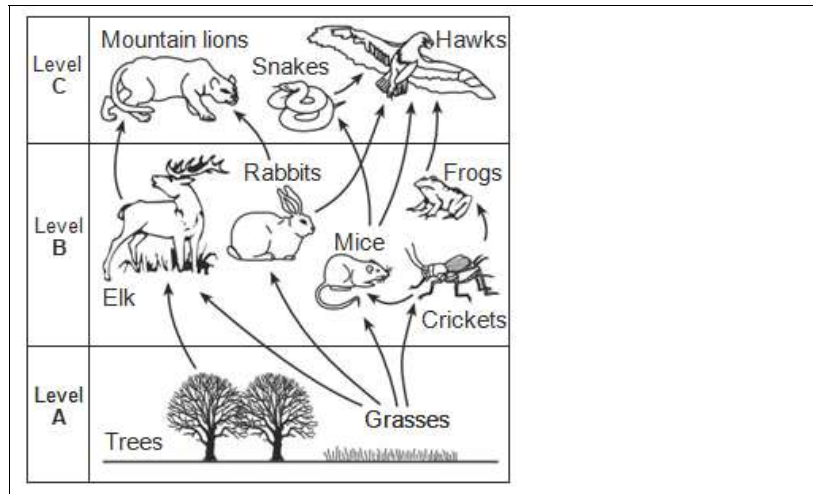
- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 1222

Regents Date Aug2017-67.bmp

Aug2017  
69 8/17/2017 S4K6

Answer 3



**food web**

864. A food web is represented in the diagram as shown. If the fish population decreases, what is the most direct effect this will have on the aquatic ecosystem?

- (1) The leopard seals will all die from lack of food.
- (2) The krill population will only be consumed by seagulls.
- (3) The zooplankton population will increase in size.
- (4) The phytoplankton population will increase in size.

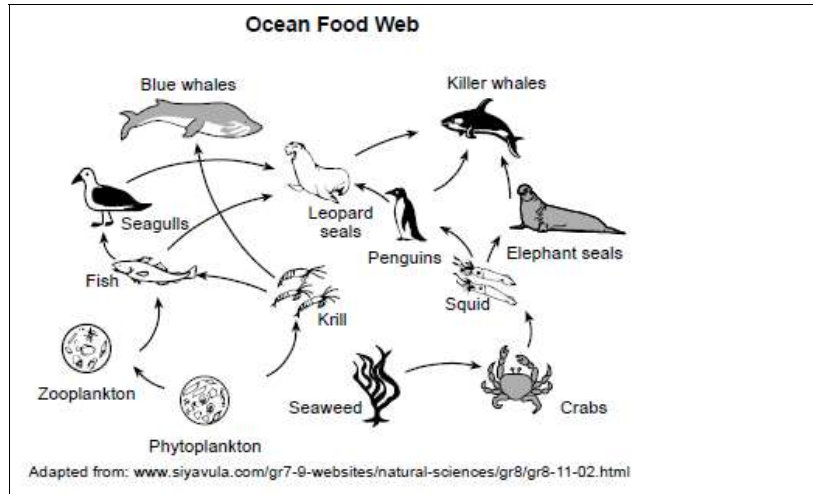
Data Base File Number: 1365

Regents Date Aug2019-17.bmp

Aug2019

17 8/14/2019 S4K1

Answer 3



**food web**

865. Base your answer to this question on the food web shown and on your knowledge of biology. Which statement best describes what would happen in this ecosystem if the phytoplankton were removed from the food web?

- (1) Copepods and krill would fill the vacant niche.
- (2) The number of heterotrophs would increase.
- (3) The food web would be disrupted, and organisms would die.
- (4) The food web would remain stable.

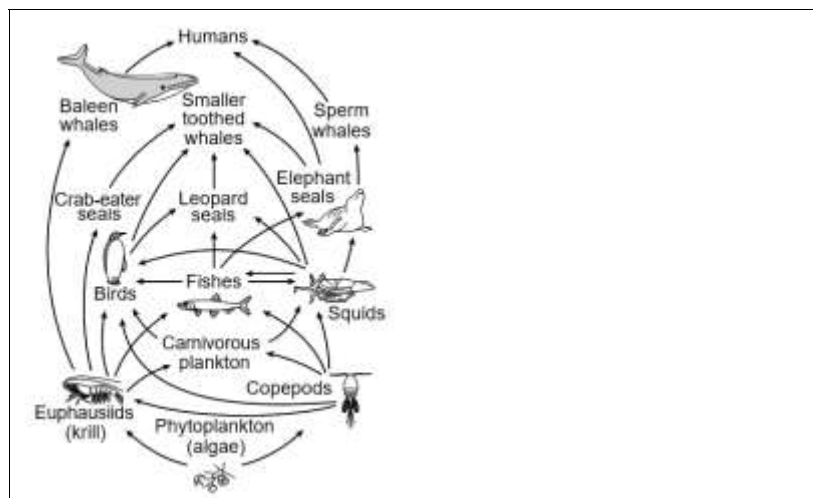
Data Base File Number: 1523

Regents Date Aug2022-49.bmp

Aug2022

50 8/17/2022 S4K1

Answer 3





**food web**

866. Part of a food web is represented in the diagram. It includes organisms located in a stream near farm fields. How would the algae population be affected if the population of crustaceans in this food web were reduced due to the use of chemicals harmful to rustaceans in the fields near the stream.

- (1) The algae may decrease because there are fewer crustaceans to eat it.
- (2) The algae may increase because there are fewer crustaceans to eat it.
- (3) The insect larvae would decrease because algae would decrease.
- (4) The fish would decrease because the insect larvae would decrease.

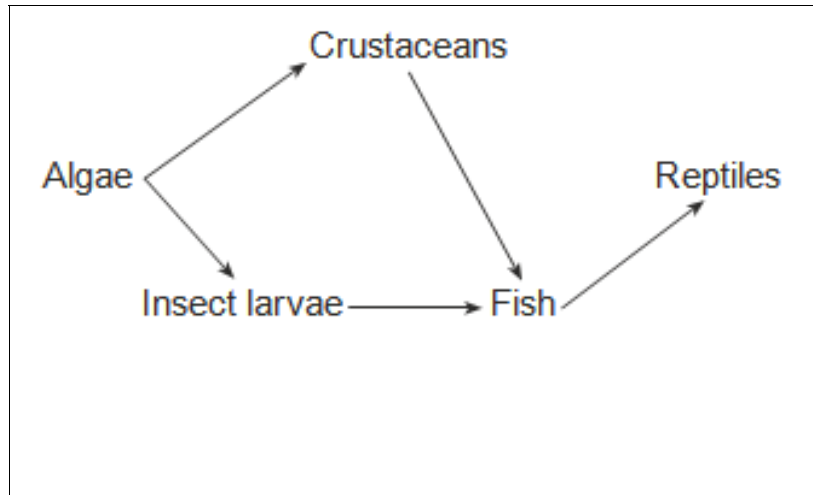
Data Base File Number: 1191

Regents Date June2017-53.bmp

June2017

53 6/14/2017 S4K1

Answer 2



**food web**

867. Base your answer to this question on the diagram of a food web as shown and on your knowledge of biology. If the population of mice is reduced by disease, which change will most likely occur in the food web?

- (1) The cricket population will increase.
- (2) The snake population will increase.
- (3) The grasses will decrease.
- (4) The deer population will decrease.

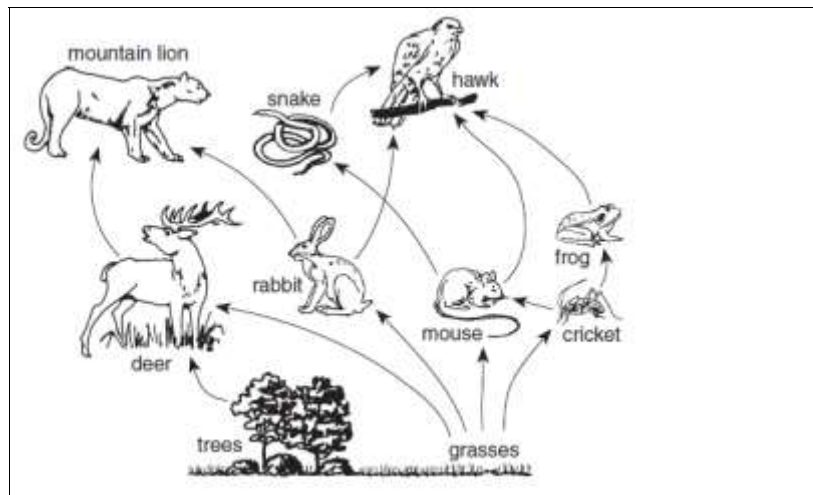
Data Base File Number: 721

Regents Date Jan2003-50.bmp

Jan2003

50 1/30/2003 S4K6

Answer 1



## food web

868. A food web is shown in the diagram. What would happen to the plant population if the number of decomposers decreased?

- (1) The number of plants would increase because there would be more sunlight for photosynthesis.
- (2) The number of plants would stay the same because decomposers are not necessary for plant survival.
- (3) The number of plants would decrease because minerals and nutrients would not be recycled.
- (4) It is impossible to determine what would happen to the plant numbers because there are too many other variables that control plant growth.

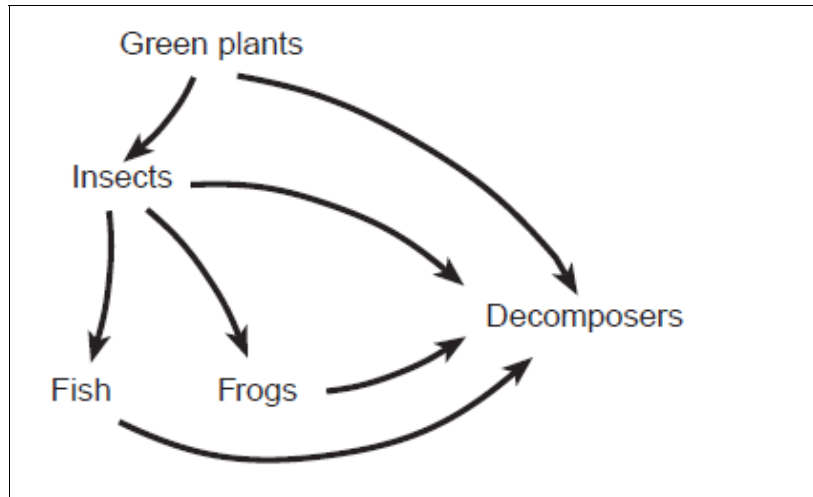
Data Base File Number: 851

Regents Date June2001-36.bmp

June2001

36 6/15/2001 S4K1

Answer 3



## food web

869. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents some of the organisms found in an ocean food web in an area where giant kelp form "forests" of this fast-growing kind of algae. Which organism in the food web is the primary food producer?

- (1) giant kelp
- (2) sea urchins
- (3) snails
- (4) large crabs

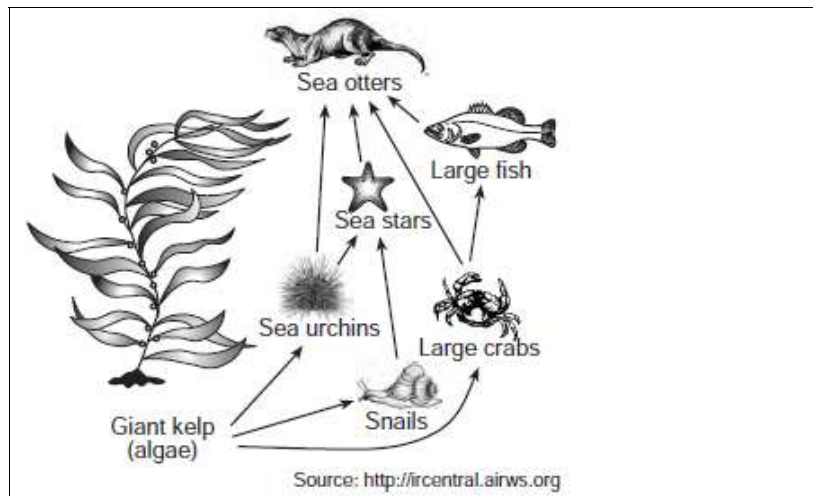
Data Base File Number: 1621

Regents Date Aug202364.bmp-

Aug2023

64 8/17/2023 S4K1

Answer 1



food web

870. A food web is represented in the diagram. Which statement best describes energy in this food web?

- (1) The energy content of level B depends on the energy content of level C.
- (2) The energy content of level A depends on energy provided from an abiotic source.
- (3) The energy content of level C is greater than the energy content of level A.
- (4) The energy content of level B is transferred to level A.

Data Base  
File Number:

477

Regents Date

June2006-11.bmp

June2006

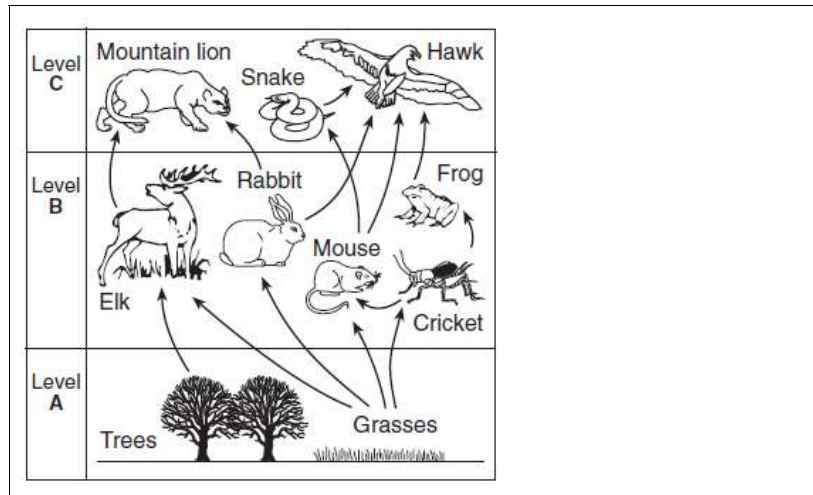
11

6/21/2006

S4K1

Answer

2



**fossil**

871. Base your answer to this question on the information given and on your knowledge of biology.

**Fossil Footprints**

Scientists examined a trail of fossil footprints left by early humans in soft, volcanic ash in Eastern Africa. A drawing of the trail of footprints is shown. Each footprint is represented as a series of lines indicating the depth that different parts of the foot sank into the volcanic ash. Which statement is an accurate observation that can be made based on this trail of footprints?

- (1) The individuals were running from a predator.
- (2) The volcano was about to erupt again.
- (3) One individual was much taller than the other.
- (4) One individual had larger feet than the other.

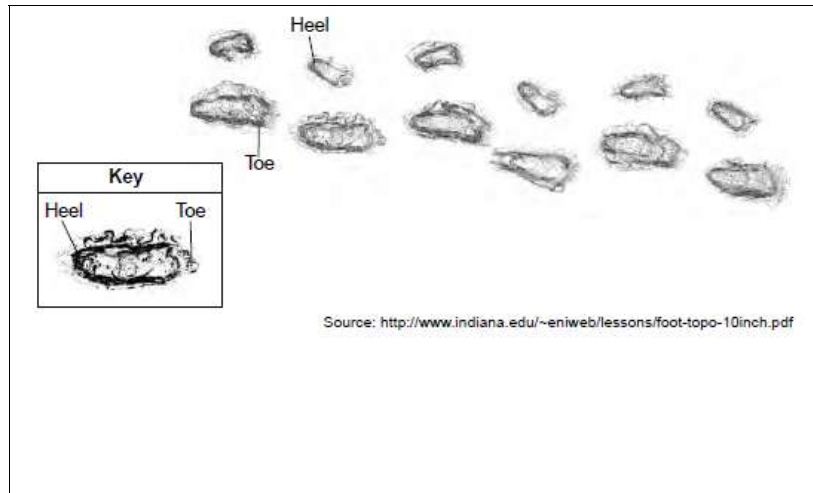
Data Base 1369  
File Number:

Regents Date Aug2019-31.bmp

Aug2019

31 8/14/2019 APPA

Answer 4



## fossil

872. Base your answer to this question on the information given and on your knowledge of biology Fossil Footprints

Scientists examined a trail of fossil footprints left by early humans in soft, volcanic ash in Eastern Africa. A drawing of the trail of footprints is shown. Each footprint is represented as a series of lines indicating the depth that different parts of the foot sank into the volcanic ash. The type of information directly provided by these fossil footprints is useful because it

- (1) offers details about how these individuals changed during their lifetime
- (2) offers data regarding their exposure to ultraviolet (UV) radiation
- (3) is a record of information about what these individuals ate during their lifetime
- (4) is a record of some similarities and differences they share with present-day species

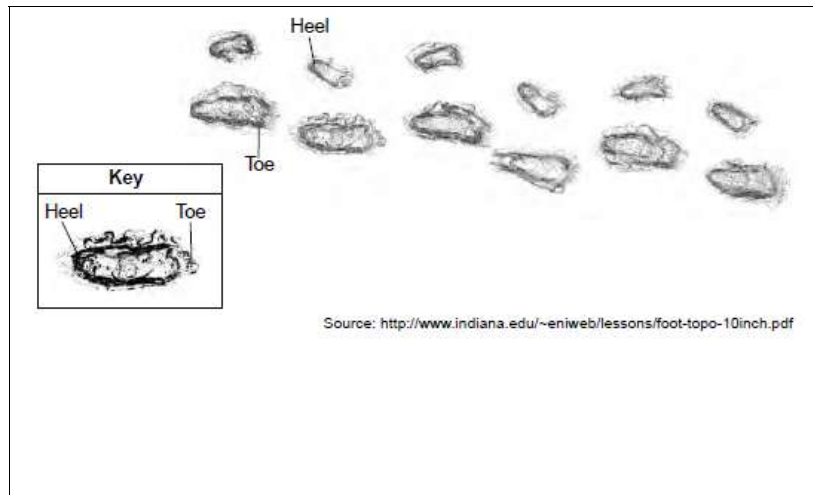
Data Base File Number: 1370

Regents Date Aug2019-32.bmp

Aug2019

32 8/14/2019 APPA

Answer 4



## fossil fuels

873. Base your answers to this question on the information in the table and on your knowledge of biology. Each year, a New York State power agency provides its customers with information about some of the fuel sources used in generating electricity. The table shown applies to the period of 2002-2003. In order to decrease the use of fossil fuels, the power agency should

- (1) decrease the use of coal and hydro (water)
- (2) increase the use of solar and hydro (water)
- (3) increase the use of oil and nuclear
- (4) increase the use of oil and coal

Data Base File Number: 108

Regents Date June08-43.bmp

June2008

43 6/24/2008 S4K7

Answer 2

Fuel Source	Percentage of Electricity Generated
hydro (water)	86
coal	5
nuclear	4
oil	1
solar	0

## fossil fuels

874. Base your answer to this question on the diagram shown and on your knowledge of biology. What information would be appropriate to add to box X in order to complete the diagram?

- (1) cellular respiration by humans
- (2) simple sugar
- (3) oxygen
- (4) burned by automobiles

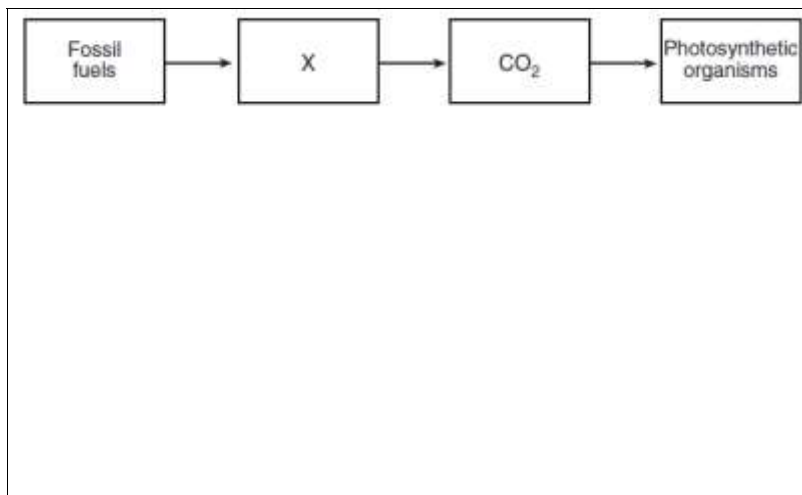
Data Base File Number: 1000

Regents Date Jan2015-43.bmp

Jan2015

43 2/26/2015 S4K7

Answer 4



## fossil fuels

875. Base your answer to this question on the passage and graph given and on your knowledge of biology.

### Atmospheric Carbon Dioxide

Records from polar ice cores show that the natural range of atmospheric carbon dioxide (CO<sub>2</sub>) over the past 800,000 years was 170 to 300 parts per million (ppm) by volume. In the early 20th century, scientists began to suspect that CO<sub>2</sub> in the atmosphere might be increasing beyond this range due to human activities, but there were no clear measurements of this trend. In 1958, Charles David Keeling began measuring atmospheric CO<sub>2</sub> at the Mauna Loa observatory on the big island of Hawaii. One likely reason for the overall change in CO<sub>2</sub> concentration observed between 1958 and 2015 is

- (1) More fossil fuels are being burned.                      (3) More oxygen is being released.  
(2) Less fossil fuels are being burned.                    (4) Less oxygen is being released.

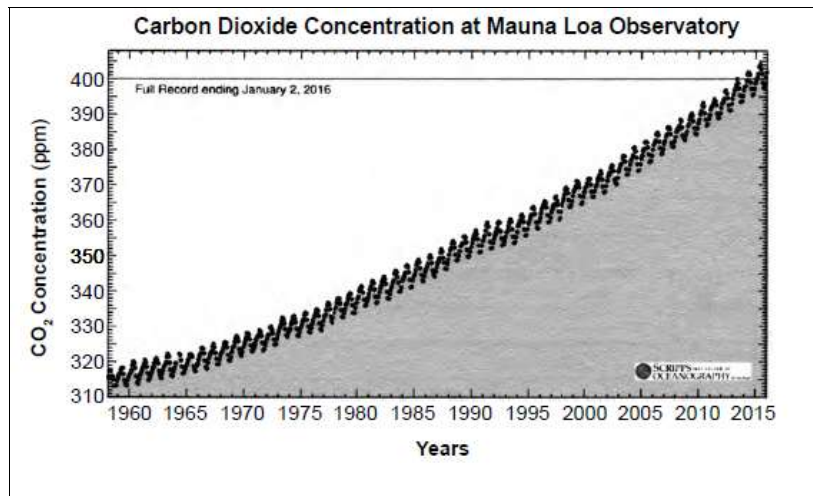
Data Base            1359  
File Number:

Regents Date        June2019-71.bmp

June2019

71            6/18/2019        S4K7

Answer            1



**functions / specialized**

876. Two methods of moving from place to place are represented in the diagrams shown. The single-celled ameba moves by a process that involves the flow of cytoplasm. Which statement is best supported by these diagrams?

- (1) Both simple and complex organisms move directly by the movement of cytoplasm.
- (2) Single-celled organisms, like complex organisms, are able to move; however, they differ in the way they carry out this activity.
- (3) Cytoplasm is a fluid substance in simple cells and a solid substance in cells of complex organisms.
- (4) Cells in complex organisms function in the exact same way as cells in simple organisms.

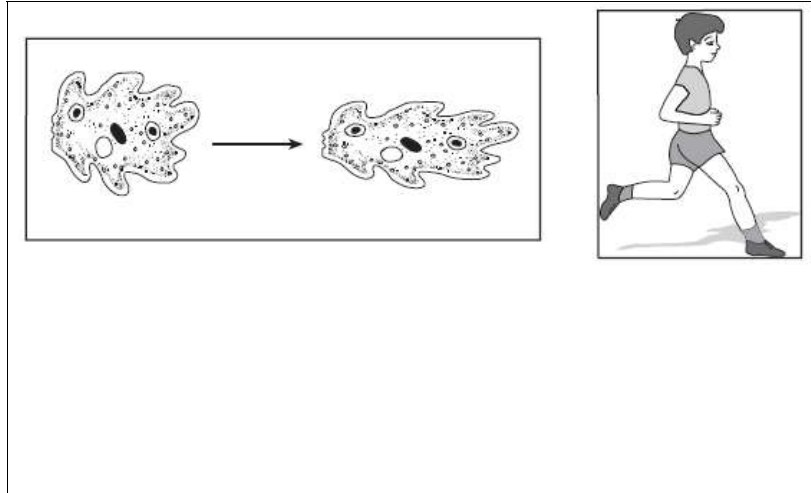
Data Base File Number: 999

Regents Date Jan2015-42.bmp

Jan2015

42 2/26/2015 S4K1

Answer 2



**galapagos Finches**

877. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows variations in the beaks of finches in the Galapagos Islands. In this diagram, the variety of beak sizes and shapes are adaptations directly related to successful

- (1) feeding
- (2) camouflage
- (3) defense
- (4) singing

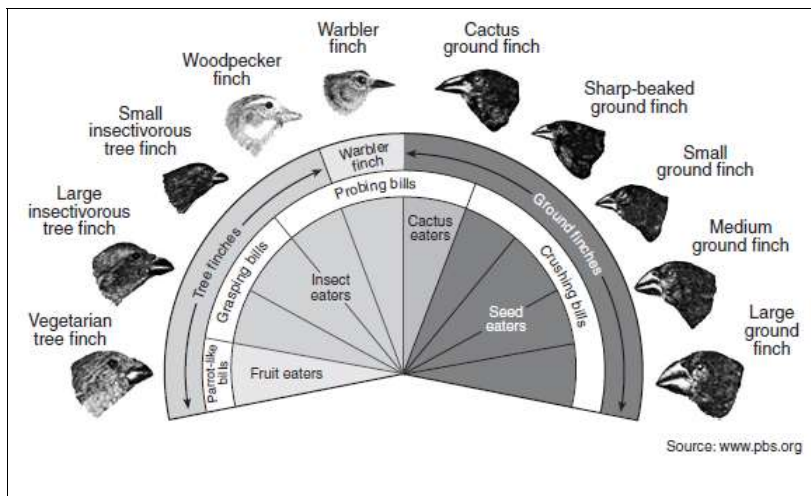
Data Base File Number: 1042

Regents Date June2015-82.bmp

June2015

82 6/16/2015 LAB3

Answer 1





## Galapagos Finches

878. Base your answer to this question on the diagram shown and on your knowledge of biology. Which species of finch has an edge-crushing bill that can also probe into plants for food?

- (1) cactus finch
- (2) sharp-billed ground finch
- (3) warbler finch
- (4) large ground finch

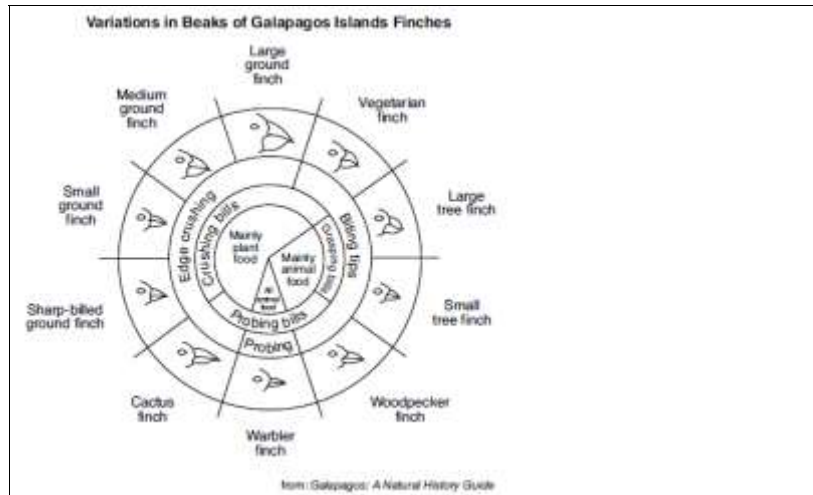
Data Base File Number: 427

Regents Date June2012-75.bmp

June2012

75 6/19/2012 LAB3

Answer 1



## Galapagos finches

879. Base your answer to this question on the diagram shown and on your knowledge of biology. Which finch population would be NEGATIVELY affected if the birth rate of small tree finches increased significantly.

- (1) Woodpecker finch
- (2) Sharp-billed ground finch
- (3) Medium ground finch
- (4) Large ground finch

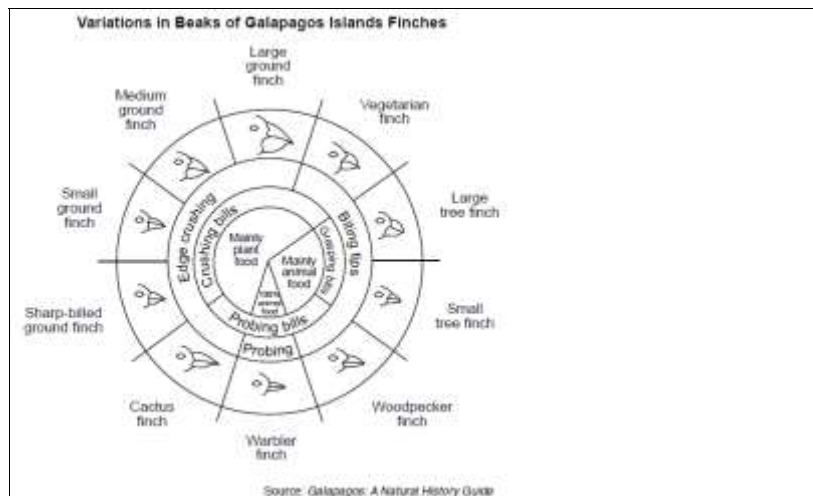
Data Base File Number: 1354

Regents Date June2019-84.bmp

June2019

84 6/18/2019 LAB3

Answer 1



## Galapagos finches

880. Base your answer to this question on the finch diversity chart shown, which contains information concerning the finches found on the Galapagos Islands. Which bird would most likely compete for food with the large tree finch?

- (1) woodpecker finch or small tree finch  
 (2) warbler finch  
 (3) small ground finch  
 (4) large ground finch

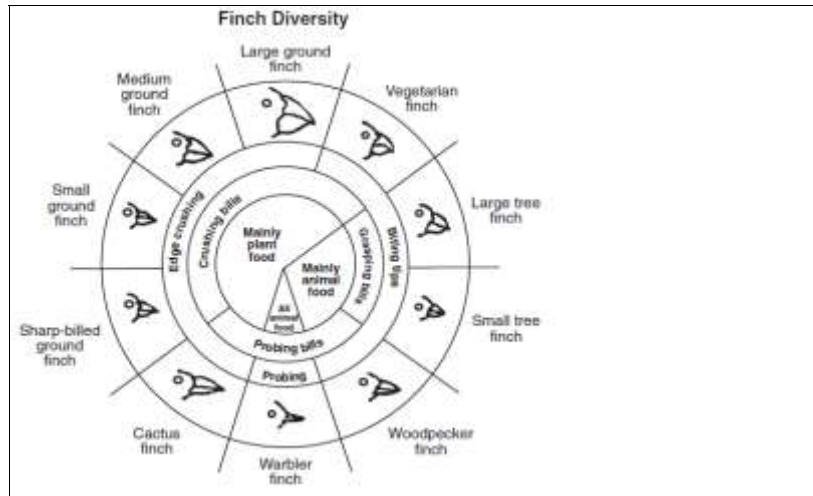
Data Base File Number: 531

Regents Date Aug2006-68.bmp

Aug2006

68 8/16/2006 LAB3

Answer 1



## Galapagos Finches

881. Base your answer to this question on the information and diagram given and on your knowledge of biology. Two species of finches found on a particular Galapagos island eat the seeds of a certain variety of plant. The relative strength of their beaks is shown in the graph below. Which point on the graph indicates that the beak strength of the two birds is equal?

- (1) A  
 (2) B  
 (3) C  
 (4) D

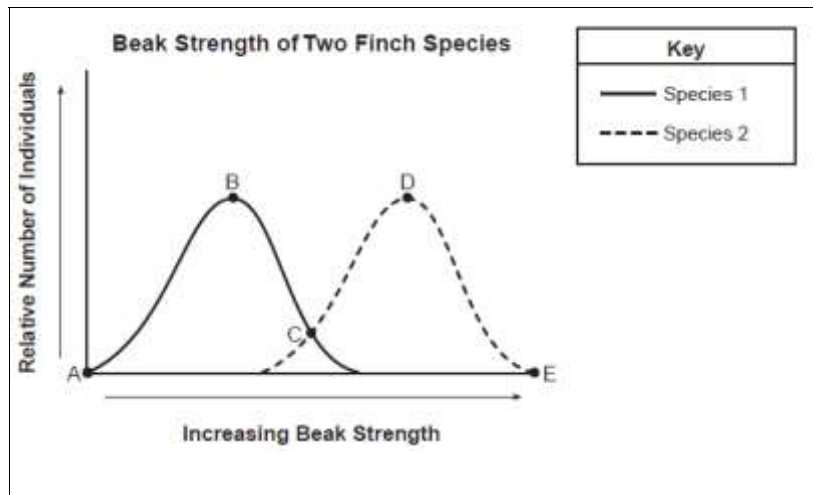
Data Base File Number: 1122

Regents Date June2016-78.bmp

June2016

79 6/15/2016 LAB3

Answer 3



## Galapagos Finches

882. The diagram shows variations in beak sizes and shapes for several birds on the Galapagos Islands. Galapagos finches evolved partly due to

- (1) cloning and recombination
- (2) migration and selective breeding
- (3) mutation and asexual reproduction
- (4) variation and competition

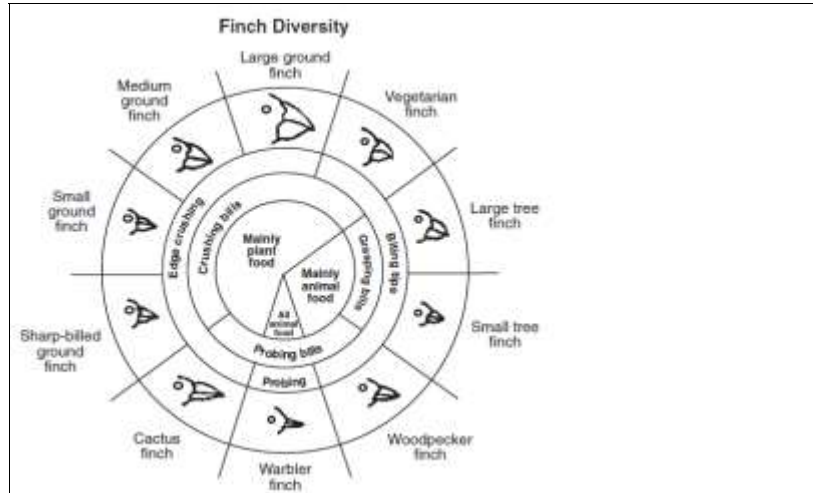
Data Base File Number: 603

Regents Date Aug2005-70.bmp

Aug2005

72 8/16/2005 LAB3

Answer 4



## Galapagos Finches

883. Base your answer to this question on the information in the diagram shown and on your knowledge of biology. How many bird species represented in the diagram are strictly carnivores?

- (1) 1
- (2) 6
- (3) 3
- (4) 4

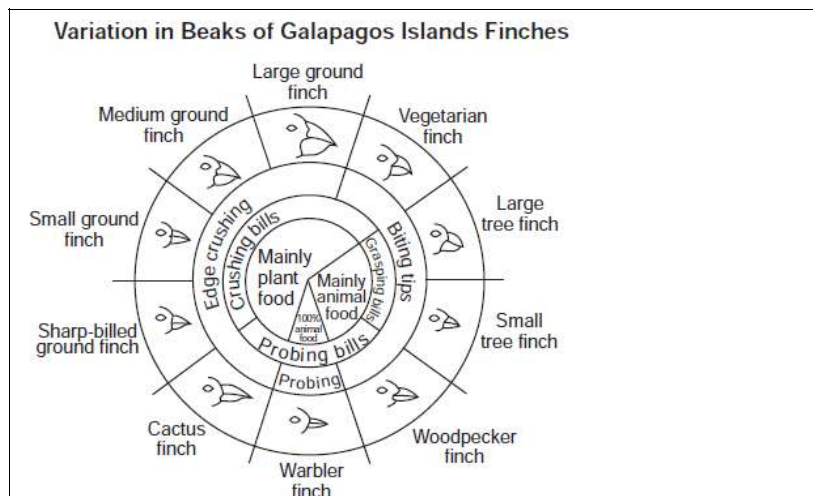
Data Base File Number: 1711

Regents Date Aug2024-74.bmp

Aug2024

74 8/20/2024 LAB3

Answer 1



## Galapagos Finches

884. Base your answer to this question on the information and diagram given and on your knowledge of biology. Average beak sizes of the seed-eating medium ground finch on one of the Galapagos Islands are shown in the diagram below. During wet years, all types of seeds are abundant. The medium ground finch prefers to eat small seeds that are easy to crush. However, during droughts (dry years), when small seeds are not as abundant, they eat the larger seeds on the island. How might an extended period of drought influence the ground finch population?

- (1) The birds with smaller beaks would be more numerous.
- (2) The birds with larger beaks would be more numerous.
- (3) Drought decreases seed availability, but has no influence on the ground finch.
- (4) Drought increases seed availability, and all ground finches would be more numerous.

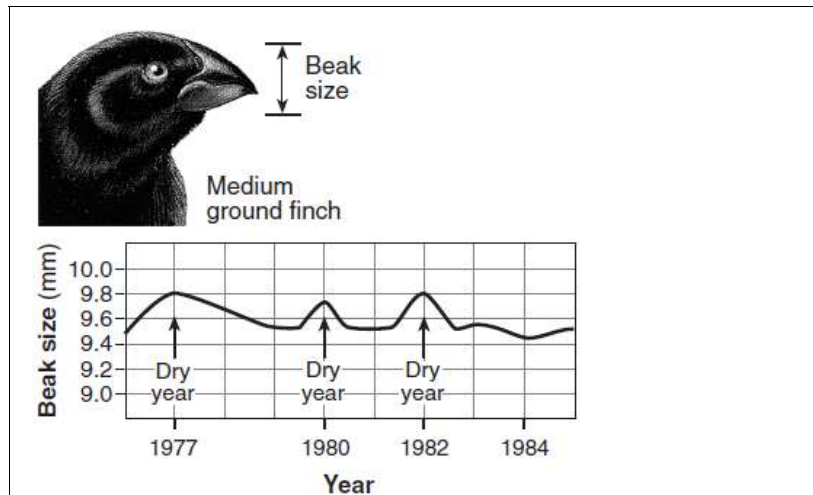
Data Base 375  
File Number:

Regents Date Aug2011-73.bmp

Aug2011

73 8/18/2011 LAB3

Answer 2



## Galapagos Finches

885. Base your answer to this question on the diagram shown and on your knowledge of biology. Several populations of finches migrated to an island that had mostly large seeds with tough outer coverings. Identify a finch population that would most likely survive on the island.

- (1) Large ground finch  
 (2) Small tree finch  
 (3) Cactus finch  
 (4) Small ground finch

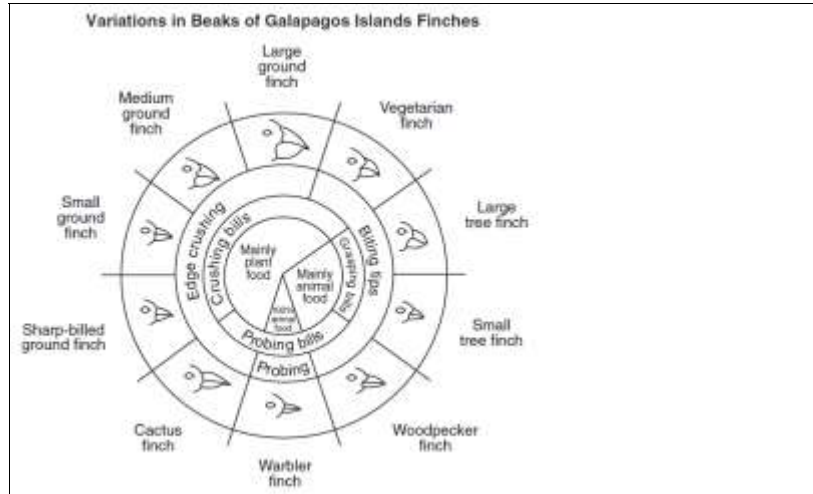
Data Base File Number: 1064

Regents Date August2015-79.b

Aug2015

79 8/12/2015 LAB3

Answer 1



## Galapagos Finches

886. The diagram shown indicates the types of food sources on a certain island where Galapagos Finches feed. The diagram of the island suggests that in region B finches can feed on

- (1) large seeds and insects  
 (2) small seeds, only  
 (3) a large variety of different-sized seeds  
 (4) insects and a limited number of small seeds

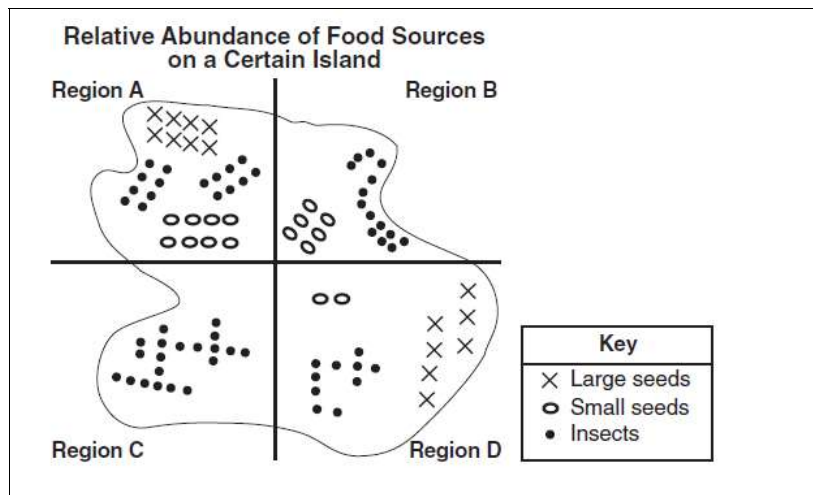
Data Base File Number: 1008

Regents Date Jan2015-81B.bm

Jan2015

81 2/26/2015 LAB3

Answer 4



## Galapagos Finches

887. Base your answer to this question on the information in the diagram shown and on your knowledge of biology. Based on the information in the chart, which statement is correct?

- (1) Finches that eat animals always have larger beaks than finches that eat plants.
- (2) Finches that eat plants all have very large beaks.
- (3) Finches with crushing bills eat only animals for food.
- (4) Finches with grasping bills usually eat animals for food

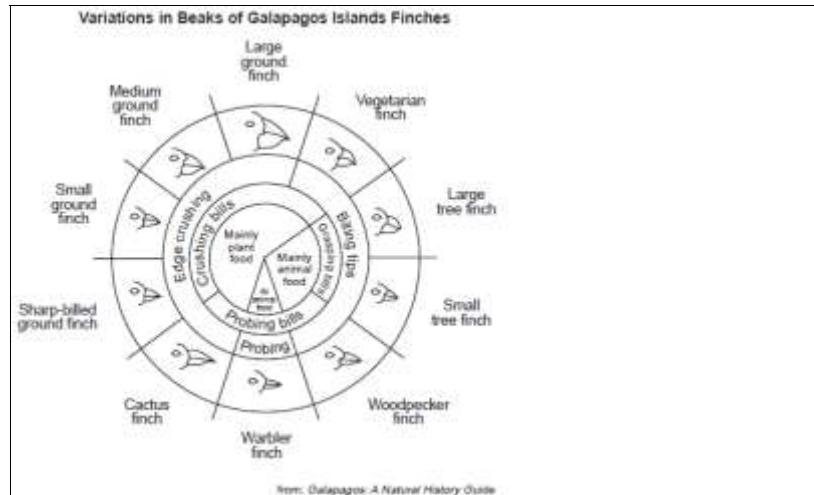
Data Base File Number: 1091

Regents Date Jan2016-81.bmp

Jan2016

81 1/27/2016 LAB3

Answer 4



## Galapagos Finches

888. Base your answer to this question on the diagram shown and on your knowledge of biology. On an island populated by both warbler finches and small tree finches, there is a significant decrease in the amount of animal food. Which finch population would DECREASE more?

- (1) large ground finch
- (2) warbler finch
- (3) small ground finch
- (4) large tree finch

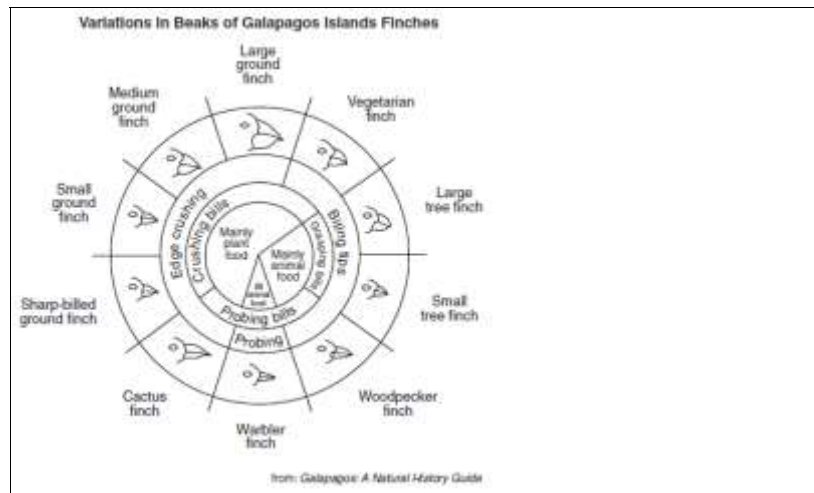
Data Base File Number: 399

Regents Date Jan2012-83.bmp

Jan2012

83 1/25/2012 LAB3

Answer 2



## Galapagos Finches

889. Base your answer to this question on the information and chart shown and on your knowledge of biology. The Galapagos Islands are home to many different species of finches. Three finch species, their relative beak sizes, and their food preferences are represented in the chart shown. All three species live on the same island. Which statement is correct concerning the nutritional preferences of these finches?

- (1) The three species do not compete for food because they eat different types of foods.
- (2) The vegetarian and cactus finches compete for food because they both feed on producers.
- (3) The vegetarian and warbler finches compete for food because they both live in trees.
- (4) The three species of finches compete for food because their beaks are similar in shape and size.

Data Base File Number: 936

Regents Date Jan2014-81.bmp

Jan2014

81 1/27/2014 LAB3

Answer 1

Name	Foods
Vegetarian finch <i>Platyspiza crassirostris</i>	Buds, leaves, fruit of trees
Warbler finch <i>Certhidea olivacea</i>	Flying and ground-dwelling insects
Cactus finch <i>Geospiza scandens</i>	Cactus flowers and nectar

## Galapagos Finches

890. Base your answer to this question on the diagram shown and on your knowledge of biology. What food do the Cactus Finches and Sharp-billed Finches consume?

- (1) Mainly plant food
- (2) All plant food
- (3) Mainly animal food
- (4) Snails

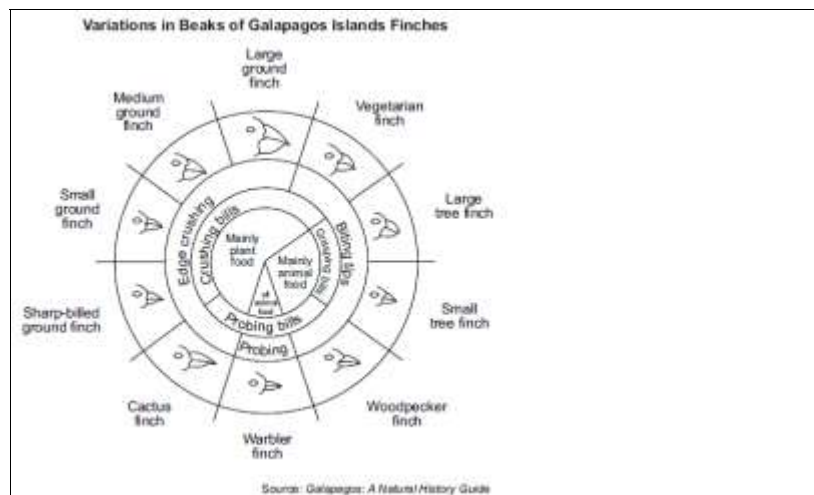
Data Base File Number: 1562

Regents Date Jan2023-84.bmp

Jan2023

84 1/24/2023 LAB3

Answer 1





## Galapagos finches

891. The table given shows the food sources for two different species of Galapagos finches on an island. One reason why these two species probably do not live in the same area of this island is

- (1) Trees and cacti do not usually grow in the same area.                      (3) The birds migrated off the island.  
 (2) Trees and cacti grow in the same area.                      (4) Food and beak type are not related.





Data Base File Number: 1271

Regents Date June2018-77.bmp

June2018

77 6/13/2018 LAB3

Answer 1

Name	Foods
Vegetarian finch <i>Platyspiza crassirostris</i> 	Buds, leaves, fruit of trees 
Cactus finch <i>Geospiza scandens</i> 	Cactus flowers and nectar 

## Galapagos Finches

892. Base your answer to this question the diagram shown and on your knowledge of biology. Insects can get diseases just like other organisms. A deadly bacteria infected the insects on one Galapagos Island. Among the birds living there, the finches most likely to experience a drastic DECREASE in population size would be the

- (1) warbler finches                      (3) large ground finches  
 (2) cactus finches                      (4) medium ground finches

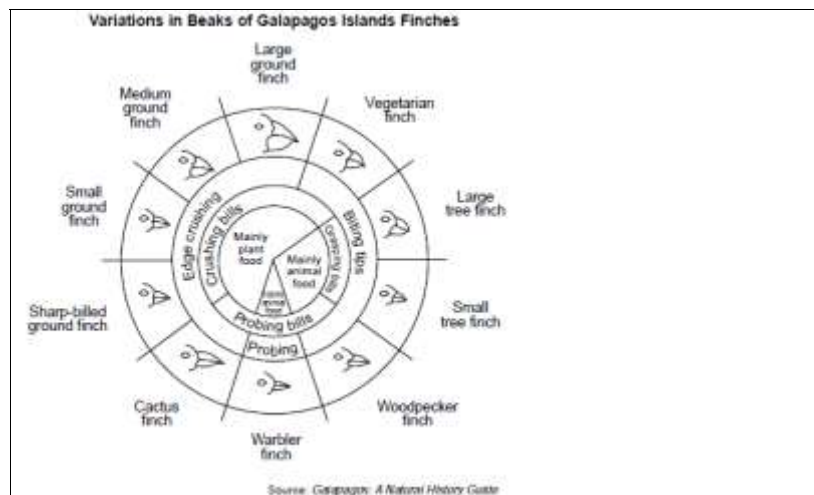
Data Base File Number: 1383

Regents Date Aug2019-74.bmp

Aug2019

74 8/14/2019 LAB3

Answer 1





## Galapagos Finches

893. Base your answers to this question on the chart shown and on your knowledge of biology. Which finches would be most like the ancestral finch?

- (1) large ground finches
- (2) cactus finches
- (3) warbler finches
- (4) large tree finches

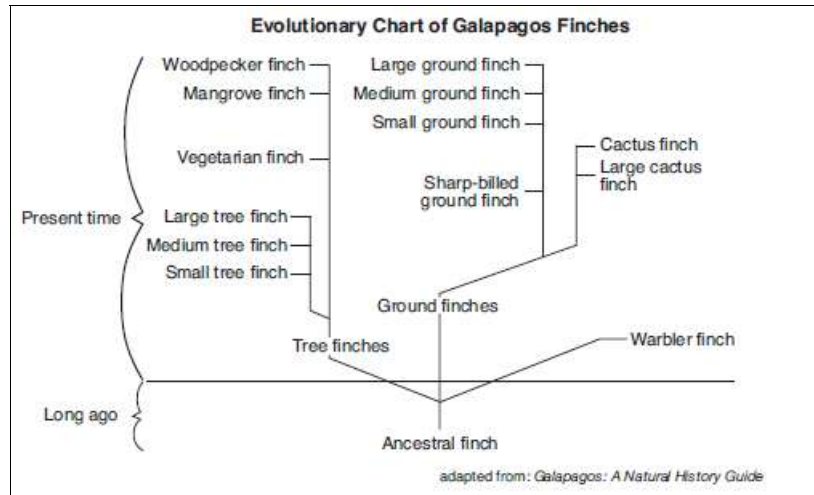
Data Base File Number: 916

Regents Date Aug2013-81.bmp

Aug2013

81 8/14/2013 LAB3

Answer 3



## Galapagos Finches

894. Base your answer to this question on the information in the diagram shown and on your knowledge of biology. Small ground finches and medium ground finches live on an island with abundant plant and animal food. The differences observed in the bird beaks are most likely due to

- (1) asexual reproduction of these finch species
- (2) the selection for different shaped beaks that best suit different niches
- (3) the genetic recombination associated with mitotic cell division
- (4) the genetic engineering of the DNA of each of these species

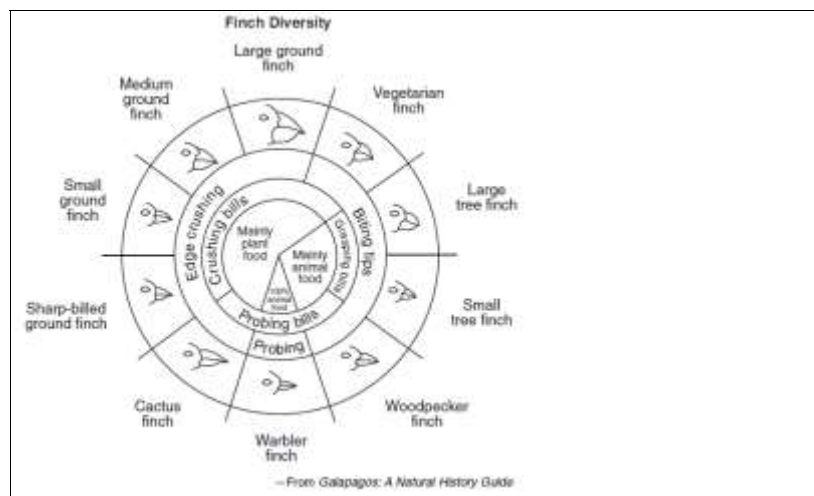
Data Base File Number: 299

Regents Date Aug2010-71.bmp

Aug2010

71 8/18/2010 LABS

Answer 2



## Galapagos Finches

895. Base your answer to this question on the diagram which shows variations in the beaks of finches in the Galapagos Islands and on your knowledge of biology. Which row correctly pairs a finch species with its primary nutritional role and bill type?

(1) 1

(3) 3

(2) 2

(4) 4

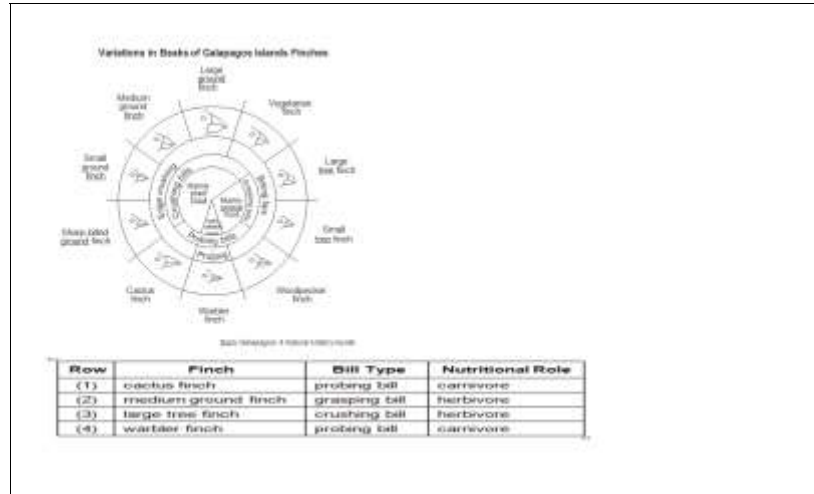
Data Base File Number: 1226

Regents Date Aug2017-76C.bm

Aug2017

76 8/17/2017 LAB3

Answer 4



## Galapagos Finches

896. Base your answer to this question on the information shown and on your knowledge of biology. The differences seen in the beaks of the four species of finches are most likely the result of

(1) gene expression and asexual reproduction

(3) migration and the need to adapt

(2) variation and natural selection

(4) heredity and a diet of seeds

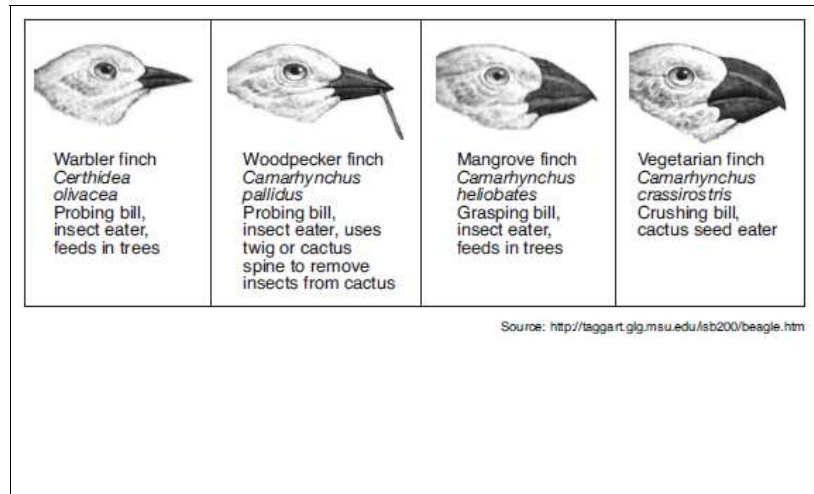
Data Base File Number: 979

Regents Date Aug2014-76.bmp

Aug2014

76 8/14/2014 LAB3

Answer 2



## Galapagos Finches

897. Base your answer to this question on the diagram shown and on your knowledge of biology. A finch that picks small insects out from cracks in the bark of trees would most likely have a beak that is

- (1) sharp and thin
- (2) sharp and thick
- (3) rounded and thin
- (4) rounded and thick

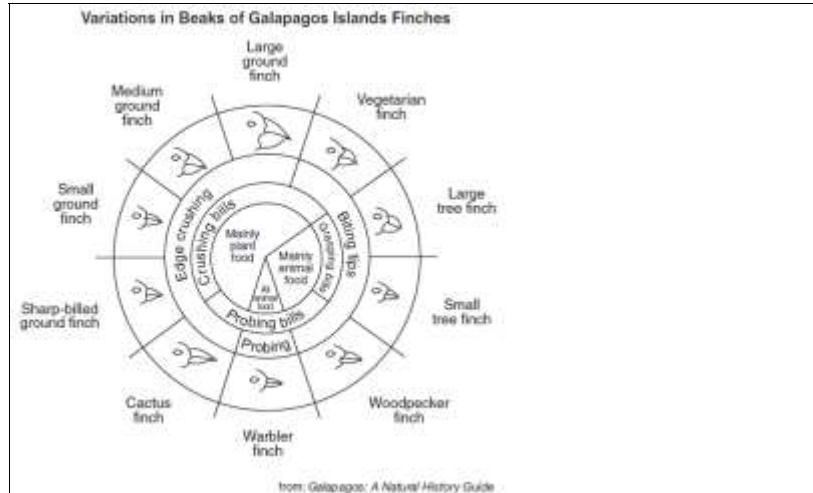
Data Base File Number: 1149

Regents Date August2016-75.b

Aug2016

75 8/18/2016 LAB3

Answer 1



## Galapagos Finches

898. The diagram shown represents the relationship between beak structure and food in several species of finches found on the Galapagos Islands. The different beak structures observed in the diagram are evidence of

- (1) different species of finches adapting to different environments over many generations
- (2) finches changing their beak characteristics so that they could feed efficiently
- (3) finch species with different beak structures coming to the Galapagos Islands from the mainland
- (4) finches mating with birds of other species and acquiring some of their traits

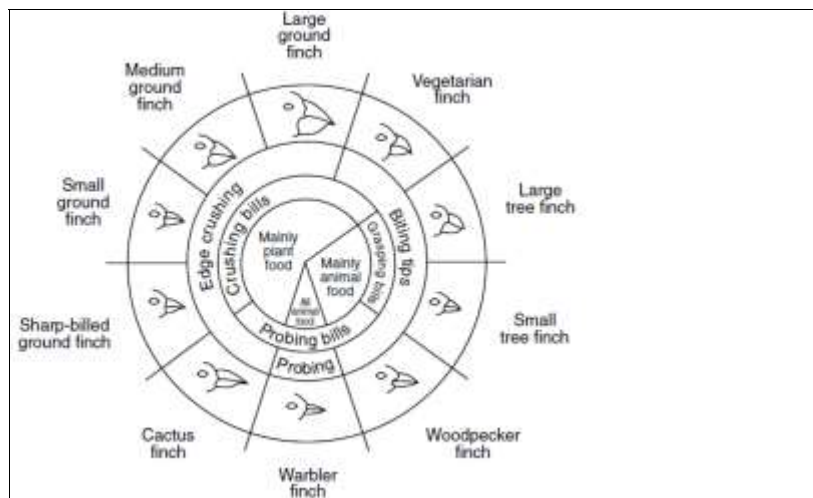
Data Base File Number: 1169

Regents Date Jan2017-75.bmp

Jan2017

75 1/25/2017 LAB3

Answer 1



## Galapagos Finches

899. Base your answer to this question the diagram shown and on your knowledge of biology. There are a number of islands in the Galapagos that these finches could possibly inhabit. Why would each island not be expected to have all of the species shown?

- (1) Some islands have a large number of predators.
- (2) Some islands have no water.
- (3) Each island has its own set of environmental conditions which might not provide food or shelter for some species.
- (4) Some islands do not have a large enough land mass to support more than one type of finch.

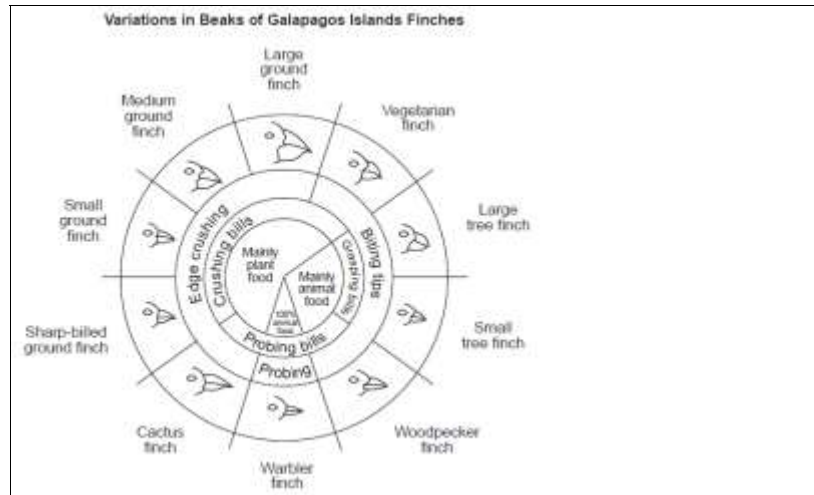
Data Base File Number: 935

Regents Date Jan2014-80.bmp

Jan2014

80 1/27/2014 LAB3

Answer 3



## Galapagos Finches

900. Base your answer to this question on the information given and on your knowledge of biology. Which two species of finch would be affected if a bird with a grasping beak that ate ants and beetles was introduced into their habitat?

- (1) large ground finch and warbler
- (2) woodpecker finch and small ground finch
- (3) large tree finch and small tree finch
- (4) cactus finch and medium ground finch

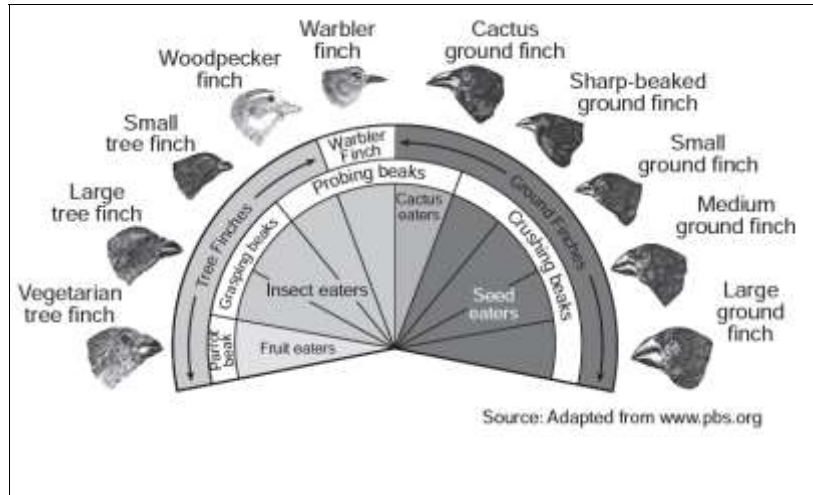
Data Base File Number: 1590

Regents Date: June2023-73.bmp

June2023

73 6/14/2023 LAB3

Answer: 3



## Galapagos finches

901. Base your answer to this question on the diagram shown and on your knowledge of biology. A new finch is found to have a diet of worms and caterpillars. Which finch from the diagram would have a beak most similar to the new finch?

- (1) cactus finch
- (2) vegetarian finch
- (3) woodpecker finch
- (4) warbler finch

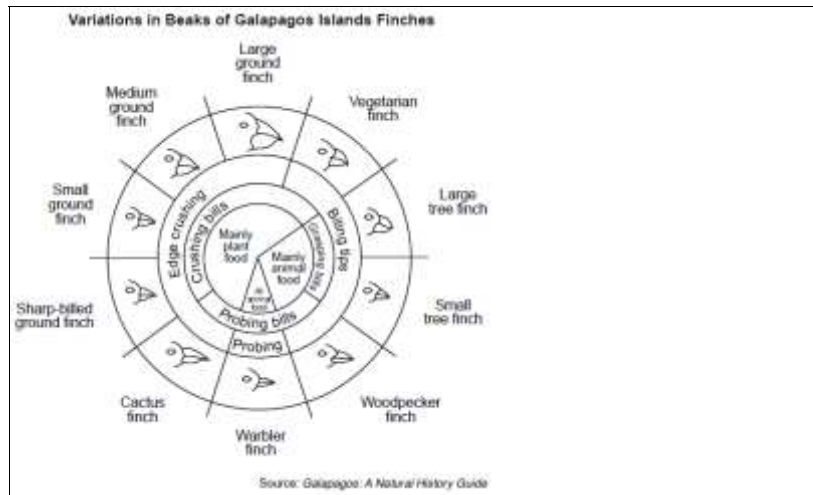
Data Base File Number: 1415

Regents Date: Jan2020-79.bmp

Jan2020

79 1/21/2020 LAB3

Answer: 4



## Galapagos Islands

902. Base your answer to this question on the diagram shown and on your knowledge of biology. Which two finches could temporarily occupy the same niche?

- (1) large ground finch and warbler finch
- (2) vegetarian tree finch and medium ground finch
- (3) large insectivorous tree finch and woodpecker finch
- (4) small insectivorous tree finch and cactus ground finch

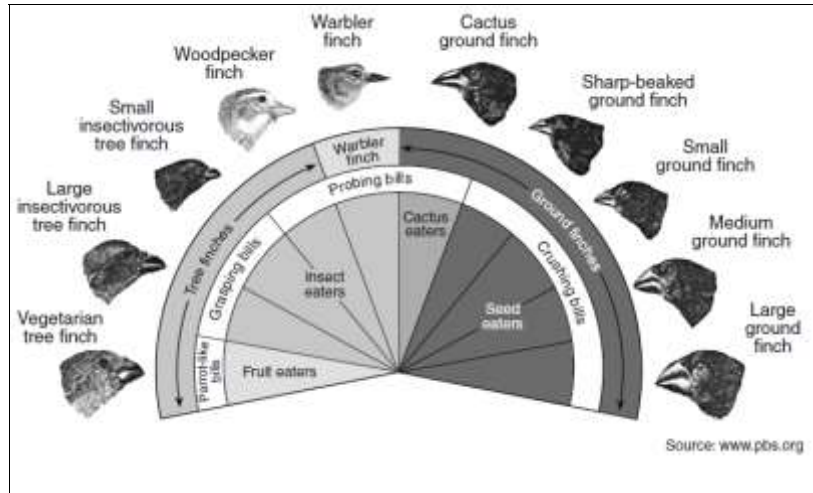
Data Base File Number: 449

Regents Date Aug2012-73.bmp

Aug2012

75 8/17/2012 LAB3

Answer 3



## gametes

903. The arrows in the diagram illustrate processes in the life of a species that reproduces sexually. Which processes result directly in the formation of cells with half the amount of genetic material that is characteristic of the species?

- (1) 1 and 2
- (2) 2 and 3
- (3) 3 and 4
- (4) 4 and 5

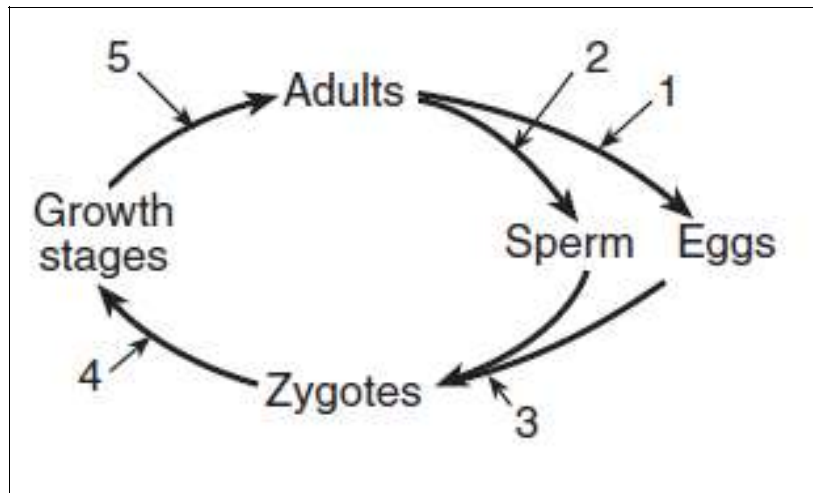
Data Base File Number: 687

Regents Date Aug2004-9.bmp

Aug2004

9 8/17/2004 S4K2

Answer 1



## gametes

904. The diagram shown represents male gametes from different animals. They all contain DNA. How are all the cells similar?

- (1) All the cells contain the haploid ( $n$ ) number of chromosomes.
- (2) All the cells contain the diploid ( $2n$ ) number of chromosomes.
- (3) All the cells contain mutant chromosomes.
- (4) All the cells contain exactly the same chromosomes

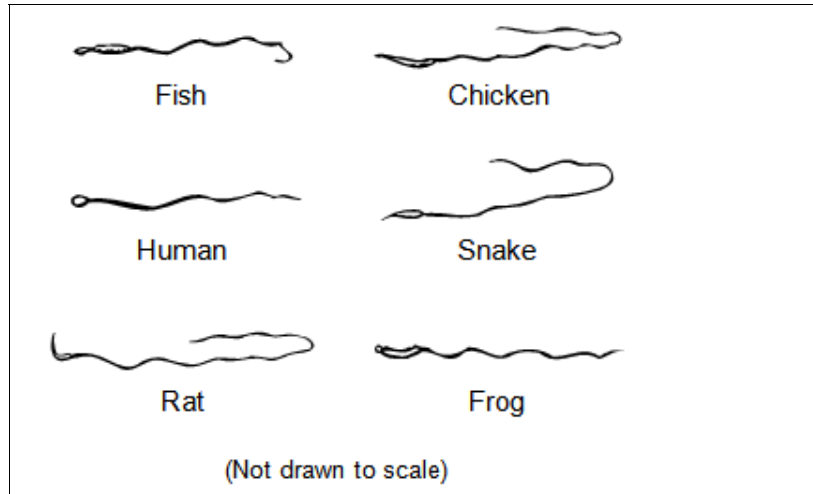
Data Base File Number: 1190

Regents Date June2017-52.bmp

June2017

52 6/14/2017 S4K4

Answer 1



## gametes

905. The fruit fly represented in the diagram shown has unusual, curled wings that formed after exposure to radiation. In order for the fly to pass this trait on to its offspring, a change had to occur in

- (1) the blood cells of the fly
- (2) the gametes of the fly
- (3) all of the body cells of the fly
- (4) the muscles of the fly

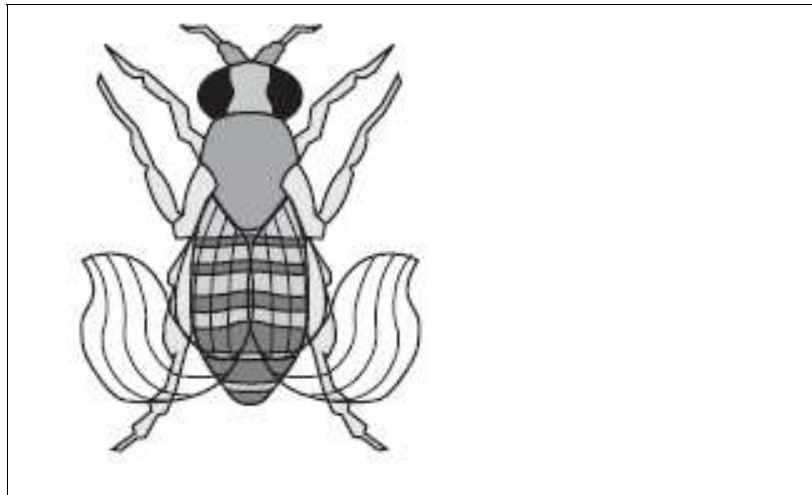
Data Base File Number: 901

Regents Date Aug2013-13.bmp

Aug2013

13 8/14/2013 S4K3

Answer 2





## gel electrophoresis

906. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents some of the steps in a procedure used in a specific laboratory activity. Samples of DNA from an eye-color gene of four individuals, W, X, Y, and Z, were cut into pieces using a type of chemical. The results of this procedure are shown. The diagram represents the results of the procedure known as

- (1) cloning  
 (2) chromatography  
 (3) gel electrophoresis  
 (4) protein sequencing

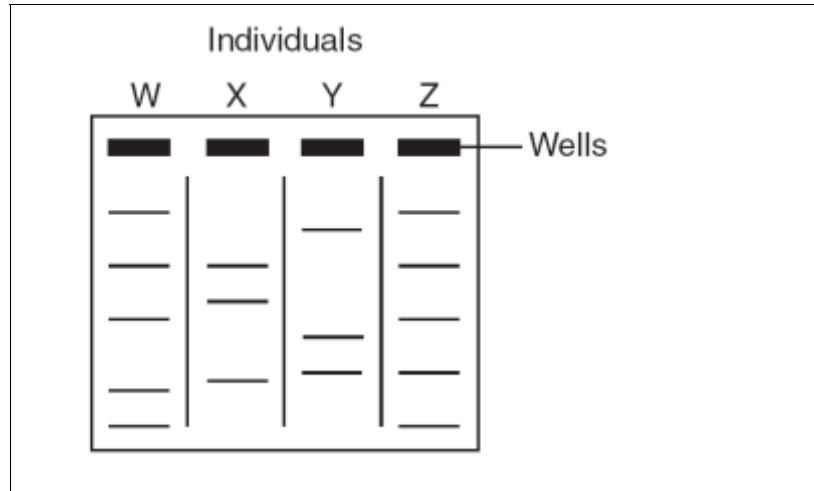
Data Base File Number: 355

Regents Date: June2011-79.bmp

June2011

81 6/21/2011 LAB1

Answer: 3



## gel electrophoresis

907. Base your answer to this question on the information given and on your knowledge of biology. An evolutionary tree shows possible relationships between several species of plants named A and B and C. According to the study of the relationships, species B and C are more closely related to each other than to species A. Which gel electrophoresis diagram would best support this statement?

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

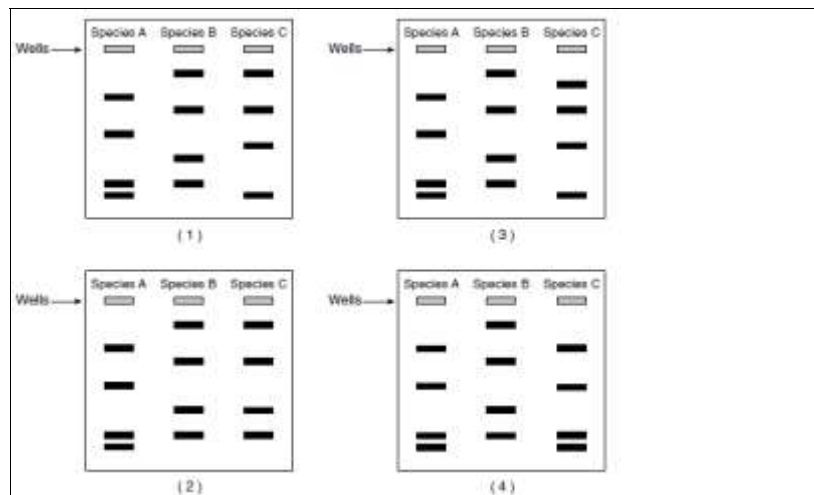
Data Base File Number: 1299

Regents Date: Aug2018-75B.bm

Aug2018

75 8/17/2018 LAB1

Answer: 2





## gel electrophoresis

908. The diagram as shown represents a DNA gel. Which individuals are most likely the result of ASEXUAL reproduction from the same parent?

- (1) W and Z  
 (2) W and X  
 (3) Y and Z  
 (4) X and Y

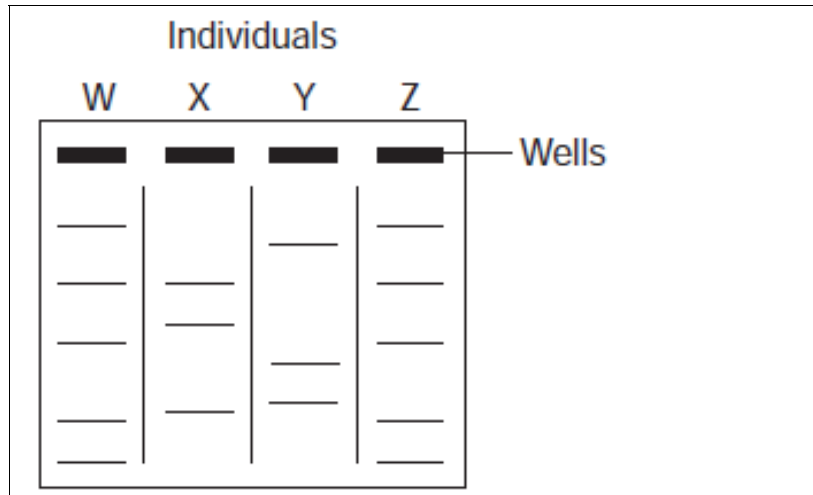
Data Base File Number: 1717

Regents Date Aug2024-85.bmp

Aug2024

85 8/20/2024 LAB1

Answer 1



## gel electrophoresis

909. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the hypothetical result of gel electrophoresis, a technique used in a lab. Where on the diagram would the largest fragments of DNA be located?

- (1) The bands closest to the wells.  
 (2) The bands far from the wells.  
 (3) The bands half-way between the wells.  
 (4) The bands one-quarter away from the wells.

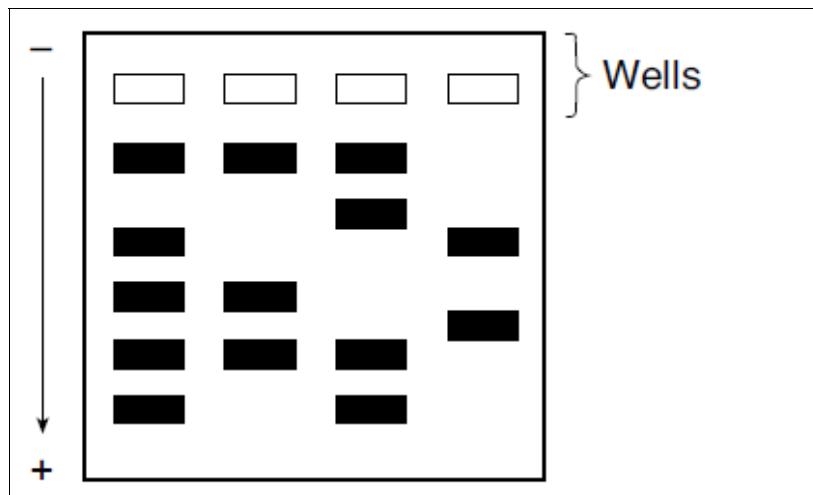
Data Base File Number: 1448

Regents Date June2021-79.bmp

June2021

79 6/22/2021 LAB1

Answer 1



## gel electrophoresis

910. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The four wells represented in the diagram were each injected with fragments that were prepared from DNA samples using identical techniques. This laboratory procedure is known as

- (1) cloning  
 (2) gel electrophoresis  
 (3) chromatography  
 (4) use of a dichotomus key

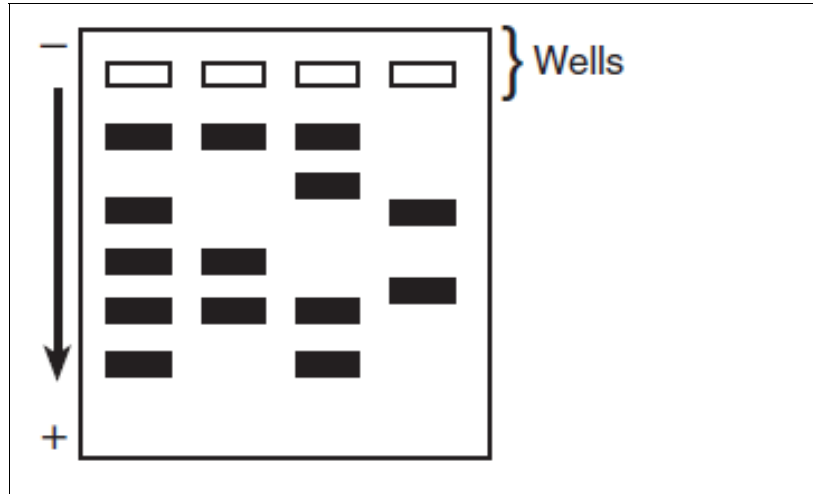
Data Base File Number: 578

Regents Date June2005-69.bmp

June2005

69 6/22/2005 LAB1

Answer 2



## gel electrophoresis

911. Base your answer to this question on the information given and on your knowledge of biology. Scientists found members of a plant species they did not recognize. They wanted to determine if the unknown species was related to one or more of four known species, A, B, C, and D. The relationship between species can be determined most accurately by comparing the results of gel electrophoresis of the DNA from different species. The chart below represents the results of gel electrophoresis of the DNA from the unknown plant species and the four known species. The unknown species is most closely related to which of the four known species?

- (1) A  
 (2) B  
 (3) C  
 (4) D

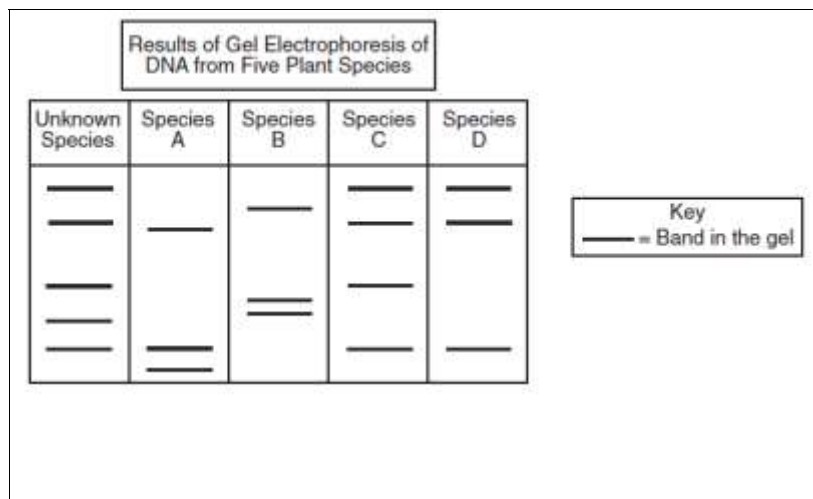
Data Base File Number: 469

Regents Date Jan2006-62.bmp

Jan2006

62 1/27/2006 LAB1

Answer 3



## gel electrophoresis

912. Base your answer to this question on the information given and on your knowledge of biology. The chart, as shown, represents the results of gel electrophoresis of DNA from an unknown individual and four known individuals. Identify the unknown individual as A, B, C, or D by comparing the gel electrophoresis results.

(1) A

(3) C

(2) B

(4) D

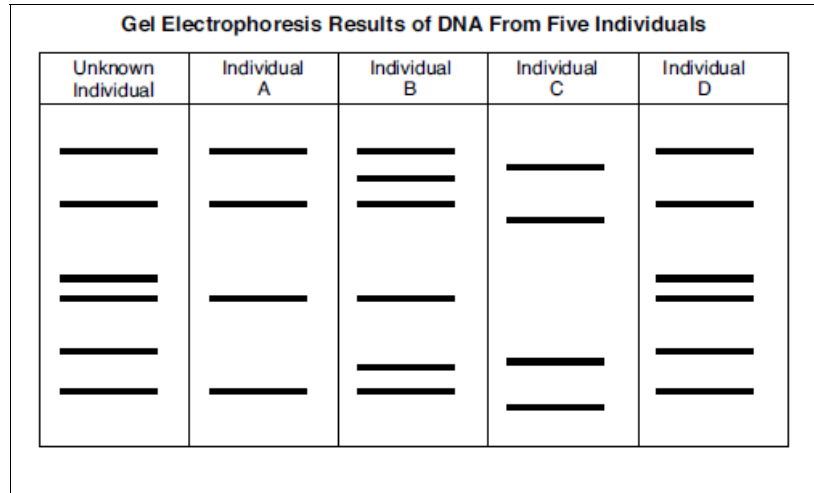
Data Base File Number: 1495

Regents Date: June2022-80.bmp

June2022

80 6/15/2022 LAB1

Answer: 4



## gel electrophoresis

913. Base your answer to this question on the information given, the diagram shown, and your knowledge of biology. A change in hemoglobin, a protein found in red blood cells, causes sickle-cell disease. Hemoglobin samples from different individuals can be compared by using a specific technique. The protein banding patterns of three samples are shown in the diagram. What technique was used to produce these results?

(1) paper chromatography

(3) active transport

(2) gel electrophoresis

(4) electron microscopy

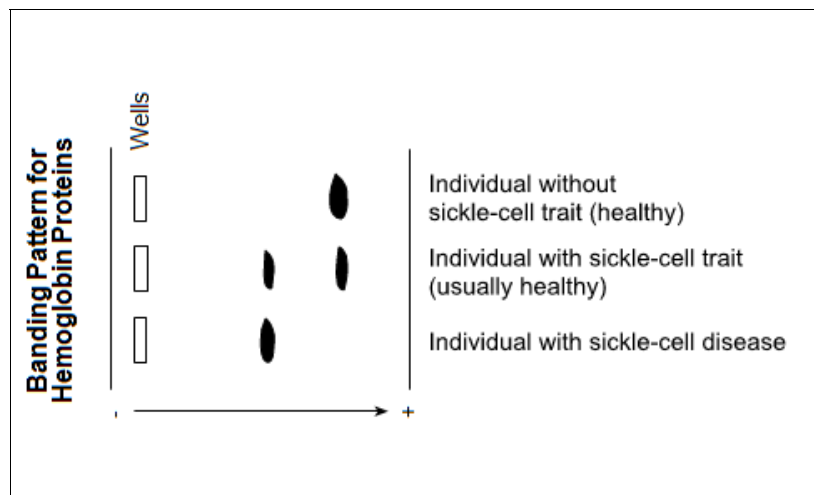
Data Base File Number: 379

Regents Date: Aug2011-84.bmp

Aug2011

84 8/18/2011 LAB1

Answer: 2



## gel electrophoresis

914. Base your answer to this question on the information and diagram given, and on your knowledge of biology. Scientists attempted to determine the evolutionary relationships between three different finch species, A, B, and C. In order to do this, they examined the physical characteristics and DNA of these species. DNA was extracted from all three species and analyzed using gel electrophoresis. The results are shown in the diagram. Which statement best describes the method used to determine the evolutionary relationships between three species of finches?

- (1) Examine the structure of the beaks and compare them.
- (2) Observe behavioral and physical characteristics of all the finches and group them by similarities.
- (3) Obtain molecular evidence from all three species and identify similarities.
- (4) Compare common ancestors of all three of the species to see if they are the same.

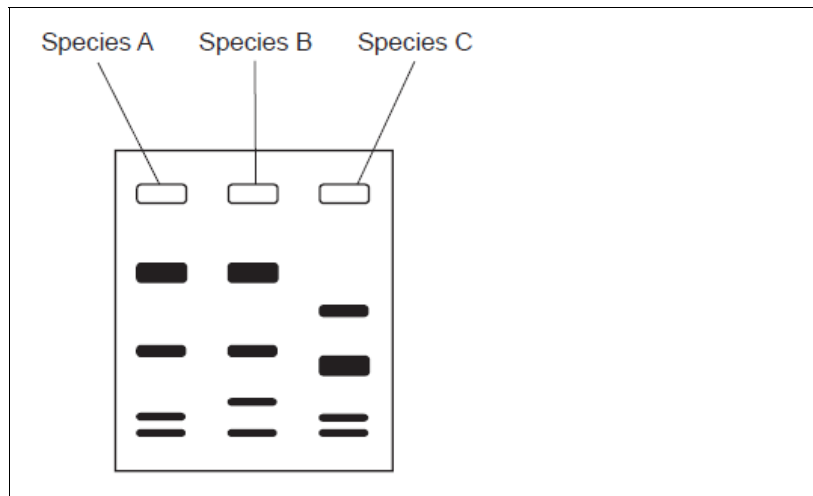
Data Base File Number: 1121

Regents Date June2016-76.bmp

June2016

76 6/15/2016 LAB1

Answer 3



## gel electrophoresis

915. A student performed a gel electrophoresis experiment. The results are represented in the diagram shown. Compared to the fragments at the top of the gel, the fragments at the lower end are

- (1) larger, and move slower
- (2) larger, and move faster
- (3) smaller, and move faster
- (4) smaller, and move slower

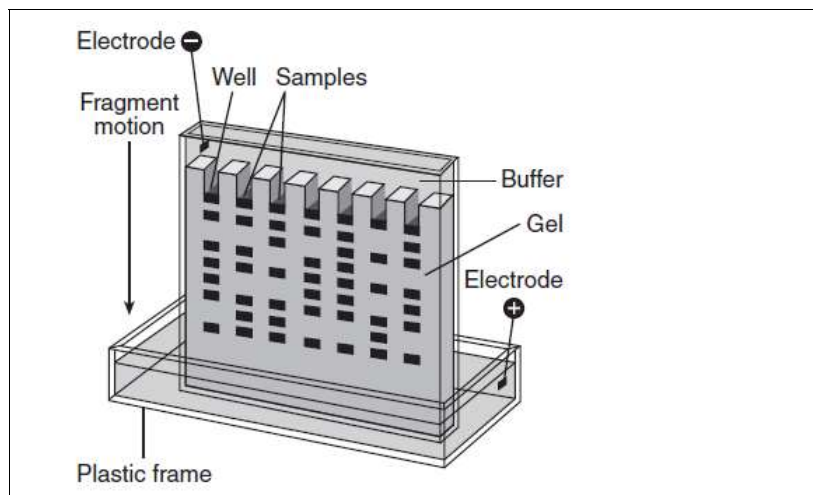
Data Base File Number: 398

Regents Date Jan2012-82.bmp

Jan2012

82 1/25/2012 LAB1

Answer 3



## gel electrophoresis

916. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram shows the results of a test that was done using DNA samples from three bears of different species. Each DNA sample was cut into fragments using a specific enzyme and placed in the wells as indicated below. The DNA fragments were then separated using gel electrophoresis. Which TWO bears are most closely related?

(1) 1 and 2

(3) 1 and 3

(2) 2 and 3

(4) 1, 2, and 3 are all closely related.

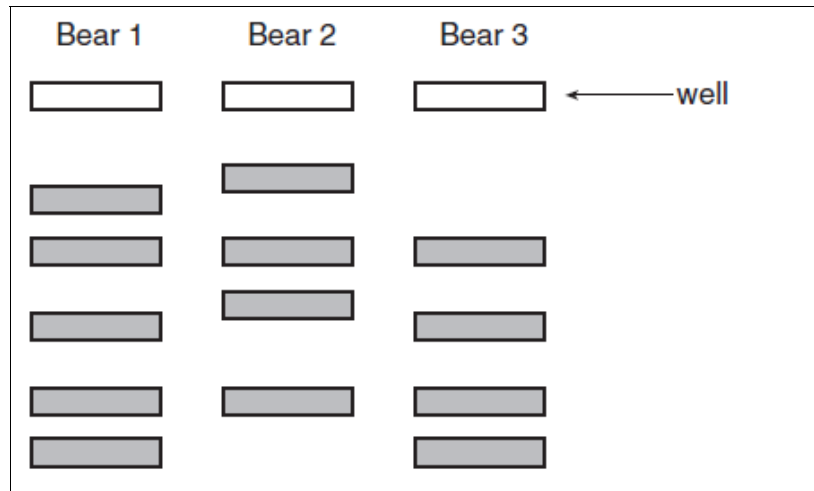
Data Base File Number: 682

Regents Date June2004-61.bmp

June2004

61 6/18/2004 LAB1

Answer 3



## gel electrophoresis

917. In the Relationships and Biodiversity lab, the enzyme used for the gel electrophoresis cut the DNA into fragments by recognizing the sequence CCGG and cutting in between C and G. Using the same enzyme on the DNA sequence shown in the diagram, how many fragments would be generated?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1710

Regents Date Aug2024-73.bmp

Aug2024

73 8/20/2024 LAB1

Answer 3

ATGCCGGAATATAAGGCCGGCGGTGTGGGC

## gel electrophoresis

918. Base your answers to questions 83 through 85 on the information below and on your knowledge of biology. As part of a laboratory technique, DNA samples taken from four plants were separated. The results are represented in the diagram shown. What lab technique was being used?

- (1) paper chromatography (2) gel electrophoresis (3) dry electrophoresis (4) plain chromatography

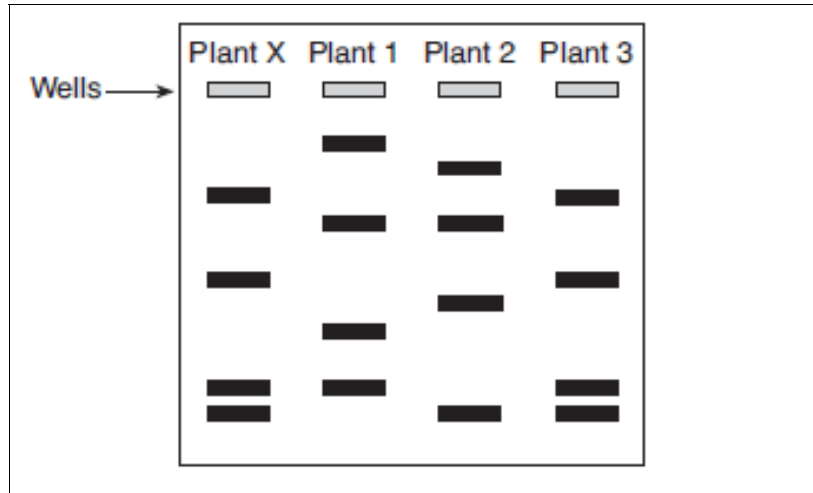
Data Base File Number: 917

Regents Date Aug2013-83.bmp

Aug2013

83 8/14/2013 LAB1

Answer 2



## gel electrophoresis

919. Base your answer to this question on the information given and on your knowledge of biology. The band labeled "X" on the image of the gel shown represents a segment of DNA associated with the production of a unique protein. The protein is being tested to determine if it might be useful in treating a disease found in horses. DNA from one of eight different plants, each thought to be from a different species, was injected into each of eight lanes of the gel. It was then compared to the plant in the first lane, which is known to produce this unique protein. In addition to the plant represented in the first lane, how many other plants most likely produce this unique protein?

- (1) 1 (2) 2 (3) 3 (4) 4

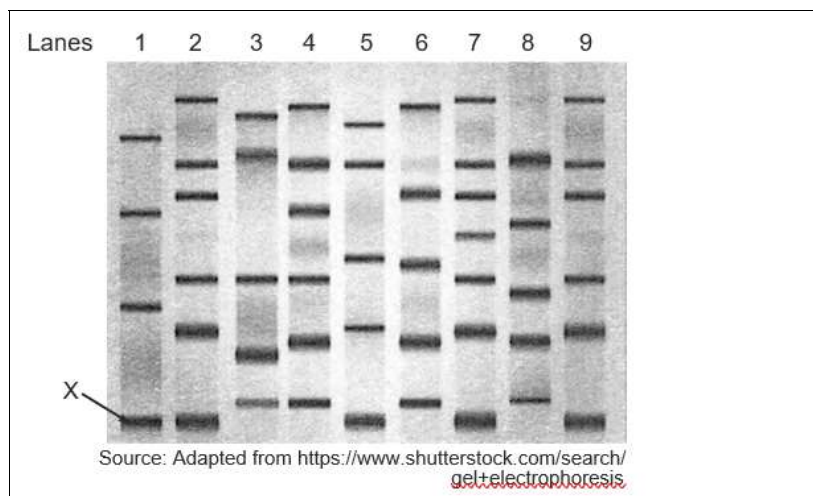
Data Base File Number: 1655

Regents Date Jan2024-83.bmp

Jan2024

83 1/23/2024 LAB1

Answer 4



## gel electrophoresis

920. The parents of a new baby believe they brought the wrong child home from the hospital. Gel electrophoresis was performed using DNA samples from the parents and the child. A section of the gel electrophoresis results is shown. Which conclusion is valid based on the gel electrophoresis results?

- (1) They have the correct child, because her genetic information is identical to that of the father.
- (2) They have the wrong child, because her genetic information does not match that of either parent.
- (3) They have the correct child, because her genetic information came from both parents.
- (4) They have the wrong child, because her genetic information matches only that of the mother.

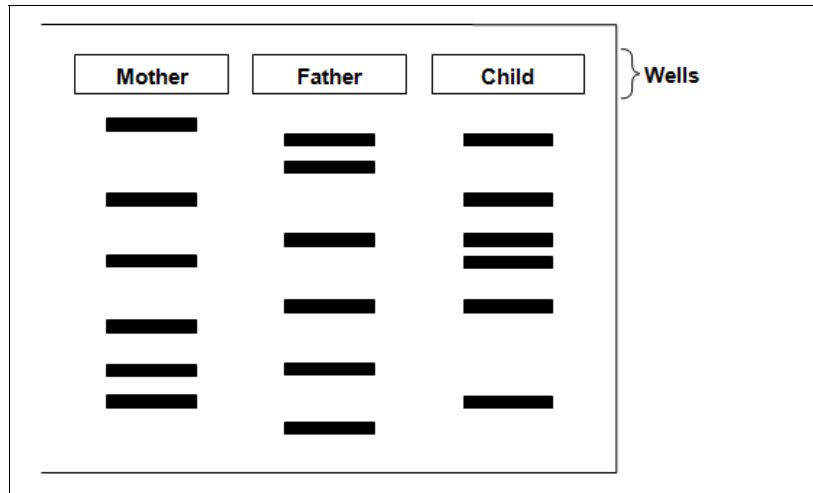
Data Base File Number: 954

Regents Date: June2014-75.bmp

June2014

75 6/17/2014 LAB1

Answer: 3



## gel electrophoresis

921. Base your answer to this question on the diagram shown that illustrates the results of a laboratory technique and on your knowledge of biology. The results of which laboratory technique are represented in the diagram?

- (1) chromatography
- (2) manipulation of genes
- (3) genetic engineering
- (4) gel electrophoresis

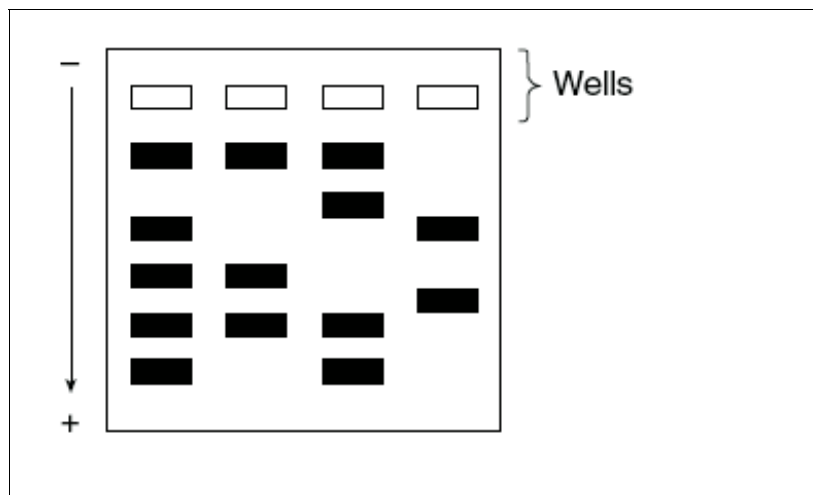
Data Base File Number: 167

Regents Date: Jan09-69.bmp

Jan2009

69 1/27/2009 LABS

Answer: 4



gene

922. The diagram shown represents a microscopic structure observed during mitosis. The region indicated by letter A is known as

- (1) an enzyme
- (2) a gamete
- (3) a gene
- (4) an amino acid

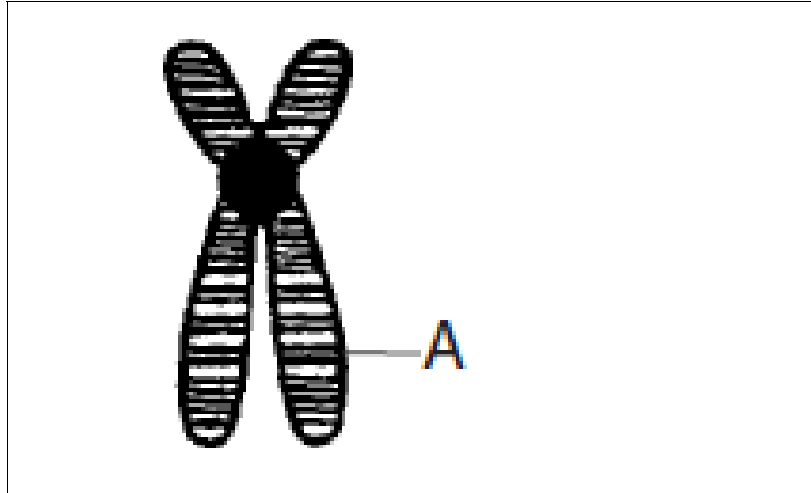
Data Base File Number: 986

Regents Date Jan2015-9.bmp

Jan2015

9 2/26/2015 S4K2

Answer 3



gene

923. Australian quolls are endangered mammals. One factor causing the death of many quolls is that they occasionally consume cane toads, which are poisonous. Scientists have identified a gene that some quolls possess that makes them avoid eating cane toads. By selectively breeding quolls with the "toad-avoiding gene" with other quolls who lack the gene, scientists found that all of the hybrid offspring inherited the survival gene. Before the survival gene could be passed on to any offspring, the genetic material present in the parent with the "toad-avoiding gene" would have to be

- (1) mutated to become a different gene
- (2) accurately replicated
- (3) genetically engineered
- (4) changed through recombination

Data Base File Number: 1691

Regents Date Aug2024-27.bmp

Aug2024

27 8/20/2024 S4K2

Answer 2





## gene

924. The kittens shown in the photo were born in the same litter. Kittens in the same litter often have similar characteristics, such as fur texture and markings, because they

- (1) were fed milk from the same mother
- (2) developed in the same environment
- (3) inherited similar genes
- (4) were born at the same time

Data Base File Number: 1628

Regents Date Jan2024-21.bmp

Jan2024

21 1/23/2024 S4K2

Answer 3



## gene alteration

925. The diagram shown represents a change that occurred in a pair of chromosomes during the formation of an egg cell. The letters represent genes on the pair of chromosomes. The alteration that occurred will most likely

- (1) be passed on to every cell that develops from the egg cell
- (2) change the chromosome number of the body cells that develop from the egg cell
- (3) convert sex cells into body cells
- (4) trigger the production of pathogens

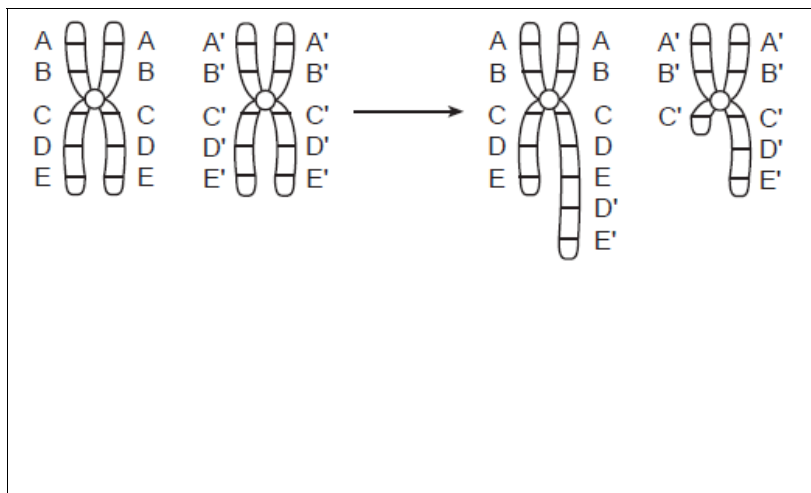
Data Base File Number: 845

Regents Date June2001-11.bmp

June2001

11 6/15/2001 S4K2

Answer 1



## gene combinations

926. The letters in the diagram shown represent genes on a particular chromosome. Gene B contains the code for an enzyme that cannot be synthesized unless gene A is also active. Which statement best explains why this can occur?

- (1) A hereditary trait can be determined by more than one gene.
- (2) Genes are made up of double-stranded segments of DNA.
- (3) All the genes on a chromosome act to produce a single trait.
- (4) The first gene on each chromosome controls all the other genes on the chromosome.

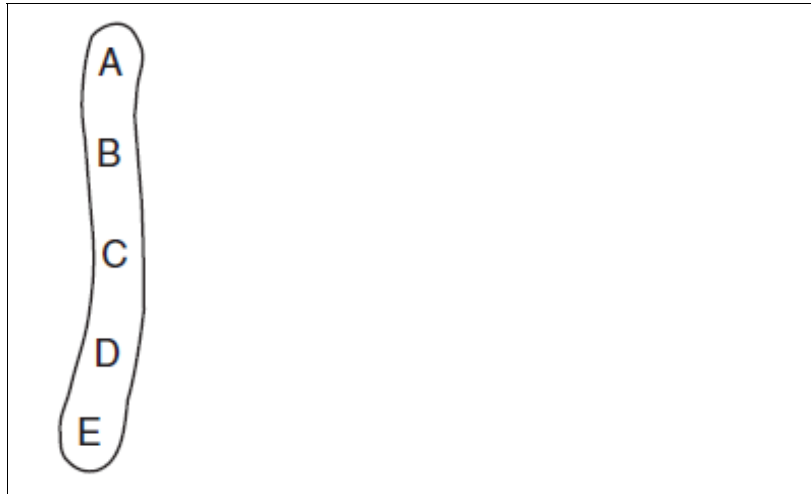
Data Base File Number: 777

Regents Date Aug2002-13.bmp

Aug2002

13 8/13/2002 S4K2

Answer 1



## gene combinations

927. A kitten was born with black fur and green eyes. The fur and eye color of its parents are shown in the chart. Which statement helps explain why the kitten has black fur?

- (1) Chromosomes present on the genes code for the characteristics of its fur.
- (2) Genetic mutations always cause the fur color and eye color to change.
- (3) Offspring receive genetic information from both parents.
- (4) Gene expression is changed in every generation, resulting in evolution.

Data Base File Number: 1174

Regents Date June2017-19.bmp

June2017

19 6/14/2017 S4K4

Answer 3

Cat	Fur	Eye Color
Father	striped	green
Mother	black	yellow
Kitten	black	green

## gene combinations

928. A reproductive cycle is illustrated as shown in the diagram. Which statement about this reproductive cycle is correct?

- (1) Mutations that occur during processes 1 and 2 will not be passed on to offspring.
- (2) Exact copies of the parents are produced, which leads to a stable population.
- (3) Sorting and recombining of genes occurs, which leads to new genetic combinations.
- (4) The three processes result in offspring with half as much genetic information as the adults.

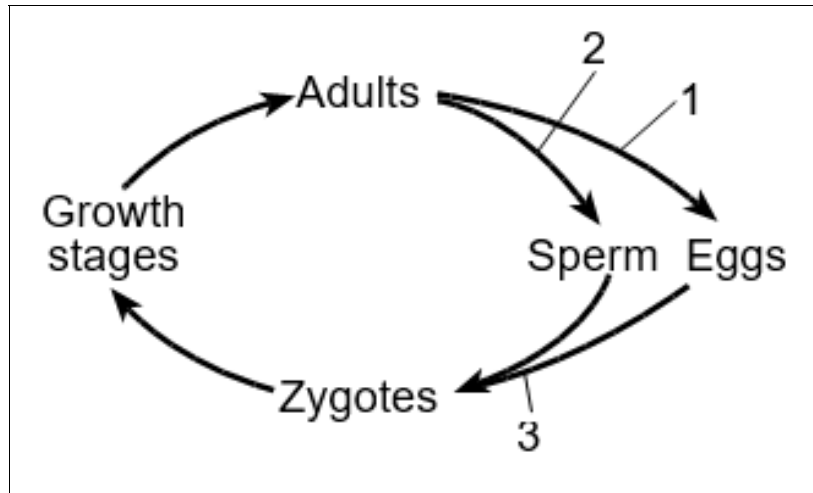
Data Base File Number: 1660

Regents Date June2024-17.bmp

June2024

17 6/14/2024 S4K3

Answer 3



## gene expression

929. Base your answer to this question on the information given and on your knowledge of biology. The models in the diagram shown illustrate two methods that can be used to modify the characteristics of plants. In both methods of reproduction, scientists are trying to produce desired traits by manipulating the

- (1) growth proteins
- (2) variation in genes inherited
- (3) number of genes inherited
- (4) DNA codes for ribosomes

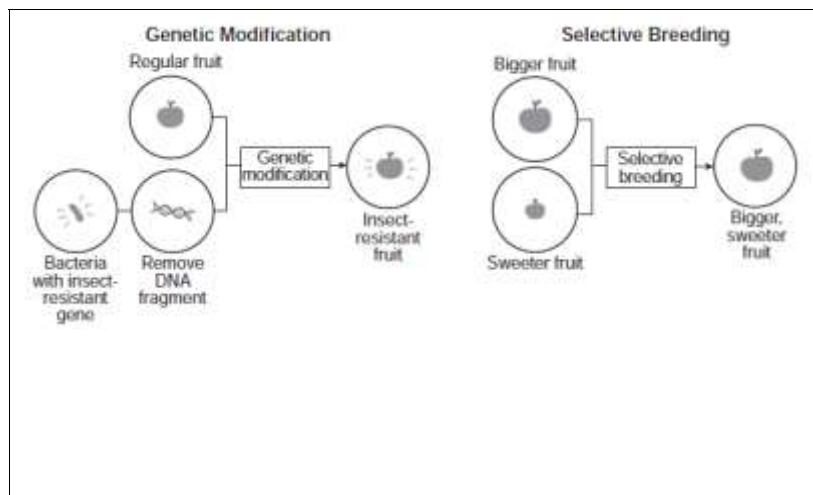
Data Base File Number: 1703

Regents Date Aug2024-48.bmp

Aug2024

49 8/20/2024 S4K2

Answer 2



## gene expression

930. Two different types of cells from an organism are shown in the diagram. How can two different types of cells function differently in the same organism even though they both contain the same genetic instructions?

- (1) The cells are mutations.
- (2) The chromosome number is different.
- (3) Different cells express different genes.
- (4) Different cells adapt to different functions.

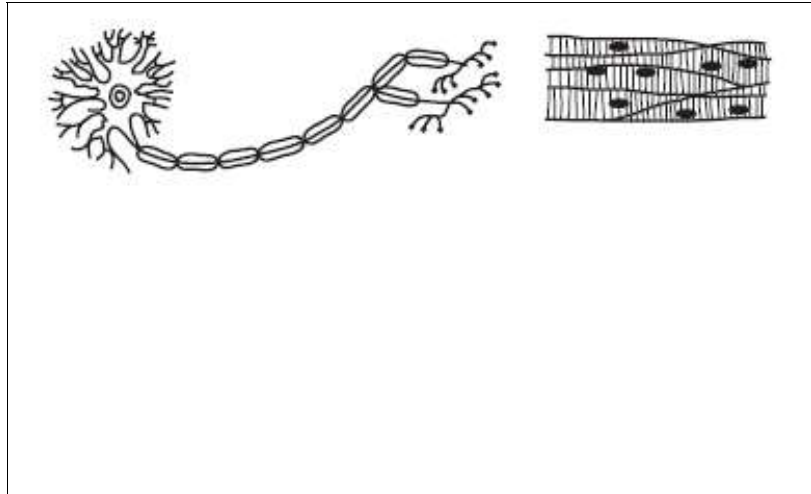
Data Base File Number: 745

Regents Date June2003-46.bmp

June2003

46 6/19/2003 S4K2

Answer 3



## gene expression

931. The Himalayan rabbit lives in the cold Tibetan mountains. It typically has white fur on its body and black fur on its outer extremities, such as the ears, nose, feet, and tail. A scientist shaved a patch of white fur off the back of a Himalayan rabbit and applied an ice pack to the area for 30 minutes. The fur in the shaved area grew in black. The best explanation for why black fur grew in the shaved area is that

- (1) the food the rabbit ate during the experiment influenced fur color
- (2) the fur in the newly shaved area was younger than the white fur on the rest of the body
- (3) the ice pack caused a mutation in the genes that regulate fur color
- (4) warm and cold temperatures activate different genes for fur color

Data Base File Number: 1687

Regents Date Aug2024-13.bmp

Aug2024

13 8/20/2024 S4K2

Answer 4



## gene expression

932. The chart shows relationships between genes, the environment, and coloration of tomato plants. Which statement best explains the final appearance of these tomato plants?

- (1) The expression of gene A is not affected by light.
- (2) The expression of gene B varies with the presence of light.
- (3) The expression of gene A varies with the environment.
- (4) Gene B is expressed only in darkness.

Data Base File Number: 656

Regents Date June2004-8.bmp

June2004

8 6/18/2004 S4K2

Answer 3

Inherited Gene	Environmental Condition	Final Appearance
A	Light	Green
B	Light	White
A	Dark	White
B	Dark	White

gene expression

933. The kittens in the photograph shown were all born in the same litter. ONE possible reason that they all have different fur colors and patterns is that

- (1) different kittens inherited more chromosomes from one parent than the other
- (2) there was a random resorting of genes during gamete formation in each parent
- (3) because there were so many, they did not receive the same amount of nutrients from the mother
- (4) there were pH differences depending on where in the uterus each kitten developed

Data Base File Number: 1700

Regents Date Aug2024-39.bmp

Aug2024

39 8/20/2024 S4K4

Answer 2



gene expression

934. Two types of cells from an individual are represented in the diagram labeled as "A". Examine the part of the diagram labeled as "B". Which model, that shows only some of the chromosomes in each of the two types of cells, best explains why these cells are so different?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

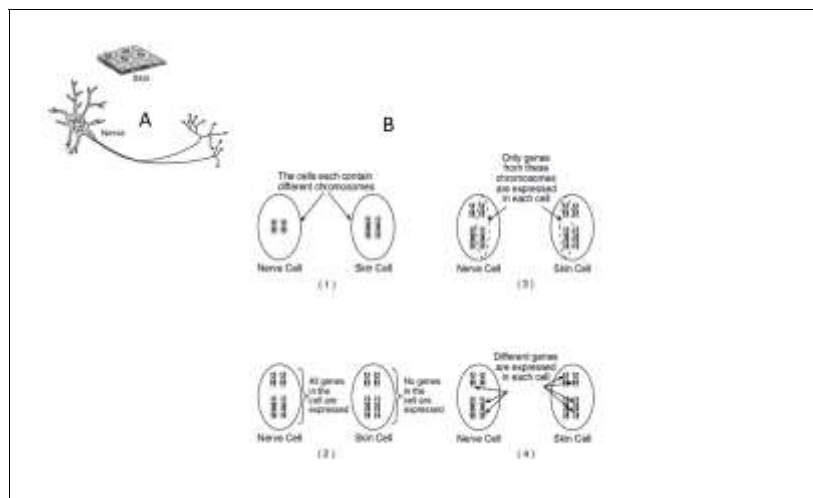
Data Base File Number: 1476

Regents Date June2022-40C.b

June2022

40 6/15/2022 S4K2

Answer 4



## gene expression

935. Base your answer to this question on the information given, and the data table shown, and on your knowledge of biology. For most animals, the sex of the offspring is determined by sex chromosomes. In some species of reptiles, such as the painted turtle, there are no sex chromosomes. It has been discovered that the sex of the offspring is determined by the temperature of the nest in which the egg develops. Examine the data table showing the effect of nest temperature on the sex of the offspring. The fact that the sex of the painted turtle offspring is controlled by the temperature of the nest is an example of

- (1) natural selection causing a new species to form
- (2) a predator-prey interaction
- (3) habitat destruction decreasing biodiversity
- (4) environment modifying gene expression

Data Base File Number: 1111

Regents Date June2016-44.bmp

June2016

47 6/15/2016 S4K2

Answer 4

Temperature (°C)	Sex of Offspring	
	Males (%)	Females (%)
19	0	100
20	5	95
21	20	80
22	25	75
23	0	100
24	0	100
25	0	100

## gene expression

936. The diagram shown represents genetic material. The expression of the section labeled X may be modified by

- (1) temperature, only
- (2) asexual reproduction
- (3) the environment
- (4) pH, only

Data Base File Number: 407

Regents Date June2012-13.bmp

June2012

13 6/19/2012 S4K2

Answer 3



## gene expression

937. The photographs shown are of two Siamese cats. The Siamese breed has a gene that controls fur color. The cat in the first photograph was kept indoors while the cat in the second photograph was kept outdoors. Which statement best explains the differences in fur color between these two cats?
- (1) The cat kept indoors is older than the cat kept outdoors.
  - (2) The environment influenced the expression of fur color genes.
  - (3) The environment influenced the production of all the proteins in the cat kept outdoors.
  - (4) The cat kept outdoors has a gene mutation that prevents it from producing light-colored fur.

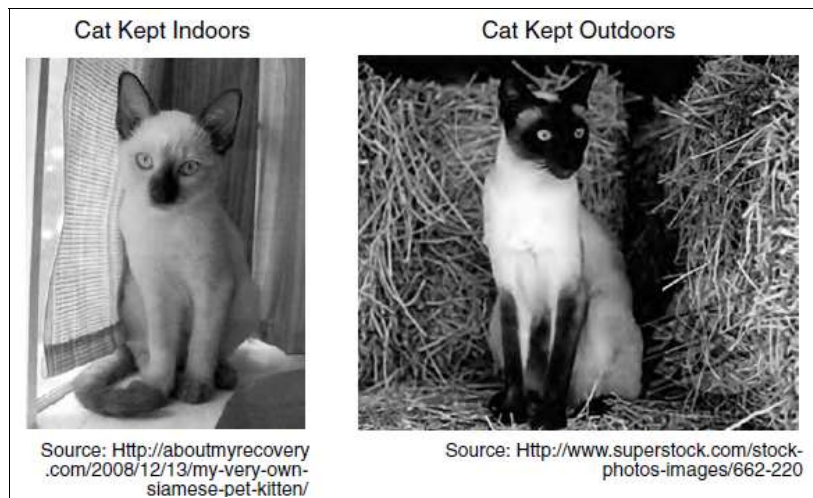
Data Base File Number: 1233

Regents Date Jan2018-29.bmp

Jan2018

29 1/22/2018 S4K2

Answer 2



## gene expression

938. The table shown indicates a reproductive pattern in some sea turtles when eggs develop in areas with differing temperatures. The sex of turtle offspring is most probably
- (1) determined only by genes inherited from the parent turtles
  - (2) controlled entirely by the location where the young are raised
  - (3) a result of genetic information being influenced by environmental conditions
  - (4) an identical pattern to the reproductive pattern found in humans

Data Base File Number: 907

Regents Date Aug2013-35.bmp

Aug2013

35 8/14/2013 S4K4

Answer 3

Temperature (°C)	Offspring Produced
below 23	usually none
23–27	mostly males
28–30	50/50 males: females
31–33	mostly females
above 33	usually none



## gene expression

939. The development of nerve, muscle, and skin cells is represented in the diagram as shown. Which statement best explains how each of the different cell types can develop from the same embryo?

- (1) The cells have identical genetic instructions, but different parts of these instructions are being expressed in each cell.
- (2) The cells have identical genetic instructions, and all parts of these instructions are being expressed in each cell.
- (3) The cells are produced by asexual reproduction and contain identical genetic instructions.
- (4) The cells contain genetic instructions from two different parents and will express the instructions from one parent, only.

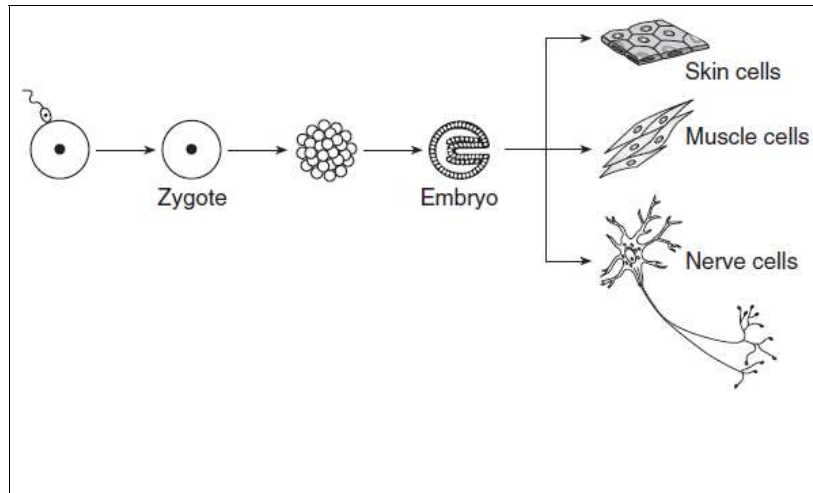
Data Base File Number: 1025

Regents Date June2015-37.bmp

June2015

37 6/16/2015 S4K2

Answer 1



gene expression

940. Base your answer to this question on the diagram and chart shown and on your knowledge of biology. The diagram represents events that occur during the early stages of embryonic development. The chart shows some of the genes (A-E) present in each of the three cell types shown in the diagram. The genes that are shaded in the chart represent genes that are expressed and used by that cell type. A substance that is essential to the functioning of all cells is most likely coded for by gene

(1) A

(3) C

(2) B

(4) D

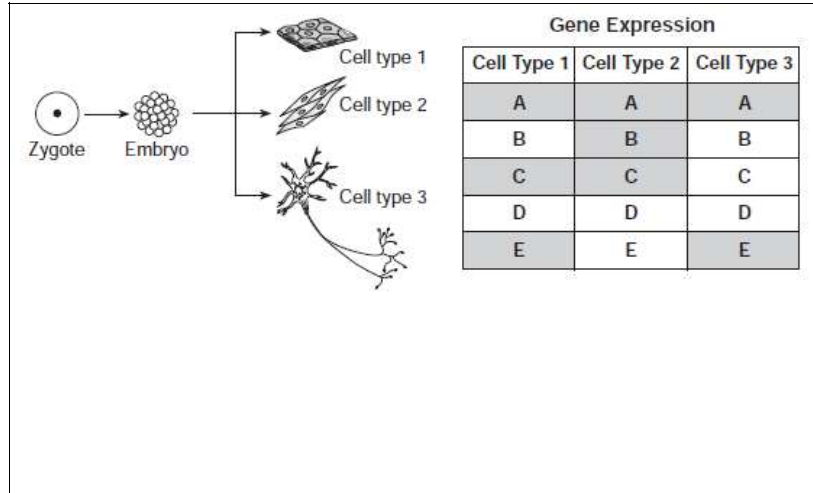
Data Base File Number: 1611

Regents Date Aug2023-36.bmp

Aug2023

37 8/17/2023 S1K3

Answer 1



## gene expression

941. Researchers studying water fleas (tiny organisms that live in fresh water) have noticed that the appearance of the water flea follows a pattern, as seen in the table shown. If all three water fleas are genetically identical, which statement best explains why the three water fleas have different appearances?

- (1) Random alterations of genes occur in water fleas when they eat different foods.
- (2) Predators in the water flea's environment cause mutations in the water flea.
- (3) Genes are not involved in the appearance of these water fleas.
- (4) Water flea gene expression can be influenced by the type of predator present in their environment.




Data Base File Number: 1670

Regents Date June2024-37.bmp

June2024

37 6/14/2024 S4K2

Answer 4

Type of predator found in water flea environment	No predator	Stickleback fish	Backswimmer bug
Water flea appearance (Not drawn to scale)			

Source: <https://www.livescience.com/55297-how-water-fleas-grow-body-armor.html>

## gene expression

942. Base your answer to this question on the information given and on your knowledge of biology. A student grew ten tomato plants from seed. Each plant received the same amount of water, sunlight and nutrients. After three weeks, the heights of the ten plants were measured in centimeters (cm). The results are shown in the table. What is one likely reason for differences in the heights of the plants.

- (1) differences in genes  
(2) more fertilizer for the higher plants  
(3) more water for higher plants  
(4) some plants were in the shade

Data Base 445  
File Number:

Regents Date Aug2012-44.bmp

Aug2012

44 8/17/2012 LABA

Answer 1

Tomato plant A = 5 cm	Tomato plant F = 9 cm
Tomato plant B = 3 cm	Tomato plant G = 7 cm
Tomato plant C = 3 cm	Tomato plant H = 5 cm
Tomato plant D = 3 cm	Tomato plant I = 3 cm
Tomato plant E = 5 cm	Tomato plant J = 7 cm

## gene expression

943. The cells that make up leaves on a tree are genetically identical, yet the leaves often have different shapes and sizes, as shown in the diagram. Which statement best explains this difference in leaf appearance?

- (1) The leaves at the top of the tree get more sunlight, causing the genes in their cells to be expressed differently.
- (2) The genes in the cells of leaves at the top of the tree are destroyed by sunlight, causing the leaves to stop growing.
- (3) The leaves near the bottom of the tree have more genes related to leaf size, causing them to grow larger.
- (4) The genes in the cells of leaves near the bottom of the tree increase in number, causing them to grow even larger.

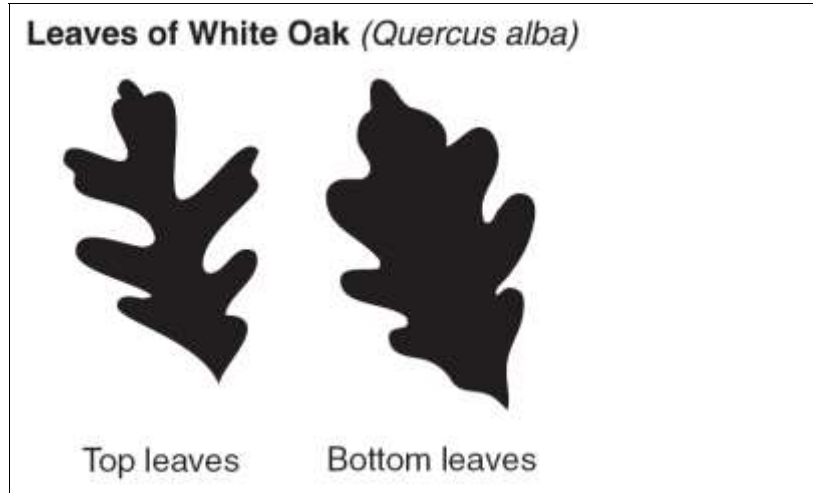
Data Base 336  
File Number:

Regents Date June2011-13.bmp

June2011

13 6/21/2011 S4K2

Answer 1



## gene expression

944. The brown anole is native to Cuba and the Bahamas. Males and females of the species share most of the same genes. They are the same size when they hatch out of their eggs. However, during the first year, the males grow to be three times larger than the females. The most likely explanation for the differences in size between male and female anoles is that

- (1) male organisms are always larger than the female members of a species
- (2) the males developed for a longer period of time
- (3) the females mutated during hatching, reducing their ability to grow
- (4) hormones can affect gene expression

Data Base File Number: 1568

Regents Date June2023-17.bmp

June2023

17 6/14/2023 LAB2

Answer 3



Source: Science Daily 3/1/17

## gene expression

945. The photograph shows two color variations of Himalayan rabbits. In the winter, the rabbits resemble the one on the left. In the summer, the rabbits resemble the one on the right. The changes in fur color are most likely due to

- (1) a virus that affected genes in specific areas of the body
- (2) the sorting and recombination of genes
- (3) gene expression due to the differences in abiotic conditions
- (4) the molecular arrangement of sugars

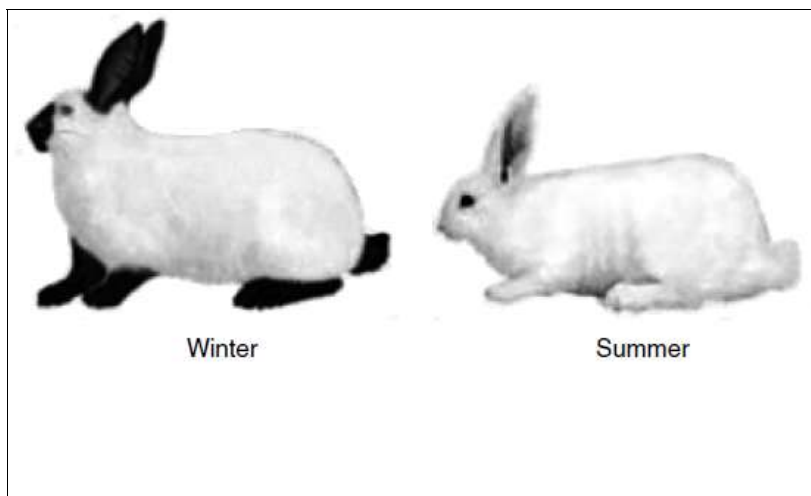
Data Base File Number: 1154

Regents Date Jan2017-16.bmp

Jan2017

16 1/25/2017 S4K4

Answer 3



## gene expression

946. Base your answer to this question on the information shown and on your knowledge of biology. Color in peppered moths is controlled by genes. A light-colored variety and a dark-colored variety of a peppered moth species exist in nature. The moths often rest on tree trunks, and several different species of birds are predators of this moth. Before industrialization in England, the light-colored variety was much more abundant than the dark-colored variety and evidence indicates that many tree trunks at that time were covered with light-colored lichens. Later, industrialization developed and brought pollution which killed the lichens leaving the tree trunks covered with dark-colored soot. The results of a study made in England are shown in the graph. Which conclusion can best be drawn from the information given?

- (1) The trait for dark coloration better suits the peppered moth for survival in non-polluted environments.
- (2) The trait for light coloration better suits the peppered moth for survival in polluted environments.
- (3) The variation of color in the peppered moth has no influence on survival of the moth.
- (4) A given trait may be a favorable adaptation in one environment, but not in another environment.

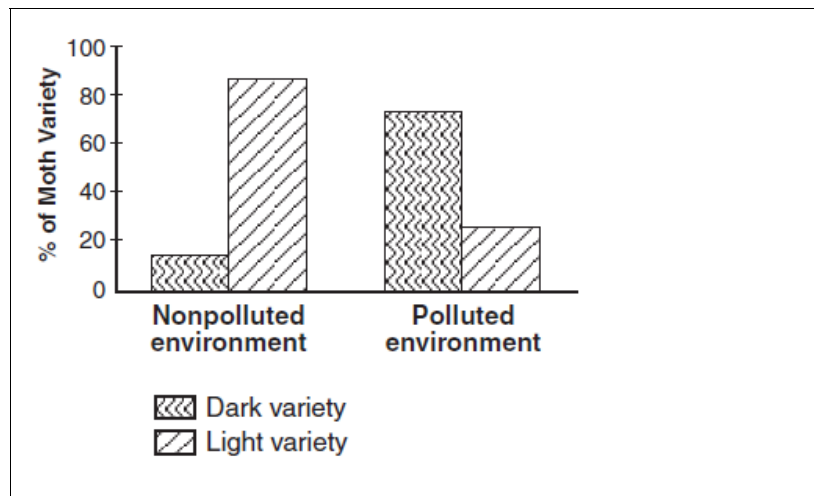
Data Base 649  
File Number:

Regents Date Jan2004-46.bmp

Jan2004

50 1/29/2004 S1K3

Answer 4



## gene expression

947. Which statement best explains the change shown in the diagram?

- (1) Gene expression in an organism can be modified by interactions with the environment.
- (2) Certain rabbits produce mutations that affect genes in specific areas of the body.
- (3) Sorting and recombination of genes can be influenced by very cold temperatures.
- (4) Molecular arrangement in existing proteins can be altered by environmental factors.

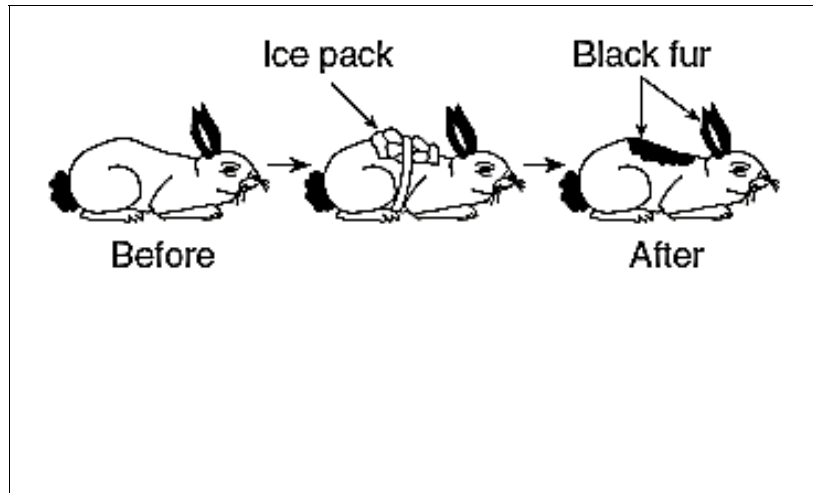
Data Base File Number: 48

Regents Date Jan07-6.bmp

Jan2007

6 1/26/2007 S4K1

Answer 1



## gene expression

948. The photographs shown are side-by-side images of twins A and B with identical genetic information. Twin A is a nonsmoker, while twin B is a longtime smoker. The best explanation for the differences in the appearance of the twins is that

- (1) twin B is older than twin A
- (2) they each inherited half of their DNA from each parent
- (3) the expression of genes is influenced by the environment
- (4) one twin resembles the mother and the other resembles the father

Data Base File Number: 1279

Regents Date Aug2018-23.bmp

Aug2018

23 8/17/2018 S4K2

Answer 3





## gene expression

949. A photograph of a Siamese cat is shown. Siamese cats have dark fur on areas of the body that are cooler and light fur on parts of the body that are warmer. The color differences in this Siamese cat are most likely due to

- (1) a decrease in glucose produced in areas with light fur
- (2) more DNA molecules being produced in areas with light fur
- (3) gene expression being influenced by the environment
- (4) mutations in the genes for eye color

Data Base File Number: 1301

Regents Date Jan2019-2.bmp

Jan2019

3 1/22/2019 S4K2

Answer 3



Source: [www.pinterest.com/explorer/siamese/cats](http://www.pinterest.com/explorer/siamese/cats)

## gene expression

950. Base your answer to this question on the information and photographs shown and on your knowledge of biology. An arctic fox has a gland in its brain that secretes a hormone that regulates the production of melanin, a pigment that accounts for brown fur. In the winter, the foxes secrete more of this hormone and their cells stop making melanin, so they appear white. The pictures shown illustrate two variations of fur color. Which statement is the most likely explanation for the color differences in the fur of the fox at different times of the year?

- (1) Mutations can be caused by changes in the number of biotic factors in the environment.
- (2) The expression of genes can be modified by the external environment.
- (3) Hereditary information is contained in genes located in the chromosomes of each cell.
- (4) Random changes in DNA can occur to change the expression of a gene.

Data Base 1515  
File Number:

Regents Date Aug2022-37.bmp

Aug2022

38 8/17/2022 S4K2

Answer 2



Source: <http://www.nationalgeographic.com/animals/mammals/a/arctic-fox/>

## gene expression

951. The diagram shown represents the change in a sprouting onion bulb when sunlight is present and when sunlight is no longer available. Which statement best explains this change?

- (1) Plants need oxygen to survive.
- (2) Environmental conditions do not alter characteristics.
- (3) Plants produce hormones.
- (4) The environment can influence the expression of certain genetic traits.

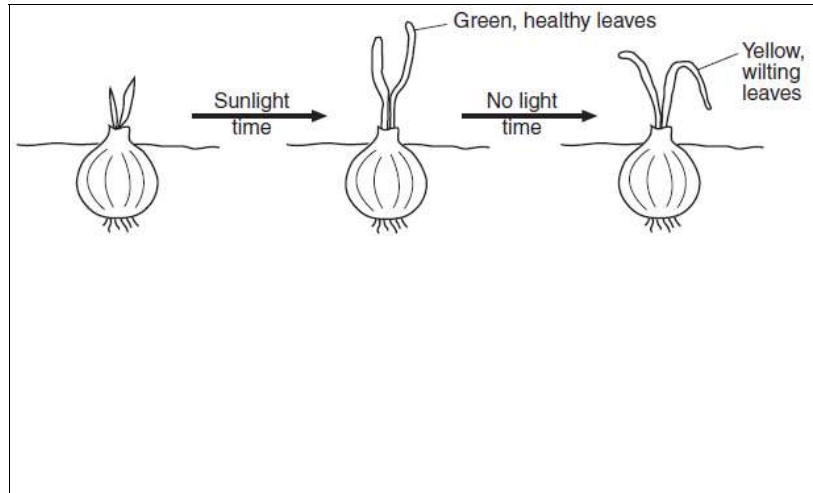
Data Base File Number: 802

Regents Date June2002-9.bmp

June2002

9 6/19/2002 S4K2

Answer 4



## gene mutation

952. The diagrams shown represent portions of the genes that code for wing structure in two organisms of the same species. Gene 1 was taken from the cells of a female with normal wings, and gene 2 was taken from the cells of a female with abnormal wings. The abnormal wing structure was most likely due to

- (1) an insertion
- (2) a substitution
- (3) a deletion
- (4) normal replication

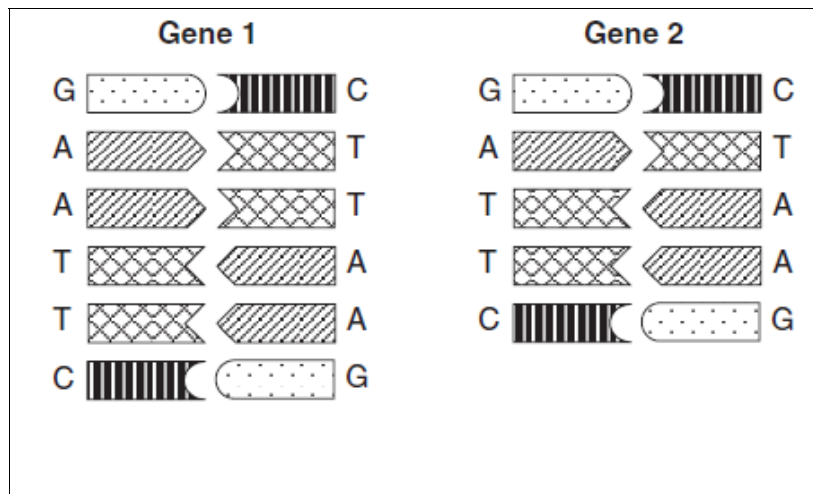
Data Base File Number: 861

Regents Date Aug2001-8.bmp

Aug2001

8 8/16/2001 S4K2

Answer 3



## gene mutation

953. A sample of body cells and samples of sex cells received from four members of a species are screened for the presence of a specific gene mutation. The results of the gene-testing procedure conducted on the cells are shown in the table. Which species member would be unlikely to pass the gene mutation on to its offspring?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 417

Regents Date June2012-40.bmp

June2012

40 6/19/2012 S4K3

Answer 4

Species Member Tested	Type of Cells Tested and the Result (+ = mutation present, - = mutation absent)		
	Body Cells	Sperm	Egg
1	+		+
2	+	+	
3	-		+
4	+	-	

## gene mutation

954. During the process of chromosome replication, a genetic error occurs. As a result, a sequence of events occurs as shown in the diagram. The usual order in which these events would occur is

(1) B--D--A--C

(3) D--A--B--C

(2) B--C--D--A

(4) D--C--B--A

Data Base File Number: 1298

Regents Date Aug2018-74.bmp

Aug2018

74 8/17/2018 LAB1

Answer 1

Event A: a protein with a new sequence of amino acids is produced  
Event B: a DNA strand with an altered base sequence is formed  
Event C: a new inheritable trait is expressed in an organism  
Event D: an mRNA strand with a new sequence of bases is synthesized

gene mutation

955. The diagrams shown represent portions of two genes that code for leaf structure in the same species of clover. Gene 1 was taken from the cells of a clover plant with 3 leaves and gene 2 was taken from the cells of a clover plant with 4 leaves. The clover plant having gene 2 (4 leaves) was most likely the result of

- (1) an insertion
- (2) a deletion
- (3) a substitution
- (4) normal replication

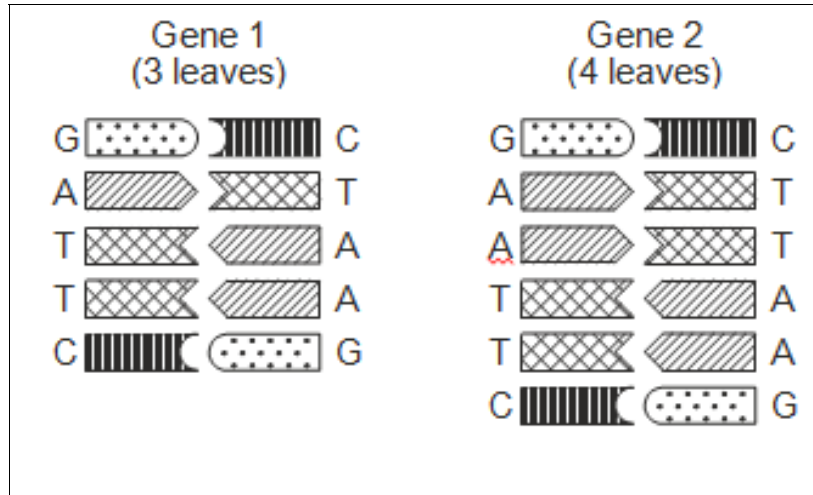
Data Base File Number: 1208

Regents Date Aug2017-34.bmp

Aug2017

34 8/17/2017 S4K2

Answer 1



gene mutation

956. The diagram shown represents cellular growth that can occur in human skin after prolonged exposure to ultraviolet light. Which statement provides a possible explanation for this growth pattern?

- (1) Manipulation of genes caused the movement of embryonic skin cells.
- (2) Exposure to light stimulated the development of cells containing ozone.
- (3) Uncontrolled mitotic division occurred as a result of gene mutations.
- (4) An immune reaction triggered the formation of excess blood cells.

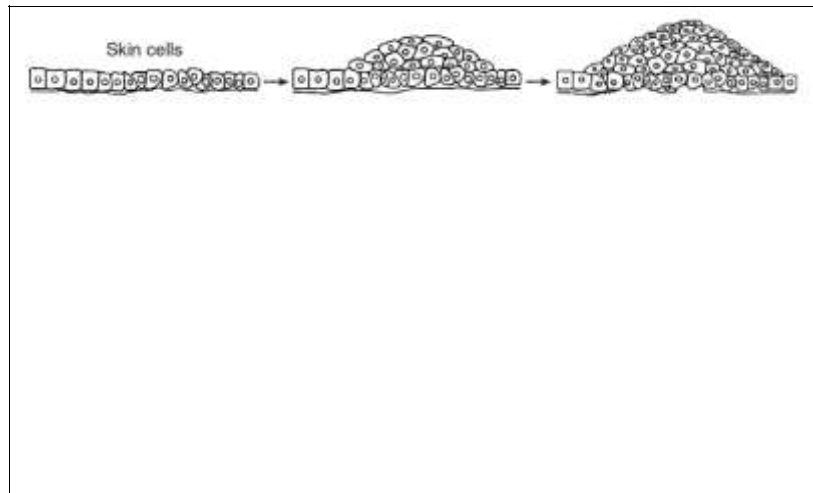
Data Base File Number: 1057

Regents Date August2015-47.b

Aug2015

47 8/12/2015 S4K5

Answer 3



## gene size

957. The chart shown compares the size of three structures: a gene, a nucleus, and a chromosome. Based on this information, structure A would most likely be a

- (1) chromosome that is part of structure C
- (2) chromosome that contains structures B and C
- (3) nucleus that contains both structure B and structure A
- (4) gene that is part of structure B

Data Base File Number: 264

Regents Date June2010-37.bmp

June2010

37 6/16/2010 S4K2

Answer 4

Size	Structure
smallest in size	A
↓	B
greatest in size	C

## gene splicing

958. The diagram below represents one technique used in biotechnology. The organic compound used to cut the bacterial DNA so that the human DNA could be inserted is a

- (1) molecular base
- (2) carbohydrate
- (3) specific enzyme
- (4) hormone

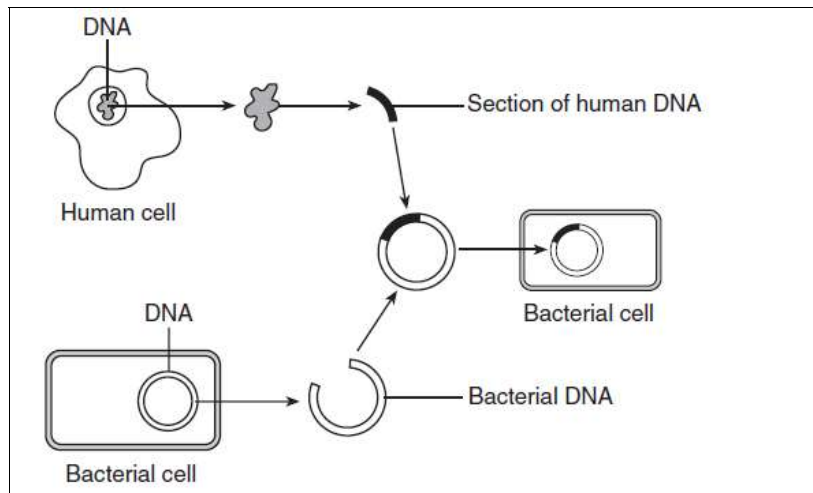
Data Base File Number: 242

Regents Date Jan2010-41.bmp

Jan2010

40 1/26/2010 S4K2

Answer 3



## gene splicing

959. The diagram shown represents a technique used in some molecular biology laboratories. Which phrase best describes a possible result of this process?

- (1) the production of gametes having both human and bacterial DNA
- (2) the production of a human hormone by the bacterial cell
- (3) the introduction of a pathogen into a human cell
- (4) the separation of DNA fingerprints in the bacterial cell

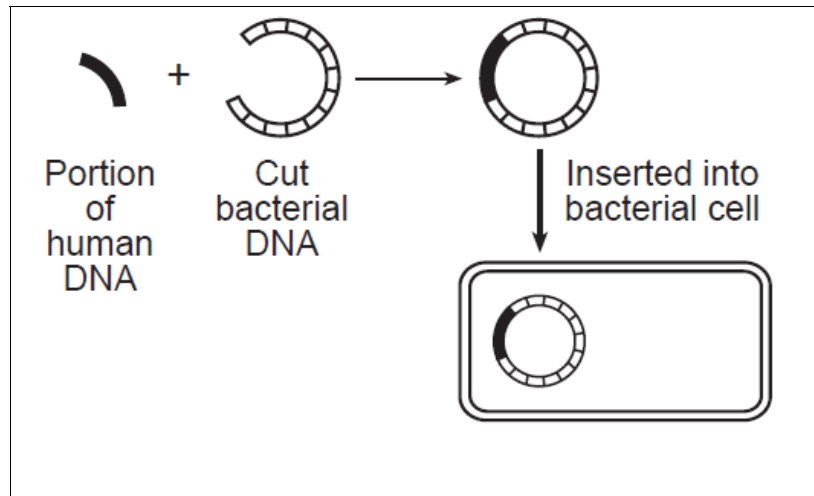
Data Base File Number: 924

Regents Date Jan2014-38.bmp

Jan2014

38 1/27/2014 S4K2

Answer 2



## gene splicing

960. The diagram shown represents a technique currently used by scientists in the field of biotechnology. Which statement describes a possible outcome of this technique?

- (1) The bacterium is able to produce a human hormone.
- (2) It allows the bacterium to grow in humans, since it contains a human gene.
- (3) It allows humans to become immune to an infection from this type of bacteria.
- (4) The bacterium can now produce human cells identical to cells of the DNA donor.

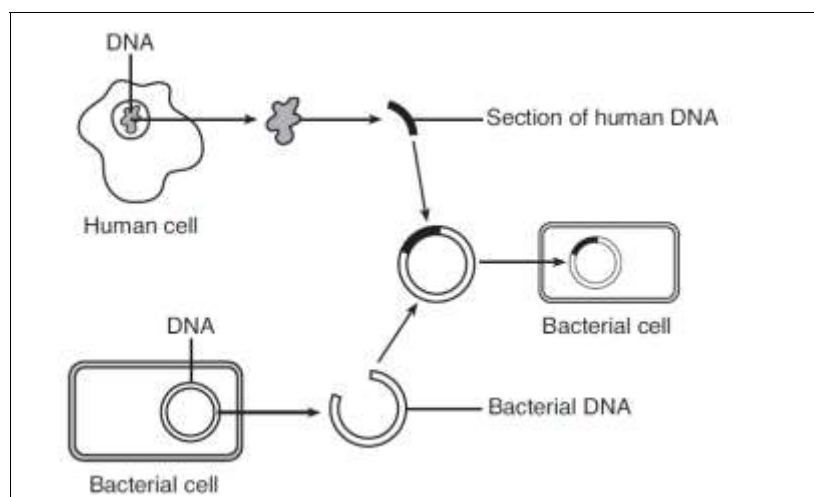
Data Base File Number: 212

Regents Date August2009-12.b

Aug2009

12 8/13/2009 S4K2

Answer 1



genetic code

961. NOTE- If you need a LARGER UNIVERSAL GENETIC CODE CHART for easier viewing, your teacher will supply it. ----- A DNA Base Sequence is : AAG-CCA-TGA-ACA. The mRNA codons for this DNA Sequence are: UUC-GGU-ACU-UGU. Using the Universal Genetic Code Chart, what is the amino acid sequence that is coded for by the mRNA codons?

- (1) LEU-SER-TYR-TRP
- (2) PHE-GLY-THR-CYS
- (3) ILE-THR-LYS-SER
- (4) VAL-ALA-ASP-GLY

Data Base File Number: 1007

Regents Date Jan2015-78.bmp

Jan2015

78 2/26/2015 LAB1

Answer 2

Universal Genetic Code Chart  
Messenger RNA Codons and the Amino Acids for Which They Code

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

genetic code

962. Within a specific kind of tissue, there are different types of cells. In bone tissue, there are four different cell types, as shown in the diagram. Since the four types of cells contain the same genetic instructions, how is it possible for them to have different shapes and carry out different functions?

- (1) Each cell type has the ability to remove unnecessary DNA sequences.
- (2) Different parts of the genetic code may be used in each of the cell types.
- (3) Different gene mutations take place within each cell type.
- (4) Each cell type is the result of different methods of cell division.

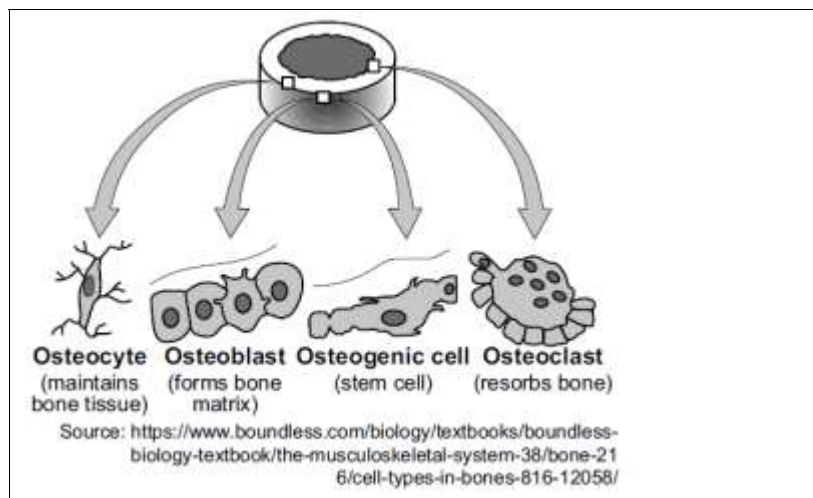
Data Base File Number: 1542

Regents Date Jan2023-26.bmp

Jan2023

26 1/24/2023 S4K2

Answer 2





## genetic code

963. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagrams represent a single-celled organism and a multicellular organism. Cells from structure E and cells from structure G are similar in that they

- (1) have the same structure and function
- (2) contain the same genetic material
- (3) are identical in structure, but different in function
- (4) contain only the genetic information needed for their specific job

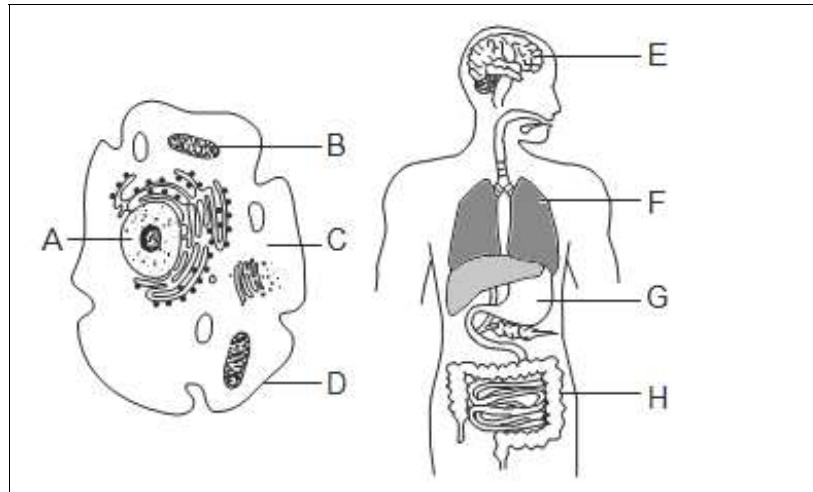
Data Base File Number: 1184

Regents Date June2017-37.bmp

June2017

38 6/14/2017 S4K2

Answer 2



## genetic code

964. Base your answer to this question on your knowledge of biology and the Universal Genetic Code Chart as shown. The messenger RNA sequence that is most likely to produce a functional protein is

- (1) UGA-UAU-CGA-GGA-GUU-GCG-CUC-UAG
- (2) UAG-UAU-CGA-GGA-GUU-GCG-CUC-AUG
- (3) AUG-UAU-CGA-GGA-GUU-GCG-CUC-UGA
- (4) UAA-CUC-UUA-UUU-GUU-CGA-UAU-UAA

Data Base File Number: 1419

Regents Date Jan2020-73.bmp

Jan2020

74 1/21/2020 LAB1

Answer 3

Universal Genetic Code Chart

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

## genetic code

965. Note: ROTATE test paper to the RIGHT to view the diagram. The process represented in the diagram occurs in many cells. The main function of this process is to

- (1) provide an exact copy of the genetic code
- (2) ensure genetic variation in a species
- (3) synthesize cellular proteins
- (4) produce antibodies to combat disease

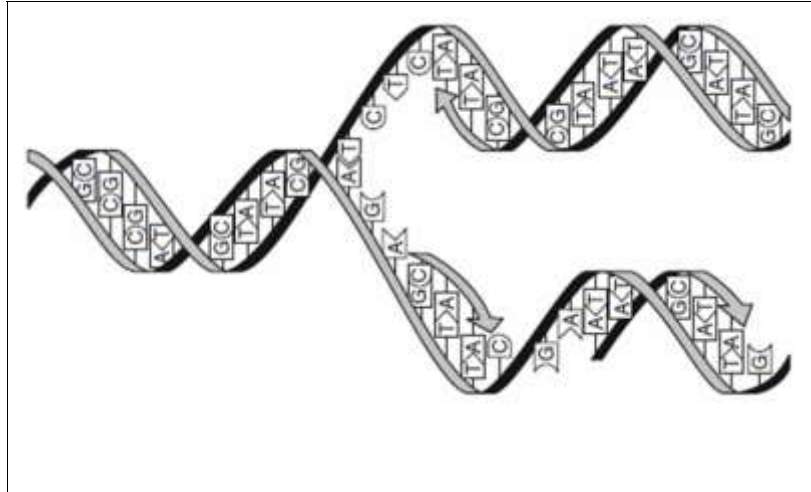
Data Base File Number: 606

Regents Date Jan2013-8B.bmp

Jan2013

8 1/23/2013 S4K2

Answer 1



## genetic code

966. The diagram as shown represents a process that occurs in many cells. The main function of this process is to (Note: ROTATE the diagram to see letters).

- (1) produce variations in cells before asexual reproduction
- (2) synthesize antigens needed to combat immunity
- (3) provide exact copies of the genetic code before cell division
- (4) make proteins needed for cellular metabolism

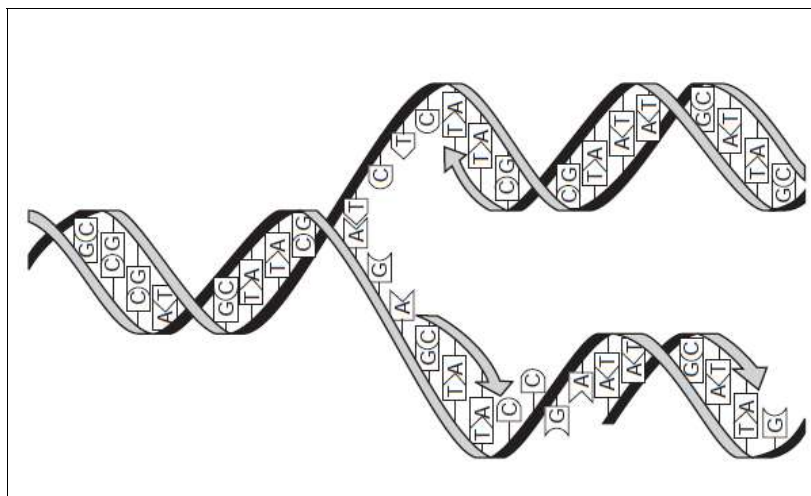
Data Base File Number: 1627

Regents Date Jan2024-8.bmp

Jan2024

8 1/23/2024 S4K2

Answer 3



genetic code

967. Base your answer to this question on the information and Universal Genetic Code Chart shown and on your knowledge of biology. The messenger RNA sequence that codes for the amino acid chain TYR-ARG-GLY-VAL-ALA-LEU is

- (1) UAU-CGA-GUU-UUU-UUA-CUC
- (2) UAU-CGA-GGA-GUU-GCG-CUC
- (3) CUC-GCG-GUU-GGA-CGA-UAU
- (4) CUC-UUA-UUU-GUU-CGA-UAU

Data Base File Number: 1413

Regents Date Jan2020-73.bmp

Jan2020

73 1/21/2020 LAB1

Answer 2

Universal Genetic Code Chart

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

genetic code

968. NOTE: YOU CANNOT COMPLETE THIS QUESTION WITHOUT THE "UNIVERSAL GENETIC CODE CHART". THIS CHART WILL BE PROVIDED TO YOU FOR REFERENCE. ---- Base your answer to this question on the Universal Genetic Code Chart, PROVIDED FOR YOU, and on your knowledge of biology. Some DNA, RNA, and amino acid information from four similar sequences of four plant species is shown in the chart, on the test paper. Using the information given, what would be the missing mRNA base sequence for species B in the chart given IN this question?

- (1) GLY THR TYR VAL HIS
- (2) ACG ACG UAU GUC CAU
- (3) GLY THR TYR VAL GLN
- (4) CCG TGC ATA CAG GTA

Data Base File Number: 499

Regents Date June2006-64.bmp

June2006

63 6/21/2006 LAB1

Answer 2

Species A	DNA base sequence	CCG	TGC	ATA	CAG	GTA
	mRNA base sequence	GGC	ACG	UAU	GUC	CAU
	Amino acid sequence	GLY	THR	TYR	VAL	HIS
Species B	DNA base sequence	TGC	TGC	ATA	CAG	GTA
	mRNA base sequence	_____	_____	_____	_____	_____
	Amino acid sequence	THR	THR	TYR	VAL	HIS
Species C	DNA base sequence	CCG	TGC	ATA	CAG	GTT
	mRNA base sequence	GGC	ACG	UAU	GUC	CAA
	Amino acid sequence	_____	_____	_____	_____	_____
Species D	DNA base sequence	CCT	TGT	ATG	CAC	GTC
	mRNA base sequence	GGA	ACA	UAC	GUG	CAG
	Amino acid sequence	GLY	THR	TYR	VAL	GLN

## genetic code

969. Base your answer to this question on the information given and on your knowledge of biology. The DNA sequences shown in the DIAGRAM are from species X, Y, and Z, and "Botana curus". Based on these sequences, which species, X, Y, or Z, is most closely related to "Botana curus"?

- (1) species Z, because there are no DNA sequence differences
- (2) species X, because there are no amino acid differences
- (3) species Y, because there are only two DNA sequence differences
- (4) species Z, because there are no amino acid differences

Data Base File Number: 1712

Regents Date Aug2024-76C.bm

Aug2024

76 8/20/2024 LAB1

Answer 4

Species	DNA Sequence
Botana curus	CAC GTA GAC TGA GGA CTC CTC
X	CAC GTG GAC AGA GGA CAC CTC
Y	CAC GTG GAC AGA GGA CAC CTC
Z	CAC GTA GAC TGA GGA CTT CTC

## genetic diversity

970. New York State is home to animals such as the Eastern chipmunk. Individuals within this species are not genetically identical. This variability is primarily the result of

- (1) asexual reproduction and mutation
- (2) mitosis and selective breeding
- (3) meiosis and recombination
- (4) sexual reproduction and cloning

Data Base File Number: 1565

Regents Date June2023-10.bmp

June2023

10 6/14/2023 S4K3

Answer 3



Source: J. Bartsch

## genetic diversity

971. The chart shows the number of differences in genetic material between individuals within the same species. Scientists can use this information to determine which populations demonstrate the greatest amount of genetic diversity. According to the chart, which two species would be more likely to survive if their environmental conditions changed?

- (1) Tasmanian tiger and Tasmanian devil                      (3) Tasmanian tiger and wolf  
(2) brown bear and whale    (4) panda and wolf

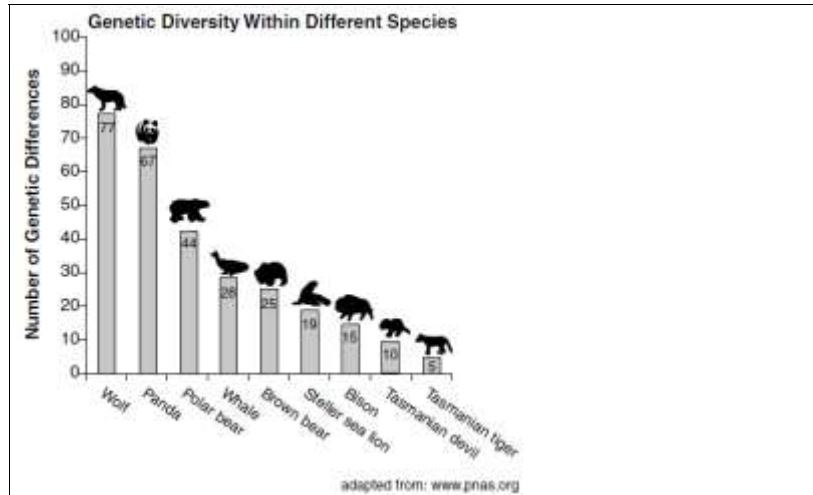
Data Base                      1236  
File Number:

Regents Date                      Jan2018-37.bmp

Jan2018

37                      1/22/2018                      S4K3

Answer                      4



## genetic engineering

972. Which statement would most likely be used to describe the procedure represented in the diagram shown?

- (1) Enzymes are used to assemble an insulin gene, which is then attached to bacterial DNA.
- (2) Bacterial DNA is cut from a human DNA strand and inserted into a human cell to form an insulin gene.
- (3) The insulin gene is cut out of a human DNA strand using an enzyme and inserted into bacterial DNA, resulting in a combination of different DNA segments.
- (4) A gene is deleted from bacterial DNA to produce an insulin gene, which is then inserted into human DNA.

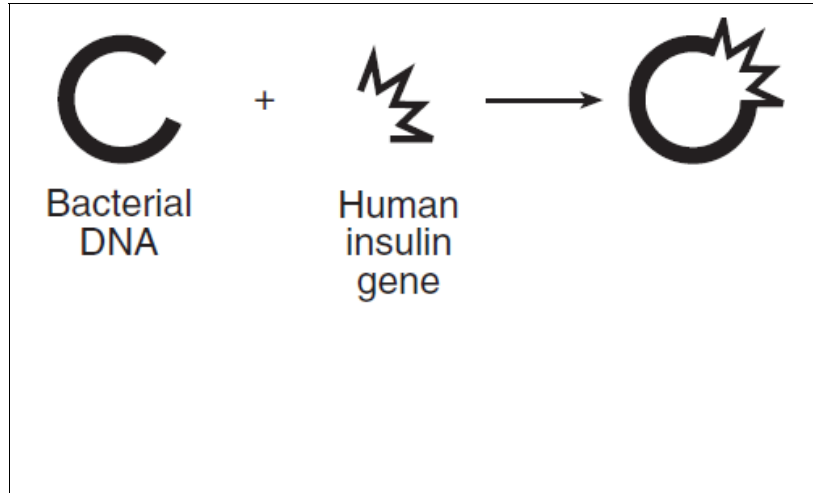
Data Base File Number: 314

Regents Date Jan2011-34.bmp

Jan2011

34 1/25/2011 S4K2

Answer 3



## genetic engineering

973. The diagram shown represents a scientific technique in use today. Scientists have used this technique to

- (1) produce hormones for human use at a lower cost than other methods
- (2) produce pathogens that are able to live in humans
- (3) clone human cells with desired characteristics
- (4) eliminate the need for laboratory production of medicines for humans

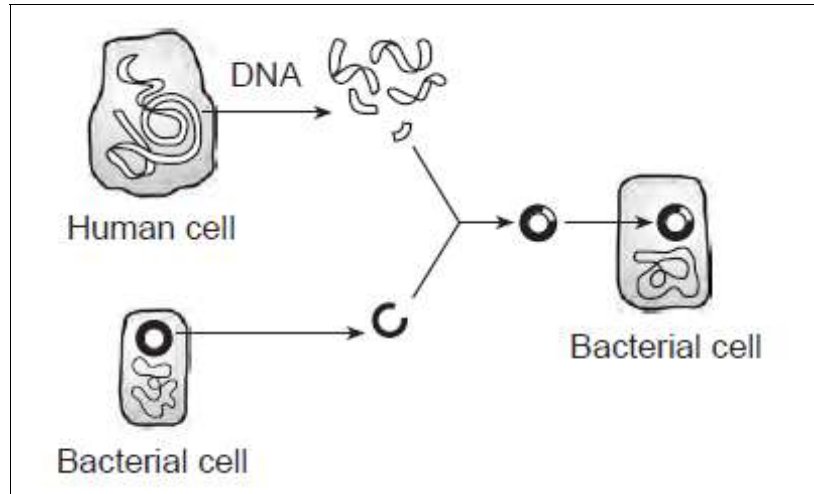
Data Base File Number: 938

Regents Date June2014-11.bmp

June2014

11 6/17/2014 S4K2

Answer 1



## genetic engineering

974. Base your answer to this question on the diagram shown and on your knowledge of biology. The original gene for the production of a human hormone was most likely removed from a

- (1) chromosome
- (2) ribosome
- (3) mitochondrion
- (4) cell membrane

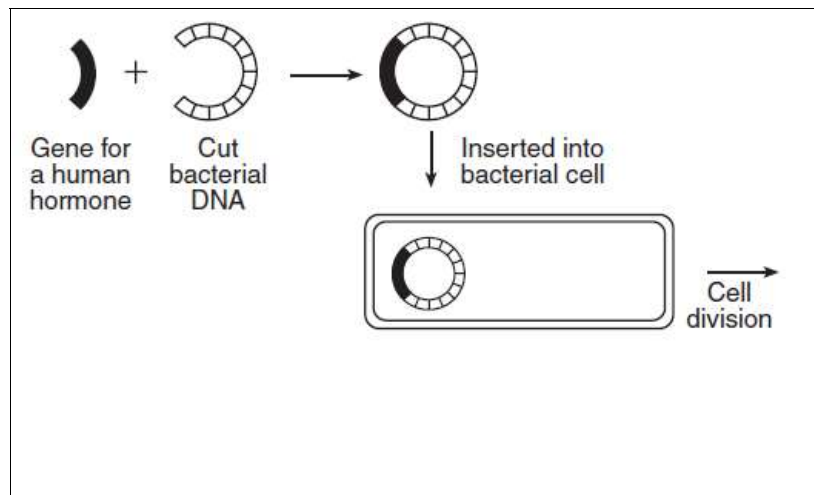
Data Base File Number: 1143

Regents Date August2016-49.b

Aug2016

50 8/18/2016 S4K2

Answer 1





## genetic engineering

975. Base your answer to this question on the diagram shown and on your knowledge of biology. The process represented in the diagram is

- (1) DNA replication
- (2) natural selection
- (3) gel electrophoresis
- (4) genetic engineering

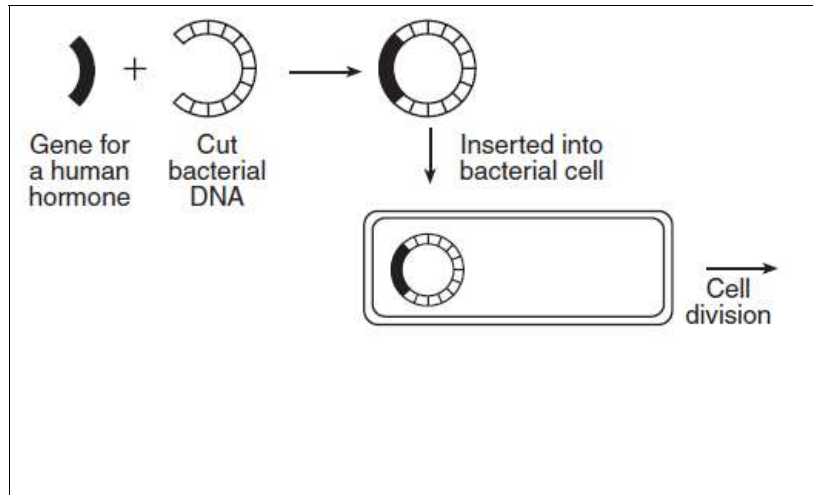
Data Base File Number: 1142

Regents Date August2016-49.b

Aug2016

49 8/18/2016 S4K2

Answer 4



## genetic engineering

976. A technique used to alter cells is represented in the diagram shown. The genetic material contained in the nucleus of each of the new cells is most likely

- (1) identical to that in the original body cell
- (2) identical to that in the original egg cell
- (3) 50% the same as the original egg cell and 50% the same as the original body cell
- (4) 25% the same as the original egg cell and 75% the same as the original body cell

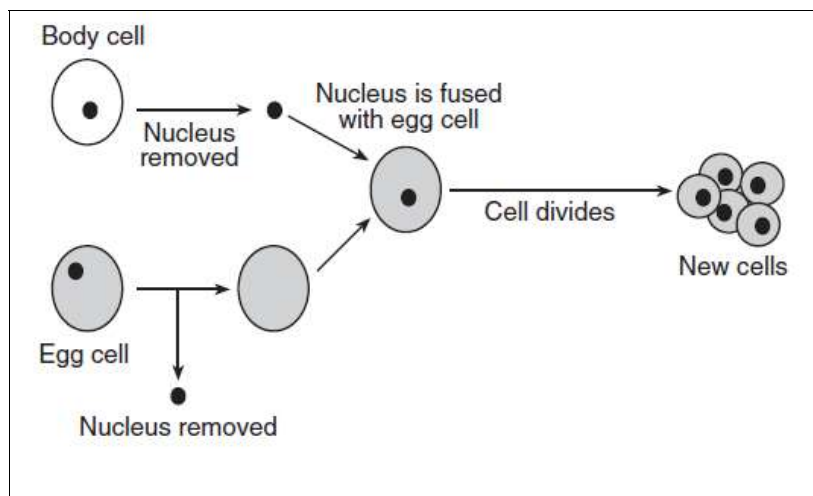
Data Base File Number: 990

Regents Date Jan2015-23.bmp

Jan2015

23 2/26/2015 S4K5

Answer 1





## genetic engineering

977. The diagram represents a process used to modify bacterial cells. In the diagram, arrows labeled X and Y represent the use of

(1) clones

(3) genes

(2) receptors

(4) enzymes

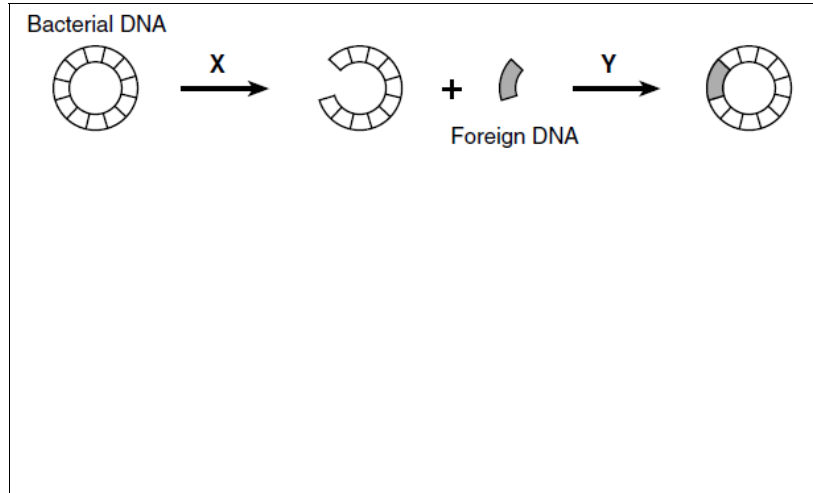
Data Base File Number: 1155

Regents Date Jan2017-17.bmp

Jan2017

17 1/25/2017 S4K2

Answer 4



## genetic engineering

978. Base your answer to this question on the information given and on your knowledge of biology. Researchers have produced rice plants that can withstand being completely submerged for up to two weeks. This is good news for farmers in the flood regions of Southeast Asia. The farmers in this region rely heavily on this crop. The diagram shown illustrates the process used to genetically modify plants, such as rice. The best explanation for these modified rice plants being flood resistant is that

- (1) the gene for flood resistance was inserted into plant cells, which grew into plants whose cells are expressing this gene
- (2) they were produced by fertilization, using gametes from two flood-resistant bacterial cells
- (3) there was a mutation in the bacterial DNA after it was inserted into the plant that caused it to be flood resistant
- (4) the researchers used selective breeding for the flood-resistance trait

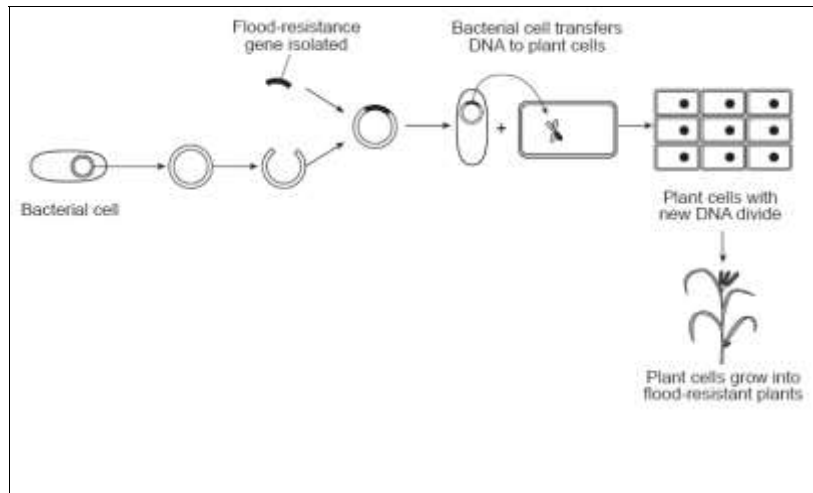
Data Base File Number: 1108

Regents Date June2016-40.bmp

June2016

41 6/15/2016 S4K2

Answer 1



## genetic engineering

979. Base your answer to this question on the information given and on your knowledge of biology. Researchers have produced rice plants that can withstand being completely submerged for up to two weeks. This is good news for farmers in the flood regions of Southeast Asia. The farmers in this region rely heavily on this crop. The diagram shown illustrates the process used to genetically modify plants, such as rice. The molecules used to cut, copy, and connect the DNA segments used in this process are

- (1) sugars (2) enzymes (3) indicators (4) antigens

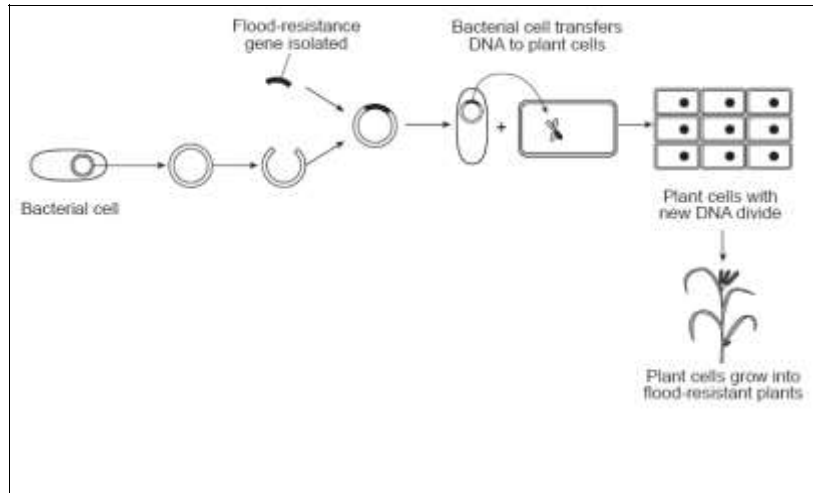
Data Base File Number: 1107

Regents Date June2016-40.bmp

June2016

40 6/15/2016 S4K2

Answer 2



## genetic engineering

980. A laboratory technique is represented in the diagram shown. Letter A represents a process in which DNA from Cell 1 is combined with DNA from Cell 2. Which specific chemicals are needed to successfully carry out the process shown at A to insert the joined DNA into Cell 3?

- (1) receptor molecules (2) carbohydrates (3) enzymes (4) starch molecules

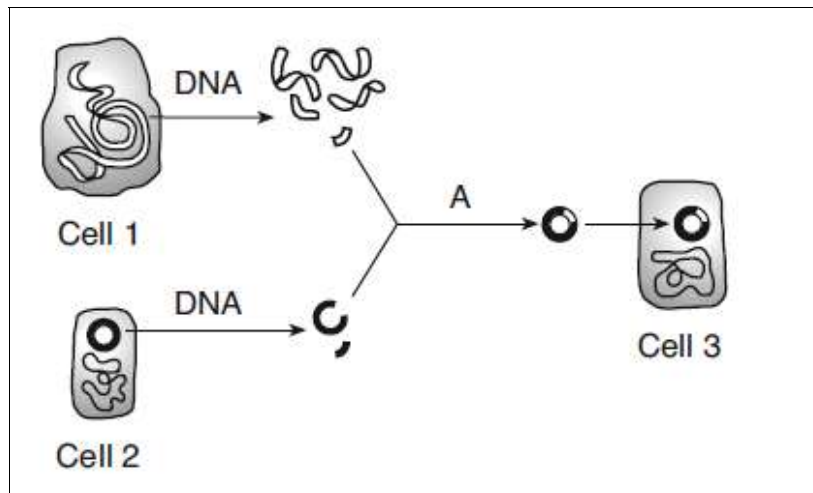
Data Base File Number: 406

Regents Date June2012-12.bmp

June2012

12 6/19/2012 S4K2

Answer 3



## genetic engineering

981. Two methods of reproduction are represented in the diagram shown. How does the DNA in the offspring produced by these methods compare to the DNA in the original organism?

- (1) The offspring contain half the original number of chromosomes in each method.
- (2) The DNA in the offspring is genetically identical to that of the original organism in both methods.
- (3) The offspring produced by method A contain twice the original number of genes, while those produced by method B contain half the original number of genes
- (4) The number of DNA bases is less than that of the original organism in method A, but more than the original number in method B.

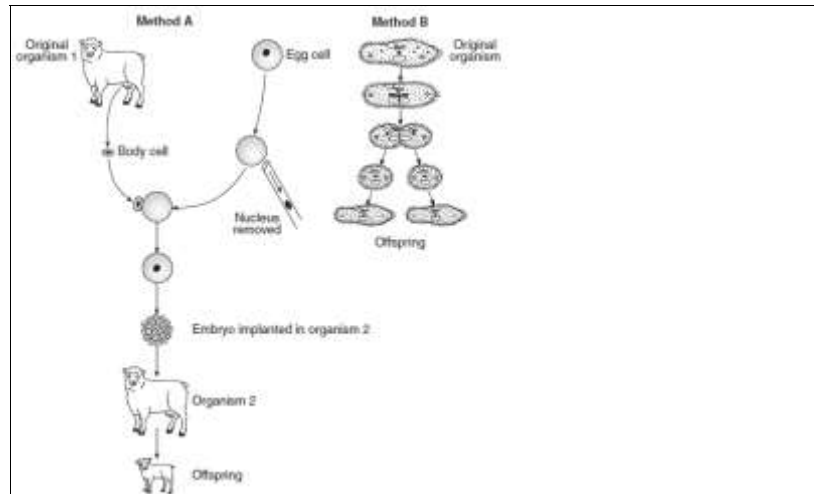
Data Base File Number: 385

Regents Date Jan2012-34.bmp

Jan2012

34 1/25/2012 S4K4

Answer 2



## genetic engineering

982. Rubber usually comes from petroleum or from the Asian rubber tree plant. Scientists have modified a single trait in the domestic plant, guayule, to increase its ability to produce rubber for commercial use. Young guayule plants are shown in the photograph. The process that was most likely used to modify the plants' trait and increase their natural rubber production was

- (1) selective breeding of two similar plant varieties
- (2) genetic recombination during sexual reproduction
- (3) genetic engineering to alter a specific gene
- (4) fertilizing the plants with key substances found in petroleum

Data Base File Number: 1499

Regents Date Aug2022-5.bmp

Aug2022

5 8/17/2022 S4K2

Answer 3



Source: <http://agresearchmag.ars.usda.gov>

## genetic engineering

983. NOTE: ROTATE the diagram to the left for proper orientation. QUESTION: The diagram shown represents the process used in 1996 to clone the first mammal, a sheep named Dolly. Which statement concerning Dolly is correct?

- (1) Gametes from sheep A and sheep B were united to produce Dolly.
- (2) The chromosome makeup of Dolly is identical to that of sheep A.
- (3) Both Dolly and sheep C have identical DNA.
- (4) Dolly contains genes from sheep B and sheep C.

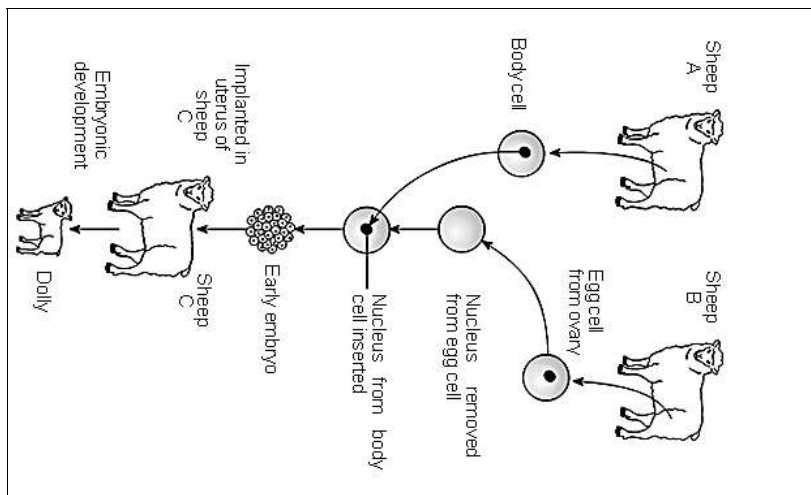
Data Base File Number: 187

Regents Date June09-31.bmp

June2009

31 6/18/2009 S4K2

Answer 2



## genetic engineering

984. A laboratory technique is represented in the diagram shown. Which knowledge was needed to develop this technique?

- (1) knowledge of sexual reproduction in plants
- (2) knowledge of the structure of starch molecules
- (3) knowledge of the development of embryos
- (4) knowledge of the structure of a DNA molecule

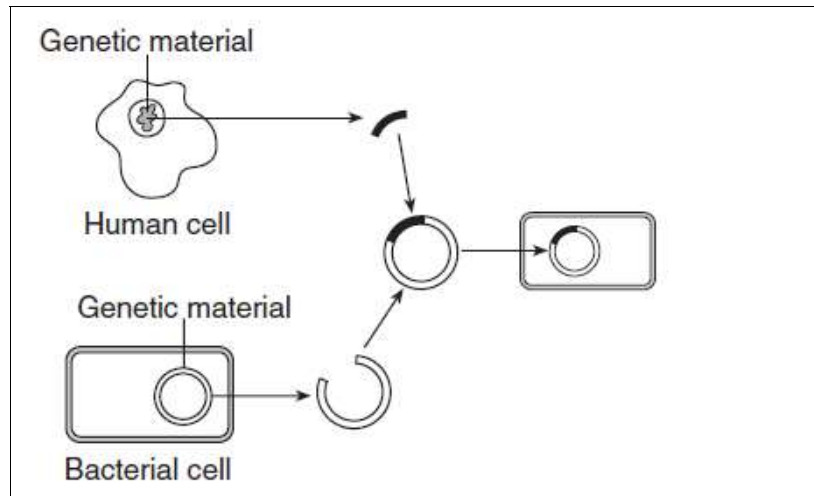
Data Base File Number: 366

Regents Date Aug2011-31.bmp

Aug2011

31 8/18/2011 S1K1

Answer 4



## genetic engineering

985. The diagram shows some of the DNA in a bacterium into which a human gene, X, has been successfully inserted. The bacteria that result from reproduction of this cell will most likely have the ability to

- (1) replicate all of the genetic instructions found in humans
- (2) produce vaccines to be used to immunize humans
- (3) produce a human blood cell according to instructions in gene X
- (4) produce the human protein coded for by gene X

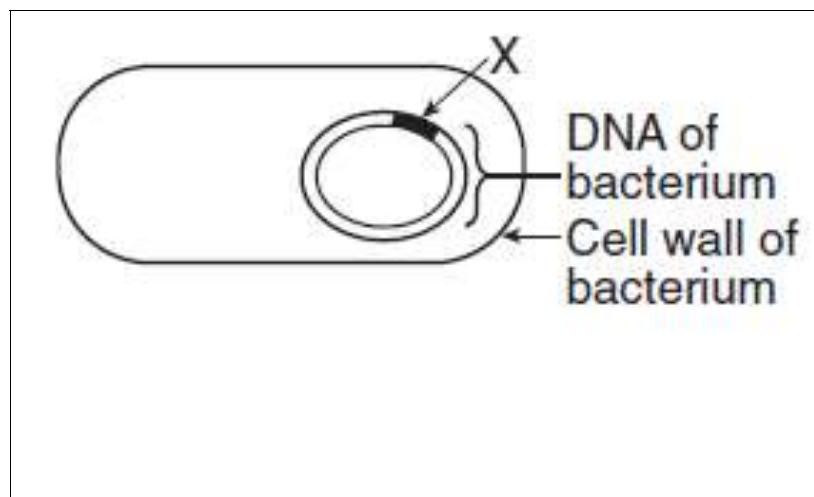
Data Base File Number: 1019

Regents Date June2015-29.bmp

June2015

29 6/16/2015 S4K2

Answer 4



## genetic engineering

986. Which process is illustrated in the diagram?

- (1) chromatography
- (2) direct harvesting
- (3) meiosis
- (4) genetic engineering

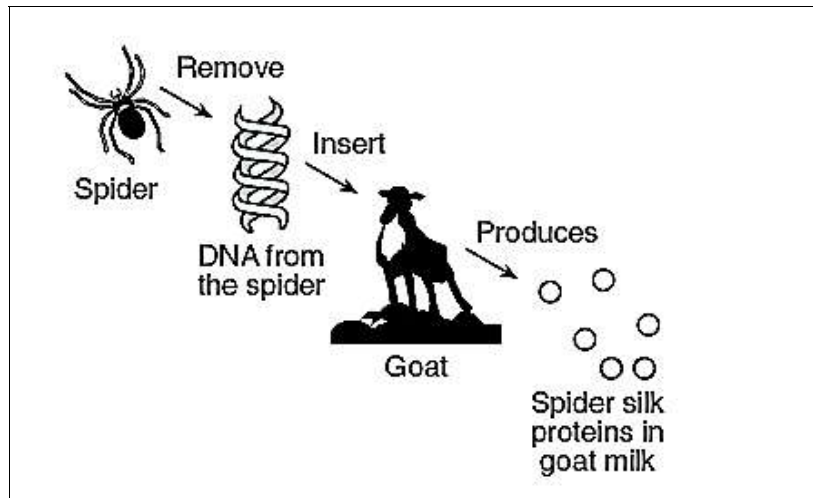
Data Base File Number: 49

Regents Date Jan07-10.bmp

Jan2007

10 1/26/2007 S4K2

Answer 4



## genetic engineering

987. A sequence of events is represented in the diagram shown. Which statement best describes a result of this process?

- (1) The spider from which the DNA sample was obtained can no longer produce spider silk.
- (2) The goat milk now contains DNA molecules made of spider silk proteins.
- (3) Both the spider and the goat can now produce both spider silk and goat milk.
- (4) Spider silk proteins can now be produced in large quantities without killing spiders to obtain them.

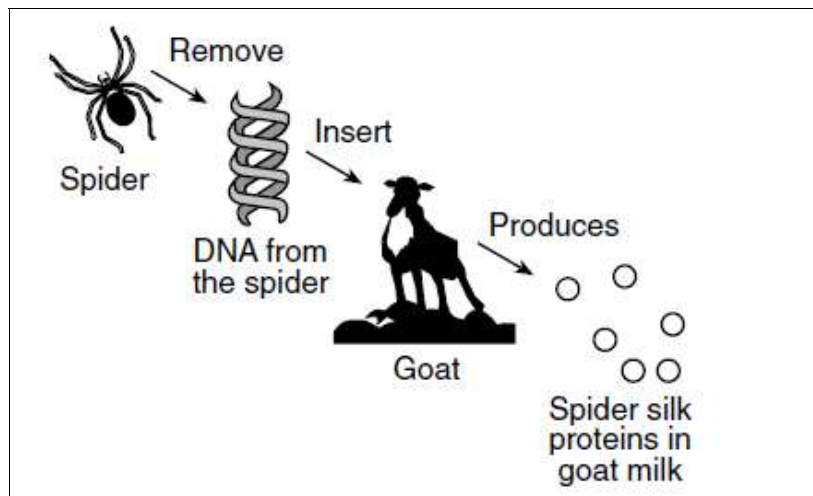
Data Base File Number: 1229

Regents Date Jan2018-11.bmp

Jan2018

11 1/22/2018 S4K2

Answer 4



## genetic engineering

988. The diagram shown represents a technique used in some molecular biology laboratories This technique is a type of

- (1) chromatography
- (2) gel electrophoresis
- (3) direct harvesting
- (4) genetic engineering

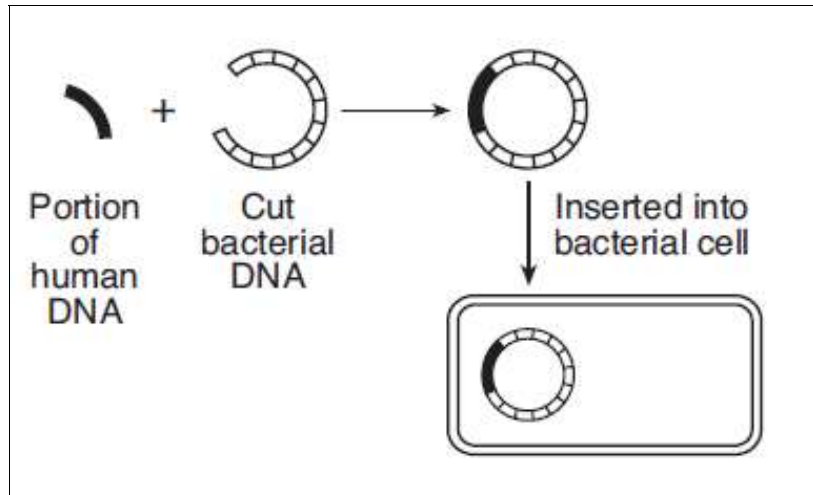
Data Base File Number: 255

Regents Date June2010-12.bmp

June2010

12 6/16/2010 S4K2

Answer 4



## genetic engineering

989. Base your answers to this question on the information and photograph shown and on your knowledge of biology. Transgenic (GMO) Tomatoes. The use of pesticides to control insects costs billions of dollars every year. Genetically modified organisms (GMOs) are an attempt to reduce this cost. Tomato plants that are genetically modified can make proteins that are poisonous to the insects that feed on them. Using these GMO tomatoes would reduce the need for the chemical control of insects. Identify a specific technique used to produce the GMO tomatoes.

- (1) gel chromatography
- (2) genetic engineering
- (3) mutations
- (4) biodiversity

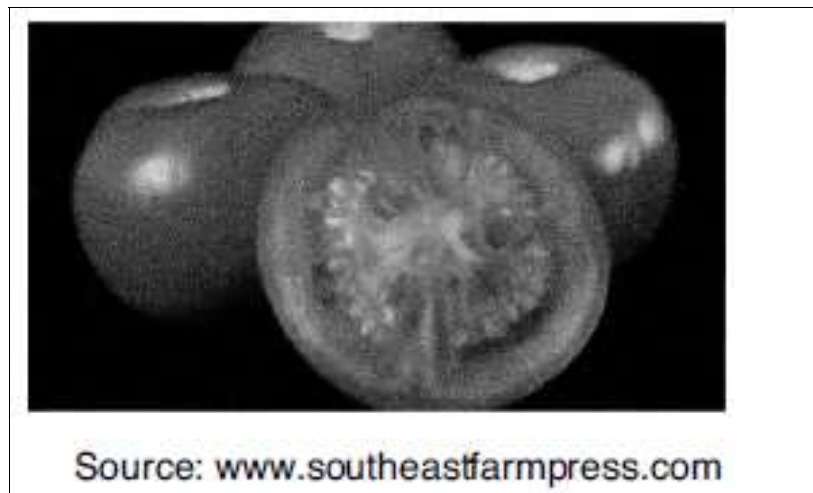
Data Base File Number: 1317

Regents Date Jan2019-51.bmp

Jan2019

51 1/22/2019 S4K2

Answer 2





## genetic engineering

990. The diagram shown represents a common laboratory technique in molecular genetics. One common use of this technology is the

- (1) production of a human embryo to aid women who are unable to have children
- (2) change of single-celled organisms to multicellular organisms
- (3) introduction of a toxic substance to kill bacterial cells
- (4) production of hormones or enzymes to replace missing human body chemicals

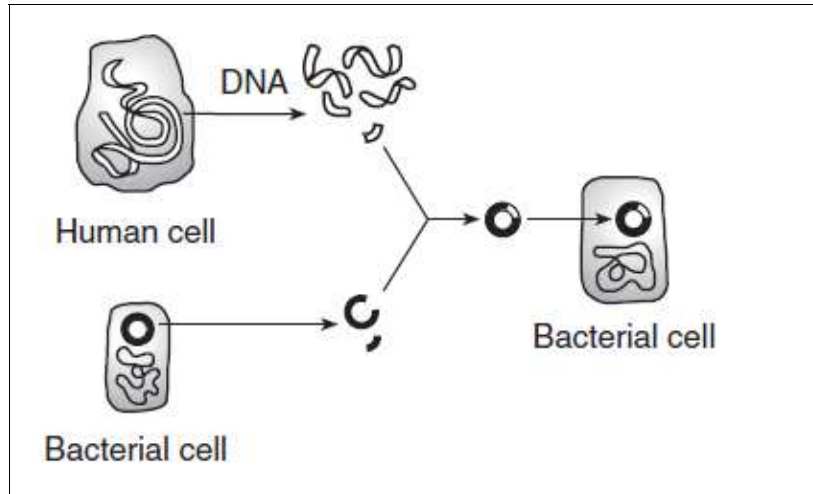
Data Base File Number: 455

Regents Date Jan2006-8.bmp

Jan2006

8 1/27/2006 S4K2

Answer 4



## genetic engineering

991. The diagram shown represents an important biological technique scientists rely on to produce replacement hormones. Which two processes are required for the technique to successfully produce hormones?

- (1) replication of DNA in bacterial cells and cell division
- (2) replication of DNA in bacterial cells and gamete formation
- (3) meiosis and development
- (4) mitosis and fertilization

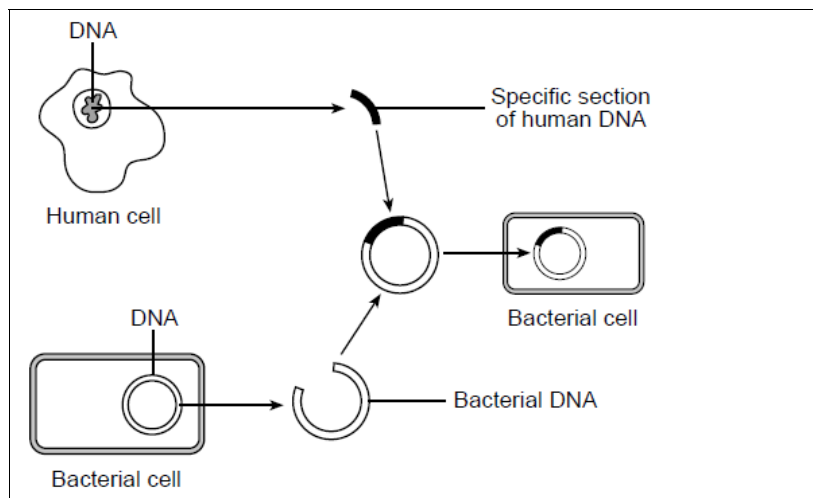
Data Base File Number: 1252

Regents Date June2018-22.bmp

June2018

22 6/13/2018 S4K2

Answer 1



genetic engineering

992. Bacteria that are removed from the human intestine are genetically engineered to feed on organic pollutants in the environment and convert them into harmless inorganic compounds. Which row in the table shown best represents the most likely negative and positive effects of this technology on the ecosystem?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 510

Regents Date Aug2006-25.bmp

Aug2006

25 8/16/2006 S4K7

Answer 2

Row	Negative Effect	Positive Effect
(1)	Inorganic compounds interfere with cycles in the environment.	Human bacteria are added to the environment.
(2)	Engineered bacteria may out-compete native bacteria.	The organic pollutants are removed.
(3)	Only some of the pollutants are removed.	Bacteria will make more organic pollutants.
(4)	The bacteria will cause diseases in humans.	The inorganic compounds are buried in the soil.

genetic engineering

993. The diagram shown represents some steps in a procedure used in the field of biotechnology. This bacterial cell can now be used to produce

- (1) the bacterial gene for insulin that can be inserted into humans
- (2) human genes for enzymes that can be inserted into humans
- (3) insulin that can be used by humans
- (4) enzymes necessary to treat human diseases

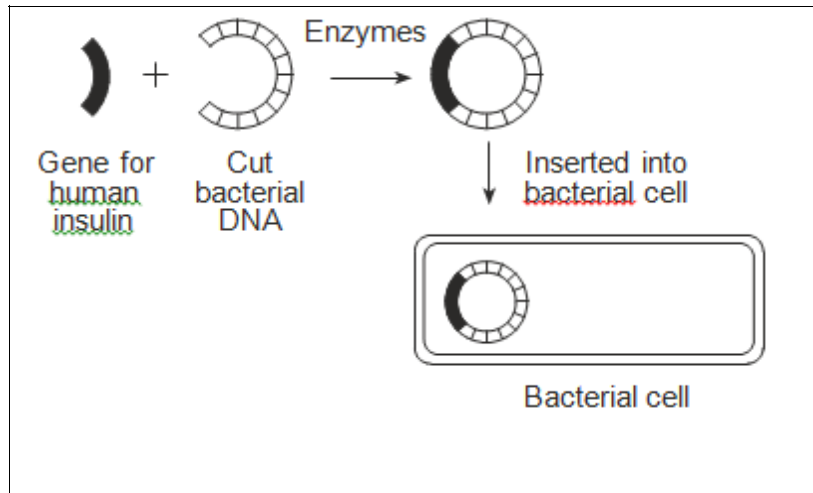
Data Base File Number: 1201

Regents Date Aug2017-16.bmp

Aug2017

16 8/17/2017 S4K2

Answer 3



## genetic engineering

994. Steps in a reproductive process used to produce a sheep with certain traits are listed in the proceduew shown. Which sheep would be most genetically similar to sheep D?

- (1) sheep A, only
- (2) sheep B, only
- (3) both sheep A and B
- (4) both sheep A and C

Data Base File Number: 478

Regents Date June2006-14.bmp

June2006

14 6/21/2006 S4K4

Answer 2

**Step 1** — The nucleus was removed from an unfertilized egg taken from sheep A.  
**Step 2** — The nucleus of a body cell taken from sheep B was then inserted into this unfertilized egg from sheep A.  
**Step 3** — The resulting cell was then implanted into the uterus of sheep C.  
**Step 4** — Sheep C gave birth to sheep D.

## genetic engineering

995. Base your answer to this question on the information given and on your knowledge of biology. -----  
**Anticancer Vaccines Become Personalized** -----Researchers are investigating a personalized approach to create an anticancer vaccine from a patient's own tumor cells. Some white blood cells are removed and grown with proteins unique to these cancer cells. The patient's white blood cells are changed by incorporating these proteins from the cancer cells. These altered blood cells can now work as a cancer vaccine. The cancer vaccine is transferred into the patient, and it stimulates the immune system to attack the cancer cells. What process is crried out at "Step C"?

- (1) genetic engineering to alter white blood cells
- (2) vitamin change in the diet to alter white blood cells
- (3) increased respiration of white blood cells
- (4) stimulation of high reproduction of white blood cells

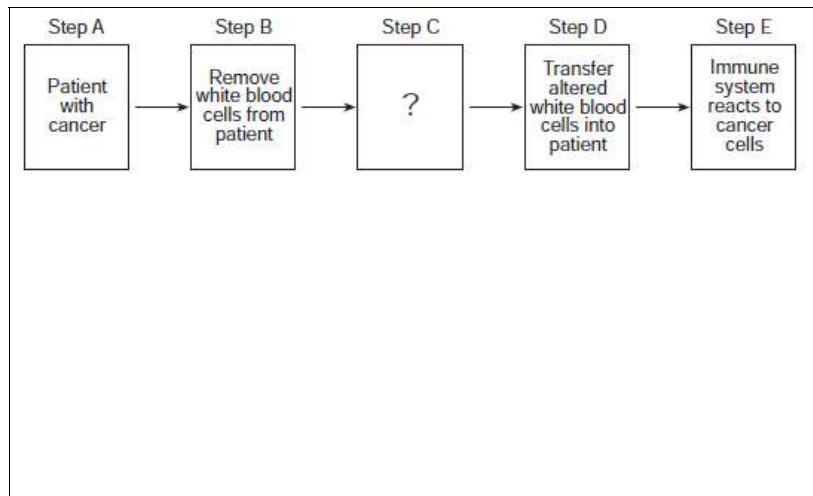
Data Base File Number: 1620

Regents Date Aug2023-60.bmp

Aug2023

60 8/17/2023 S1K1

Answer 1



## genetic engineering

996. Base your answer to this question on the diagram shown which illustrates some steps in genetic engineering, and on your knowledge of biology. What is the result of step 3?

- (1) a new type of molecular base is formed
- (2) different types of minerals are joined together
- (3) DNA from the bacterial cell is cloned
- (4) DNA from different organisms is joined together

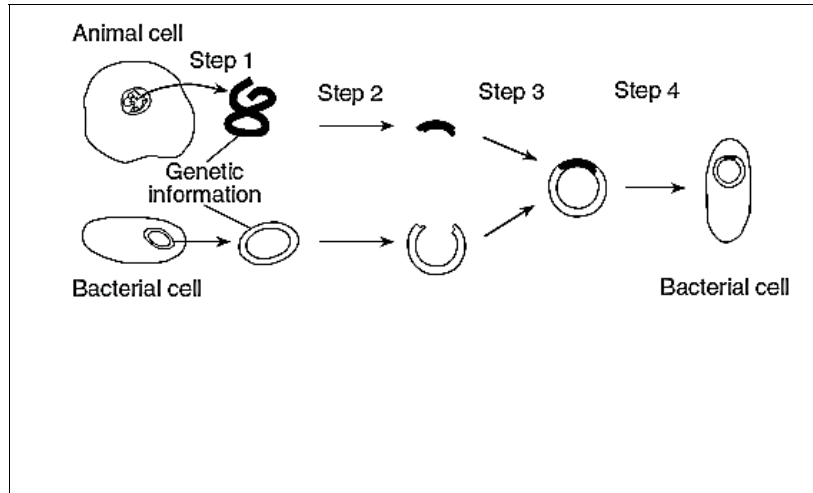
Data Base File Number: 19

Regents Date Aug07-49.bmp

Aug2007

49 8/16/2007 S4K2

Answer 4



## genetic engineering

997. Which set of terms correctly identifies the procedure shown in the diagram and a substance produced by this procedure?

- (1) selective breeding -- growth hormone
- (2) cloning -- antibiotics
- (3) genetic engineering -- insulin
- (4) replicating -- glucose

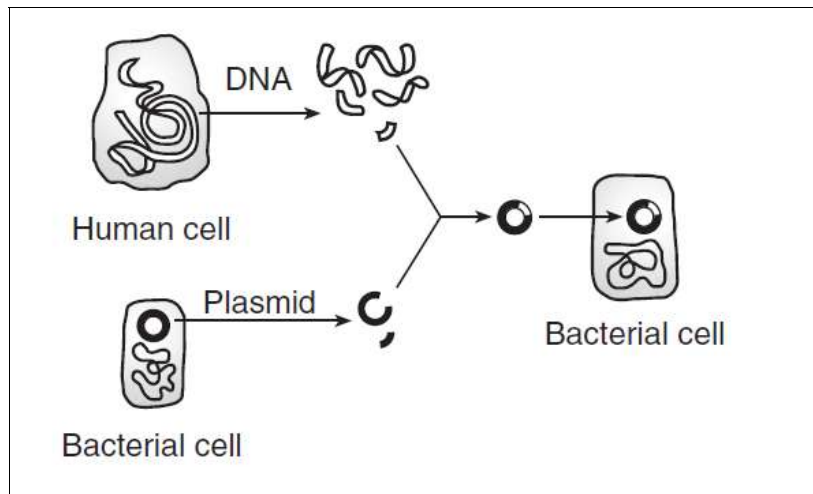
Data Base File Number: 283

Regents Date Aug2010-33.bmp

Aug2010

33 8/18/2010 S4K2

Answer 3



## genetic engineering

998. The process shown in the diagram is used to

- (1) determine if a person has a genetic disease
- (2) produce human growth hormone
- (3) identify the father of a newborn
- (4) produce a hormone to regulate blood sugar

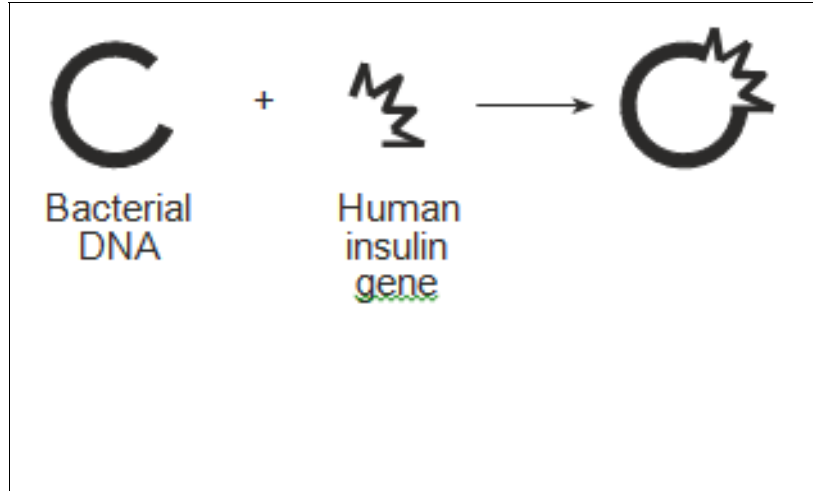
Data Base File Number: 1182

Regents Date June2017-36.bmp

June2017

36 6/14/2017 S4K2

Answer 4



## genetic engineering

999. A product of genetic engineering technology is represented in the diagram shown. Which substance was needed to join the insulin gene to the bacterial DNA as shown?

- (1) a specific carbohydrate
- (2) a specific enzyme
- (3) hormones
- (4) antibodies

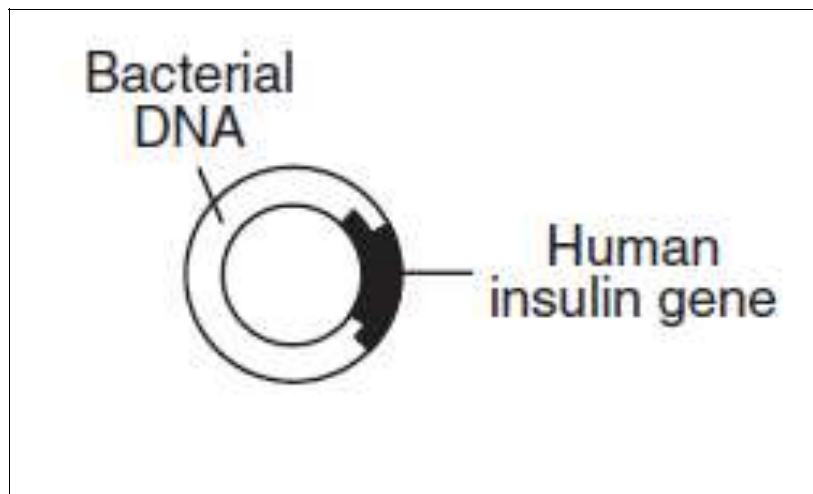
Data Base File Number: 556

Regents Date June2005-8.bmp

June2005

8 6/22/2005 S4K2

Answer 2



## genetic engineering

1000. The diagram shown represents a technique used in biotechnology. The name of this technique is known as

- (1) gel electrophoresis
- (2) spectroscopy analysis
- (3) active transport
- (4) genetic engineering

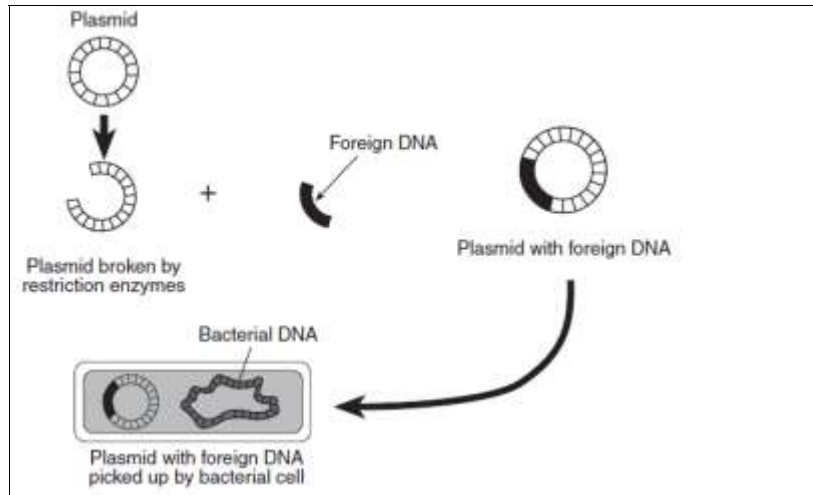
Data Base File Number: 793

Regents Date Aug2002-55.bmp

Aug2002

55 8/13/2002 S4K2

Answer 4



## genetic engineering

1001. The diagrams shown represent some steps in a procedure used in biotechnology. Letters X and Y represent the

- (1) hormones that stimulate the replication of bacterial DNA
- (2) biochemical catalysts involved in the insertion of genes into other organisms
- (3) hormones that trigger rapid mutation of genetic information
- (4) gases needed to produce the energy required for gene manipulation

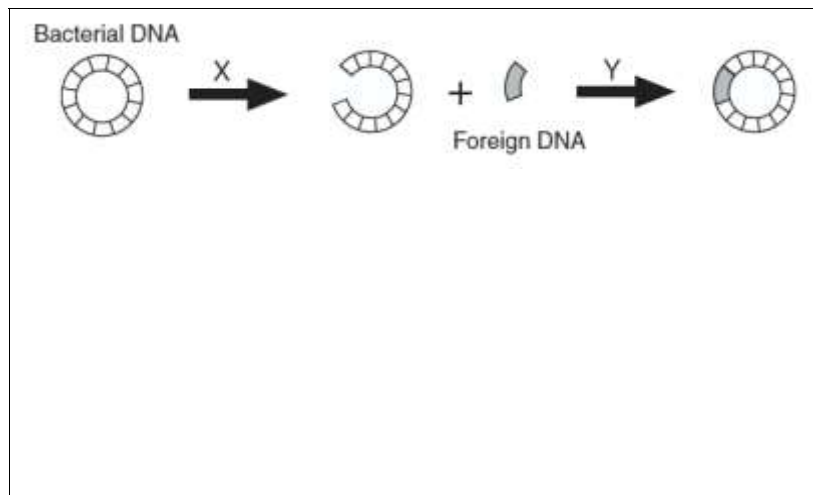
Data Base File Number: 708

Regents Date Jan2003-12.bmp

Jan2003

12 1/30/2003 S4K2

Answer 2



## genetic engineering

1002. In some people, the lack of a particular enzyme causes a disease. Scientists are attempting to use bacteria to produce this enzyme for the treatment of people with the disease. Which row in the chart shown best describes the sequence of steps the scientists would most likely follow?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 180

Regents Date June09-10.bmp

June2009

10 6/18/2009 S4K2

Answer 3

Row	Step A	Step B	Step C	Step D
(1)	identify the gene	insert the gene into a bacterium	remove the gene	extract the enzyme
(2)	insert the gene into a bacterium	identify the gene	remove the gene	extract the enzyme
(3)	identify the gene	remove the gene	insert the gene into a bacterium	extract the enzyme
(4)	remove the gene	extract the enzyme	identify the gene	insert the gene into a bacterium

## genetic inheritance

1003. Base your answer to this question on the information and chart given and on your knowledge of biology.

### Finding Relationships Between Organisms

Organisms living in the same environment may have similar body structures, but this does not always indicate a close biological relationship. The chart shown provides information about four organisms that live in an Antarctic Ocean ecosystem. Two features that would be the most useful in determining which of these organisms are most closely related are

(1) presence of hair and similar proteins

(3) habitat and diet

(2) presence of feathers and similar body structures

(4) body size and color





Data Base File Number: 1444

Regents Date June2021-73.bmp

June2021

73 6/22/2021 LAB1

Answer 1

Body Structures of Four Antarctic Marine Organisms				
Organism	Killer whale	Adélie penguin	Leopard seal	Baleen whale
Skin covering	Very little hair	Feathers	Thick hair	Very little hair
Diagram*				
*Pictures are not drawn to scale.				

## genetic inheritance

1004. Base your answer to this question on the information given and your knowledge of biology. Refer to the diagram of HONEYBEE GENETICS, as shown. Queen bees are fertile females with a diploid chromosome number of 32 ( $2n=32$ ). Worker bees are sterile females with a diploid chromosome number of 32 ( $2n=32$ ). Drone bees are fertile males produced by the development of unfertilized eggs. Drones are haploid since they develop from an unfertilized egg and have a chromosome number of 16. Drones produce sperm and mate with the queen to produce fertilized eggs. Which type of cell division produces the sperm in the drone bee?

- (1) meiosis  
(2) budding  
(3) sporulation  
(4) mitosis

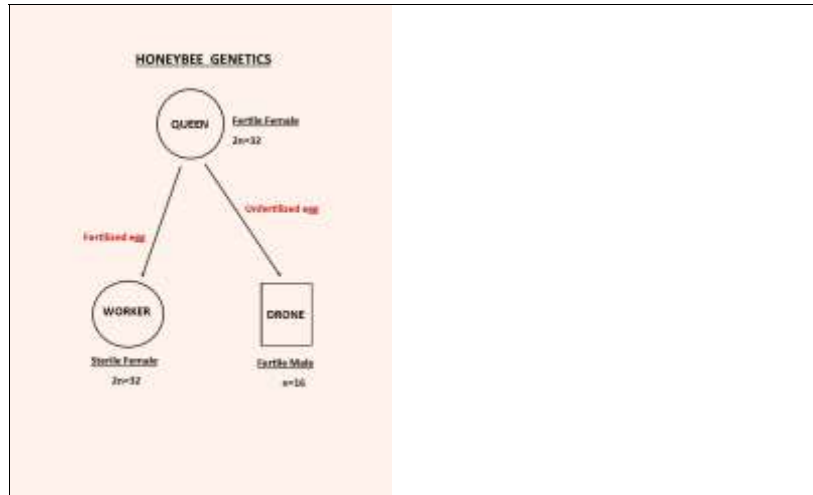
Data Base File Number: 1458

Regents Date BeeGenetics.bm

RBS2021

9/3/2021 RBS

Answer 4





## genetic modification

1005. Tasmanian devils are predators found on the Tasman Peninsula of Australia. Their numbers were greatly reduced after two forms of contagious cancer appeared in the population. Scientists have found an effective cancer vaccine that has saved a number of adult Tasmanian devils. The beneficial effect of the vaccine will not be passed on to the Tasmanian devils' offspring because the

- (1) vaccine contained only a small amount of the cancer
- (2) cancer can mutate, and the vaccine would then be ineffective
- (3) cancer caused the body of the adults to produce antigens against it
- (4) vaccine did not produce a change in the sex cells of the adults

Data Base File Number: 1567

Regents Date June2023-15.bmp

June2023

15 6/14/2023 S4K3

Answer 4



Source: <http://bigstory.ap.org/>

## genetic variation

1006. Base your answer to this question on the chart and photographs shown and on your knowledge of biology. An arctic fox has a gland in its brain that secretes a hormone that regulates the production of melanin, a pigment that accounts for brown fur. In the winter, the foxes secrete more of this hormone and their cells stop making melanin, so they appear white. The pictures shown illustrate two variations of fur color. Which TWO rows in the chart, best support the information provided?

- (1) A and B
- (2) B and C
- (3) C and D
- (4) D and A

Data Base File Number: 1514

Regents Date Aug2022-37C.bm

Aug2022

37 8/17/2022 S4K2

Answer 2



Source: <http://www.nationalgeographic.com/animals/mammals/arctic-fox/>

A	winter	increased melanin	white fur
B	summer	increased melanin	brown fur
C	winter	decreased melanin	white fur
D	summer	decreased melanin	brown fur

## genetic variation

1007. Base your answer to this question on the information given and on your knowledge of biology.--  
**Lessening Snow Cover Affects Survival of Snowshoe Hare** ----- Snowshoe hares are found in the northern evergreen forests of the United States. The physical characteristics of the hares enable them to hunt for food and hide from their predators during the cold, snow-covered winters. They have large, snowshoe-shaped feet and thick fur. A change in fur color during an annual molt (shedding) occurs before the winter season, causing white fur to replace the brown fur of summer. The amount of snow cover in these northern forests has decreased in recent years. Research has shown that this decrease has had a significant effect on the snowshoe hare population, even though the carrying capacity of the forests has not changed. Researchers have estimated that for every seven days that snow covers the ground, the snowshoe hare populations are four times more likely to survive.

Since the molt from brown fur to white fur is a response to the decreasing hours of daylight in the fall and not the arrival of snow, the later the snow arrives, the greater the chance that the white hares will be caught by their predators.

The snowshoe hare plays a major role in the stability of these forest ecosystems. Their loss would affect other species such as lynx and great horned owls. If the amount of snow cover continues to decrease, researchers are concerned that it will be harder for the snowshoe hare to survive in their current habitats. ---- What is likely to happen to the population of snowshoe hares in a winter when there is no snow?

- (1) Population increases  
(2) Population decreases  
(3) Population remains stable.  
(4) Insufficient data is presented to make a prediction.

Data Base File Number: 1528

Regents Date Aug2022-67.bmp

Aug2022

67 8/17/2022 S4K7

Answer 2



genetic variation

1008. Which process usually results in offspring that exhibit new genetic variations?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

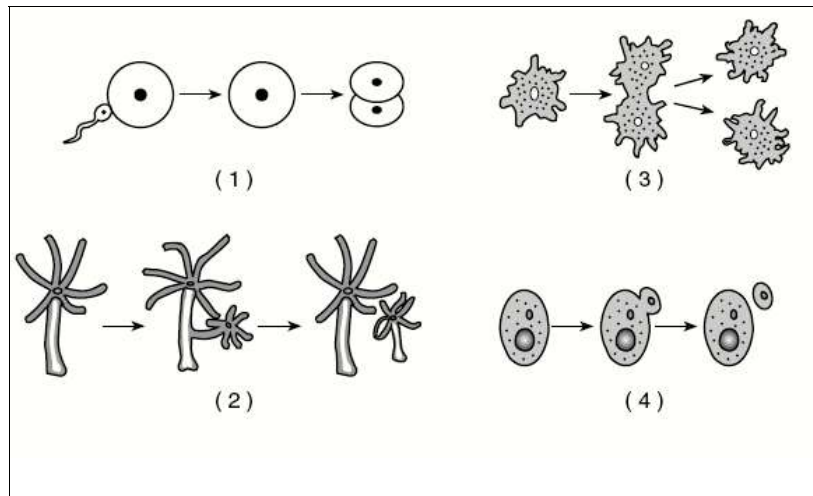
Data Base File Number: 150

Regents Date Jan09-10.bmp

Jan2009

10 1/27/2009 S4K2

Answer 1



genetic variation

1009. A small village that is heavily infested with mosquitoes was sprayed with an insecticide once a week for several months. Changes in the size of the mosquito population are shown in the graph. One way that the population of mosquitoes present 7 months after spraying differs genetically from the population of mosquitoes present before the spraying began is

- (1) Seven months later, there is a higher frequency in the population of the gene for resistance to the insecticide.
- (2) The mosquitos have eaten the insecticide.
- (3) All the mosquitos have been killed.
- (4) Seven months later, the mosquitos ignore the presence of the insecticide.

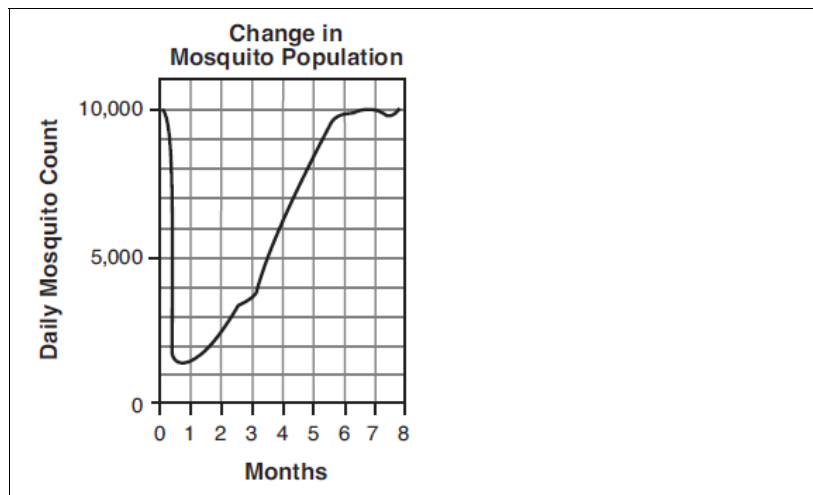
Data Base File Number: 423

Regents Date June2012-42.bmp

June2012

42 6/19/2012 S4K3

Answer 1



## genetic variation

1010. The chart given shows a comparison of the blood sugar levels for two individuals who took part in a scientific study. Scientists have observed that blood sugar levels rose by different amounts in the two individuals even though they were given identical portions of bananas and cookies. These results were obtained because

- (1) glucose is too large a molecule to be absorbed into the blood, so the researchers were only measuring the amount of glucose already present
- (2) participant 445 didn't like bananas, and his body absorbed more of the food that he likes
- (3) individuals have genetic differences that alter their responses to environmental factors
- (4) two different foods were used; the scientists should have had only one experimental variable

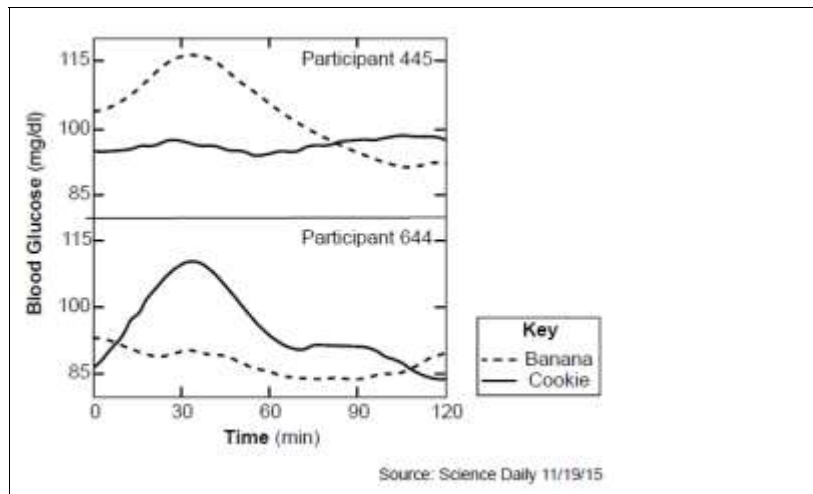
Data Base File Number: 1332

Regents Date June2019-12.bmp

June2019

12 6/18/2019 S4K1

Answer 3



## genetic variation

1011. The diagrams below represent two reproductive processes used by different organisms. When compared to organisms that utilize process A, organisms that utilize process B would most likely produce offspring with

- (1) a greater variety of genetic combinations
- (2) fewer genetic differences
- (3) more genetic combinations
- (4) more DNA within each nucleus

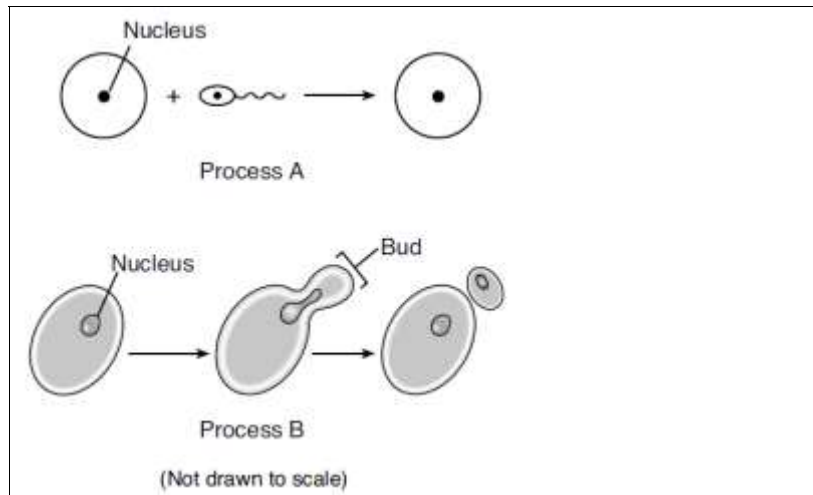
Data Base File Number: 1421

Regents Date June2021-9.bmp

June2021

9 6/22/2021 S4K2

Answer 2



## genetic variation

1012. Macaques are a species of monkey. They normally reproduce sexually, but in January 2018, scientists cloned two baby macaques from a single body cell. These monkeys are genetically

- (1) identical to each other, but different from the donor of the body cell
- (2) different from each other, but identical to the donor of the body cell
- (3) identical to each other and to the donor of the body cell
- (4) different from each other and from the donor of the body cell

Data Base File Number: 1665

Regents Date June2024-26.bmp

June2024

26 6/14/2024 S4K4

Answer 3



Source: <https://www.sciencenews.org/article/baby-macaques-primates-clones-dolly-sheep>

## global warming

1013. Base your answer to this question on the information given in the table and on your knowledge of biology. A reporter conducted a number of ON-THE-STREET interviews with people selected at random. The reporter found that many people gave responses similar to those of the person quoted in the table shown. Which statement is best supported by these interviews?

- (1) Many people are very aware of the possible effects of global warming.
- (2) Many people care more about their personal comforts than about the possible effects of global warming.
- (3) Many people are willing to sacrifice to reduce the possible effects of global warming.
- (4) Many people are now taking action to reduce the possible effects of global warming.

Data Base File Number: 288

Regents Date Aug2010-38.bmp

Aug2010

38 8/18/2010 S4K7

Answer 2

Question	Response of Person Interviewed
Would you be concerned if winters in this area became more severe and the cost of plowing and sanding snowy roads increased?	Of course I would be concerned. I can't afford higher taxes!
Would you be willing to pay more for a car that has better fuel economy if it would benefit the environment?	No! Cars that would use less gasoline would have to be much smaller. I like my big car—and besides that, it's safer.
If droughts became more common, would you be upset if you had to pay more for your food at the grocery store or a restaurant?	Definitely. My weekly food bill is too high already!
Would it bother you if the sea level increased a foot or two, causing many lowland areas to flood?	Not really. People could always move to higher ground. But I wouldn't want to see my taxes go up because we have to spend more on aid to help them move.
Are you concerned about global warming?	Not really. It doesn't affect me.

## global warming

1014. The news article shown appeared in a New Zealand newspaper dated August 14, 1912. The prediction in the news article, which was made over 100 years ago, may be considered
- (1) accurate because the average global temperature has risen
  - (2) accurate because the average global temperature has lowered
  - (3) inaccurate because we don't burn coal today
  - (4) inaccurate because our carbon dioxide production has decreased

Data Base File Number: 1609

Regents Date Aug2023-34.bmp

Aug2023

35 8/17/2023 S4K7

Answer 1

### COAL CONSUMPTION AFFECTING CLIMATE.

The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries.

Source: <https://www.livescience.com/63334-coal-affecting-climate-century-ago.html>

## glucose

1015. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram illustrates the steps in a process that occurs in the cells of many organisms. Based on the diagram, the process of glycolysis most likely
- (1) begins the breakdown of glucose
  - (2) produces oxygen for organisms to use
  - (3) stores energy in molecules of water and carbon dioxide
  - (4) recycles glucose within the cells of simple organisms

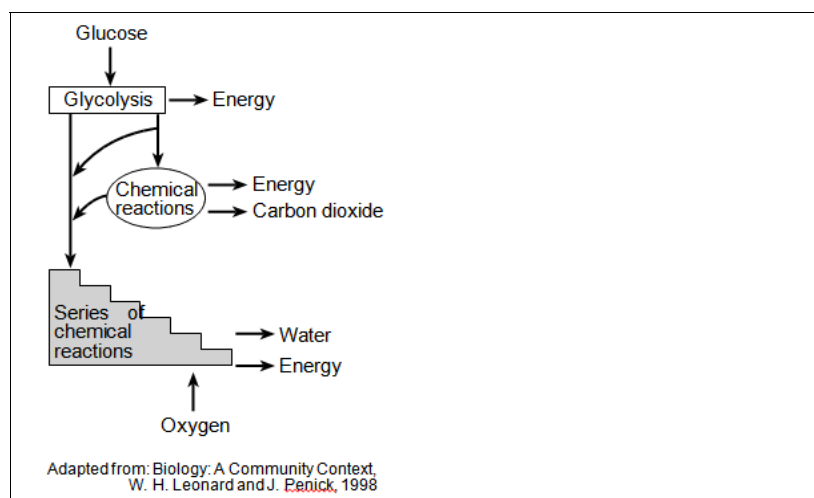
Data Base File Number: 1189

Regents Date June2017-48.bmp

June2017

50 6/14/2017 S4K5

Answer 1





**glucose levels**

016. The blood glucose range for a healthy adult is 65-104 mg/dL. Which graph best illustrates normal blood glucose levels in a healthy adult over the course of a day?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

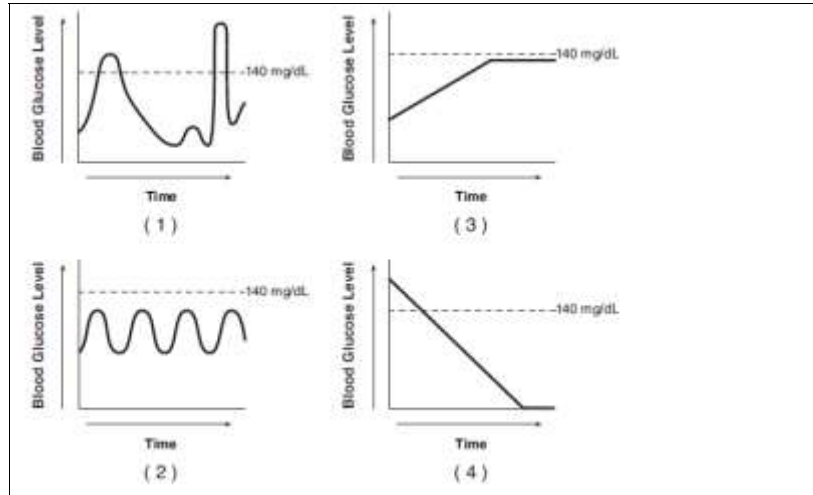
Data Base File Number: 910

Regents Date Aug2013-40.bmp

Aug2013

40 8/14/2013 S4K5

Answer 2



**glucose levels**

017. Base your answer to this question on the information given, the data table shown and on your knowledge of biology. Diabetes is a disease characterized by consistently high blood glucose levels (at or above 126 mg/100 mL) as a result of hormone deficiency. For a study of diabetes, blood glucose levels from individual A and individual B were recorded each hour over a 5-hour period following a meal. The results are shown in the data table. Which individual most likely has diabetes?

- (1) A
- (2) B
- (3) both A and B
- (4) neither A nor B

Data Base File Number: 392

Regents Date Jan2012-44.bmp

Jan2012

44 1/25/2012 S4K5

Answer 1

Hours	Individual A	Individual B
0	135	90
1	175	122
2	200	110
3	185	87
4	165	85
5	150	90



## glucose levels

1018. Base your answers to this question on the information and diagram given and on your knowledge of biology.

### GLYCOGEN STORAGE DISEASE:

An increase in the glucose level in the blood causes a release of insulin. Insulin signals the liver to absorb excess glucose. In order to store it, the liver then synthesizes glycogen from glucose. When blood sugar is low, the liver breaks the large glycogen molecules back down into glucose and releases it back into the bloodstream for use by the cells. The diagram shown illustrates how a person normally metabolizes glucose. People with glycogen storage disease (GSD) cannot break the glycogen down, so they can't access their stored glucose. It is essentially "locked" in the liver. Symptoms of this disease include low blood sugar, poor growth, and weakness. Currently, one of the treatments for children with GSD is to drink a starch solution several times a day. Why is glucose able to be absorbed across cell membranes but glycogen is unable to be absorbed unless it is broken down?

- (1) The glucose molecule is smaller than glycogen and is the product of glycogen digestion.
- (2) Glycogen is produced by digesting glucose.
- (3) Glycogen contains nitrogen
- (4) Glycogen can pass through a cell membrane by active transport.

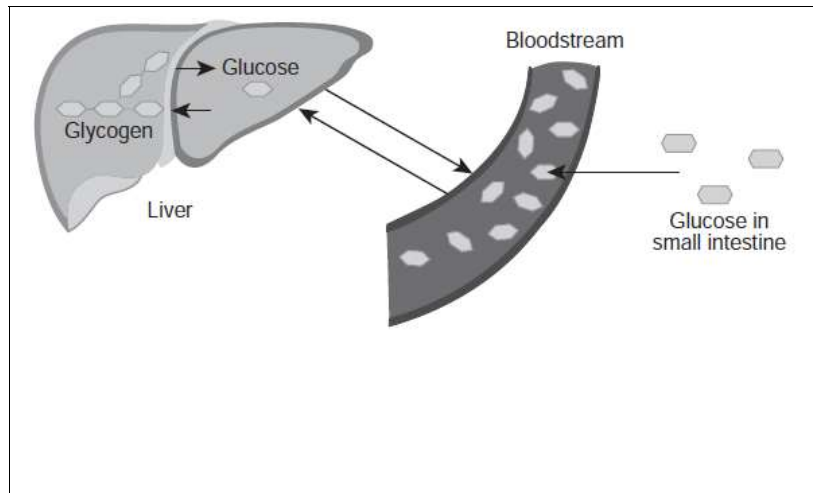
Data Base File Number: 1707

Regents Date Aug2024-64.bmp

Aug2024

65 8/20/2024 S4K1

Answer 1



## glucose test

1019. Part of a laboratory procedure is shown in the diagram. This setup would most likely be involved in a procedure to
- (1) stain specimens while making a wet mount
  - (2) test for the presence of glucose using an indicator
  - (3) separate pigments in a mixture
  - (4) determine the pH of solutions

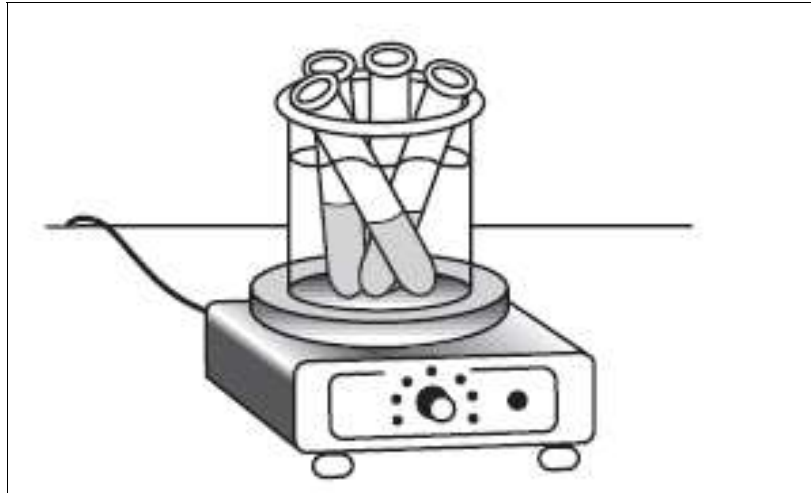
Data Base 328  
File Number:

Regents Date Jan2011-71.bmp

Jan2011

71 1/25/2011 LABS

Answer 2



## graph

1020. The graph shows the effect of moisture on the number of trees per acre of five tree species. Which observation best represents information shown in the graph?
- (1) All five species grow in the same habitat.
  - (2) The American elm grows in the widest range of moisture conditions.
  - (3) Red oaks can grow in wetter conditions than black willows.
  - (4) Sugar maples can grow anywhere black oaks can grow.

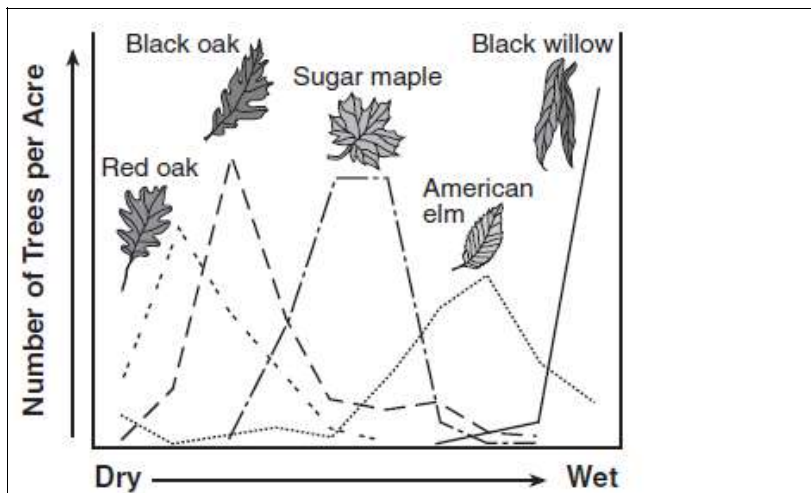
Data Base 487  
File Number:

Regents Date June2006-31.bmp

June2006

31 6/21/2006 S4K1

Answer 2



graph

1021. Base your answer to this question on the graph shown and on your knowledge of biology. The greatest difference between the incidence of measles and the incidence of bacterial pneumonia occurred in

- (1) 1940
- (2) 1950
- (3) 1960
- (4) 1970

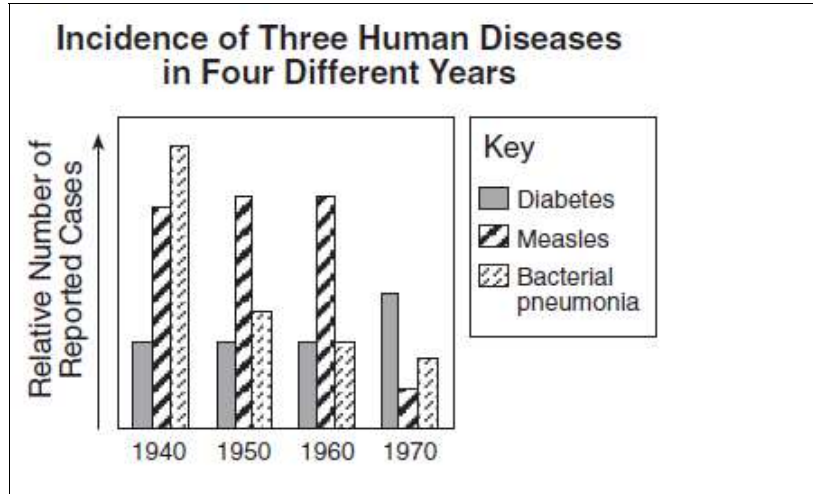
Data Base File Number: 590

Regents Date Aug2005-35.bmp

Aug2005

35 8/16/2005 S1K1

Answer 3



graph

1022. Base your answer to this question on the information given, the graph shown and on your knowledge of biology. What effect did the pH change in these Adirondack Lakes have on lake trout, brown trout, smallmouth bass, and mussels?

- (1) The pH changes had no effect on the species named.
- (2) There are not as many trout, bass and mussels.
- (3) The species named increased in numbers.
- (4) The species named migrated to another lake.

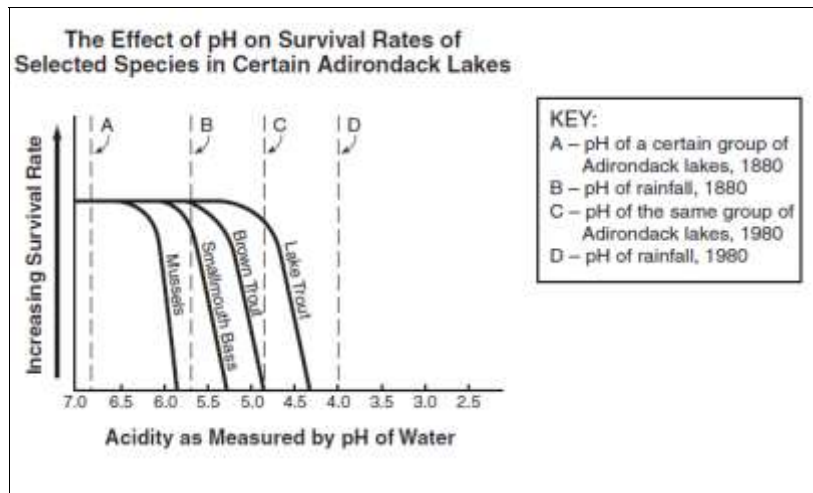
Data Base File Number: 467

Regents Date Jan2006-50.bmp

Jan2006

51 1/27/2006 S4K7

Answer 2



graph

1023. Base your answer to this question on the graphs shown. The graphs show changes in the number of aspen trees and the beaver population in an area over a 50-year period. What is the relationship that exists between the number of aspen trees and the beaver populations in this region during the first 15 years?

- (1) Beaver and aspen tree numbers remain in dynamic equilibrium.
- (2) As the beaver numbers increased, the number of aspen trees decreased.
- (3) Beaver numbers and aspen tree numbers remained stationary.
- (4) The data do not support any conclusion.

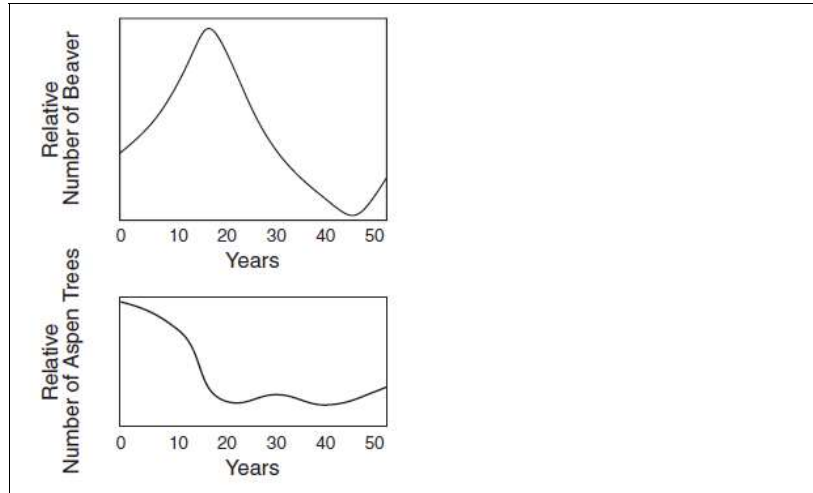
Data Base File Number: 596

Regents Date Aug2005-41.bmp

Aug2005

41 8/16/2005 S4K6

Answer 2



graph

1024. Thrips are insects that feed on the pollen and flowers of certain plants. The size of a thrip population depends on the number of flowers available. Which graph best represents changes in a population of thrips if winter was longer than usual and the summer was too cool and dry for many flowers to bloom?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

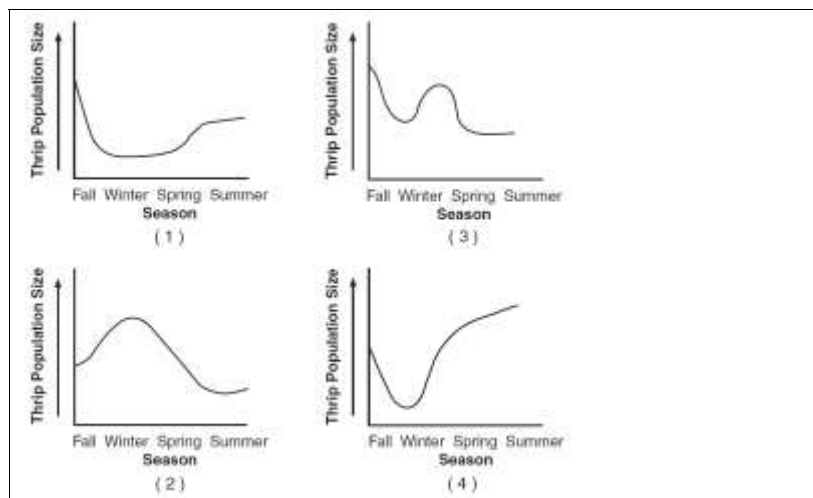
Data Base File Number: 344

Regents Date June2011-40.bmp

June2011

40 6/21/2011 S4K1

Answer 1



## graph

1025. For over 100 years scientists have monitored the carbon dioxide concentrations in the atmosphere in relation to changes in the atmospheric temperature. The graphs show the data collected for these two factors. According to the data collected, what happened to the atmospheric temperature, over time, as the carbon dioxide levels in the atmosphere increased?

- (1) The atmospheric temperature increased.
- (2) The atmospheric temperature decreased.
- (3) The atmospheric temperature remained the same.
- (4) No conclusion can be made based on the data shown.

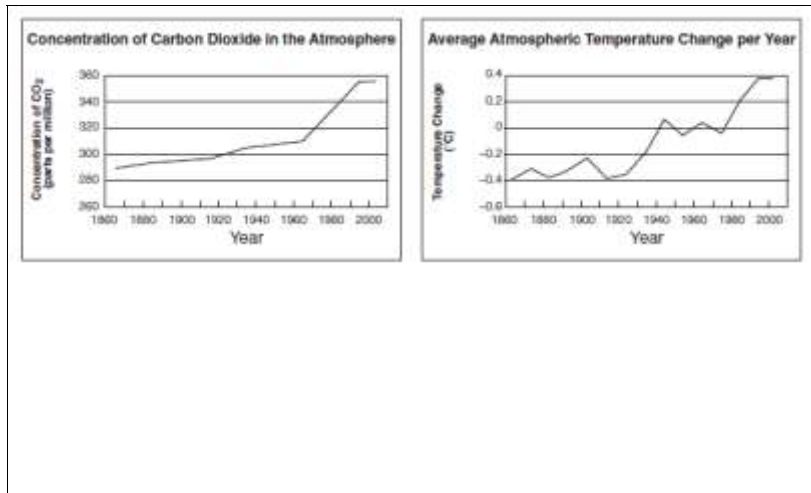
Data Base File Number: 576

Regents Date June2005-58.bmp

June2005

58 6/22/2005 S4K7

Answer 1



## graph

1026. The graph shows the results of an action of the enzyme catalase on a piece of meat. Evidence of enzyme activity is indicated by bubbles of oxygen. Which statement best summarizes the activity of catalase shown in the graph?

- (1) The enzyme works better at 10°C than at 50°C.
- (2) The enzyme works better at 5°C than at 65°C.
- (3) The enzyme works better at 35°C than at either temperature extreme.
- (4) The enzyme works at the same level in all environments.

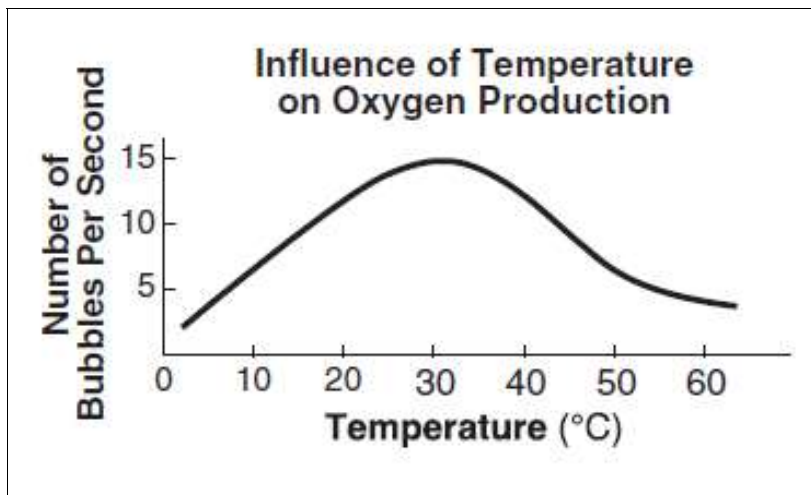
Data Base File Number: 388

Regents Date Jan2012-39.bmp

Jan2012

39 1/25/2012 S4K3

Answer 3



## graph

1027. A student studied how the amount of oxygen affects ATP production in muscle cells. The data for amount X are shown in the graph. If the student supplies the muscle cells with LESS oxygen in a second trial of the investigation, a bar placed on the graph to represent the results of this trial would most likely be

- (1) shorter than bar X and placed to the left of bar X
- (2) shorter than bar X and placed to the right of bar X
- (3) taller than bar X and placed to the left of bar X
- (4) taller than bar X and placed to the right of bar X

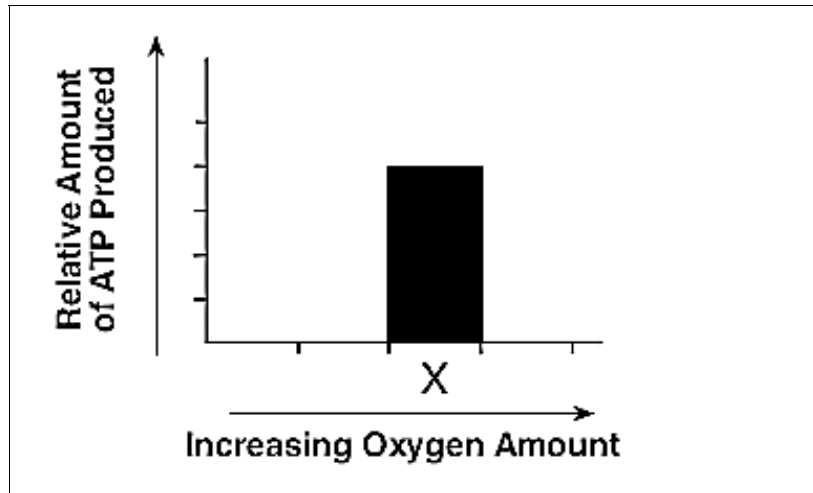
Data Base 71  
File Number:

Regents Date Jan08-33.bmp

Jan2008

33 1/25/2008 S1K3

Answer 1



graph

1028. A graph of the population growth of two different species is shown. Which conclusion can be drawn from information in the graph?

- (1) Oxygen concentration affects population sizes of different species in the same manner.
- (2) Species A requires a high oxygen concentration for maximum population growth.
- (3) Species B requires a high oxygen concentration to stimulate population growth.
- (4) Low oxygen concentration does not limit the population size of either species observed.

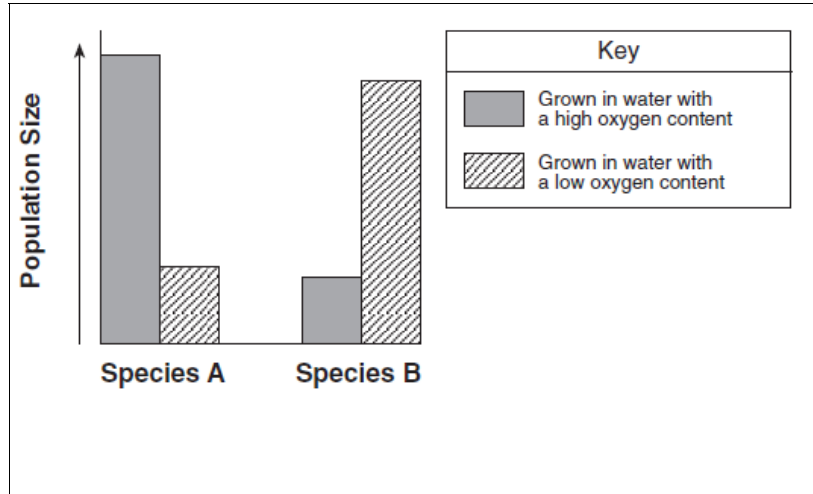
Data Base File Number: 495

Regents Date June2006-43.bmp

June2006

43 6/21/2006 S4K6

Answer 2



graph

1029. Refer to the graph shown. The empty (white) boxes on the grid represent data collected from SITE 1. The circles (black) represent data collected from SITE 2. Compounds containing phosphorous that are dumped into the environment can upset ecosystems because phosphorous acts as a fertilizer. The graph shows measurements of phosphorous concentrations taken during the month of June at two different sites from 1991 to 1997. Which statement represents a valid inference based on the information in the graph?

- (1) There was no decrease in the amount of compounds containing phosphorous dumped at site2 during the period from 1991 to 1997.
- (2) Pollution controls may have been put into operation at site 1 in 1995.
- (3) There was most likely no vegetation present near site 2 from 1993 to 1994.
- (4) There was a greater variation in phosphorous concentration at site 1 than there was at site 2.

Data Base  
File Number:

58

Regents Date

Jan07-37.bmp

Jan2007

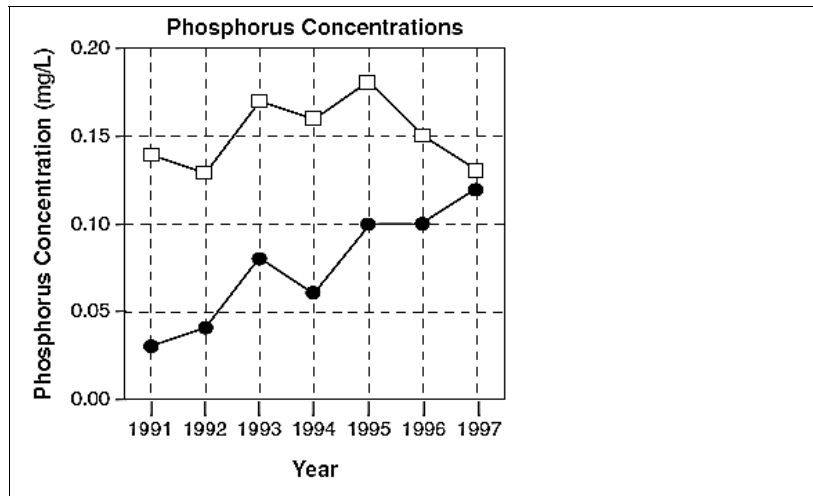
37

1/26/2007

S4K7

Answer

2





graph

1030. The graphs shown display the percent of monitoring stations where three different amphibian species were seen. The data were collected between 1995 to 2007 in the wetlands surrounding the Great Lakes. Which claim is best supported by the data represented in the graphs?

- (1) The American toad population increased by approximately 57% in 1995 and 40% more in 2007.
- (2) The bullfrog population decreased every year between 1995 and 2005.
- (3) The spring peeper population is at about the same level in 2007 as it was in 1995.
- (4) All three amphibian populations were infected by a parasite in 2003.

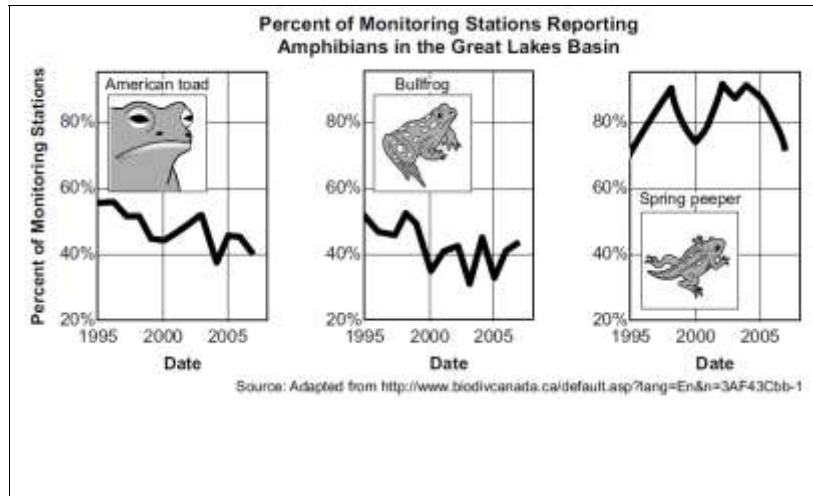
Data Base File Number: 1552

Regents Date Jan2023-43.bmp

Jan2023

43 1/24/2023 S1K1

Answer 3



graph

1031. Base your answer to this question on the information in the data table and on your knowledge of biology. An insect known as a sawfly is found in evergreen forests in North America. Sawfly cocoons are the main source of food for shrews (small mammals) and some bird species. Scientists studied 1-acre plots in various parts of a state to determine the average number of sawfly cocoons, shrews, and robins. The data collected are shown in the table. What is the average number of shrews per acre when the average number of sawfly cocoons is 500,000?

- (1) 10
- (2) 15
- (3) 20
- (4) 25

Data Base File Number: 835

Regents Date Jan2002-36.bmp

Jan2002  
36 1/23/2002 LABA

Answer 2

Average Number of Sawfly Cocoons per Acre (in thousands)	Average Number of Shrews per Acre	Average Number of Robins per Acre
100	5.0	0
300	7.5	0.5
600	19.0	0.8
900	23.5	1.0
1200	23.5	1.3

## graph

1032. Researchers studied the relationship between lichen nitrogen content and the growth of lichens on trees. They recorded the amount of growth after determining the percentage of the tree that was covered in lichens. Their data are shown in the graph. Which statement best describes the relationship between the nitrogen content and the growth of the lichen?

- (1) As nitrogen content in the lichen increases, the growth of the lichen increases.
- (2) As nitrogen content in the lichen decreases, the growth of the lichen decreases.
- (3) As nitrogen content in the lichen decreases, the growth of the lichen increases.
- (4) There is not a clear relationship between the amount of nitrogen in the lichen and growth.

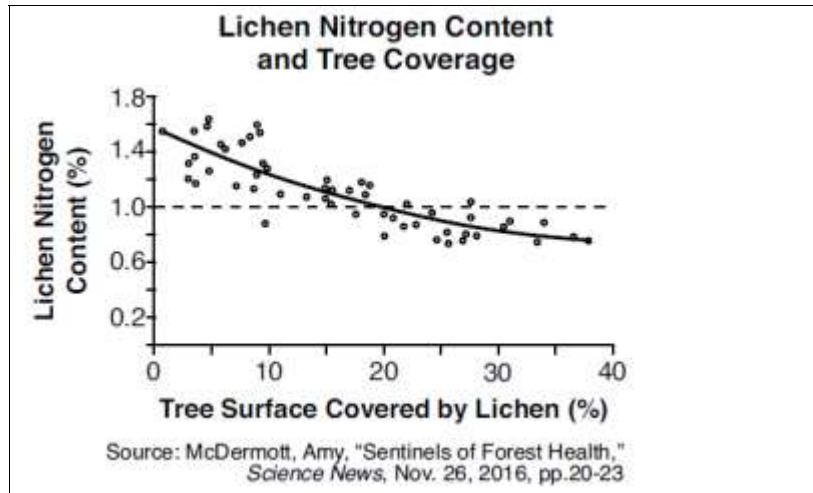
Data Base File Number: 1480

Regents Date June2022-34.bmp

June2022

34 6/15/2022 LABA

Answer 3



graph

1033. **IMPORTANT NOTE: Turn your paper to the LEFT to properly view the diagram.** A student measures his pulse rate while he is watching television and records it. Next, he walks to a friend's house nearby and when he arrives, measures and records his pulse rate again. He and his friend then decide to run to the mall a few blocks away. On arriving at the mall, the student measures and records his pulse rate once again. Finally, after sitting and talking for a half hour, the student measures and records his pulse rate for the last time.  
Which graph best illustrates the expected changes in his pulse rate according to the activities described above?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

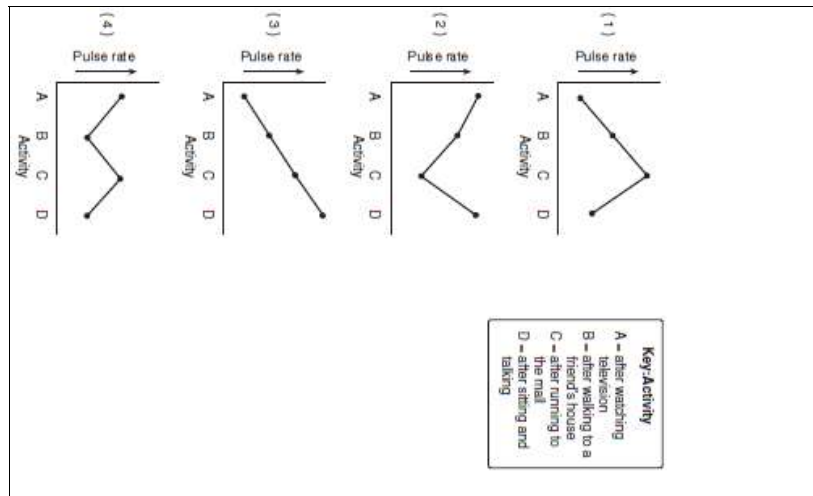
Data Base File Number: 683

Regents Date June2004-66B.b

June2004

66 6/18/2004 LAB2

Answer 1



graph

1034. Base your answer to this question on the graph as shown and on your knowledge of biology. The graph shows the carbon dioxide (CO<sub>2</sub>) concentration of the atmosphere since the year 1000. What was the approximate change in CO<sub>2</sub> level from the year 1000 to the year 2000?

- (1) an increase of 135 ppm
- (2) an increase of 95 ppm
- (3) a decrease of 135 ppm
- (4) a decrease of 95 ppm

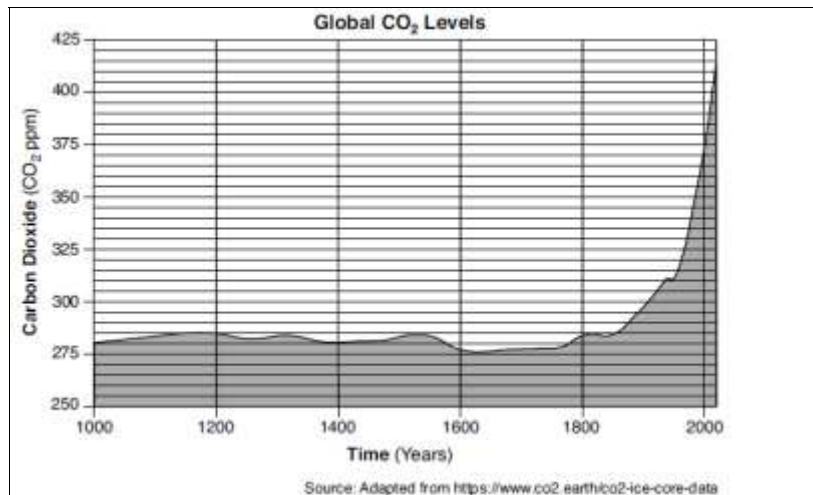
Data Base File Number: 1482

Regents Date June2022-32.bmp

June2022

37 6/15/2022 S1K3

Answer 2



graph

1035. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the number of species that have become extinct since 1800. It also shows the change in the size of the human population for the same period of time. The graph indicates that the number of species that have become extinct

- (1) has increased with increasing human population
- (2) has decreased with increasing human population
- (3) is not affected by the size of the human population
- (4) is greater than the size of the human population

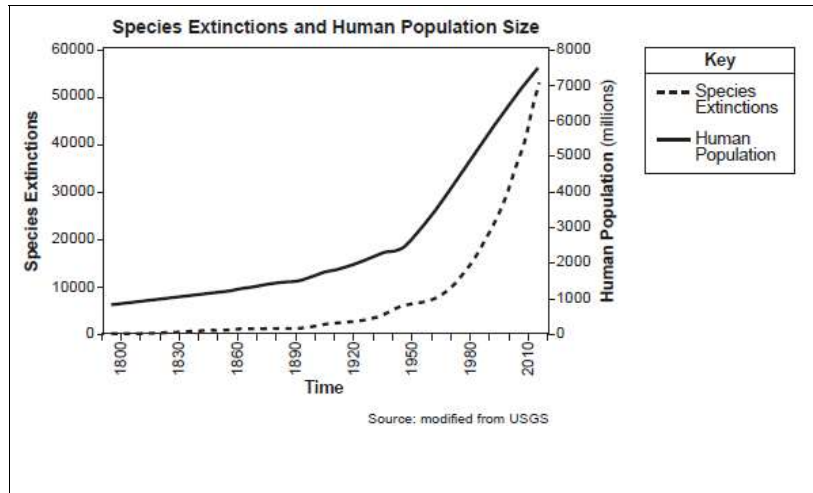
Data Base File Number: 1079

Regents Date Jan2016-42.bmp

Jan2016

42 1/27/2016 S4K7

Answer 1



graph

1036. A study was done on three different fish species living in a pond in New York State. The influence of temperature on the growth rates of the fish populations is shown in the graph. In this pond where these fish live, temperature is a

- (1) limiting factor
- (2) heredity factor
- (3) source of ATP
- (4) source of solar energy

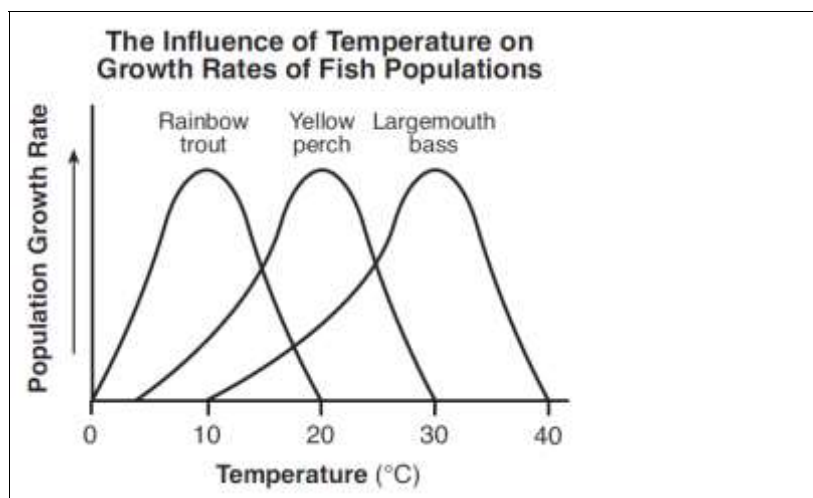
Data Base File Number: 876

Regents Date June2013-23.bmp

June2013

23 6/11/2013 S4K6

Answer 1



graph

1037. The graph shown summarizes how effective the seasonal flu vaccine has been at preventing infection with the flu virus. The data were collected over a 13-year period. Based on the data provided, a reasonable interpretation would be that

- (1) in 2004-2005, some individuals caught the flu from the vaccine
- (2) the virus mutated in 2014-2015, resulting in the vaccine being less effective
- (3) people have become immune to the flu vaccine over the 13-year period
- (4) the vaccine has become increasingly effective over the 13-year period

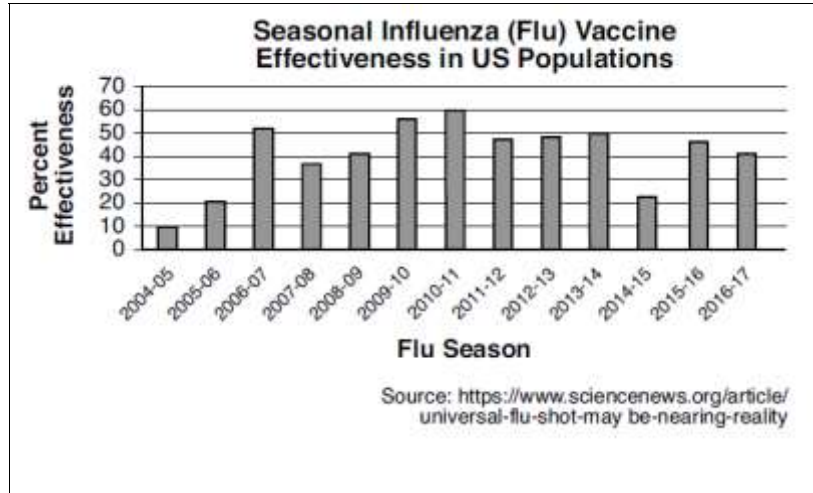
Data Base File Number: 1485

Regents Date June2022-43.bmp

June2022

43 6/15/2022

Answer 2



graph

1038. Base your answer to this question on the graphs shown and on your knowledge of biology. The graphs show the effect of sewage (human organic waste) flowing into a lake on the level of dissolved oxygen in the water and the size of different fish populations. Which statement concerning the oxygen level in the lake can be inferred from the graphs?

- (1) Trout and whitefish require higher oxygen levels than do carp.
- (2) Carp are more sensitive to oxygen levels than are other fish.
- (3) The fish in this lake all require the same amount of oxygen for survival.
- (4) Walleye populations were highest when the oxygen levels were lowest.

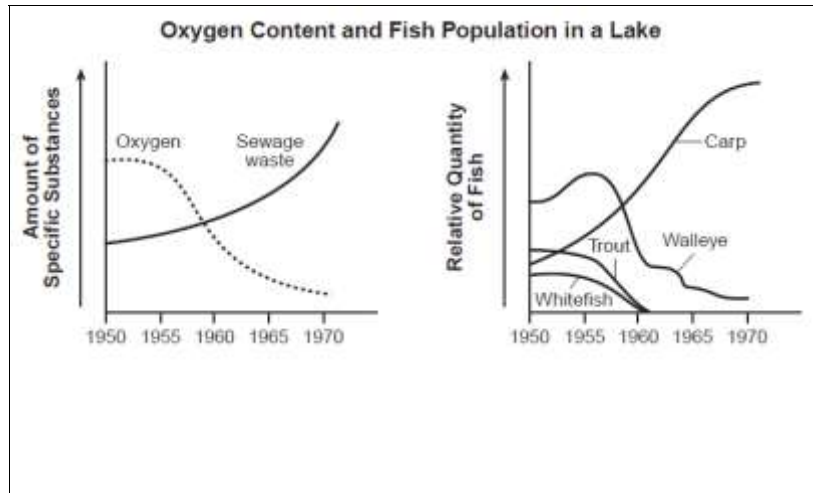
Data Base File Number: 1074

Regents Date Jan2016-31.bmp

Jan2016

31 1/27/2016 S4K7

Answer 1



graph

1039. What is the dependent variable in the experiment summarized in the graph as shown?

- (1) pH
- (2) Percent Maximum Activity of Trypsin
- (3) temperature
- (4) time

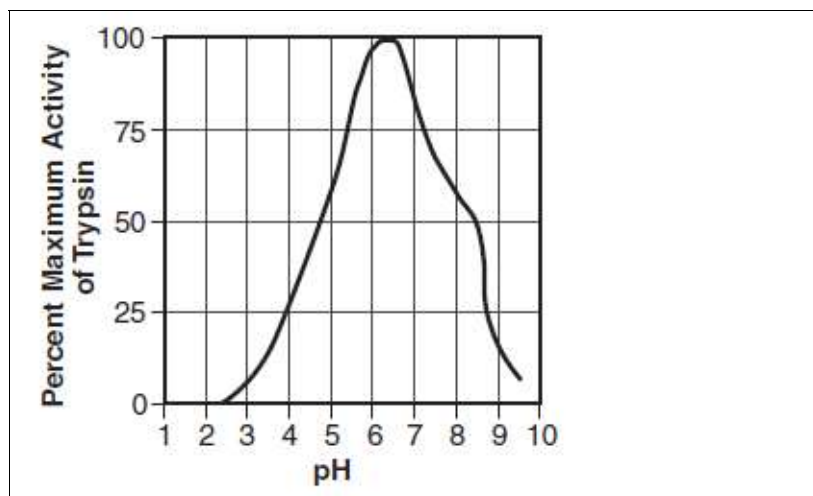
Data Base File Number: 820

Regents Date June2002-48.bmp

June2002

48 6/19/2002 LABA

Answer 2



## graph

1040. Base your answer to this question on the graph shown and on your knowledge of biology. The graph illustrates a single species of bacteria grown at various pH levels. Which statement is supported by data from this graph?

- (1) All species of bacteria can grow well at pH 7.
- (2) This type of bacterium would grow well at pH 7.5.
- (3) This type of bacterium would grow well at pH 2.
- (4) Other types of bacteria can grow well at pH 4.

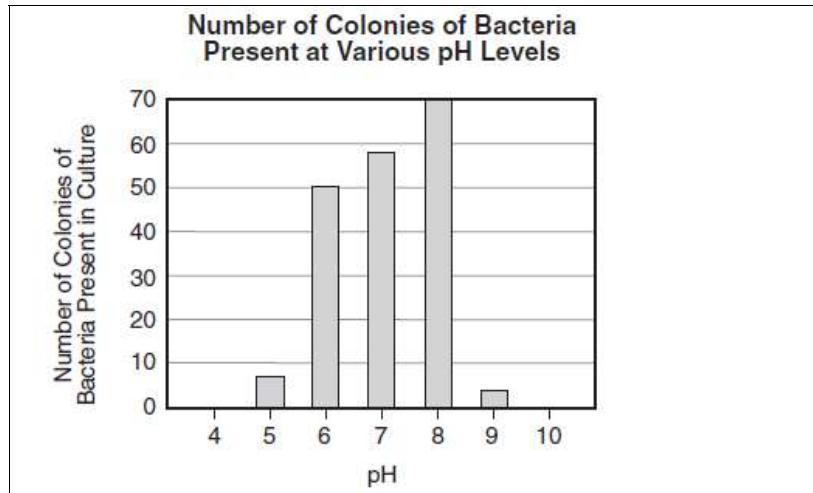
Data Base File Number: 741

Regents Date June2003-37.bmp

June2003

38 6/19/2003 S1K3

Answer 2



## graph

1041. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the masses of different types of plants found in an area of the Adirondack Mountains after a forest fire occurred. Based on the information provided in the graph, the time shown in the graph is most likely measured in

- (1) days
- (2) weeks
- (3) months
- (4) years

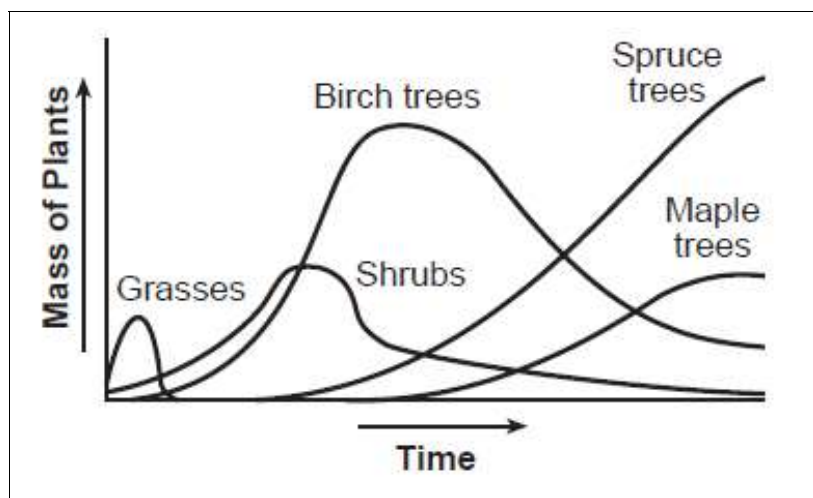
Data Base File Number: 1103

Regents Date June2016-34.bmp

June2016

35 6/15/2016 S4K6

Answer 4





graph

1042. Base your answer to this question on the diagram shown and on your knowledge of biology. Only an electron microscope can be used to view

- (1) bacteria
- (2) mitochondria
- (3) animal cells
- (4) viruses

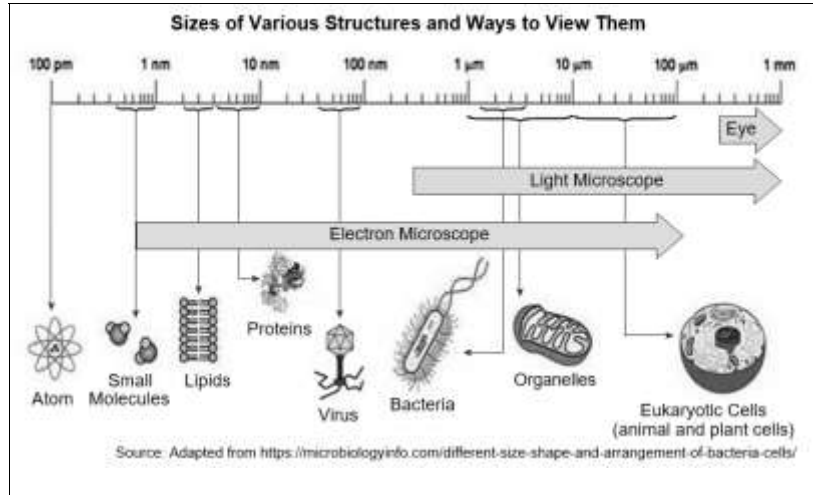
Data Base File Number: 1510

Regents Date Aug2022-31.bmp

Aug2022

31 8/17/2022 LABA

Answer 4



graph

1043. Base your answer to this question on the diagram shown and on your knowledge of biology. A scientist is developing a system to remove harmful bacteria from a contaminated water supply. In order to trap the bacteria and prevent them from going through the filter, she must make sure the pores in the filter are no larger than

- (1) 1 nm
- (2) 1 μm
- (3) 10 μm
- (4) 100 μm

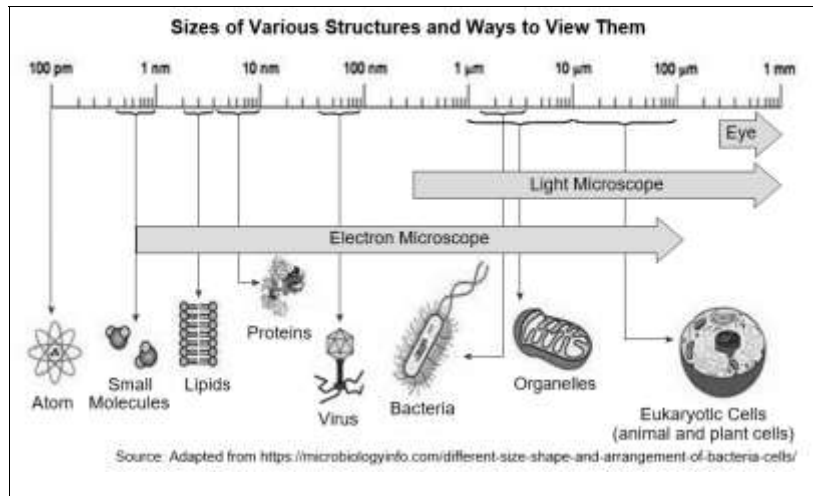
Data Base File Number: 1511

Regents Date Aug2022-31.bmp

Aug2022

32 8/17/2022 LABA

Answer 2



graph

1044. Base your answers to this question on the information and diagram shown and on your knowledge of biology. A live plant was placed in a closed container in a lab. Sensors were set up to monitor the levels of oxygen in the container over several hours. At which hour were the lights turned on in the lab?

- (1) 8
- (2) 2
- (3) 0
- (4) 4

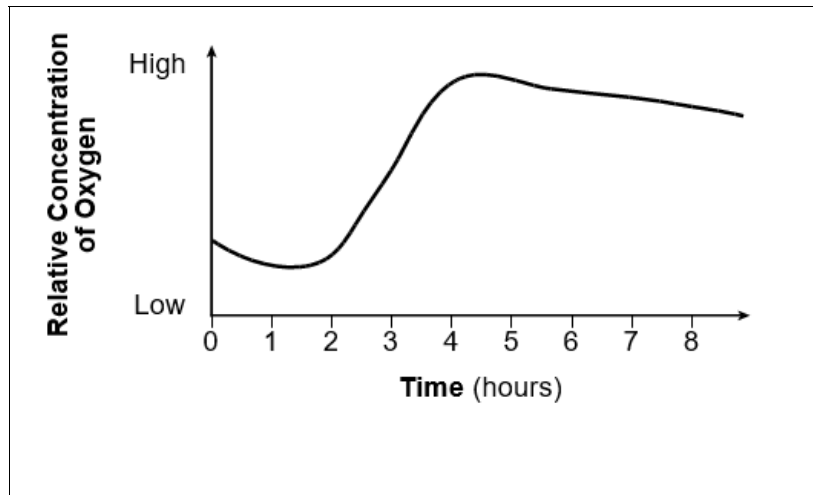
Data Base File Number: 1517

Regents Date Aug2022-41.bmp

Aug2022

41 8/17/2022 S4K5

Answer 2



graph

1045. Base your answer to this question on the information shown and on your knowledge of biology. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is a toxic compound that is produced by plant and animal cells. These cells also produce the enzyme catalase, which converts H<sub>2</sub>O<sub>2</sub> into water and oxygen gas, preventing the buildup of H<sub>2</sub>O<sub>2</sub>. A student designed an experiment to test the effect of an acidic pH on the rate of the reaction of H<sub>2</sub>O<sub>2</sub> with catalase. The data table summarizes the outcome of the experiment. Which graph most accurately represents the results obtained by this student?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

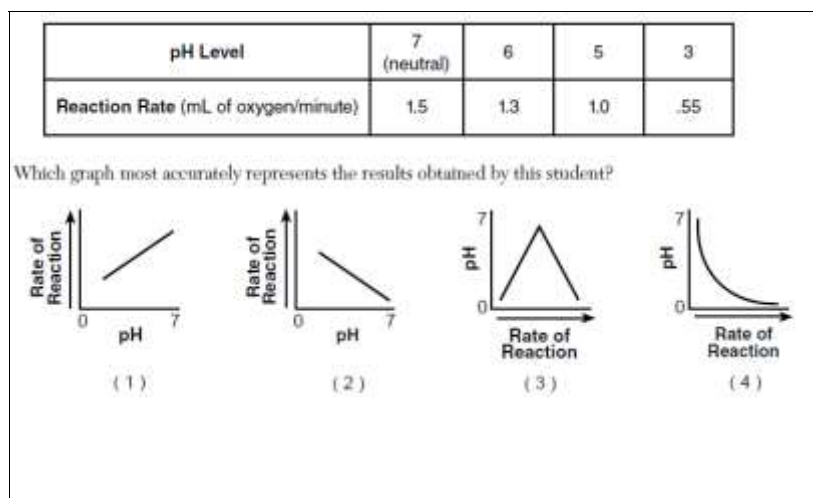
Data Base File Number: 1286

Regents Date Aug2018-37.bmp

Aug2018

37 8/17/2018 S4K1

Answer 1



## graph

1046. Base your answer to this question on the information and diagram given and on your knowledge of biology. A live plant was placed in a closed container in a lab. Sensors were set up to monitor the levels of oxygen in the container over several hours. During the 8 hours studied, the plant performed
- (1) photosynthesis, only  
(2) respiration, only  
(3) both photosynthesis and respiration  
(4) neither photosynthesis nor respiration

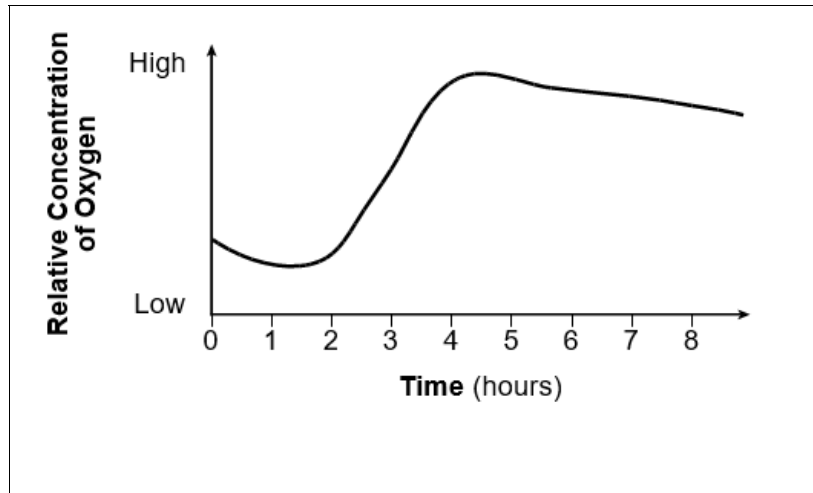
Data Base File Number: 1518

Regents Date Aug2022-41.bmp

Aug2022

42 8/17/2022 S4K5

Answer 3



## graph

1047. Base your answer to this question on the information given and on your knowledge of biology. One important vitamin that pregnant women should consume is folic acid. Folic acid is converted to folate in the body. It is well known that women who have a diet rich in folic acid show a decreased risk of having babies with neural tube (central nervous system) defects. Scientists conducted a study to determine the optimal amount of folic acid needed in the mother's diet to prevent neural tube defects. The results are shown in the graph. According to the graph, what is the MINIMUM amount of folate needed to reduce the risk of neural tube defects to 10 or less per 10,000 births?
- (1) 800 nmol/L  
(2) 800 nmol/L  
(3) 1000 nmol/L  
(4) 1400 nmol/L

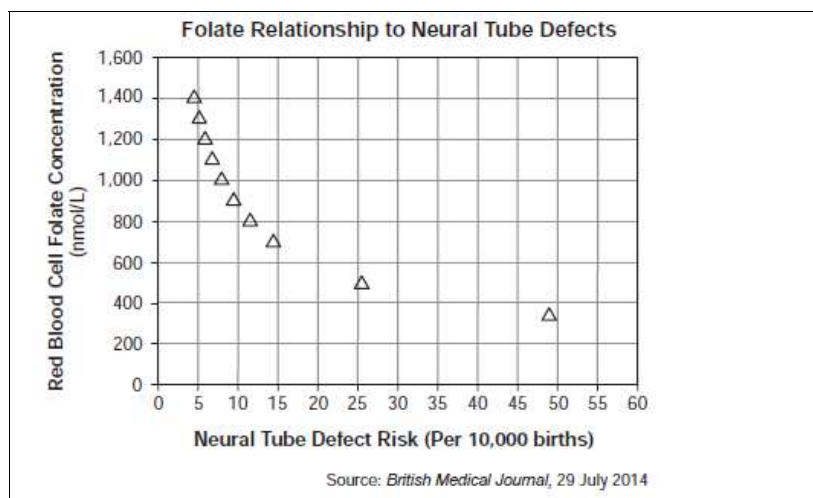
Data Base File Number: 1641

Regents Date Jan2024-50.bmp

Jan2024

50 1/23/2024 LABA

Answer 2



graph

1048. Base your answer to this question on the information and data table given and on your knowledge of biology. **OVERFISHING OF NEWFOUNDLAND COD** ---

When fishing results in small catches, it is said that the species has been overfished. Over the last 75 years, ocean fish populations have dropped by almost 90%. The data chart given shows the approximate amount, in thousands of tons, of Newfoundland cod caught each year from 1970 to 1995. --- During which five-year span did the largest drop in fishing occur?

- (1) 1970 and 1975
- (2) 1975 and 1980
- (3) 1980 and 1985
- (4) 1990 and 1995

Data Base File Number: 1486

Regents Date June2022-45.bmp

June2022

47 6/15/2022 S1K1

Answer 2

Approximate Amount of Newfoundland Cod Catches, 1970-1995

Years	Tons x 10 <sup>3</sup> of Newfoundland Cod Caught
1970	1500
1975	1300
1980	600
1983	700
1985	300
1987	400
1990	210
1993	100
1995	50

graph

1049. Base your answer to this question on the graph shown and on your knowledge of biology. What is the total number of students who participated in this data collection?

- (1) 18
- (2) 36
- (3) 80
- (4) 90

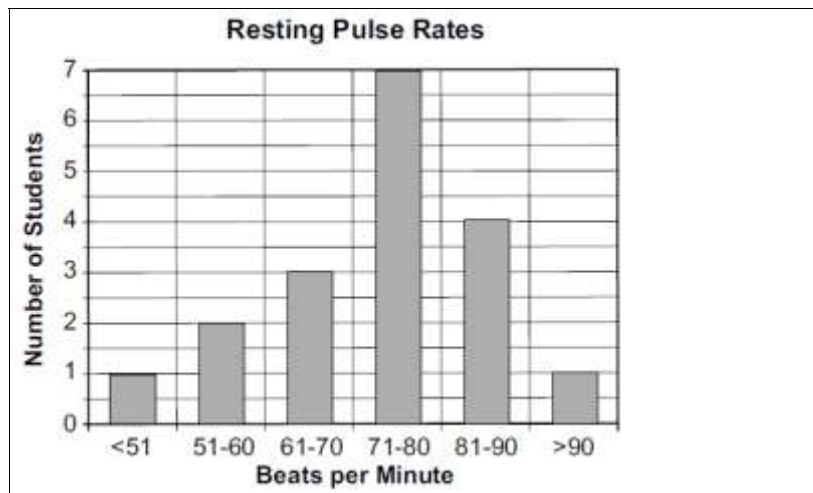
Data Base File Number: 1560

Regents Date Jan2023-78.bmp

Jan2023

78 1/24/2023 LAB2

Answer 1



graph

1050. Which line in the graph shown best illustrates an effect of the carbon dioxide level in the blood on breathing rate before, during, and after a period of exercise?

- (1) A
- (2) B
- (3) C
- (4) D

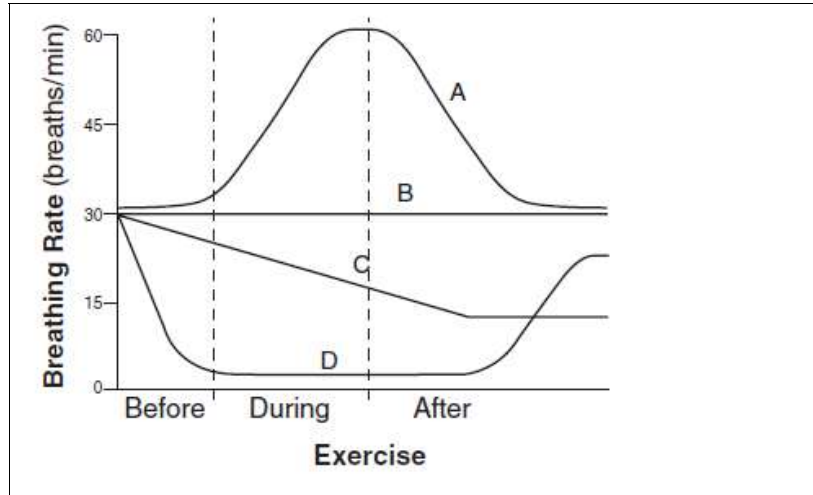
Data Base File Number: 764

Regents Date Aug2003-36.bmp

Aug2003

36 8/13/2003 S4K1

Answer 1



graph

1051. Base your answer to this question on the graph which shows pollution from nitrogen-containing compounds (nitrates) in a brook flowing through a deforested and a forested area between 1965 and 1968. How did the nitrate pollution in the brook change after the brook flowed through the deforested area?

- (1) The nitrate pollution decreased.
- (2) The nitrate pollution remain unchanged.
- (3) The nitrate pollution increased.
- (4) The data is not complete enough to make a determination of the nitrate pollution.

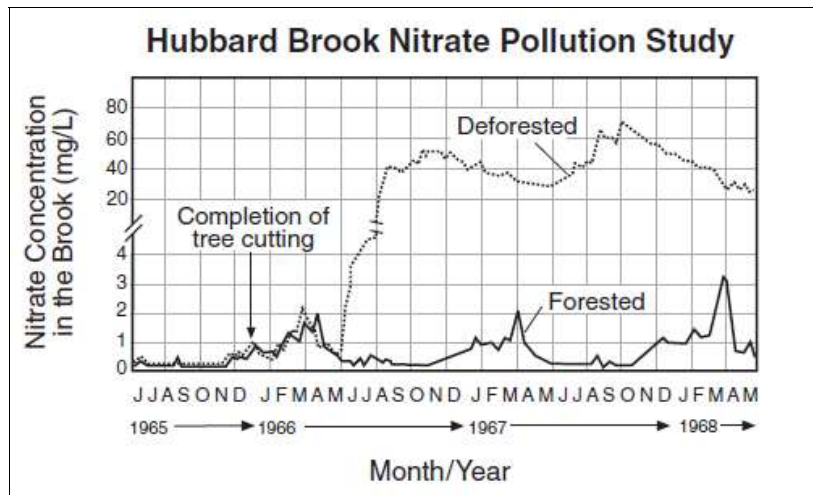
Data Base File Number: 771

Regents Date Aug2003-47.bmp

Aug2003

47 8/13/2003 S4K7

Answer 3



graph

1052. Base your answer to this question on the information below and on your knowledge of biology.  
Wildebeest

Located in southern Africa, wildebeest are the largest members of the antelope family, weighing from 260-595 pounds. In some parts of southern Africa, their population is decreasing. Their natural predators include lions, hyenas, cheetahs, and African wild dogs. Humans are disrupting the wildebeest habitat by putting up fences. However, in Serengeti National Park, where the population has been studied and monitored since the 1960s, the herd has experienced a rapid increase. A successful vaccination program had been developed to protect cattle that had passed the deadly disease called rinderpest to wildebeest. Based on the graph, which of the following describes the wildebeest population over time?

- (1) The trend in the graph shown indicates that the carrying capacity for the wildebeest was reached around 1975.
- (2) The trend in the graph shown indicates that the carrying capacity for the wildebeest was reached around 1979.
- (3) The trend in the graph shown indicates that the carrying capacity for the wildebeest was reached around 1983.
- (4) The trend in the graph shown indicates that the carrying capacity for the wildebeest was reached around 1991.

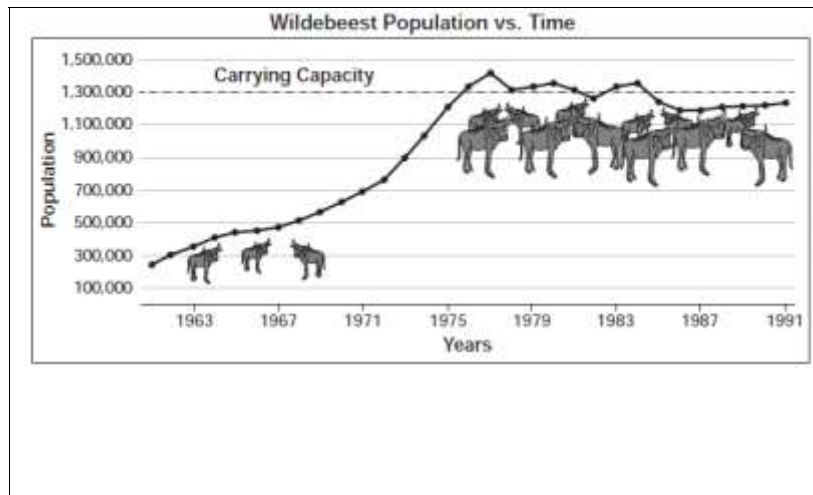
Data Base 1708  
File Number:

Regents Date Aug2024-66.bmp

Aug2024

66 8/20/2024 S4K6

Answer 1



graph

1053. Base your answer to this question on the information and graph shown and on your knowledge of biology. An investigation was carried out to determine the effect of drinking an excessive amount of water on urine flow. A subject drank 1 liter of water in 5 minutes, and then urine output was measured. The graph shows how the human adult kidneys responded to regulate water balance in the body. Urine output was measured every 10 minutes for a little over 3 hours. Normal output for an average adult is approximately 0.5-1 mL/min. One half-hour after the liter of water was consumed, the urine produced by the kidneys was

- (1) between 2 and 3 mL/min
- (2) between 4 and 5 mL/min
- (3) eight times greater than normal
- (4) below the normal range

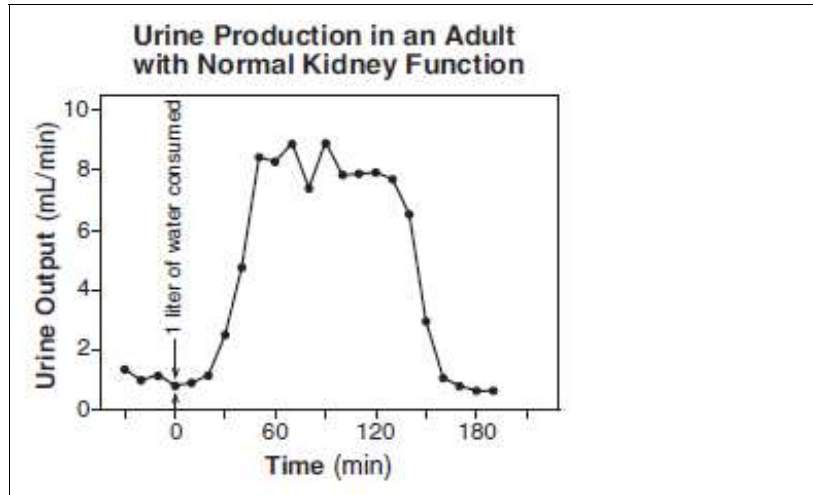
Data Base File Number: 1032

Regents Date June2015-49.bmp

June2015

49 6/16/2015 S4K5

Answer 1



graph

1054. The graph shows the acid tolerance of nine species living in water at different pH values. Which statement best represents the information shown in the graph?

- (1) Frogs tolerate more acidic conditions than the other organisms.
- (2) All nine species survive equally well in the same habitat, regardless of acidity.
- (3) Perch are more sensitive to acidic conditions than are snails.
- (4) Mayfly larvae and trout are equally sensitive to acidity.

Data Base File Number: 1632

Regents Date Jan2024-34.bmp

Jan2024

34 1/23/2024 S4K3

Answer 1

Acid Tolerance	pH 6.5	pH 6.0	pH 5.5	pH 5.0	pH 4.5	pH 4.0
Trout	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Bass	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Perch	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Frogs	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Salamanders	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Clams	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Crayfish	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Snails	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Mayfly larvae	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded

← Less acidic / More acidic →



## graph

1055. Base your answer to this question on the graphs shown and on your knowledge of biology. The graphs show the effect of sewage (human organic waste) flowing into a lake on the level of dissolved oxygen in the water and the size of different fish populations. Which inference can be made from the graphs?

- (1) The increase in sewage waste from 1950 to 1970 was due to a decreasing human population.
- (2) The decrease in sewage waste shows that the environmental problems associated with land pollution have been solved.
- (3) Sewage waste is a good source of nutrients for most fish.
- (4) Increases in sewage waste were responsible for decreasing oxygen levels in the lake.

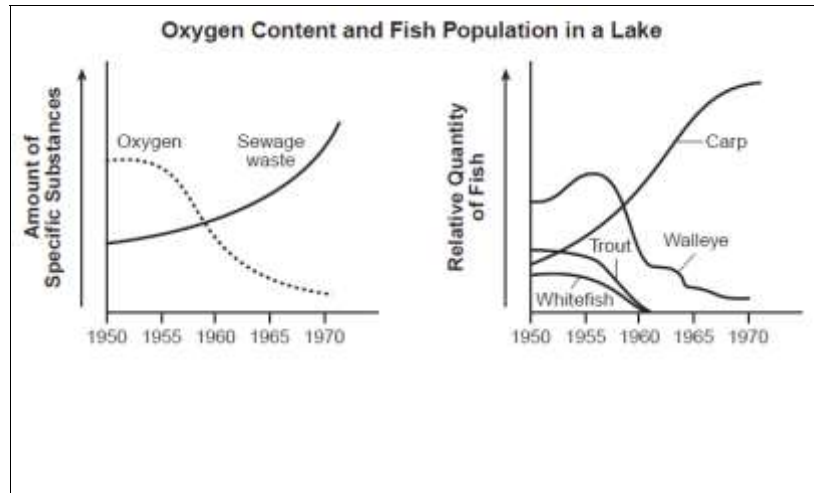
Data Base File Number: 1075

Regents Date Jan2016-31.bmp

Jan2016

32 1/27/2016 S1K3

Answer 4





## graph

1056. The graph shows three projections for future carbon dioxide (CO<sub>2</sub>) levels. The "Business as usual" line shows CO<sub>2</sub> levels if emissions remain at current levels. The "Constant 1990 emissions" line shows CO<sub>2</sub> levels if emissions are cut to the same level that they were in 1990. The "Half 1990 emissions" line shows CO<sub>2</sub> levels if emissions are cut to half of the level that they were in 1990. Which statement is supported by the graph?

- (1) Climate change will result in the melting of polar ice caps.
- (2) The increase in carbon dioxide levels will cause a decrease in global average temperature.
- (3) Human activities have no effect on atmospheric carbon dioxide levels.
- (4) Future generations can be affected by the choices of current generations.

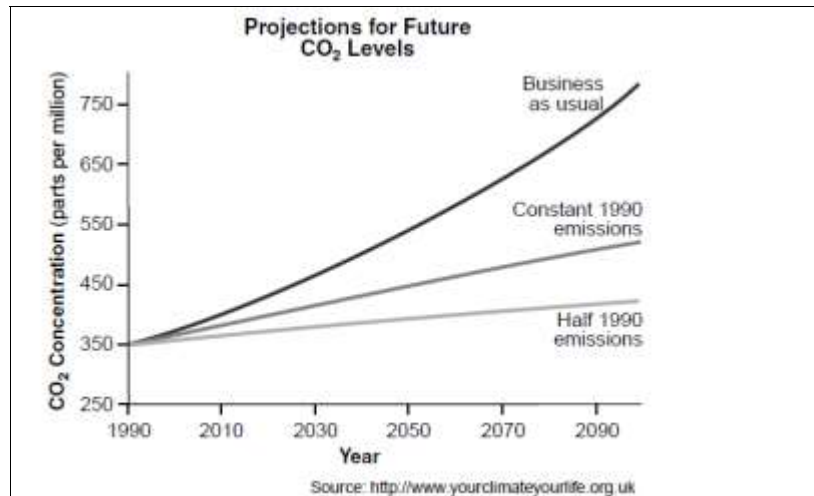
Data Base File Number: 1285

Regents Date Aug2018-36.bmp

Aug2018

36 8/17/2018 S4K7

Answer 4



## graph

1057. The graph shows the populations of two species of ants. Ants of species 2 have a thicker outer covering than the ants of species 1. The outer covering of an insect helps prevent excessive evaporation of water. Which statement would best explain the population changes shown in the graph?

- (1) The food sources for species 1 increased while the food sources for species 2 decreased from January through November.
- (2) Disease killed off species 1 beginning in May.
- (3) The weather was hotter and dryer than normal from April through September.
- (4) Mutations occurred from April through September in both species, resulting in both species becoming better adapted to the environment.

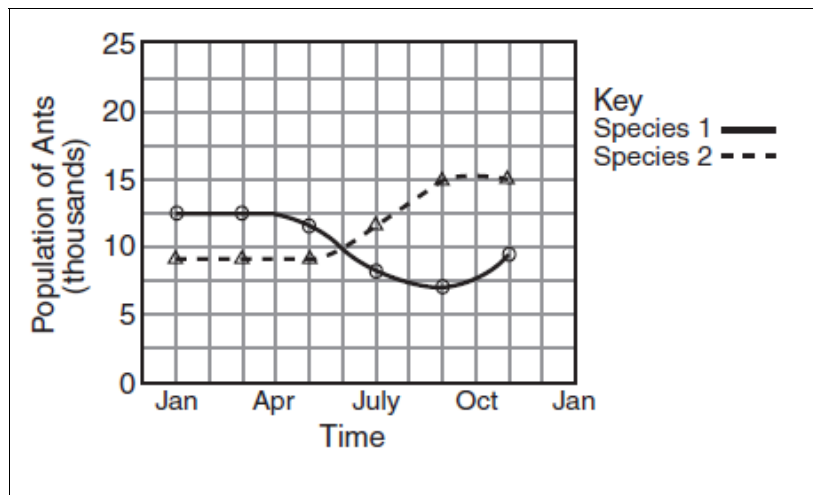
Data Base 691  
File Number:

Regents Date Aug2004-34.bmp

Aug2004

34 8/17/2004 S4K3

Answer 3



graph

1058. Base your answer to this question on the information and graph given and on your knowledge of biology. The graph shows the number of animals in a population throughout the course of a year. The population migrated into the area at the beginning of 2011. The approximate number of animals that were found in June 2012 was most likely

- (1) 16
- (2) 26
- (3) 76
- (4) 86

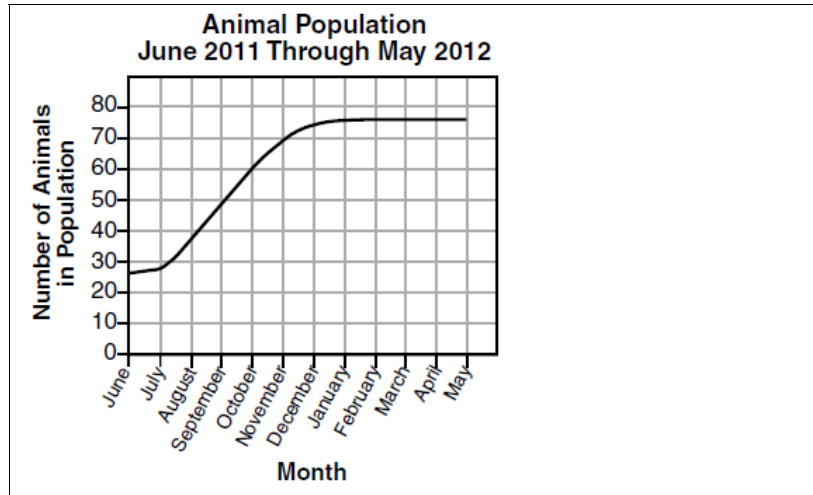
Data Base File Number: 1284

Regents Date Aug2018-33.bmp

Aug2018

34 8/17/2018 S1K3

Answer 3



graph

1059. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows how the population growth rate of several species of fish is affected by temperature. What is the most favorable temperature for the growth of the yellow perch population?

- (1) 10°C
- (2) 15°C
- (3) 20°C
- (4) 30°C

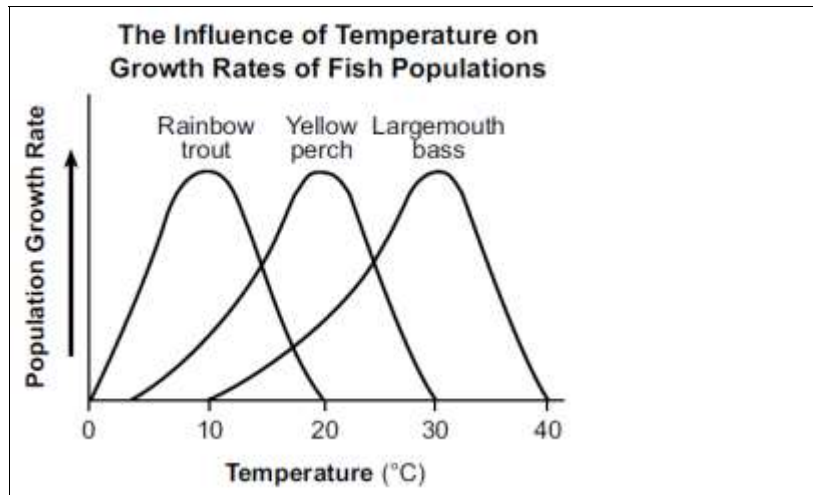
Data Base File Number: 1555

Regents Date Jan2023-50.bmp

Jan2023

50 1/24/2023 S1K3

Answer 3



graph

1060. Base your answers to this question on the graph shown and on your knowledge of biology. The graph shows the growth of a population of rabbits in a specific ecosystem. Over a period of time, the location of the dashed line would move from location B to location C on this graph if

- (1) the birthrate of the rabbit population was equal to the death rate of the rabbit population
- (2) there was a decrease in the number of rabbit predators and an increase in the availability of plants
- (3) there was a decrease in the availability of minerals, water, and shelter
- (4) the entire rabbit population migrated to a new ecosystem containing more autotrophs

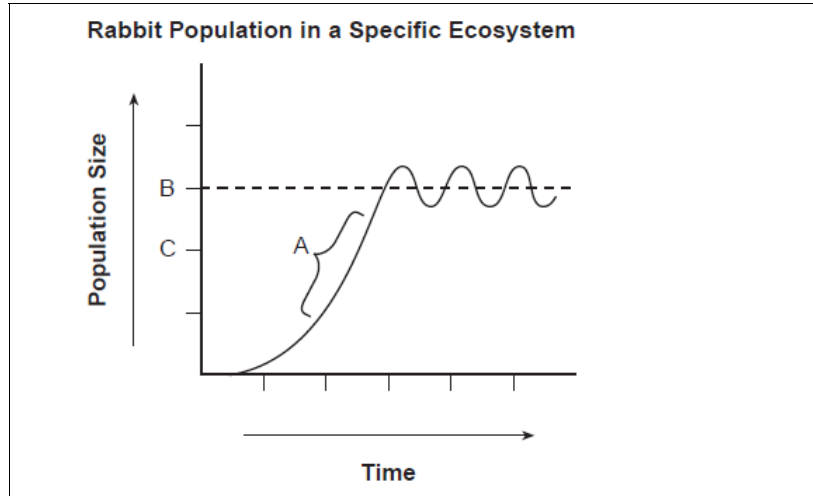
Data Base 948  
File Number:

Regents Date June2014-40.bmp

June2014

41 6/17/2014 S4K1

Answer 3



graph

1061. Base your answers to this question on the graph shown and on your knowledge of biology. The graph shows the growth of a population of rabbits in a specific ecosystem. Which environmental factor could have caused the change indicated at A?

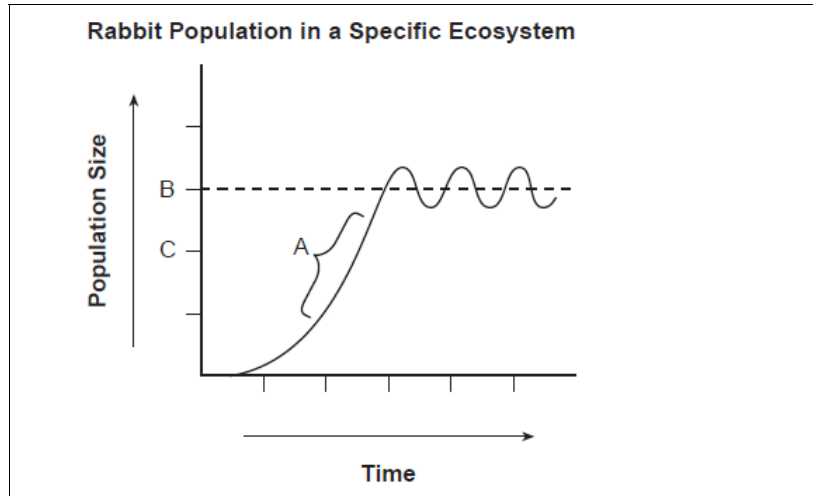
- (1) increased predation by herbivores
- (2) increased availability of food
- (3) increased number of decomposers
- (4) increased competition among carnivores

Data Base File Number: 947

Regents Date June2014-40.bmp

June2014  
40 6/17/2014 S4K1

Answer 2



## graph

1062. Base your answer to this question on the information and graph shown and on your knowledge of biology. Students were asked to design a lab that investigated the relationship between exercise and heart rate. Heart rate was determined by recording the pulse rate in beats per minute. The students hypothesized that increased exercise results in an increased heart rate. The class results for the experiment are shown in the graph. Which statement is best supported by the graph?

- (1) Before exercising, the average pulse rate was 65; four minutes after exercising, the average pulse rate was 65.
- (2) After four minutes of exercising, the average pulse rate was 120; two minutes after exercising, the average pulse rate was 120.
- (3) While exercising, the highest average pulse rate was 150; before exercising, the average pulse rate was 65.
- (4) Two minutes before exercising, the average pulse rate was 80; after two minutes of exercise, the average pulse rate was 140.

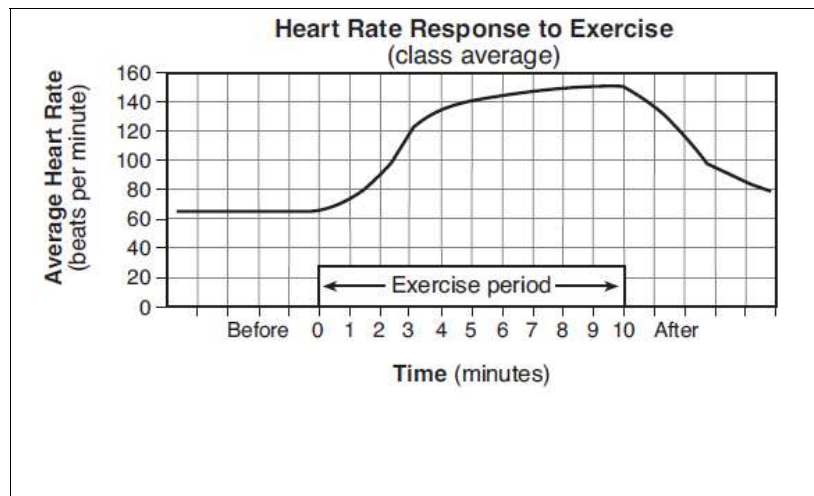
Data Base File Number: 915

Regents Date Aug2013-73.bmp

Aug2013

73 8/14/2013 LAB2

Answer 3



graph

1063. Base your answer to this question on the information and graphs shown, and on your knowledge of biology. The diagrams show the number of fish in a lake and the average water temperature in the lake for the months of May through October. During certain times of the year, bears feed heavily on a population of fish in a lake. At other times of the year, the bear population feeds primarily on fruits, berries, and insects. During which month would the bears in the area have the most fish available?

- (1) May
- (2) July
- (3) August
- (4) October

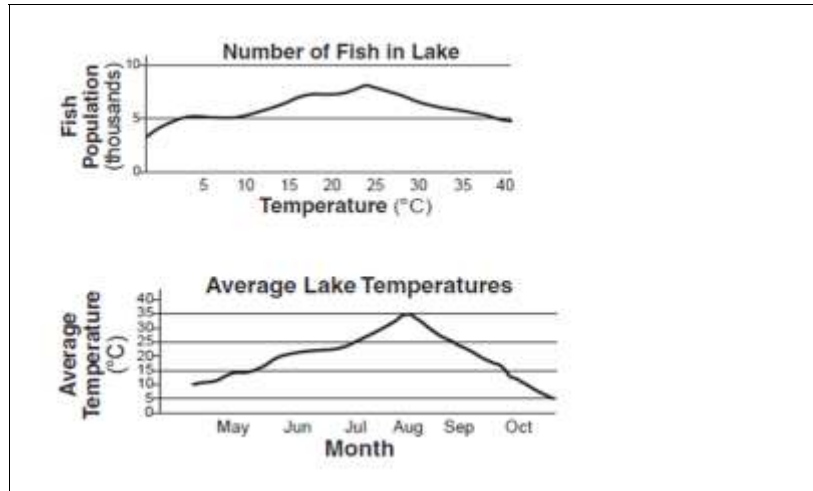
Data Base File Number: 1235

Regents Date Jan2018-C.bmp

Jan2018

31 1/22/2018 S1K3

Answer 2



graph

1064. Students in a science class took their pulse rates before and after they ran in place for one minute. The class data showed that pulse rates increased with exercise. A graph of the data would look most like

- (1) 1
- (2) 2
- (3) 3
- (4) 4

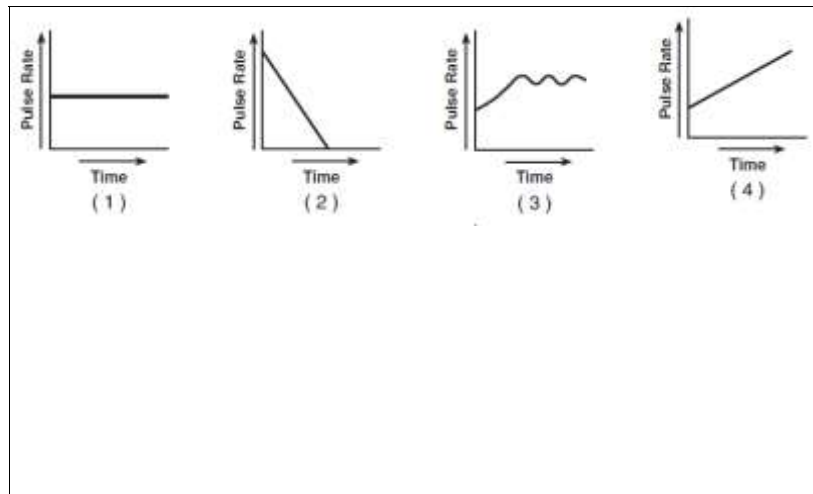
Data Base File Number: 1062

Regents Date August2015-75.b

Aug2015

75 8/12/2015 LAB2

Answer 4



## graph

1065. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the masses of different types of plants found in an area of the Adirondack Mountains after a forest fire occurred. Based on the information provided in the graph, the mass of plants shown in the graph refers to the mass of a number of

- (1) populations
- (2) decomposers
- (3) ecosystems
- (4) communities

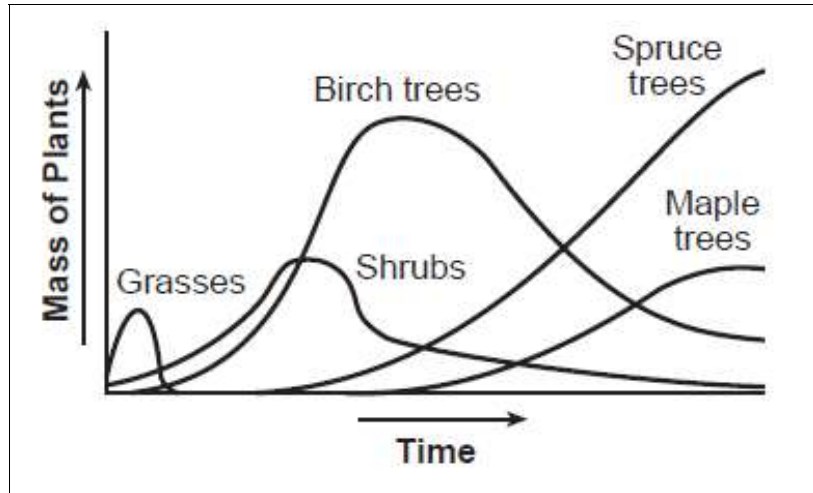
Data Base File Number: 1104

Regents Date June2016-34.bmp

June2016

36 6/15/2016 S4K1

Answer 1



## greenhouse gases

1066. The table shows the abundance of some greenhouse gases in the atmosphere. According to the table, which greenhouse gas is the most abundant?

- (1) carbon dioxide
- (2) methane
- (3) nitrous oxide
- (4) other gases

Data Base File Number: 268

Regents Date June2010-44.bmp

June2010

44 6/16/2010 S4K7

Answer 1

Abundance of Some Atmospheric Greenhouse Gases

Greenhouse Gases	Abundance (%)
carbon dioxide (CO <sub>2</sub> )	99.438
methane (CH <sub>4</sub> )	0.471
nitrous oxide (N <sub>2</sub> O)	0.084
other gases (CFCs, etc.)	0.007
<b>Total</b>	<b>100.000</b>



## greenhouse gases

1067. The chart shown compares the greenhouse gas emissions of several fuel sources. An accurate prediction that could be made regarding the information shown in the chart is that

- (1) a total change from gasoline to ethanol as a fuel would have no effect on greenhouse gas emissions
- (2) fossil fuels emit the least amount of greenhouse gases
- (3) the use of any one of the ethanol sources for fuel will each produce less greenhouse gases than the use of gasoline for fuel
- (4) the use of biomass-based fuels instead of fossil fuels will greatly increase the production of greenhouse gases

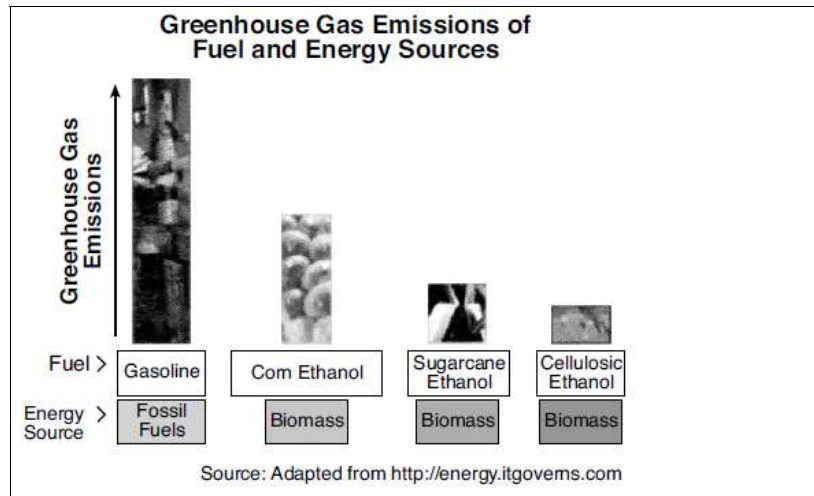
Data Base File Number: 1312

Regents Date Jan2019-40.bmp

Jan2019

40 1/22/2019 S4K7

Answer 3



## growth curve

1068. The graph shown indicates the growth of a population of bacteria over a period of 80 hours. Which statement best describes section II of the graph?

- (1) The population has reached the carrying capacity of the environment.
- (2) The rate of reproduction is slower than in section I,
- (3) The population is greater than the carrying capacity of the environment.
- (4) The rate of reproduction exceeds the death rate,

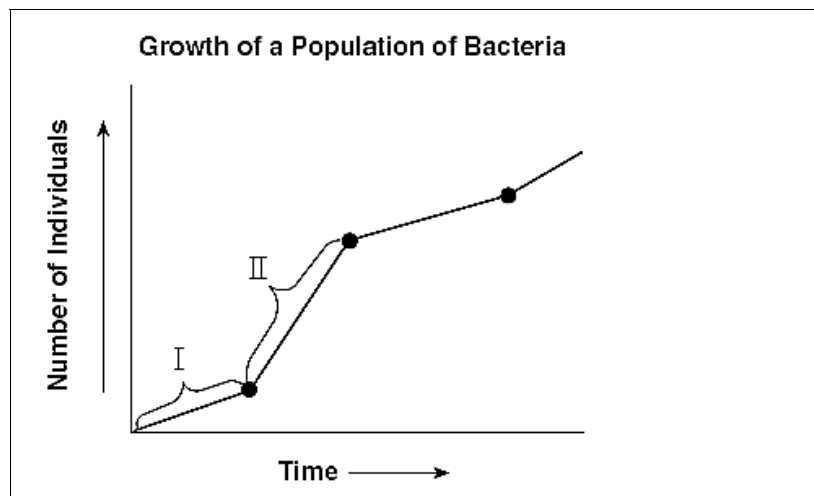
Data Base File Number: 37

Regents Date June07-34.bmp

June2007

34 6/20/2007 S1K3

Answer 4



## habitat destruction

069. Which row in the chart shown correctly matches the human activity with its effect?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1333

Regents Date June2019-13.bmp

June2019

13 6/18/2019 S4K7

Answer 3

Row	Human Activity	Effect
(1)	planting 20 acres of one crop	increases biodiversity
(2)	industrialization	decreases fossil fuel use
(3)	habitat destruction	decreases ecosystem stability
(4)	use of finite resources	increases resource renewal

## habitats

070. Information concerning nests built in the same tree by two different bird species over a ten-year period is shown in the table. What inference best describes these two species?

(1) They most likely do not compete for nesting sites because they occupy different niches.

(3) They compete for nesting sites because they build the same kind of nest.

(2) They do not compete for nesting sites because they have the same reproductive behavior.

(4) They compete for nesting sites because they nest in the same tree at the same time.

Data Base File Number: 38

Regents Date June07-36.bmp

June2007

36 6/20/2007 S4K6

Answer 1

Distance of Nest Above Ground (m)	Total Number of Nests Built by Two Different Species	
	A	B
less than 1	5	0
1-5	10	0
6-10	5	0
over 10	0	20

## heart rate

1071. As part of an experiment, the heart rate of a person at rest was measured every hour for 7 hours. The data are shown in the table. Answer this question based on the data in the table. What is the relationship between the heart rate in beats/min and the hours of rest from hour 1 to hour 7 as shown in the chart ?

- (1) The heart rate dropped. (3) The heart rate stayed the same.  
(2) The heart rate increased. (4) The heart rate will increase if the activity of the person increases.

Data Base File Number: 143

Regents Date Aug08-73.bmp

Aug2008

73 8/13/2008 LABS

Answer 1

Data Table

Hour	Heart Rate (beats/min)
1	72
2	63
3	61
4	61
5	60
6	63
7	68

## heart rate

072. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the average heart rate data for a group of students before, during, and after exercise. What is one benefit of the increase in average heart rate during exercise.

- (1) Increased heart rate results in more glucose/oxygen being delivered to cells.
- (2) Increased heart rate results in less glucose/oxygen being delivered to cells.
- (3) Increased heart rate results in no change of glucose/oxygen being delivered to cells.
- (4) Increased heart rate results in the increase of carbon dioxide released by cells.

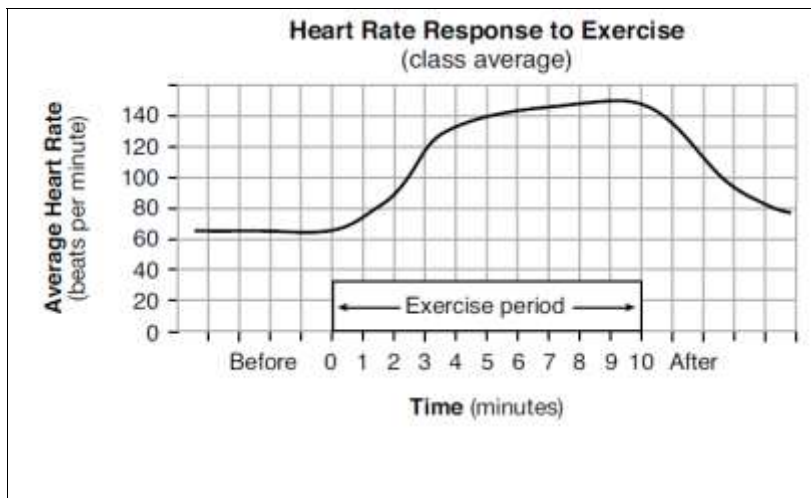
Data Base File Number: 1450

Regents Date June2021-83.bmp

June2021

83 6/22/2021 LAB2

Answer 1



## herbivores

073. Note: The question from the diagram is REPEATED here for easier reading. Question: Gardeners sometimes use slug traps to capture and kill slugs. These traps were tested in a garden with a large slug population. Organisms found in the trap after one week are shown in the table. How many organisms in the trap were herbivores.

- (1) 5
- (2) 9
- (3) 22
- (4) 99

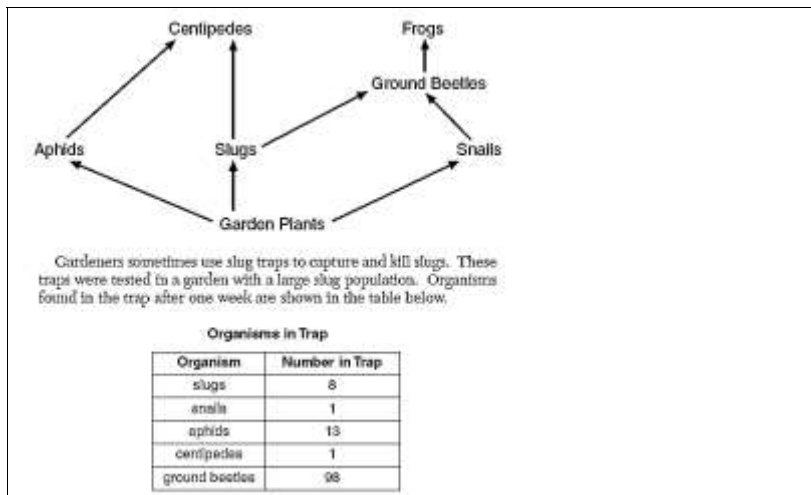
Data Base File Number: 18

Regents Date Aug07-41.bmp

Aug2007

41 8/16/2007 S4K6

Answer 3



## heredity

1074. Base your answer to this question on the diagram shown, which provides information related to heredity, and on your knowledge of biology. Which molecules are represented by box B?

- (1) bases
- (2) proteins
- (3) amino acids
- (4) simple sugars

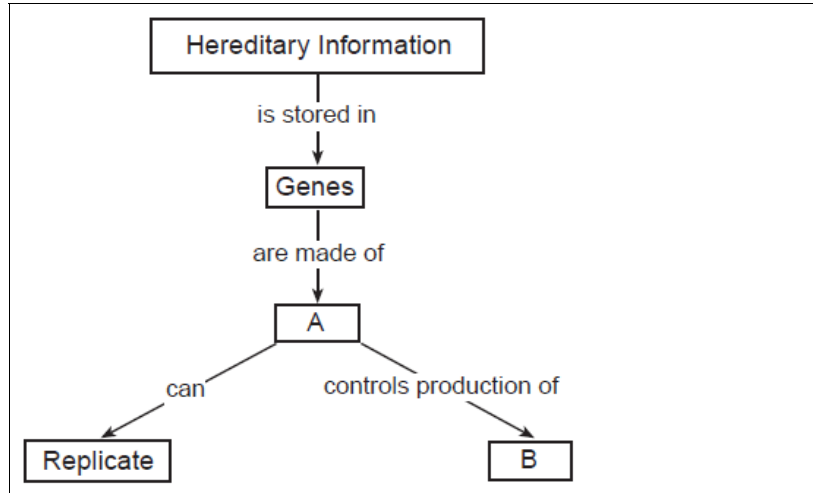
Data Base File Number: 836

Regents Date Jan2002-44.bmp

Jan2002

45 1/23/2002 S4K2

Answer 2



## heterotroph

1075. The diagram shown represents a woodpecker finch. This bird may best be described as

- (1) a decomposer that most likely feeds on nectar (a sugary liquid) from flowers
- (2) a heterotroph that may eat insects and is more closely related to a robin than to an earthworm
- (3) a scavenger that feeds on animals and reproduces asexually
- (4) an autotroph that probes tree bark for insects and is pathogenic

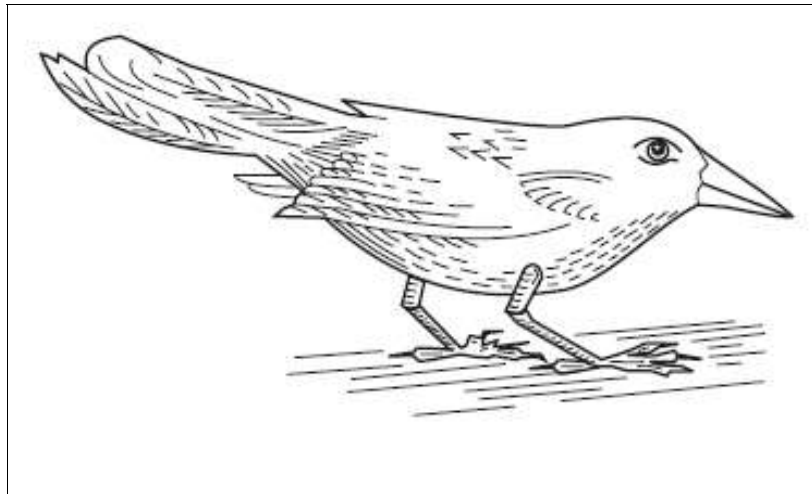
Data Base File Number: 358

Regents Date Aug2011-2.bmp

Aug2011

2 8/18/2011 S4K1

Answer 2



## heterotroph

1076. The chart shown contains both autotrophic and heterotrophic organisms. Organisms that carry out only heterotrophic nutrition are found in

- (1) row A, only
- (2) row B, only
- (3) Rows A and B
- (4) Rows A and C

Data Base File Number: 89

Regents Date June08-1.bmp

June2008

1 6/24/2008 S4K1

Answer 1

A	owl	cat	shark
B	mouse	corn	dog
C	squirrel	bluebird	alga

## heterotroph

1077. Base your answer to this questions on the diagram shown, which represents an ameba engulfing bacteria, and on your knowledge of biology. The activity taking place is

- (1) photosynthesis
- (2) differentiation
- (3) autotrophic nutrition
- (4) heterotrophic nutrition

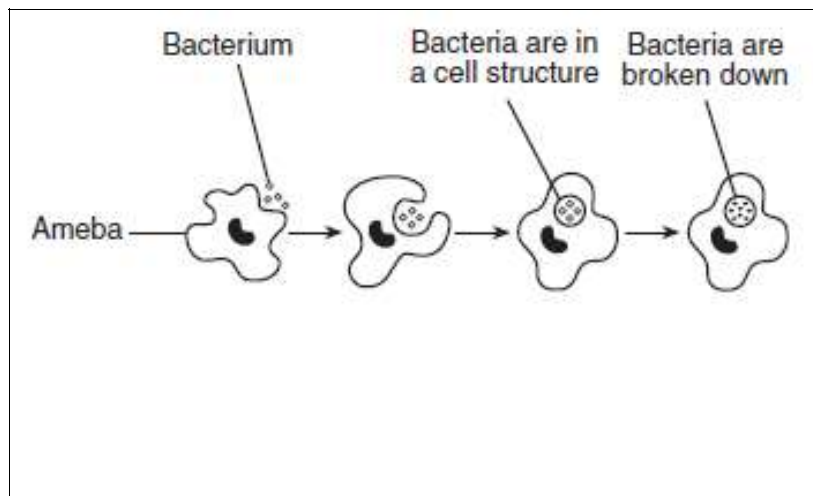
Data Base File Number: 1030

Regents Date June2015-43.bmp

June2015

43 6/16/2015 S4K1

Answer 4



## homeostasis

1078. The diagram shown represents an activity that occurs in the human body. This diagram best illustrates

- (1) active transport
- (2) maintenance of homeostasis
- (3) synthesis of nutrients
- (4) differentiation

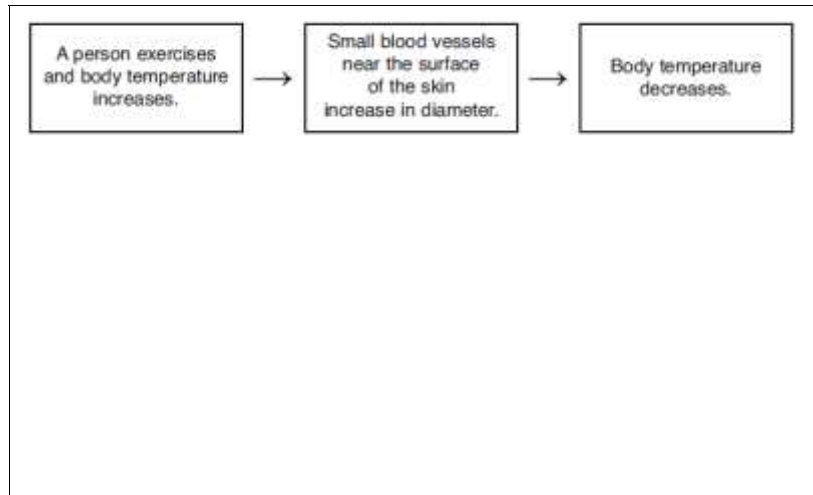
Data Base File Number: 404

Regents Date June2012-10.bmp

June2012

10 6/19/2012 S4K5

Answer 2



## homeostasis

1079. The diagram shown represents some activities carried on by a single-celled organism. This single-celled organism is maintaining homeostasis by

- (1) limiting the number of the molecules of A that it excretes
- (2) eliminating molecules of compound B
- (3) excreting molecules of compound C
- (4) using sunlight to increase the number of food molecules that it takes in

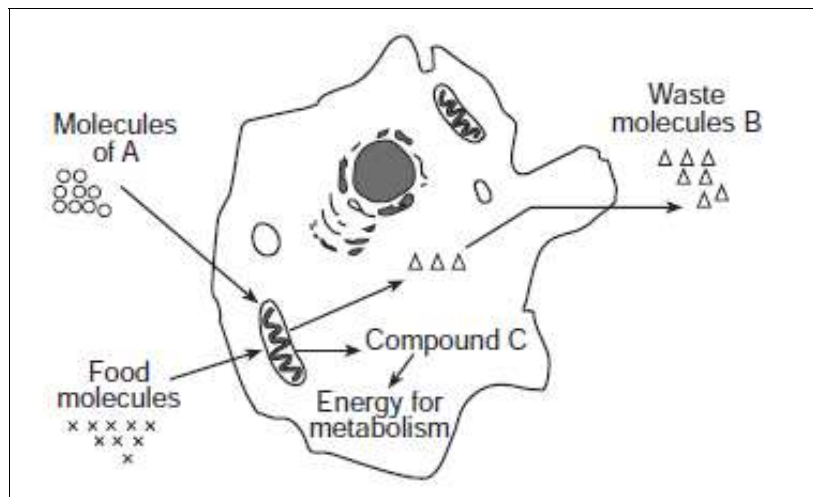
Data Base File Number: 1602

Regents Date Aug2023-27.bmp

Aug2023

27 8/17/2023 S4K5

Answer 2



## homeostasis

1080. The data table shown compares blood flow in various human body structures, both at rest and during strenuous exercise. Base your answer to this question on the data shown in the table and on your knowledge of biology. Which structure shown in the table helps the most to maintain homeostasis in the body during strenuous exercise by greatly increasing the blood supply, containing oxygen and nutrients to cells in the body?

- (1) heart
- (2) skeletal muscle
- (3) digestive organs
- (4) cannot be determined by the data in the chart

Data Base File Number: 85

Regents Date Jan08-71.bmp

Jan2008

71 1/25/2008 LABS

Answer 1

Structure	Blood Flow at Rest (mL/min)	Blood Flow During Strenuous Exercise (mL/min)
heart	250	750
skeletal muscle	1200	12,500
digestive organs	1400	600

## homeostasis

1081. The diagram shown illustrates some functions of the pituitary gland. The pituitary gland secretes substances that, in turn, cause other glands to secrete different substances. Which statement best describes events shown in the diagram?

- (1) Secretions provide the energy needed for metabolism.
- (2) The raw materials for the synthesis of secretions come from nitrogen.
- (3) The secretions of all glands speed blood circulation in the body.
- (4) Secretions help the body to respond to changes from the normal state

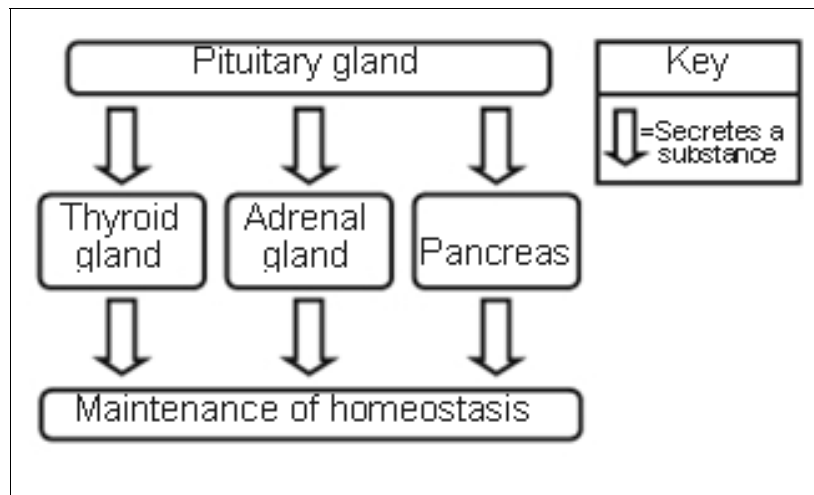
Data Base File Number: 189

Regents Date June09-33.bmp

June2009

33 6/18/2009 S4K5

Answer 4





## homeostasis

1082. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the effect of two chemical substances, A and B, in maintaining the level of glucose in the blood in humans. The interaction of substances A and B is an example of

- (1) a genetic mutation  
 (2) homeostatic feedback  
 (3) an immune response  
 (4) active transport

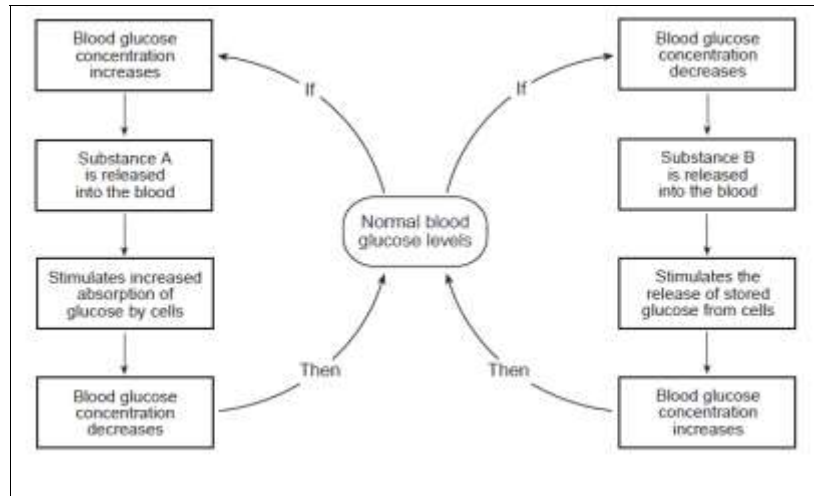
Data Base File Number: 949

Regents Date June2014-42.bmp

June2014

42 6/17/2014 S4K5

Answer 2



## homeostasis

1083. The arrows in the diagram indicate the movement of materials into and out of a single-celled organism. The movements indicated by all the arrows are directly involved in

- (1) the maintenance of homeostasis  
 (2) respiration, only  
 (3) excretion only  
 (4) the digestion of proteins

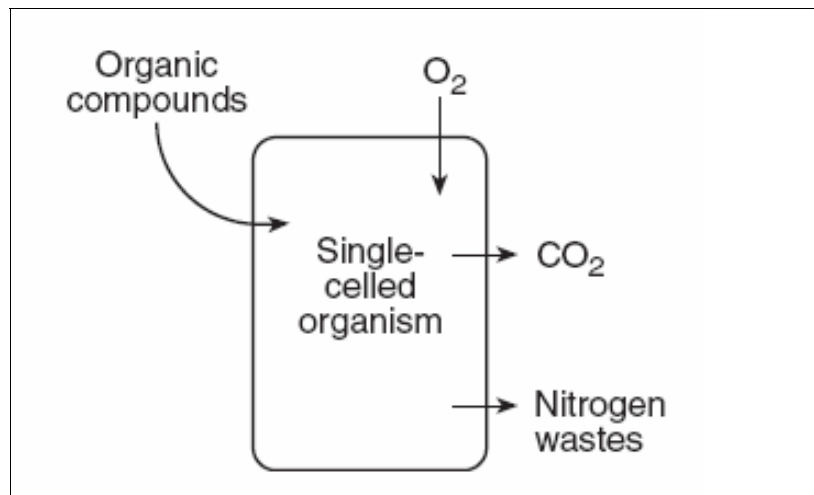
Data Base File Number: 1

Regents Date Aug07-7.bmp

Aug2007

7 8/16/2007 S4K1

Answer 1



## homeostasis

1084. Some processes that occur in a cell are listed in the chart. Which processes will all living organisms use to maintain homeostasis?

- (1) A and B, only
- (2) B and C, only
- (3) C and A, only
- (4) A, B, and C

Data Base File Number: 898

Regents Date Aug2013-3.bmp

Aug2013

3 8/14/2013 S4K1

Answer 4

A. utilize energy  
B. detect changes in the environment  
C. rearrange and synthesize chemical compounds

## homeostasis

1085. The graph shows the relationship between kidney function and arterial pressure in humans. How would a steady decrease in arterial pressure affect homeostasis in the human?

- (1) the kidneys will increase the rate of filtration
- (2) the carbon dioxide level in the blood would increase
- (3) the rate of filtration by the kidneys would be reduced
- (4) the blood would clot in the kidneys

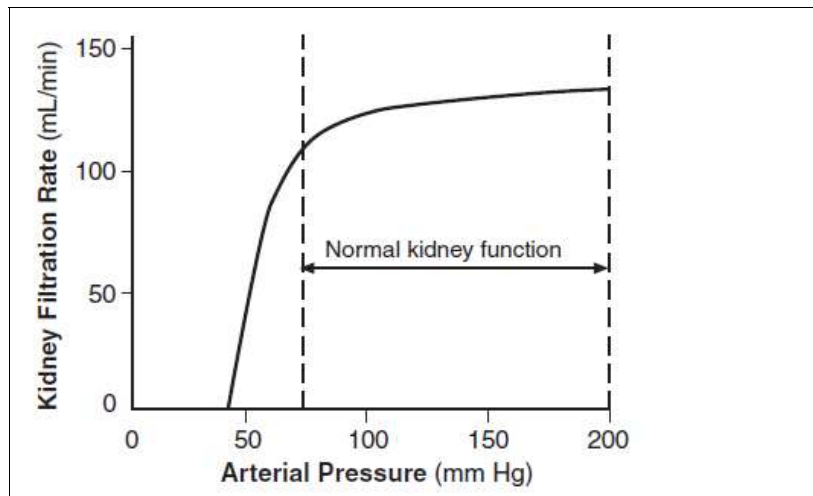
Data Base File Number: 821

Regents Date June2002-55.bmp

June2002

55 6/19/2002 S4K1

Answer 3



## homeostasis

1086. The diagram given shows cell A completing a life process. Cell A performs functions similar to the tissues and systems in complex, multicellular organisms. This process results in

- (1) increased genetic variation
- (2) the maintenance of homeostasis
- (3) a reduction in competition
- (4) increased autotrophic nutrition

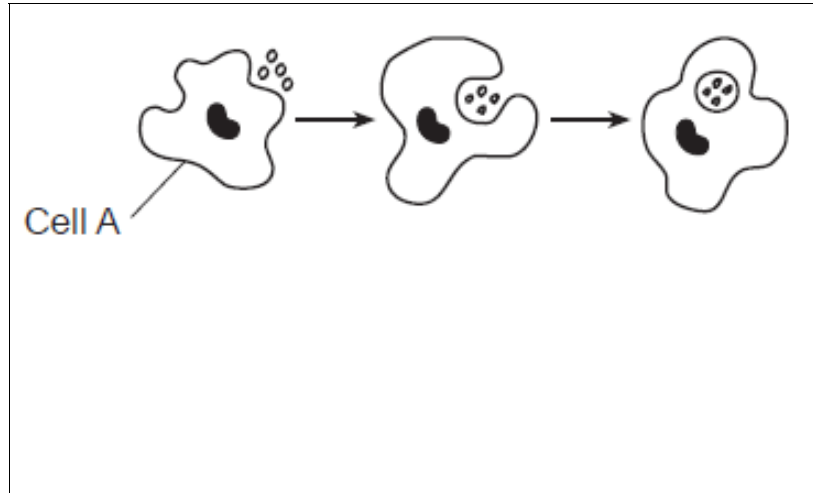
Data Base File Number: 1093

Regents Date June2016-6.bmp

June2016

6 6/15/2016 S4K1

Answer 2



## homeostasis

1087. The diagram shown represents some structures observed in a drop of human blood. Which statement correctly describes all of these structures in human blood?

- (1) They produce antibiotics that fight disease.
- (2) They are useful in the digestion of oxygen.
- (3) They use all of the DNA present in the cells of the body.
- (4) They perform specific functions that aid in maintaining homeostasis.

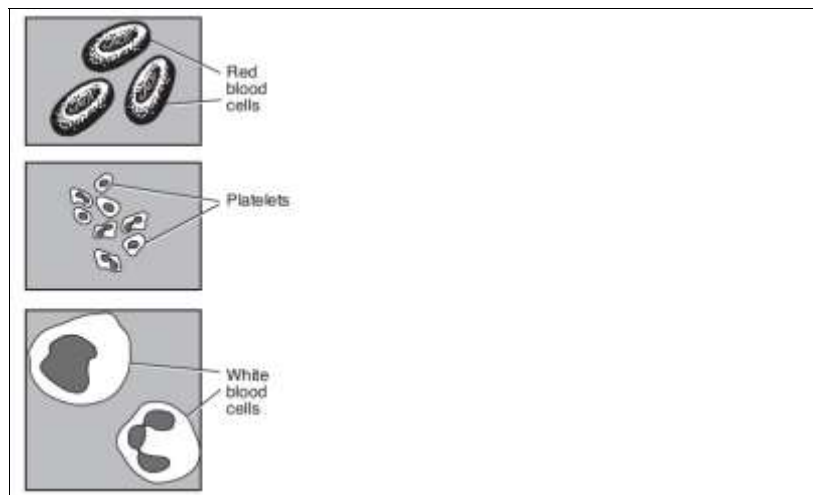
Data Base File Number: 964

Regents Date Aug2014-32.bmp

Aug2014

32 8/14/2014 S4K1

Answer 4



## homeostasis

1088. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the roles of different parts of the human body in keeping blood sugar at a balanced, normal level over time. The diagram shows human body structures that are coordinated to maintain homeostasis. When body system X releases too much sugar into the blood, the body can maintain homeostasis by making

- (1) more hormone A, only
- (2) more hormone B, only
- (3) more hormone A and more hormone B
- (4) no hormone A and no hormone B

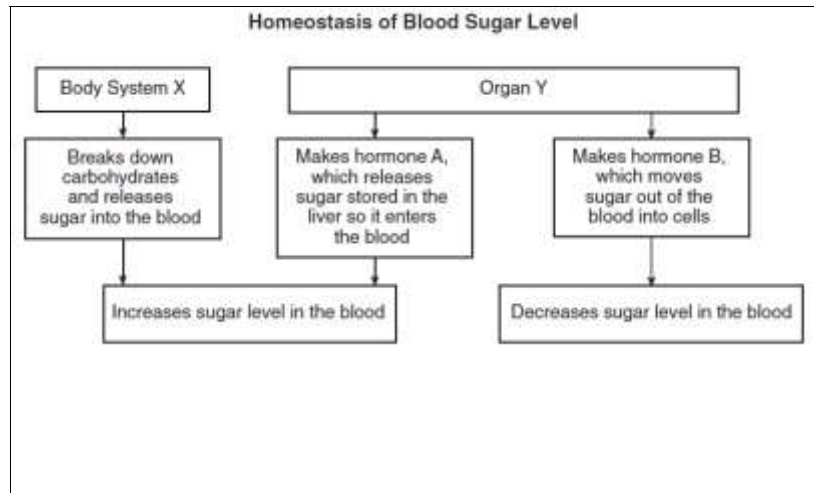
Data Base File Number: 1137

Regents Date August2016-40A.

Aug2016

41 8/18/2016 S4K5

Answer 2



## homeostasis

1089. Base your answer to this question on the diagram shown and on your knowledge of biology. In a cell, a variety of structures perform specific functions and interact to maintain homeostasis. The diagram shown represents a typical cell with three cell structures labeled 1, 2, and 3. Which of the following match the labeled part with its function?

- (1) 1 -- ribosome -- site of protein synthesis
- (2) 2 -- nucleus -- control of cell processes
- (3) 3 -- mitochondrion -- ATP production
- (4) all of the above are correctly matched.

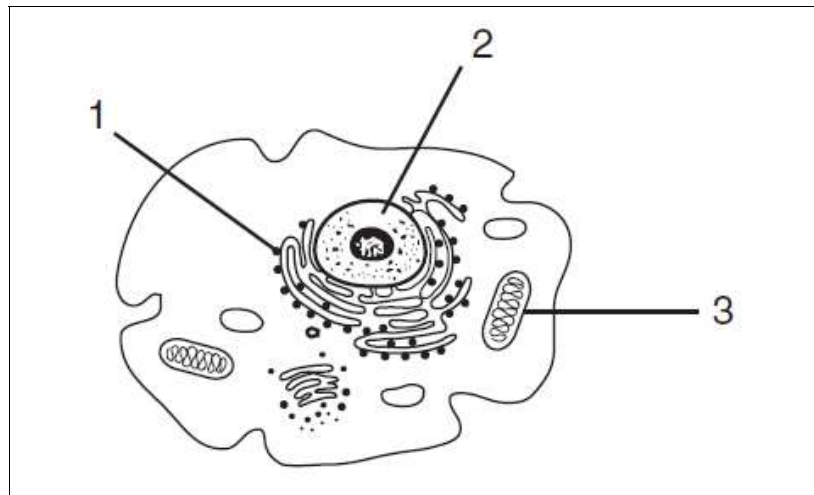
Data Base File Number: 295

Regents Date Aug2010-56.bmp

Aug2010

56 8/18/2010 S4K1

Answer 4



## homeostasis

1090. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the roles of different parts of the human body in keeping blood sugar at a balanced, normal level over time. The diagram shows human body structures that are coordinated to maintain homeostasis. Which of the following correctly identifies the functions of these structures?

- (1) digestion and regulation
- (2) circulation and synthesis
- (3) excretion and transport
- (4) locomotion and nutrition

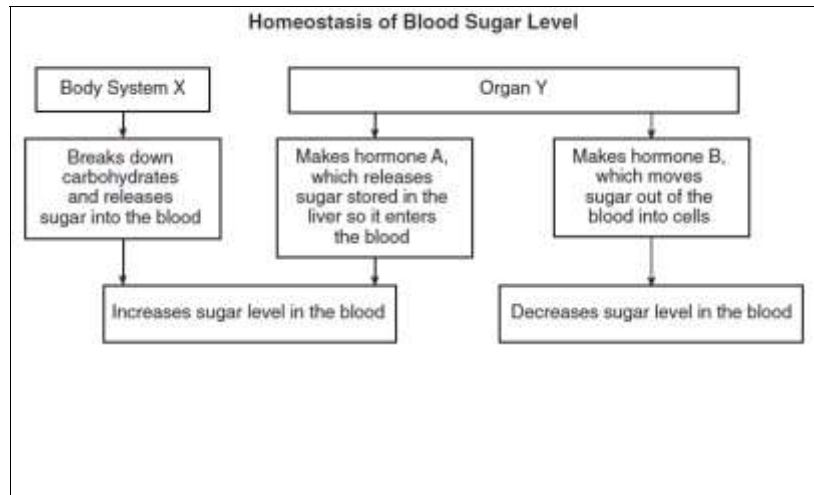
Data Base File Number: 1136

Regents Date August2016-40A.

Aug2016

40 8/18/2016 S4K1

Answer 1



## homeostasis

1091. Two organisms are represented in the diagram. Which statement concerning organism A and organism B is correct?

- (1) Organism A contains tissues while organism B lacks tissues.
- (2) Organism A and organism B have the same organs.
- (3) Organism A and organism B have structures that allow them to maintain homeostasis.
- (4) Organism A lacks structures that maintain a dynamic equilibrium, while organism B has these structures.

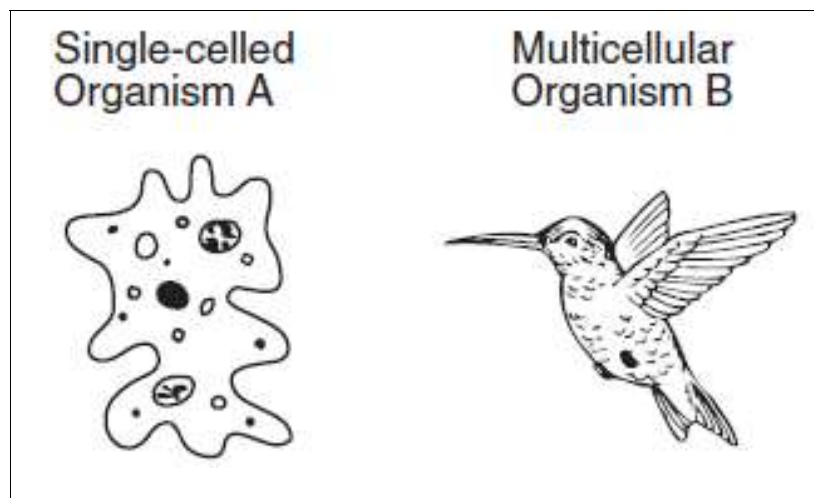
Data Base File Number: 756

Regents Date Aug2003-13.bmp

Aug2003

13 8/13/2003 S4K1

Answer 3



## homeostasis

1092. The graph shows the levels of glucose and insulin in the blood of a human over a period of time. This graph represents

- (1) an allergic reaction
- (2) an antigen-antibody reaction
- (3) maintenance of homeostasis
- (4) autotrophic nutrition

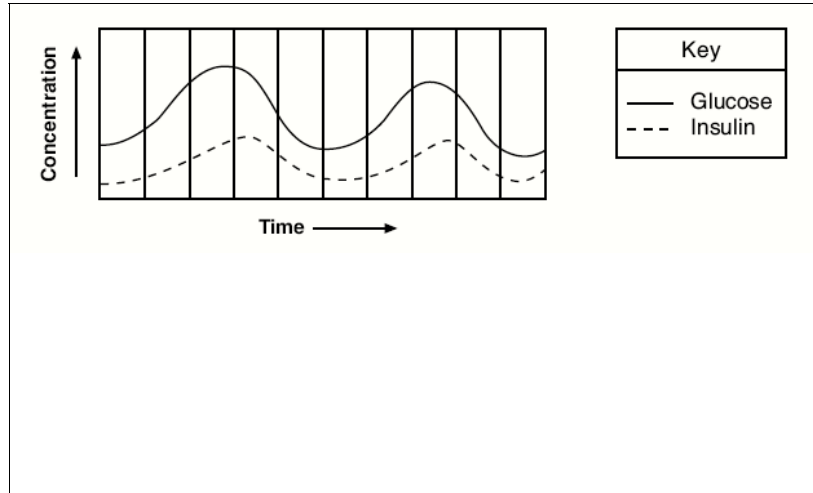
Data Base File Number: 124

Regents Date Aug08-23.bmp

Aug2008

23 8/13/2008 S4K5

Answer 3



## homeostasis

1093. Base your answer to this question diagram shown and on your knowledge of biology. What term does letter X most likely represent?

- (1) homeostasis
- (2) excretion
- (3) photosynthesis
- (4) digestion

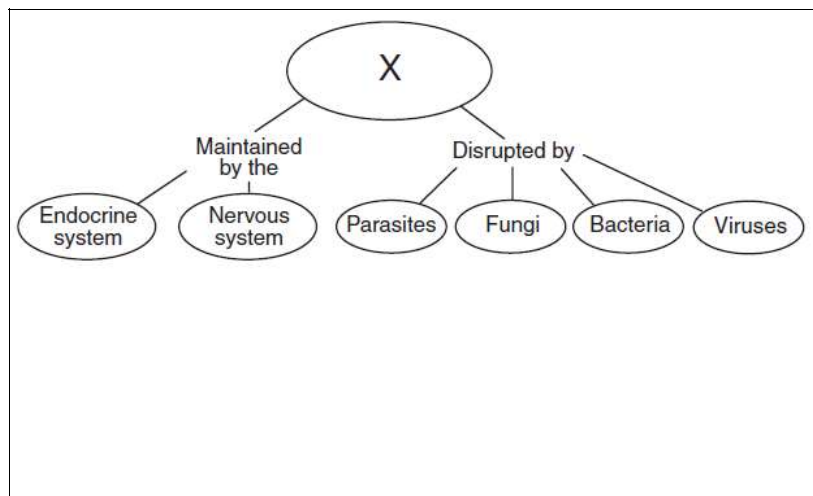
Data Base File Number: 675

Regents Date June2004-42.bmp

June2004

42 6/18/2004 S4K5

Answer 1



## homeostasis

1094. The chart shown contains information about some structures found in single-celled organisms. The information in this chart best illustrates the biological concept that

- (1) all single-celled organisms contain contractile vacuoles, a flagellum, and chloroplasts
- (2) single-celled organisms contain structures that function in maintaining homeostasis
- (3) the organs found in complex organisms evolved from these three structures
- (4) multicellular organisms do not contain any cell structures

Data Base File Number: 1158

Regents Date Jan2017-28.bmp

Jan2017

28 1/25/2017 S4K1

Answer 2

Structure	Function
contractile vacuole	maintains water balance
flagellum	movement
chloroplast	food production

## homeostasis

1095. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the roles of different parts of the human body in keeping blood sugar at a balanced, normal level over time. The diagram shows human body structures that are coordinated to maintain homeostasis. If organ Y becomes unable to produce enough hormone B, then homeostasis would be disrupted. To restore homeostasis and compensate for the lack of hormone B, one useful action would be to

- (1) increase the production of hormone A
- (2) remove organ Y from the body surgically
- (3) reduce the carbohydrates in body system X
- (4) reduce the synthesis of enzymes in organ Y

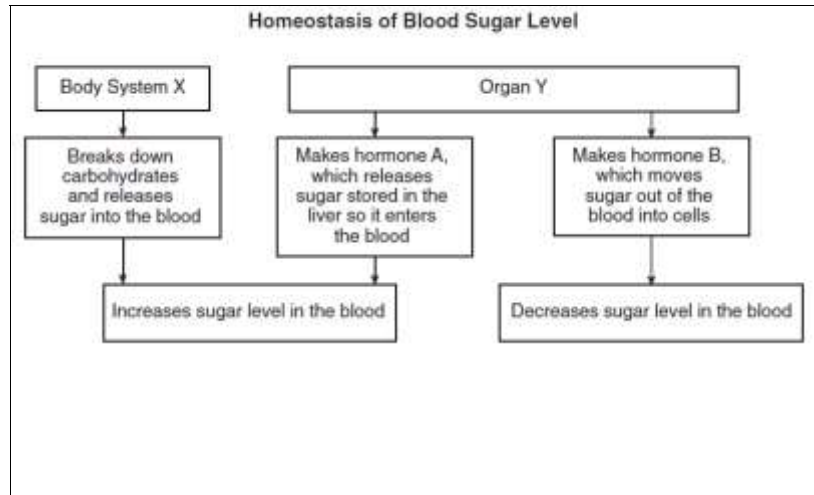
Data Base File Number: 1138

Regents Date August2016-40A.

Aug2016

42 8/18/2016 S4K5

Answer 3





## homeostasis

1096. Diagram A represents a microscopic view of the lower surface of a leaf. Diagram B represents a portion of the human body. What are the correct functions of X in Diagram A, and X in Diagram B?

- |   |  |
|---|--|
| (1) controls water loss and controls insulin production   | (3) controls starch manufacture and controls bile production |
| (2) controls photosynthesis and controls water absorption | (4) controls starch storage and controls waste storage       |

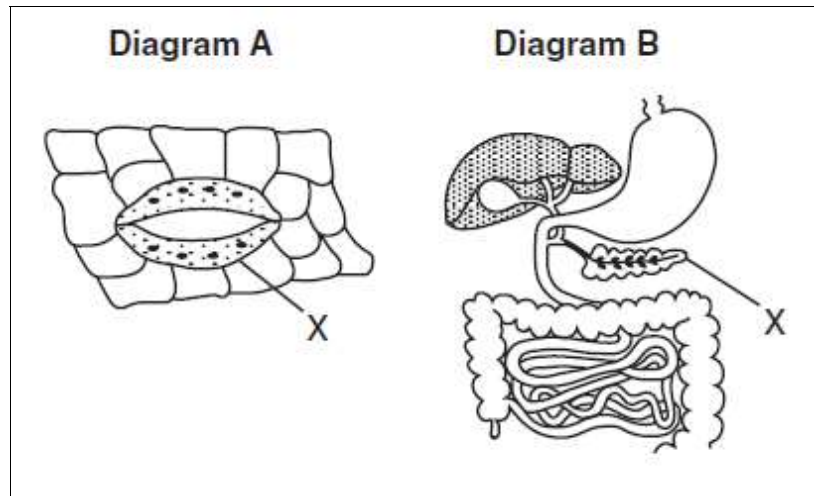
Data Base File Number: 750

Regents Date June2003-57.bmp

June2003

57 6/19/2003 S4K5

Answer 1



## homeostasis

1097. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the roles of different parts of the human body in keeping blood sugar at a balanced, normal level over time. The diagram shows human body structures that are coordinated to maintain homeostasis. If body system X temporarily stops releasing sugar into the blood, a likely response of the body would be to

- |   |  |
|---|--|
| (1) stop using enzymes in body system X   | (3) start to increase synthesis of hormone B |
| (2) stop organ Y from producing hormone A | (4) start to increase synthesis of hormone A |

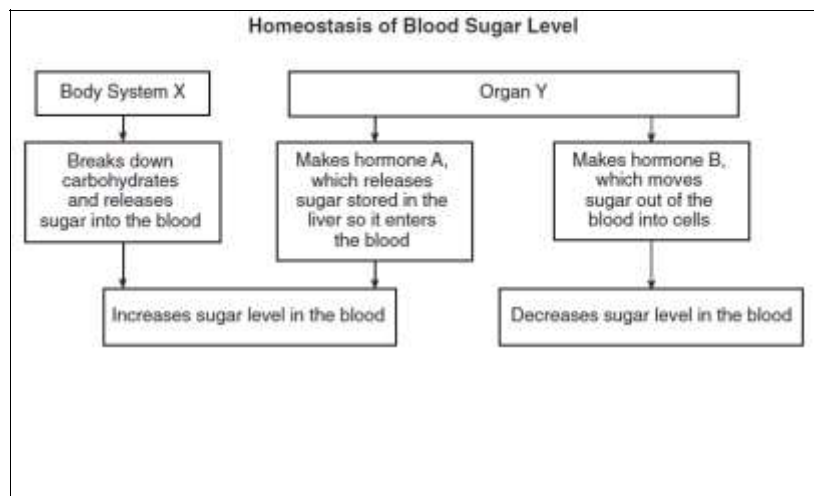
Data Base File Number: 1139

Regents Date August2016-40A.

Aug2016

43 8/18/2016 S4K5

Answer 4



## homeostasis

1098. The arrows in the diagram shown indicate the movement of materials into and out of a single celled organism. The movements indicated by all the arrows are directly involved in

- (1) the maintenance of homeostasis
- (2) photosynthesis, only
- (3) excretion, only
- (4) the digestion of minerals

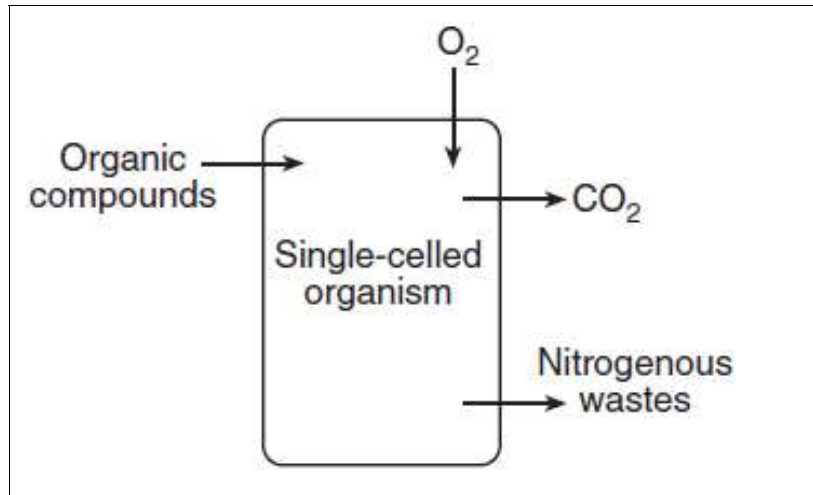
Data Base File Number: 655

Regents Date June2004-7.bmp

June2004

7 6/18/2004 S4K1

Answer 1



## homeostasis / feedback

1099. Base your answer to this question on the information and graph shown and on your knowledge of biology. An investigation was carried out to determine the effect of drinking an excessive amount of water on urine flow. A subject drank 1 liter of water in 5 minutes, and then urine output was measured. The graph shows how the human adult kidneys responded to regulate water balance in the body. Urine output was measured every 10 minutes for a little over 3 hours. Normal output for an average adult is approximately 0.5-1 mL/min. The change in urine production during this 3-hour period was most likely the result of

- (1) antibody production
- (2) homeostatic feedback
- (3) enzymatic breakdown of the water consumed
- (4) nerve cell malfunctions of the kidneys

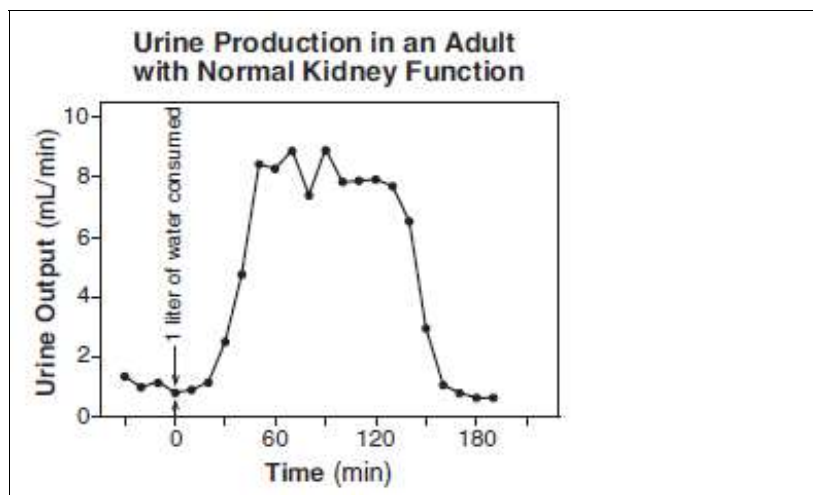
Data Base File Number: 1033

Regents Date June2015-50.bmp

June2015

50 6/16/2015 S4K5

Answer 2



## homologous structures

100. Base your answer to this question on the diagram shown and on your knowledge of biology. The similarities of the bones labeled A provide evidence that

- (1) the organisms may have evolved from a common ancestor
- (2) all species have one kind of bone structure
- (3) the cells of the bones contain the same type of mutations
- (4) all structural characteristics are the same in animals

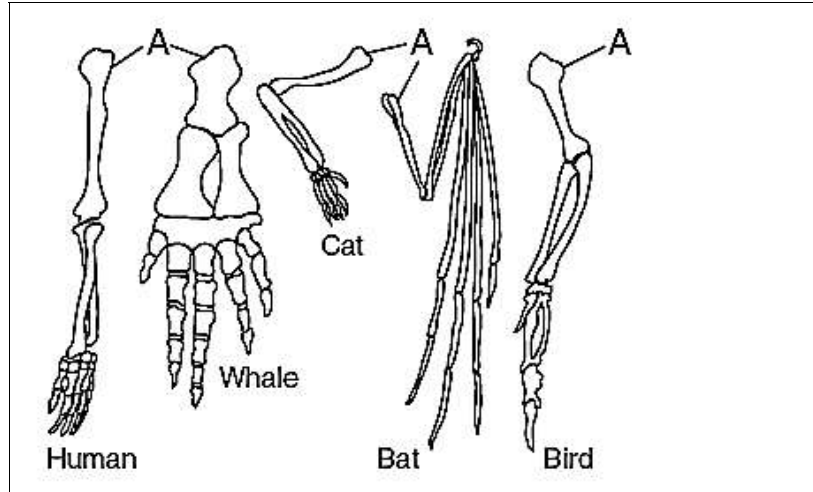
Data Base File Number: 59

Regents Date Jan07-39.bmp

Jan2007

39 1/26/2007 S4K3

Answer 1



## hormone

101. Base your answer to this question on the information, diagram, and table shown and on your knowledge of biology. A student wanted to test the hypothesis that rooting hormones will stimulate the production of new roots at a faster rate than would take place without rooting hormones. Two stem cuttings of equal length, similar to the one shown AT THE LEFT, were taken from a rose, a begonia, and a geranium plant. The cut end of one cutting from each plant was dipped into the hormone and then planted in wet sand. The other cutting from each plant was planted in wet sand without dipping it into the hormone. All cuttings were maintained in identical environmental conditions. At the end of 4 weeks, all the cuttings were removed from the sand and the lengths of the roots that had developed were measured. The results are summarized in the data table AT THE RIGHT. The effect of the rooting hormone on the production of new roots was most likely due to the influence of the hormone on the process of

(1) photosynthesis

(3) mitosis

(2) meiosis

(4) excretion

Data Base File Number: 789

Regents Date Aug2002-47C.bm

Aug2002

47 8/13/2002 S4K4

Answer 3



Plant Cutting	Total Length of Roots in Centimeters	
	Treated with Hormone	Untreated
Begonia	1.50	1.00
Geranium	0.75	0.50
Rose	0.00	0.00

**hormone**

102. The diagram shown represents a function of the thyroid gland. What is one effect of an increasing level of TSH-releasing factor?

- (1) TSH is released
- (2) TSH is not released
- (3) TSH slows down thyroid activity
- (4) TSH controls the hypothalamus

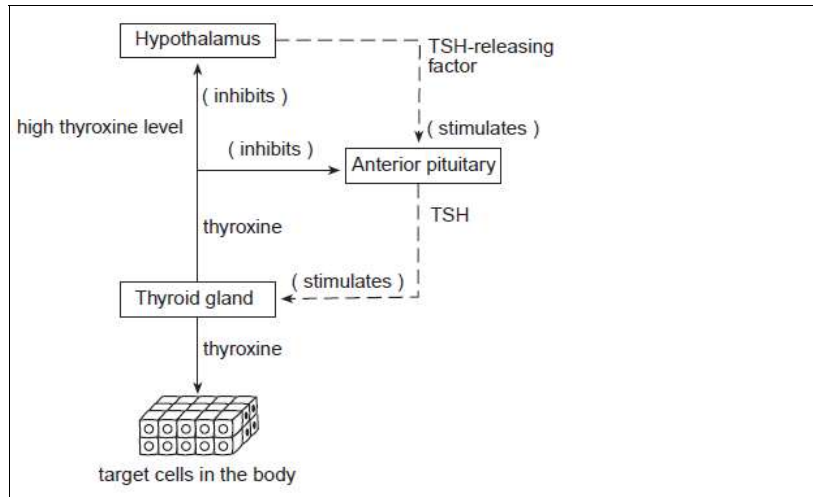
Data Base File Number: 854

Regents Date June2001-49.bmp

June2001

49 6/15/2001 S1K3

Answer 2



**hormone**

103. The diagram shown represents an interaction between parts of an organism. The term chemicals in this diagram represents

- (1) starch molecules
- (2) DNA molecules
- (3) hormone molecules
- (4) receptor molecules

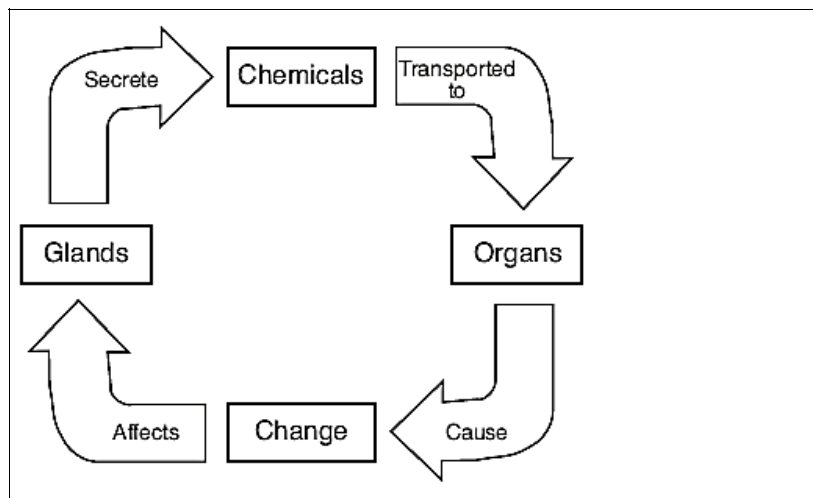
Data Base File Number: 100

Regents Date June08-35.bmp

June2008

35 6/24/2008 S4K1

Answer 3



## hormone

104. The diagram shown represents cells and hormones present in the human body. Which statement correctly describes an interaction between the hormones and the cells?
- (1) Hormone A is synthesized by cell 2 and targets cell 1.
  - (2) Hormone B bonds with both cell 1 and cell 2.
  - (3) Specific reactions carried out by cell 1 are regulated by hormone C.
  - (4) The specialized receptor molecules on cell 1 secrete hormone B.

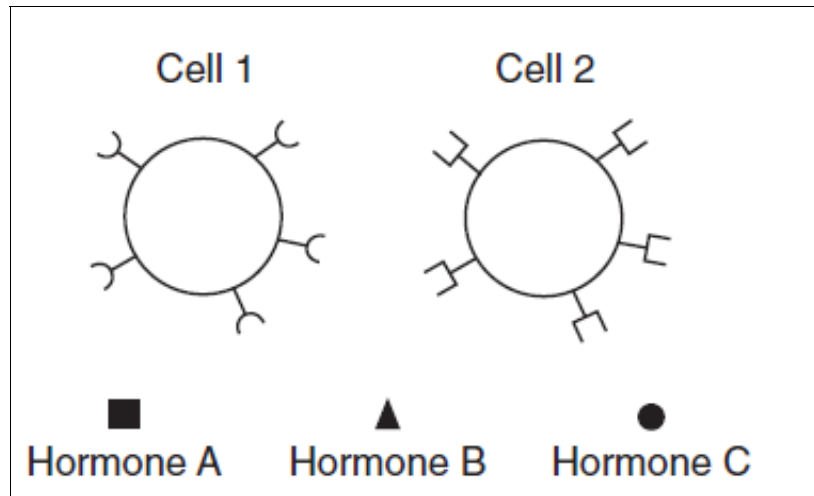
Data Base File Number: 386

Regents Date Jan2012-36.bmp

Jan2012

36 1/25/2012 S4K1

Answer 3



## hormone

105. A biological process is represented in the diagram as shown. The reason the hormones affect the target cell and not the other cells is that the
- (1) hormone provides energy only for the target cell
  - (2) target cell has specific receptors for the hormone
  - (3) nontarget cells produce antibodies that block the hormone
  - (4) hormones can only leave the bloodstream near the target cell

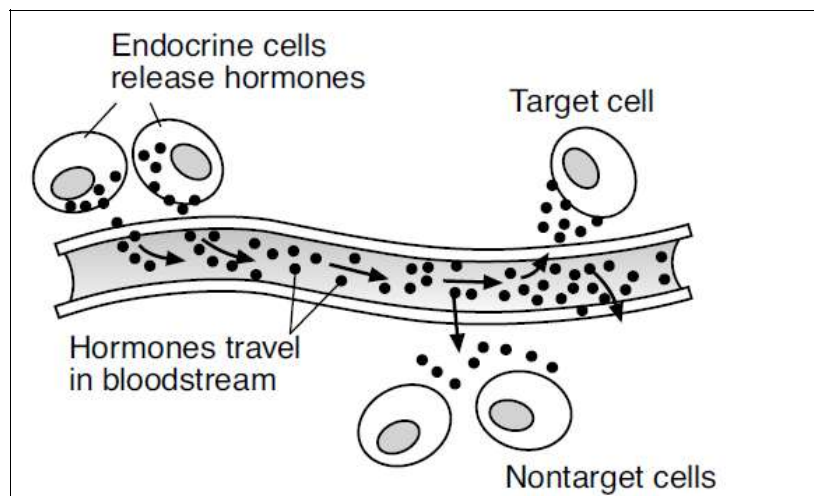
Data Base File Number: 1467

Regents Date June2022-11.bmp

June2022

11 6/15/2022 S4K1

Answer 2



hormones / human

106. The data in the table shown indicates the presence of specific reproductive hormones in blood samples taken from three individuals. An X in the hormone column indicates a positive lab test for the appropriate levels for normal reproductive functioning in that individual. Which processes could occur in individual 3?

- (1) production of sperm, only
- (2) production of sperm and production of eggs
- (3) production of eggs and embryonic development
- (4) production of eggs, only

Data Base 53  
File Number:

Regents Date Jan07-30.bmp

Jan2007

30 1/26/2007 S4K4

Answer 1

Data Table

Individuals	Hormones Present		
	Testosterone	Progesterone	Estrogen
1		X	X
2			X
3	X		

## hormones / human female

107. The graph as shown represents the interactions of two female reproductive hormones. Based on the graph, which statement is correct regarding the interaction of the levels of estrogen and progesterone?

- (1) When the amounts of estrogen and progesterone are at the same level, an egg begins to develop in the ovary.
- (2) When an egg is released from the ovary, the level of estrogen is higher than the level of progesterone.
- (3) The level of progesterone controls the cycle since it is always higher than the level of estrogen.
- (4) After an egg is released from the ovary, the level of estrogen keeps increasing, causing the level of progesterone to decrease.

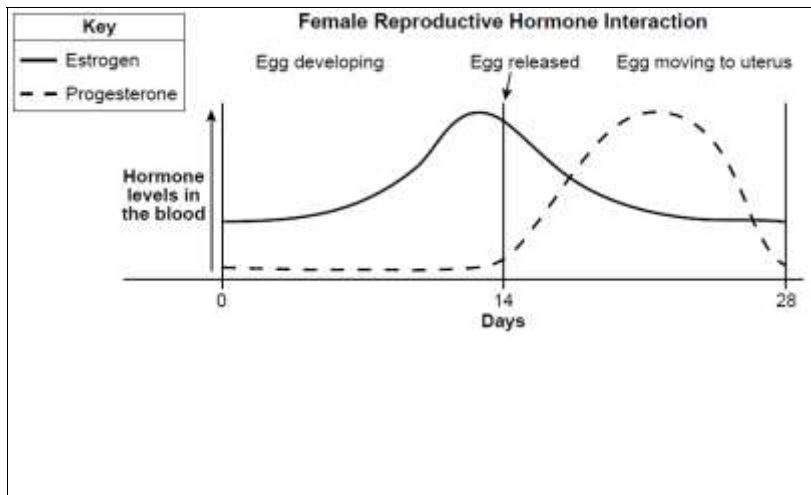
Data Base File Number: 1573

Regents Date June2023-33.bmp

June2023

33 6/14/2023 S4K2

Answer 2



## hormones / human female

108. The graph shows the relative concentrations of certain hormones in the blood during the human female reproductive cycle. Which hormone has the lowest concentration on which day?

- (1) hormone A on day 4
- (2) hormone B on day 2
- (3) hormone C on day 12
- (4) hormone D on day 20

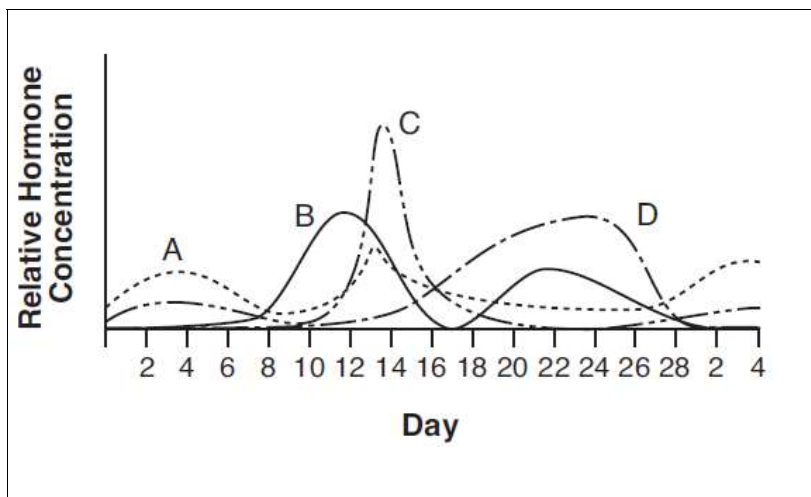
Data Base File Number: 221

Regents Date August2009-40.b

Aug2009

40 8/13/2009 S1K3

Answer 2





## hormones / human female

109. The graph shows the different concentrations of female reproductive hormones A, B, C, and D over a 28-day cycle. Although the data used to make this graph was originally entered in a data table, most scientists prefer to see the information in the form of a graph because

- (1) the information in a graph is more accurate than the information in a data table
- (2) it is easier to see relationships between variables in a graph than in a data table
- (3) it is possible to put more information in a graph than in a data table
- (4) only graphs can be used to predict future trends

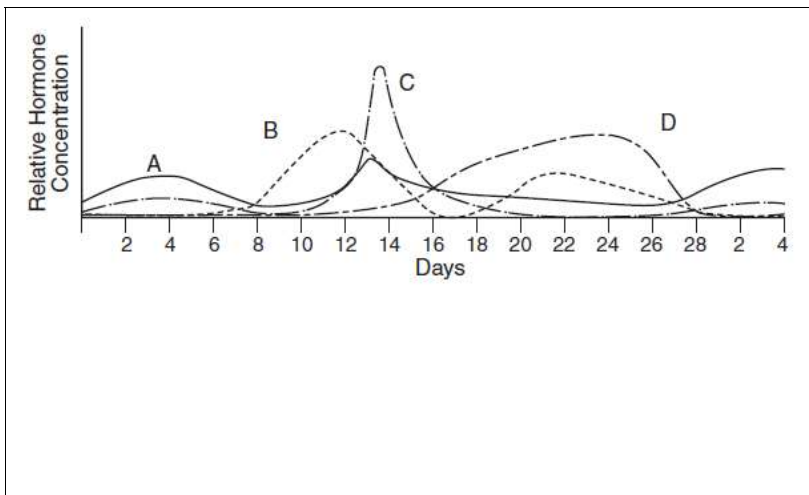
Data Base File Number: 538

Regents Date Jan2005-26.bmp

Jan2005

26 1/28/2005 4.3

Answer 2



## hormones / human female

110. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows some events associated with the reproductive cycle of human females. Which sections of the graph represent structures affected directly by the hormones shown?

- (1) section A and section B, only
- (2) section B and section C, only
- (3) section A and section C, only
- (4) section A, section B, and section C

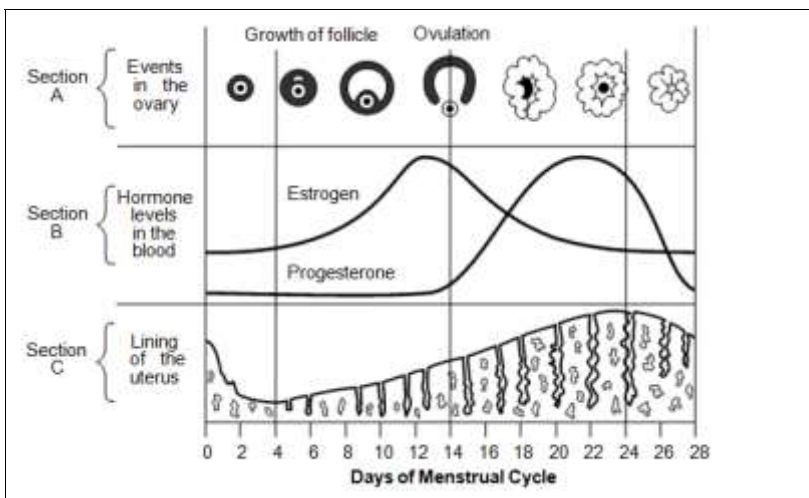
Data Base File Number: 952

Regents Date June2014-50.bmp

June2014

50 6/17/2014 S4K4

Answer 3



human activities

111. The diagram shown represents a cycle that occurs in nature. Which phrase describes a human activity that could have a negative effect on this cycle?

- (1) a decrease in the amount of sulfates given off by motor vehicles
- (2) an increase in recycling programs for plastics and metals
- (3) the continued deforestation and removal of forest resources
- (4) development of programs to conserve wildlife

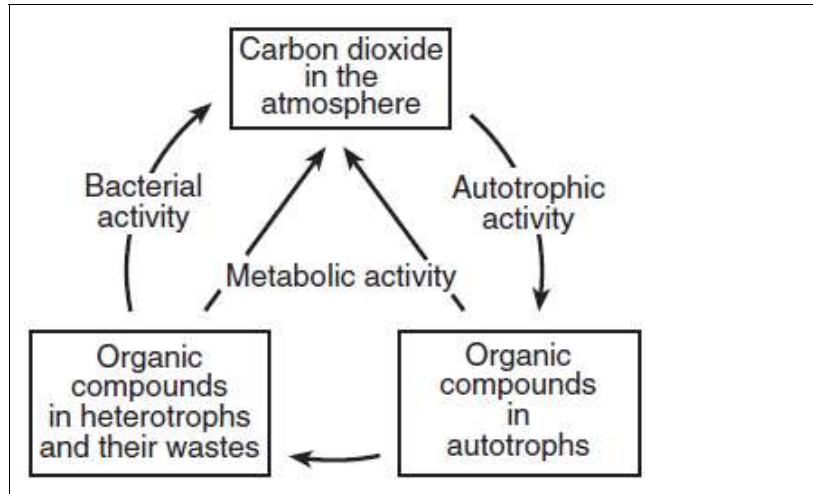
Data Base File Number: 1130

Regents Date August2016-34.b

Aug2016

34 8/18/2016 S4K7

Answer 3



human activities

112. Base your answers to this question on the information given and on your knowledge of biology. Humans rely on the stability of ecosystems for long-term health. Some of the current hazards to human health are represented in the diagram as shown. Decreases in soil, air, and water quality can result from human activities that have

- (1) negatively influenced these resources by removing pollutants
- (2) modified natural cycles, increasing the quality of these resources
- (3) resulted in an increase in the stability of these resources
- (4) had a negative influence on the natural systems that maintain these resources

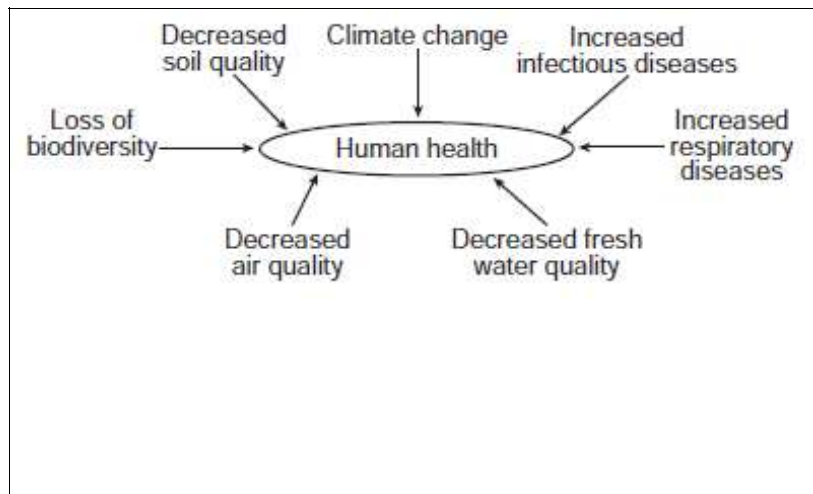
Data Base File Number: 1634

Regents Date Jan2024-36.bmp

Jan2024

36 1/23/2024 S4K7

Answer 4



## human activities

113. Base your answer to this question on the graphs shown and on your knowledge of biology. The graphs show some of the atmospheric and ice sheet changes that have been observed on Earth. Based on the graphs shown, what human activity is likely to be the cause of the decrease in the Greenland Ice Sheet?

- (1) Burning of fossil fuels and adding carbon dioxide to the atmosphere..
- (2) Decrease in carbon dioxide levels in the atmosphere due to burning of fossil fuels.
- (3) Increase in oxygen levels in the atmosphere due to increased photosynthesis.
- (4) Increase in oxygen levels in the atmosphere due to a decrease in photosynthesis.

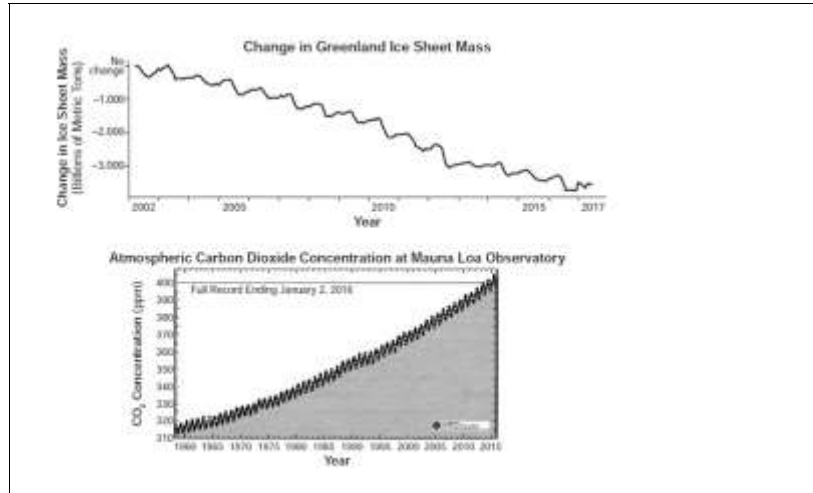
Data Base File Number: 1709

Regents Date Aug2024-71C.bm

Aug2024

71 8/20/2024 S4K7

Answer 1



## human activity

114. Scientists are concerned about the decreasing numbers in the populations of Atlantic salmon along the east coast of North America due to overfishing and changes in their breeding environments. Some businesses have developed farm-raised populations of certain varieties of salmon. Large, farm-raised populations have a limited genetic diversity as compared to wild-caught salmon. Which row in the chart as shown correctly pairs possible effects of fish farming?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1668

Regents Date June2024-35.bmp

June2024

35 6/14/2024 S4K7

Answer 1

Row	Negative Effect of Fish Farming	Positive Effect of Fish Farming
(1)	Loss of biodiversity among farmed fish	Increased sales of fish, a food source
(2)	Increased sales of fish, a food source	Limited genetic diversity in salmon population
(3)	Loss of biodiversity in wild fish	Decreased population size
(4)	Increased biodiversity	Increased population size

## human activity

115. Which row in the chart shown correctly pairs a human activity with its impact on the environment?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1200

Regents Date Aug2017-15.bmp

Aug2017

15 8/17/2017 S4K7

Answer 4

Row	Human Activity	Impact
(1)	decrease in the use of pesticides	erosion of rock in the soil
(2)	increase in housing developments	improvement in air quality
(3)	increase in human population	reduction in water usage
(4)	decrease in recycling	reduction in amount of available resources

## human growth

116. Which graph best shows the changes in global human population and natural resource use over the past 500 years?

(1) 1

(3) 3

(2) 2

(4) 4

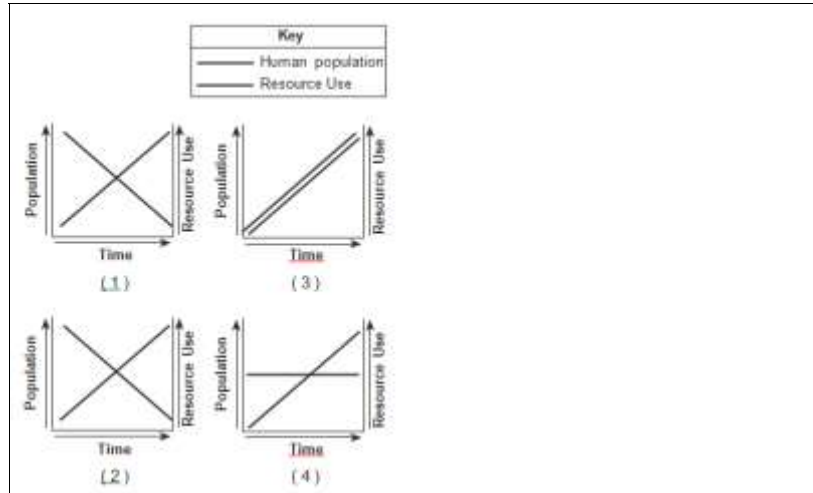
Data Base File Number: 1171

Regents Date June2017-5.bmp

June2017

5 6/14/2017 S4K7

Answer 3



## human growth

117. Which graph best illustrates the change in the human population over the past 2000 years?

(1) 1

(3) 3

(2) 2

(4) 4

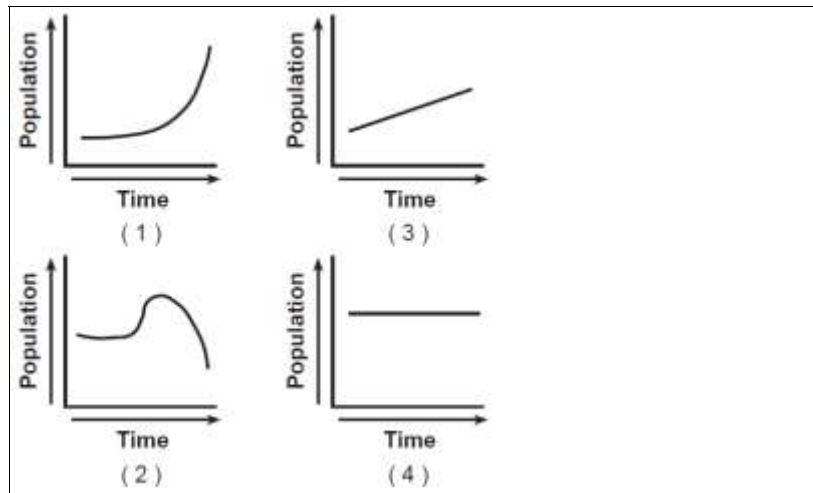
Data Base File Number: 922

Regents Date Jan2014-25.bmp

Jan2014

25 1/27/2014 S4K7

Answer 1



## human growth

118. The graph shows changes in human population numbers over time.  
A consequence of these changes is

- (1) an increase in the numbers and kinds of organisms worldwide
- (2) a decrease in the availability of natural resources
- (3) a decrease in deforestation due to technological improvements
- (4) an increase in biosphere stability

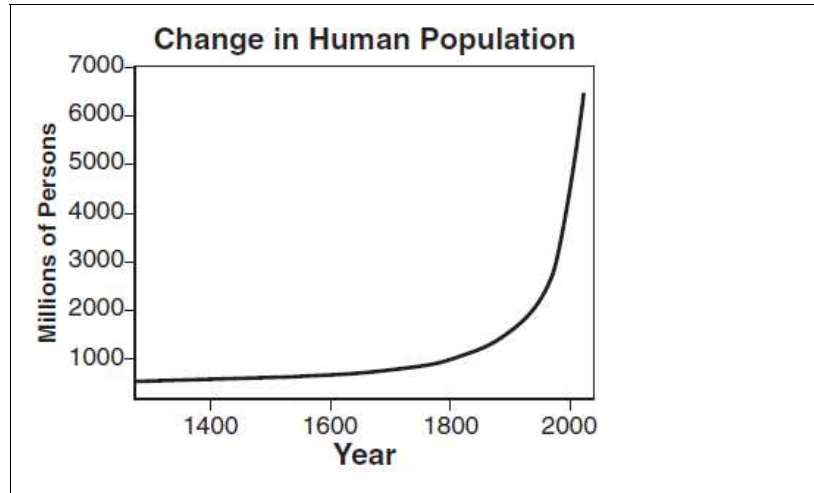
Data Base File Number: 1045

Regents Date August2015-26.b

Aug2015

26 8/12/2015 S4K7

Answer 2



## human impact

119. Which concept is best represented in the diagram shown ?

- (1) Human actions are a threat to equilibrium in ecosystems.
- (2) Equilibrium in ecosystems requires that humans modify ecosystems.
- (3) Equilibrium in ecosystems directly affects how humans modify ecosystems.
- (4) Human population growth is the primary reason for equilibrium in ecosystems.

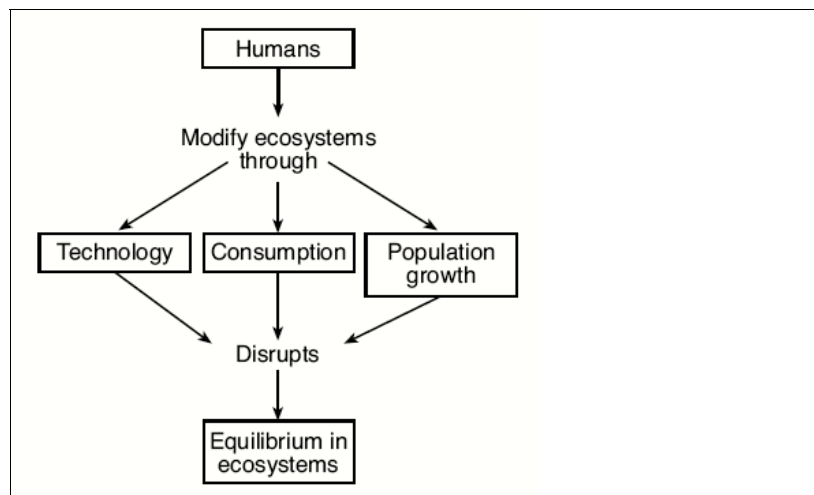
Data Base File Number: 125

Regents Date Aug08-24.bmp

Aug2008

24 8/13/2008 S4K5

Answer 1



## human impact

120. Coral reefs are vital components of marine ecosystems. They provide shelter and nutrition to many organisms that live on or in them. Some coral reefs in the Pacific Ocean are heavily polluted with plastic objects that provide surfaces where disease-causing microbes are able to grow. If the amount of plastic present on coral reefs continues to increase, it is likely that the

- (1) coral will adapt to the presence of the plastic and thrive
- (2) microbes will adapt to living directly on the coral
- (3) algae that live on the reef will begin to decompose the dying coral
- (4) species dependent on the coral will be negatively impacted

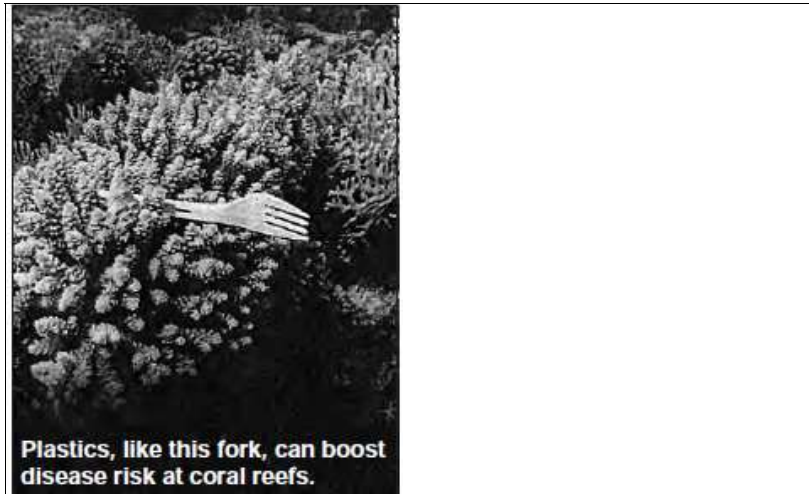
Data Base File Number: 1690

Regents Date Aug2024-25.bmp

Aug2024

25 8/20/2024 S4K7

Answer 4



## human impact

121. Base your answer to this question on the information given and on your knowledge of biology. Throughout the world, in nearly every ecosystem, there are animal and plant species present that were introduced into the ecosystem by humans or transported to the ecosystem as a result of human activities. Some examples are listed in the chart shown. What is one reason that an introduced species might be very successful in a new environment.

- (1) There is no competition.
- (2) There is more competition.
- (3) Competition remains the same.
- (4) There are no predators.

Data Base File Number: 140

Regents Date Aug08-56.bmp

Aug2008

56 8/13/2008 S4K7

Answer 1

Organism	New Location
purple loosestrife (plant)	wetlands in New York State
zebra mussel	Great Lakes
brown tree snake	Guam

## human impact

122. Base your answers to this question on the information and food web below and on your knowledge of biology. The organisms in the food web below live near large cattle ranches. Over many years, mountain lions occasionally killed a few cattle. One year, a few ranchers hunted and killed many mountain lions to prevent future loss of their cattle. Later, ranchers noticed that animals from this food web were eating large amounts of grain from their fields. Which two specific populations most likely increased in number after the mountain lion population decreased?

- (1) rabbit and deer
- (2) rabbit and snake

- (3) hawk and frog
- (4) mouse and hawk

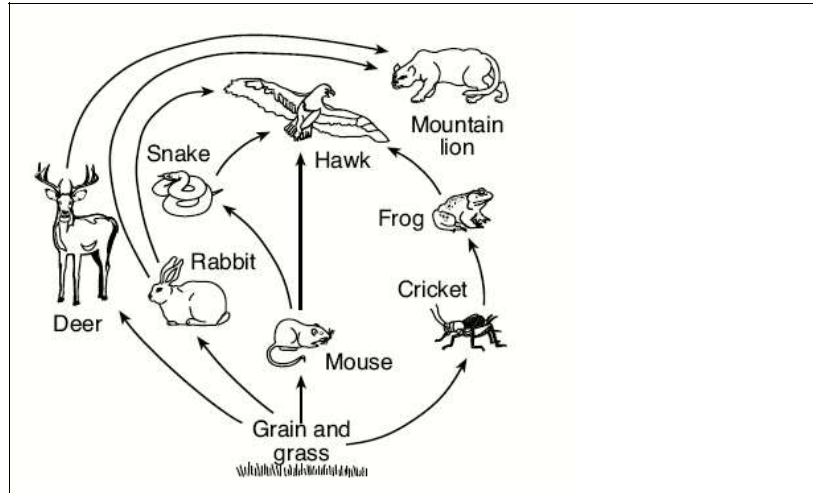
Data Base 141  
File Number:

Regents Date Aug08-59.bmp

Aug2008

59 8/13/2008 S4K7

Answer 1





## human impact

123. Which statement best illustrates a concept represented in the diagram shown?

- (1) Tsunamis triggered by oceanic earthquakes cause widespread flooding that can lead to large scale environmental destruction.
- (2) Annual hunting laws determine the number of deer that can be hunted to ensure population stability.
- (3) More individuals are purchasing hybrid cars that use less gasoline and produce less carbon dioxide.
- (4) The increased use of electronics has led to increased mining for precious metals and minerals in developing countries.

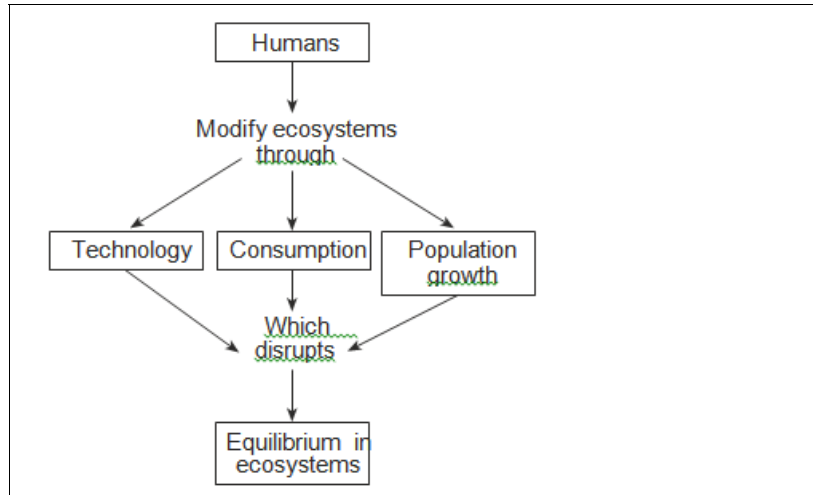
Data Base File Number: 1181

Regents Date June2017- 35.bm

June2017

35 6/14/2017 S4K7

Answer 4



## human impact

124. Orcas are endangered whales. Only about 80 individuals remain off the coast of Washington State. Salmon are a source of food for orcas. Some individuals are proposing that four dams in Washington State be removed so that habitat areas for salmon will be increased. Those opposed to the dam removals say that the dams provide low-cost hydroelectric power and positively influence the local economy. This situation is an example of

- (1) direct harvesting of an endangered orca species by humans
- (2) orcas overproducing in an ecosystem with no resources
- (3) a community relying on nonrenewable energy sources
- (4) a decision where benefits and risks have to be weighed

Data Base 1390  
File Number:

Regents Date Jan2020-15.bmp

Jan2020

15 1/21/2020 S4K7

Answer 4



Source: The Times-Tribune 11/3/16

## human impact

125. The brown tree snake was accidentally introduced to the island of Guam during World War II. Since then, this snake has caused the extinction of twelve native bird species by eating their eggs and young. One NEGATIVE result of this snake's introduction was most likely

- (1) an increase in diversity as new species evolved to replace extinct species
- (2) an increase in mosquitoes due to an increase in bird species in the environment
- (3) a disruption of food chains and food webs in Guam's ecosystems
- (4) an abundance of brown tree snakes as a food source for humans

Data Base File Number: 1307

Regents Date Jan2019-30.bmp

Jan2019

30 1/22/2019 S4K1

Answer 3



Source: www.aquariumlife.com.au

## human impact

126. Which phrase would be appropriate for area A in the chart shown?

- (1) produces radioactive waste
- (2) results in greater biodiversity
- (3) provides light from radioactive substances
- (4) reduces dependence on fossil fuels

Data Base File Number: 645

Regents Date Jan2004-29.bmp

Jan2004

29 1/29/2004 S4K5

Answer 1

Technological Device	Positive Impact	Negative Impact
Nuclear power plant	Provides efficient, inexpensive energy	A

## human impact

127. Base your answer to this question on the information and photo shown and on your knowledge of biology.

Fishers are mammals that prefer to live in forested areas. The fisher feeds on acorns, berries, and apples, as well as on smaller mammals and birds. They are one of the few organisms that are successful in killing and eating porcupines. Porcupines are large rodents that have sharp spines, or quills, that cover most of their body. The fisher has no natural enemies. Most fisher deaths are due to automobiles and trapping. The population has also been negatively affected by logging and road-building. Recently, new regulations have been adopted that affect the trapping of fishers. Which action would probably result in an increase in the fisher population?

- (1) removing all regulations regarding fisher trapping
- (2) increasing the area where fisher trapping is allowed
- (3) changing the fisher trapping season from 46 to 30 days
- (4) decreasing the cost of the permit needed for fisher trapping

Data Base 1672  
File Number:

Regents Date June2024-42.bmp

June2024

42 6/14/2024 S4K1

Answer 3



Source: [www.massaudubon.org](http://www.massaudubon.org)

## human impact

128. The chart shown summarizes the effect of commercial fishing on a local Atlantic cod population over a 9-year period. According to the chart, it can be concluded that

- (1) the number of fishing boats has less effect on the local cod population than pollution
- (2) more fishing boats make the cod population estimates more accurate
- (3) an increase in fishing boats has had a positive impact on cod population growth
- (4) commercial fishing is having a negative effect on the local cod population

Data Base File Number: 619

Regents Date Jan2013-40.bmp

Jan2013

40 1/23/2013 S4K7

Answer 4

Year	Number of Commercial Fishing Boats	Estimated Population of Atlantic Cod (in thousands)
1995	4	14.0
1997	6	12.5
1999	12	11.5
2001	14	9.0
2003	17	4.5

## human impact

129. Base your answer to this question on the information and data table shown and on your knowledge of biology. Invasive species have damaged agricultural crops all over the world. One study, completed in Japan, calculated the number of invasive insect species present in Japan from 1880 to 1990. Some of the data are recorded in the table shown. In the last decade of this study, there was a decrease in the number of invasive insects that entered Japan. One likely reason for this decrease is that people have

- (1) produced insecticides that are strong enough to kill every insect that is present in crops going from one country to another
- (2) improved inspections of crops that are transported from one area of the world to another area of the world
- (3) genetically altered all insects so they don't feed on crops that humans use
- (4) stopped the transportation of all food crops from other countries, requiring each area to use only locally grown crops

Data Base File Number: 1314

Regents Date Jan2019-47.bmp

Jan2019

47 1/22/2019 S4K7

Answer 2

Number of Invasive Insect Species per Decade

Year	Number of Invasive Insect Species
1880	3
1900	3
1920	7
1940	10
1960	13
1980	41
1990	25

Adapted from "Invasive Insect Pests and Plant Quarantine." 1998

## human impact

130. Base your answer to this question on the information and graph shown. Reducing toxic chemicals released into the environment often requires laws. When making decisions about whether or not to support the passing of such laws, individuals must weigh the benefits against the potential risks if the law is not passed. The amounts of toxic chemicals released into the environment of New York State over a ten-year period are shown in the graph. Why did the amount of toxic chemicals released remain relatively constant between 1995 and 1997?

- (1) The environment reached a saturation level of toxic waste.
- (2) The existing laws regarding the release of toxic wastes were strictly enforced.
- (3) Toxic wastes were recycled in nature.
- (4) Companies releasing toxic wastes voluntarily reduced the total amounts of toxic wastes released.

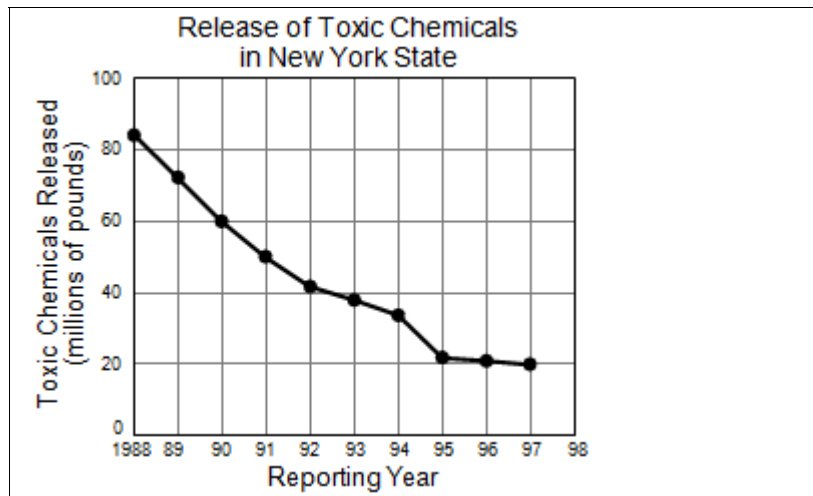
Data Base 681  
File Number:

Regents Date June2004-56.bmp

June2004

56 6/18/2004 S4K7

Answer 2



## human impact

131. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows an effect of secondhand smoke (SHS) on newborn babies of nonsmoking women. Based on this and other similar studies involving newborns, medical professionals recommend that pregnant women avoid secondhand smoke because chemicals in the smoke

- (1) cause mutations in the cells of the ovaries
- (2) affect the growth of the fetus
- (3) are unable to pass through the placenta
- (4) decrease digestion in the stomach of the fetus

Data Base File Number: 1637

Regents Date Jan2024-40.bmp

Jan2024

41 1/23/2024 S4K4

Answer 2

	Women Exposed to SHS	Women Not Exposed to SHS
Number of Newborns in Study	1085	2341
Birth Weight (mean)	3.15 Kg	3.21 Kg
Length (mean)	49.62 cm	49.67 cm
Head Circumference (mean)	34.05 cm	34.14 cm

Source: www.biomedcentral.com

## human impact

132. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram identifies four groups that can have an effect on air quality in New York State. Which of the following could cause air-quality problems that affect New York State?

- (1) acid rain
- (2) global warming
- (3) smog
- (4) All of the above could be correct.

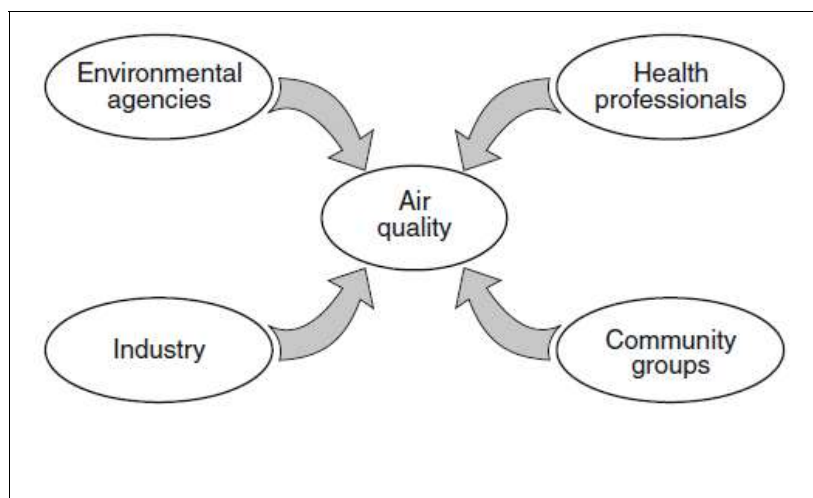
Data Base File Number: 448

Regents Date Aug2012-71.bmp

Aug2012

71 8/17/2012 S4K7

Answer 4





## human impact

133. In which row in the chart below is a human action correctly paired with its environmental impact?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 405

Regents Date June2012-11.bmp

June2012

11 6/19/2012 S4K7

Answer 3

Row	Human Action	Environmental Impact
(1)	deforestation	increased biodiversity
(2)	population growth	increased number of species
(3)	industrialization	increased global temperature
(4)	overharvesting	increased mineral resources

## human impact

134. Base your answer to this question on the information given, the data table shown, and on your knowledge of biology. Birds colliding with aircraft either on the ground or in the air create problems for the Air Force. An organization known as BASH (Bird Aircraft Strike Hazard) studied the impact of birds colliding with aircraft. In 2001, there were 3854 bird collisions reported at a total cost to the Air Force of over 31 million dollars in damage --- approximately eight thousand dollars per collision. August, September, and October were the busiest months with 1442 collisions. Nearly 50% of all these collisions occurred in the airfield environment, an environment that can most easily be controlled. The top five species of birds involved in these collisions are listed in the data table as shown. The bird species causing the least amount of damage to aircraft is species

(1) A

(3) C

(2) B

(4) D or E

Data Base File Number: 269

Regents Date June2010-46.bmp

June2010

46 6/16/2010 S1K3

Answer 4

Top Five Bird Species Involved in Collisions in 2001

Type of Bird	Number of Collisions
American mourning dove (species A)	123
horned lark (species B)	100
barn swallow (species C)	83
American cliff swallow (species D)	55
American robin (species E)	55

Source of data: Bird Aircraft Strike Hazard by Matt Granger, <http://www.find.articles.com>

## human impact

135. The sea cucumber, a relative of sea stars and sea urchins, was once mostly ignored by humans. Even though no scientific evidence exists, some people believe that eating sea cucumbers has medical benefits. As a result, sea cucumbers that were once plentiful are now found in small numbers. Which statement most directly describes this situation?
- (1) Sea cucumbers are an animal resource being appropriately managed to benefit humans.
  - (2) The population of sea cucumbers is being greatly reduced by natural predators, such as sea stars.
  - (3) The direct harvesting of organisms by humans can have irreversible effects.
  - (4) Biological research has led to the use of plant and animal products that have medical benefits.

Data Base 1605  
File Number:

Regents Date Aug2023-30.bmp

Aug2023

30 8/17/2023 S4K7

Answer 3



Source: <https://farm3.staticflickr.com>

## human impact

136. Base your answer to this question the information given and on your knowledge of biology. A genetically modified pig, nicknamed the "enviropig", has the ability to produce a bacterial enzyme in its saliva that helps reduce the amount of phosphorus in its wastes. Phosphorus pollution is a serious environmental concern. "Enviropigs" are expensive, but the cost is balanced against the benefit to the environment. There is also a concern that the US Department of Agriculture still has not cleared Enviropig meat for human consumption. Government agencies and citizens should propose the use of "Enviropig" in the future only after

- (1) developing ways to remove the bacterial enzyme
- (2) assessing risks, costs, and benefits
- (3) people have eaten lots of enviropig meat and determined the effects
- (4) a different, cheaper pig can be produced regardless of the output of phosphorus

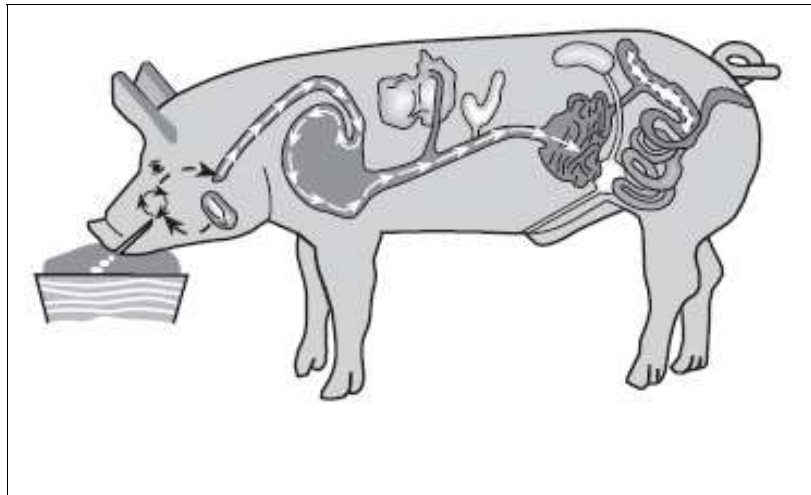
Data Base 1106  
File Number:

Regents Date June2016-39.bmp

June2016

39 6/15/2016 S4K7

Answer 2



## human impact

137. Base your answer to this question on the information given and on your knowledge of biology. ----- Meet the Sentinels -----

Canaries are the most familiar example of a sentinel species, which are animals and plants that serve as harbingers [indicators] of danger to human health and the environment. In the case of canaries, if odorless carbon monoxide were present in a high enough concentration in a coal mine, the small bird would die first and give miners time to escape. Cats, too, have been sentinels. In the 1950s, people in the town of Minamata, Japan, began to notice that local cats were acting strangely; The cats were unable to walk straight and uncontrollably jumped about. After some time, people began to act similarly. The cause of the "dancing cat fever" was quickly connected to the release of methylmercury in the wastewater of a local chemical factory. The discharge fed into the city's harbor, where it bioaccumulated in tissues of fish and shellfish. Although several thousand people were affected with what became known as Minamata Disease, the outcome could have been worse if not for the warning from the "dancing cats". Bald eagle populations declined when a pesticide called DDT was used to kill insects. Once DDT was banned in 1972, the population of bald eagles rebounded. Why could the the bald eagles be considered a sentinel species like canaries in coal mines?

- (1) The bald eagles were reacting to harmful substances that could eventually harm humans.
- (2) The bald eagles can sense danger and migrate to a different environment.
- (3) The bald eagles died from DDT and became extinct.
- (4) The bald eagles increased in number.

Data Base 1588  
File Number:

Regents Date June2023-68.bmp

June2023

68 6/14/2023 S4K7

Answer 1



## human impact

138. Infestation with bedbugs is a serious health problem, and scientists seeking to control bedbug reproduction are constantly researching new options. It has now been shown that freezing any articles of clothing or bedding containing bedbugs at a temperature below  $-15^{\circ}\text{C}$  for 3.5 days will kill all of the bedbugs and their eggs. Using the technique of freezing is preferable to using chemical insecticides because a major disadvantage of using chemical pesticides is that they

- (1) are highly toxic to the bedbugs, but not toxic to other organisms
- (2) could remain in the clothing or bedding and harm humans later
- (3) are made of molecules so the bedbugs will not develop resistance to them
- (4) could be useful for medical research and should not be wasted on bedbugs

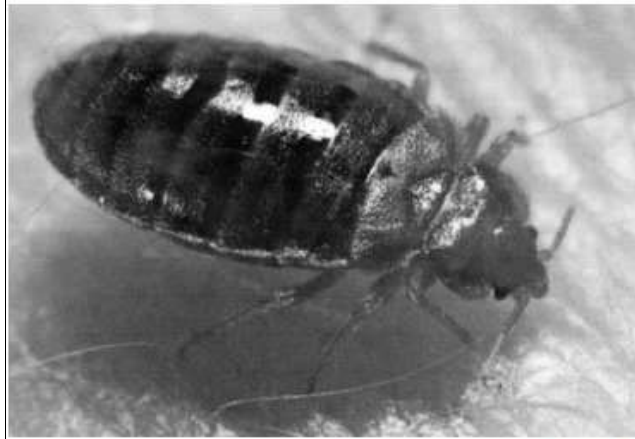
Data Base 1541  
File Number:

Regents Date Jan2023-24.bmp

Jan2023

24 1/24/2023 S4K4

Answer 2



Source: Science Daily 12/8/13

## human impact

139. Base your answer to this question on the information given and on your knowledge of biology.

----- Lionfish Invasion -----

Lionfish are native to the Indian and Pacific Oceans. They have recently been found along the southeast coast of the U.S., the Caribbean, and in parts of the Gulf of Mexico. Experts speculate that the lionfish invasion was caused by people dumping unwanted lionfish into the Atlantic Ocean from home aquariums. Lionfish have venomous spines and feed on small crustaceans and many fish, including the young of important commercial fish species such as snapper and grouper. The current invasion of lionfish most likely started with the dumping of about 12 fish. Today, there are thousands of them over a wide area. Why have these invasive fish been able to rapidly increase their population and range over the last 20 years.?

- (1) There are no natural predators.
- (2) The oxygen content of the ocean is low.
- (3) There is no food available.
- (4) The ocean temperature is cooler.

Data Base 1585  
File Number:

Regents Date June2023-59.bmp

June2023

59 6/14/2023 S4K6

Answer 1



## human life cycle

140. Base your answer to this question on the information in the diagram and on your knowledge of biology.- The diagram shown, represents some stages in the life cycle of humans. The numbers in the diagram represent various processes in the cycle. How do processes 1 and 2 affect the amount of genetic information provided by a parent to its offspring.

- (1) Each egg or sperm will carry the identical amounts of genetic information contained in the parent's body cells.
- (2) Each egg or sperm will carry only half of the genetic information contained in the parent's body cells.
- (3) Each egg or sperm will carry one-fourth of the genetic information contained in the parent's body cells.
- (4) Each egg or sperm will carry double the genetic information contained in the parent's body cells.

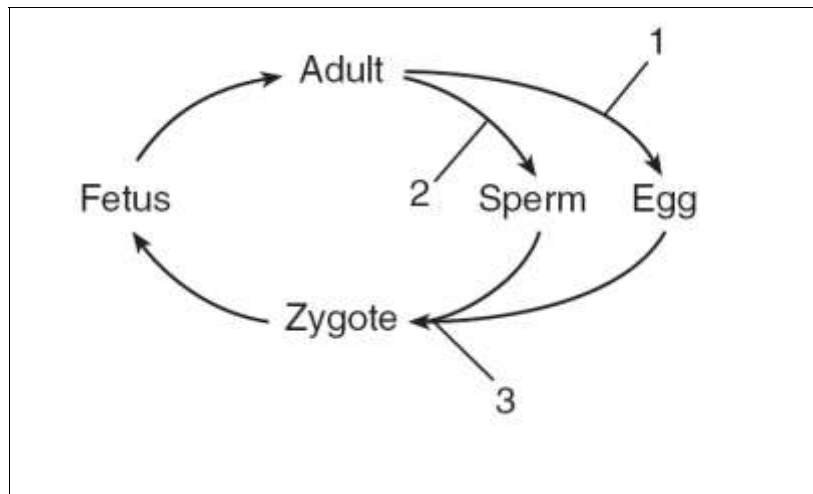
Data Base 351  
File Number:

Regents Date June2011-67.bmp

June2011

67 6/21/2011 S4K4

Answer 2



## human organs

141. Base your answer to this questions on the diagram shown and on your knowledge of biology. Structure B represents

- (1) cells, only
- (2) cells and tissues, only
- (3) an organ with cells and tissues
- (4) a complete system with organs, tissues, and cells

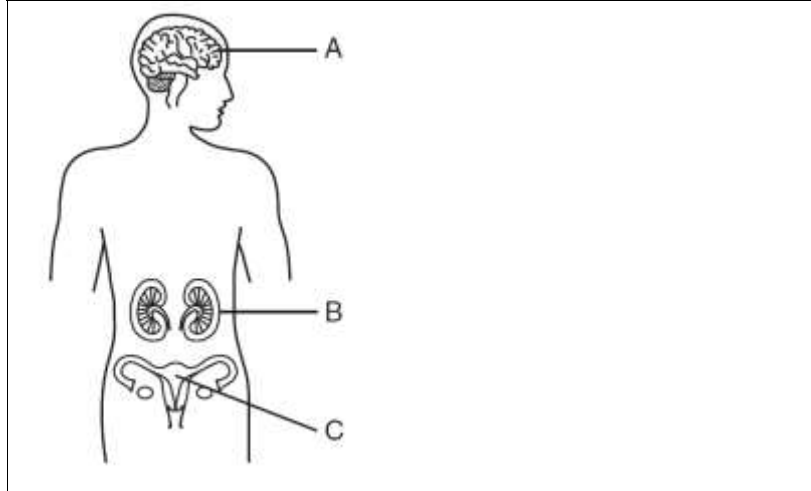
Data Base File Number: 343

Regents Date June2011-37.bmp

June2011

38 6/21/2011 S4K1

Answer 3



## human reproduction

142. The diagram shown represents part of a human reproductive system. One of the functions of this part of the system is to

- (1) supply essential nutrients to the offspring in the form of milk
- (2) provide nutritional support for the embryo
- (3) provide a structure that allows the mixing of maternal and fetal blood
- (4) produce specialized proteins used in the production and release of sperm

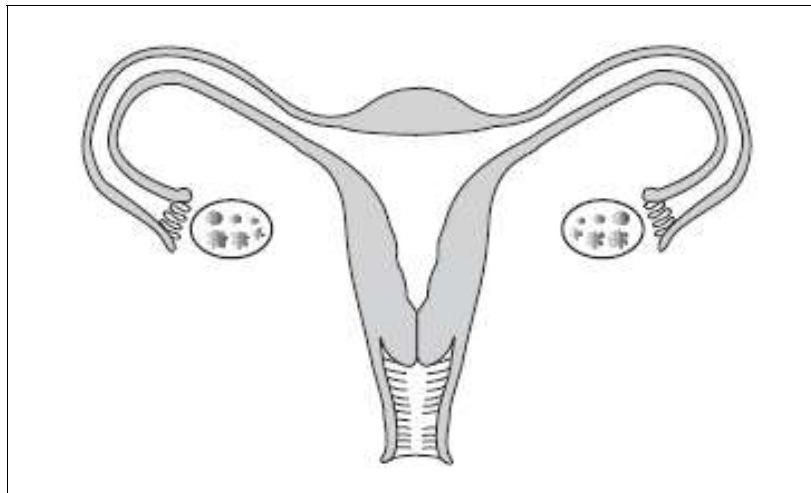
Data Base File Number: 363

Regents Date Aug2011-15.bmp

Aug2011

15 8/18/2011 S4K4

Answer 2





## human reproduction

143. The human female reproductive system is represented in the diagram shown. Which structure in the diagram produces gametes?

(1) A

(3) C

(2) B

(4) D

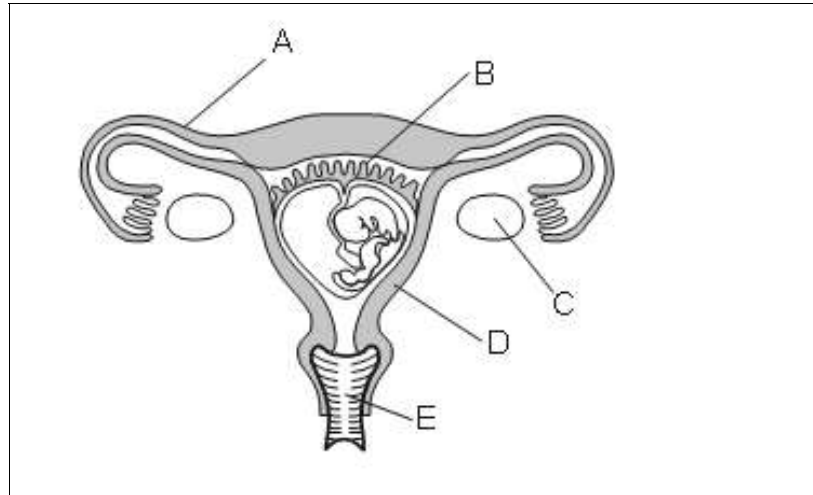
Data Base File Number: 201

Regents Date June09-51.bmp

June2009

51 6/18/2009 S4K4

Answer 3



## human reproduction

144. The human female reproductive system is represented in the diagram shown. Production of gametes and support of the fetus normally occur in structures

(1) 1 and 2

(3) 3 and 5

(2) 2 and 4

(4) 4 and 5

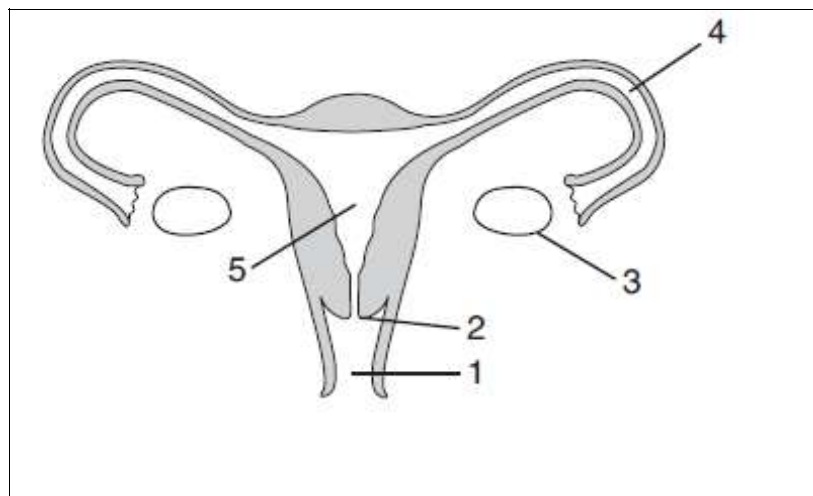
Data Base File Number: 258

Regents Date June2010-18.bmp

June2010

18 6/16/2010 S4K4

Answer 3



## human reproduction

145. The diagram shown represents a process that occurs during human reproduction. The process represented by the arrow will ensure that the

- (1) zygote contains a complete set of genetic information
- (2) gametes contain a complete set of genetic information
- (3) zygote contains half of the genetic information
- (4) gametes contain half of the genetic information

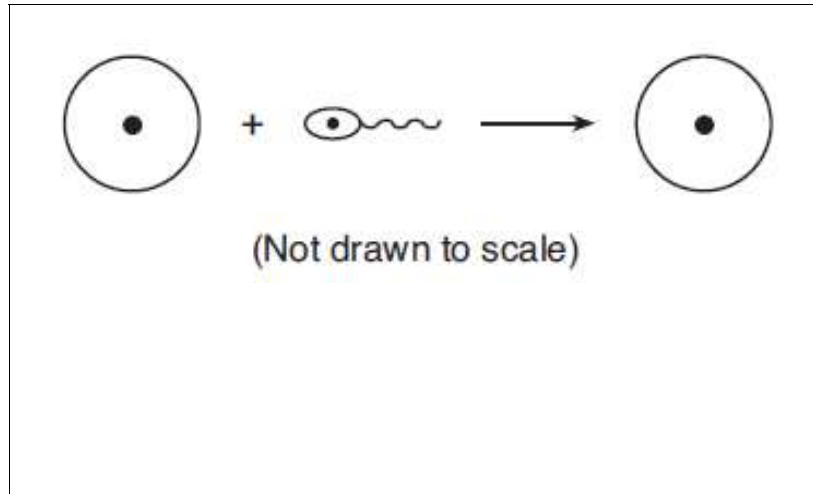
Data Base File Number: 257

Regents Date June2010-15.bmp

June2010

15 6/16/2010 S4K4

Answer 1



## human reproduction

146. The diagram shown represents processes involved in human reproduction. Which row in the chart shown correctly identifies the processes represented by the letters in the diagram?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

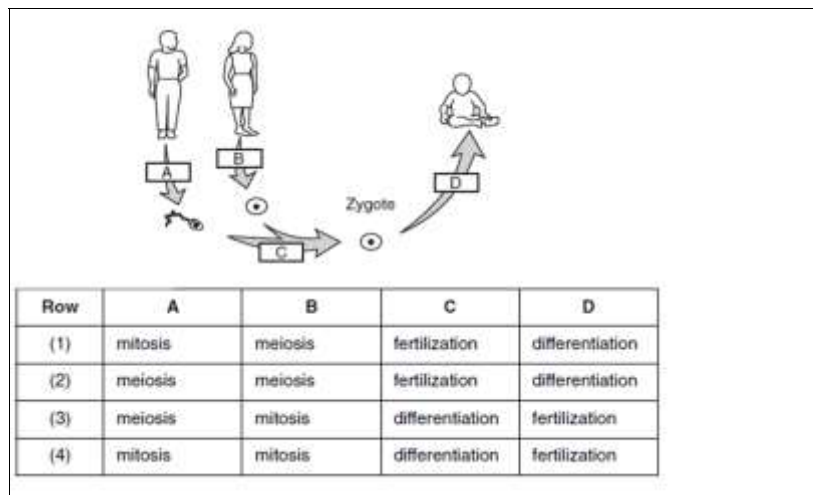
Data Base File Number: 563

Regents Date June2005-30.bmp

June2005

30 6/22/2005 S4K4

Answer 2



## human response

147. Which row in the chart shown contains an event that is paired with an appropriate response in the human body?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 117

Regents Date Aug08-9.bmp

Aug2008

9 8/13/2008 S4K1

Answer 1

Row	Event	Response
(1)	a virus enters the bloodstream	increased production of antibodies
(2)	fertilization of an egg	increased levels of testosterone
(3)	dehydration due to increased sweating	increased urine output
(4)	a drop in the rate of digestion	increased respiration rate

## human systems

148. Base your answer to this question on the diagrams shown and on your knowledge of biology. The UPPER diagram represents some of the systems that make up the human body. Which row in the LOWER diagram correctly identifies the main function of these systems?

(1) 1

(3) 3

(2) 2

(4) 4





Data Base File Number: 1237

Regents Date Jan2018-39C.bm

Jan2018

39 1/22/2018 S4K1

Answer 2

System A
System B
System C
System D

Row	System A	System B	System C	System D
(1)	response	excretion	circulation	digestion
(2)	movement	response	circulation	digestion
(3)	response	circulation	excretion	digestion
(4)	movement	circulation	digestion	reproduction

## human systems

149. Which row in the chart correctly shows what systems A, B, and C provide for the human body?

(1) Row 1

(3) Row 3

(2) Row 2

(4) Row 4

Data Base File Number: 2

Regents Date Aug07-05.bmp

Aug2007

5 8/16/2007 S4K1

Answer 3

Which row in the chart below correctly shows what systems A, B, and C provide for the human body?

Row	System A	System B	System C
(1)	blood cells	glucose	hormones
(2)	oxygen	absorption	gameles
(3)	gas exchange	nutrients	waste removal
(4)	immunity	coordination	carbon dioxide

## human systems

150. In the diagram of a single-celled organism as shown, the arrows indicate various activities taking place. Which systems perform these same activities in humans?

(1) digestive, circulatory, and immune

(3) respiratory, excretory, and digestive

(2) excretory, respiratory, and reproductive

(4) respiratory, nervous, and endocrine

Data Base File Number: 686

Regents Date Aug2004-5.bmp

Aug2004

5 8/17/2004 S4K1

Answer 3

## human systems

151. Shown in the diagram are representations of SIX human body systems. Which systems are paired CORRECTLY?

- (1) Pair 1 - Muscle and digestive  
(2) Pair 2 - Respiratory and circulatory  
(3) Pair 3 - Circulatory and muscle  
(4) Pair 1 - Muscle and nerve

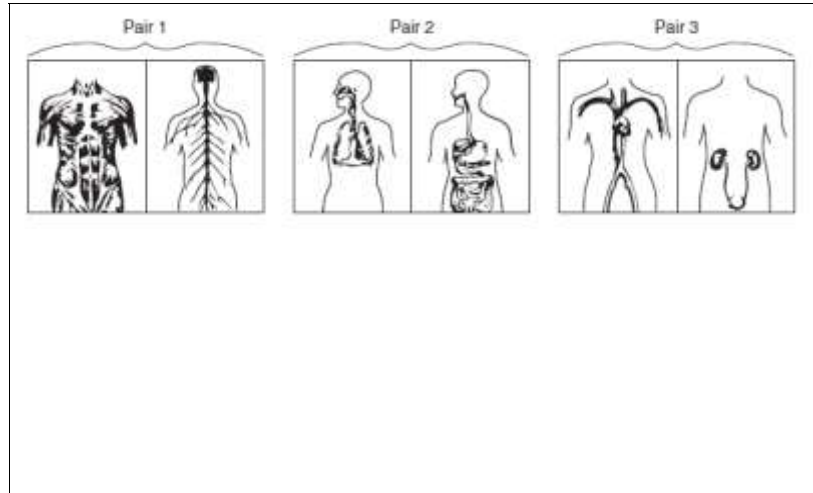
Data Base 696  
File Number:

Regents Date Aug2004-48.bmp

Aug2004

48 8/17/2004 S4K1

Answer 4



## hypothesis

152. Base your answers to this question on the information given and on your knowledge of biology. Euglena are single-celled organisms that live in ponds. All euglena have chloroplasts and can make their own food. They can also take in food from the environment. The diagram shown represents a euglena. An experiment was set up to determine the effect of nitrates, a pollutant, on the number of chloroplasts present in euglena. Five tanks were set up, each with euglena and a different concentration of nitrate solution: 0%, 0.5%, 1.0%, 1.5%, and 2.0%. The tanks were placed in a sunny location where each tank received the same amount of light. Which statement is a possible hypothesis for this experiment that could be supported by the results of this experiment?

- (1) If the average number of chloroplasts in euglena decreases, will less nitrate be needed in each tank?
- (2) If the nitrate concentration is increased, then the euglena will have a lower average number of chloroplasts.
- (3) If the number of euglena in a tank increases, will more nitrates be produced?
- (4) If the nitrate concentration is decreased, then more light will reduce the average number of chloroplasts in euglena.

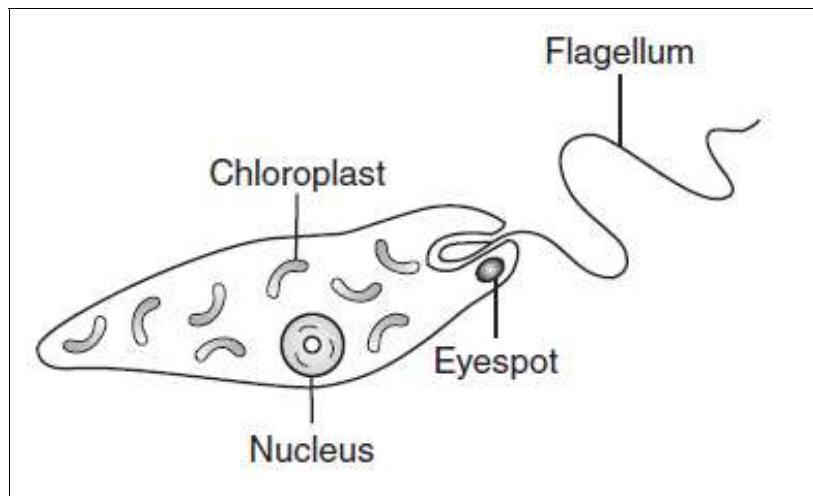
Data Base 384  
File Number:

Regents Date Jan2012-31.bmp

Jan2012

31 1/25/2012 S1K2

Answer 2



## hypothesis

153. An experimental setup is shown in the diagram below. Which hypothesis would most likely be tested using this setup?
- (1) Green water plants release a gas in the presence of light.
  - (2) Roots of water plants absorb minerals in the absence of light.
  - (3) Green plants need light for cell division
  - (4) Plants grow best in the absence of light.

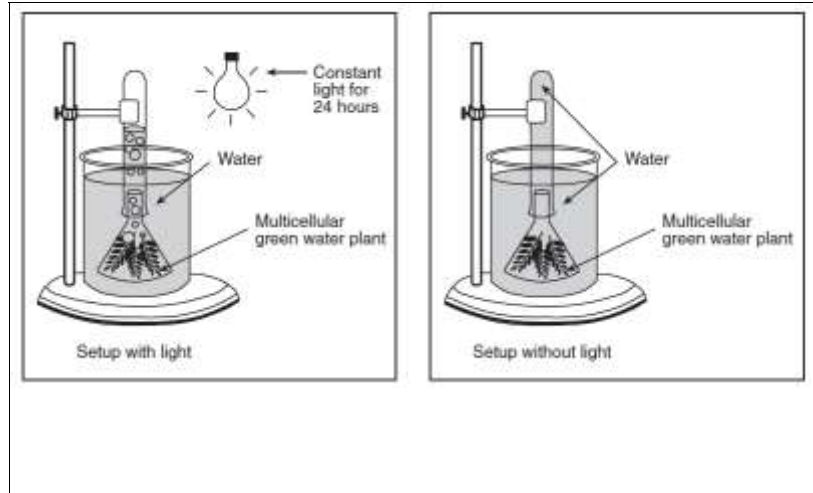
Data Base File Number: 493

Regents Date June2006-39.bmp

June2006

39 6/21/2006 S1K2

Answer 1



## hypothesis

154. Base your answer to this question on the experimental setup shown. The tubing connected to both flask setups used in the experiment provides oxygen to the solution. What is a possible hypothesis for the experiment?
- (1) Potassium helps plants grow.
  - (2) Potassium is not needed by plants for proper growth.
  - (3) Plants lacking potassium will not be green
  - (4) ANY of the above choices could be a hypothesis.

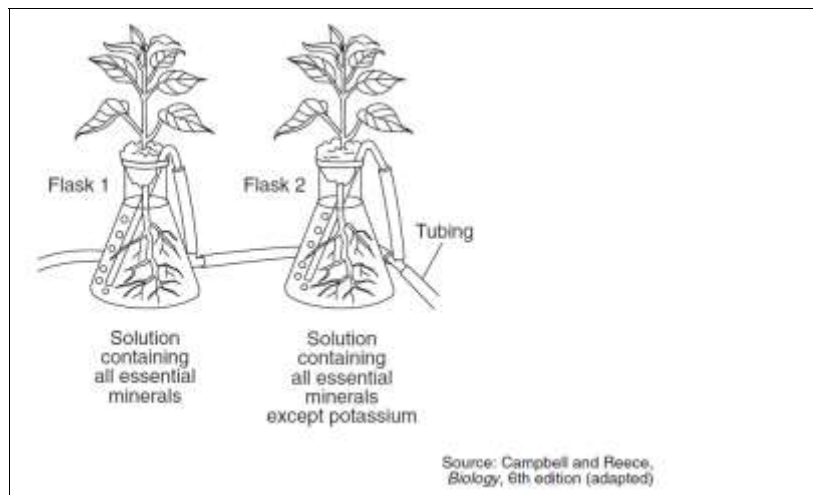
Data Base File Number: 327

Regents Date Jan2011-56.bmp

Jan2011

56 1/25/2011 S1K2

Answer 4



## hypothesis

155. A student hypothesized that lettuce seeds would not germinate (begin to grow) unless they were covered with soil. The student planted 10 lettuce seeds under a layer of soil and scattered 10 lettuce seeds on top of the soil. The data collected are shown in the table. To improve the reliability of these results, the student should

- (1) conclude that darkness is necessary for lettuce seed germination
- (2) conclude that light is necessary for lettuce seed germination
- (3) revise the hypothesis
- (4) repeat the experiment using a larger sample size

Data Base File Number: 816

Regents Date June2002-39.bmp

June2002

39 6/19/2002 S1K3

Answer 4

Data Table

Seed Treatment	Number of Seeds Germinated
Planted under soil	9
Scattered on top of soil	8



## hypothesis

156. A student hypothesized that lettuce seeds would not sprout (germinate) unless they were exposed to darkness. The student planted 10 lettuce seeds under a layer of soil and scattered 10 lettuce seeds on top of the soil. The data collected are shown in the table. One way to improve the validity of these results would be to

- (1) conclude that darkness is necessary for lettuce seed germination
- (2) conclude that light is necessary for lettuce seed germination
- (3) revise the hypothesis
- (4) repeat the experiment

Data Base File Number: 753

Regents Date Aug2003-4.bmp

Aug2003

4 8/13/2003 S1K2

Answer 4

Seed Treatment	Number of Seeds Germinated
Planted under soil	9
Scattered on top of soil	8

## immune system

157. Answer this question based on the information given and on your knowledge of biology. ----- NEW DRUG "WAKES UP" IMMUNE SYSTEM TO FIGHT PANCREATIC CANCER ----- Pancreatic cancer makes up three percent of all cancers. Recently, scientists announced the discovery of a new drug that has helped extend the lives of some patients with pancreatic cancer. Pancreatic tumors usually have a protective protein layer surrounding them. The protein is produced by the tumor cells. This protein shield seems to deactivate white blood cells that would normally recognize and target the tumor cells for destruction. The new drug reactivates these white blood cells, stimulating them to attack the tumor again. A specific chemotherapy drug blows holes in the protective protein layer around the tumor. This action then allows the activated white blood cells to directly attack the tumor. The process is modeled as shown in the diagram. If the new drug is used without the chemotherapy drug, would the immune system be able to successfully attack the cancer cells?

- (1) No - the chemotherapy drug is necessary to make holes in the protective shield so white blood cells can reach the cancer cells.
- (2) Yes - the white blood cells would attack the cancer tumor cells without assistance from the chemotherapy drug.
- (3) No - red blood cells would attack the cancerous tumor cells.
- (4) Yes - Certain bacteria in the body would attack the cancerous tumor cells.

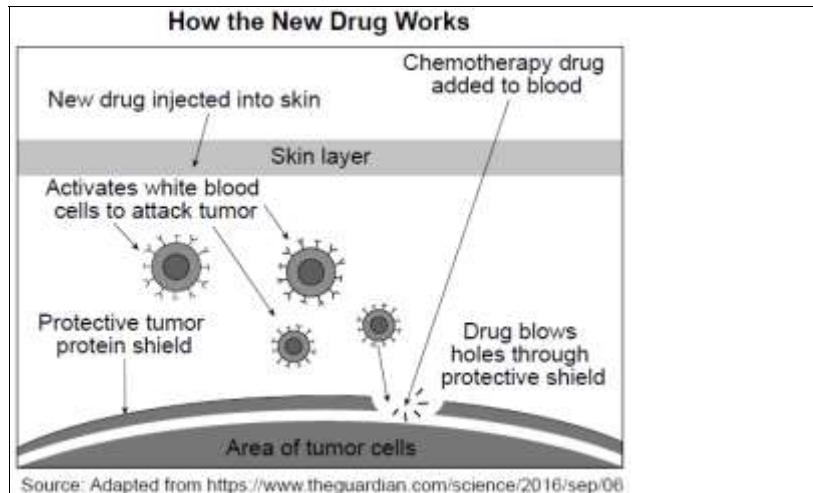
Data Base 1586  
File Number:

Regents Date June2023-62.bmp

June2023

62 6/14/2023 S4K5

Answer 1



## immune system

158. The diagram shown represents what can happen when homeostasis in an organism is threatened. Which statement provides a possible explanation for these events?

- (1) Antibiotics break down harmful substances by the process of digestion
- (2) Some specialized cells mark and other cells engulf microbes during immune reactions.
- (3) Embryonic development of essential organs occurs during pregnancy.
- (4) Cloning removes abnormal cells produced during differentiation.

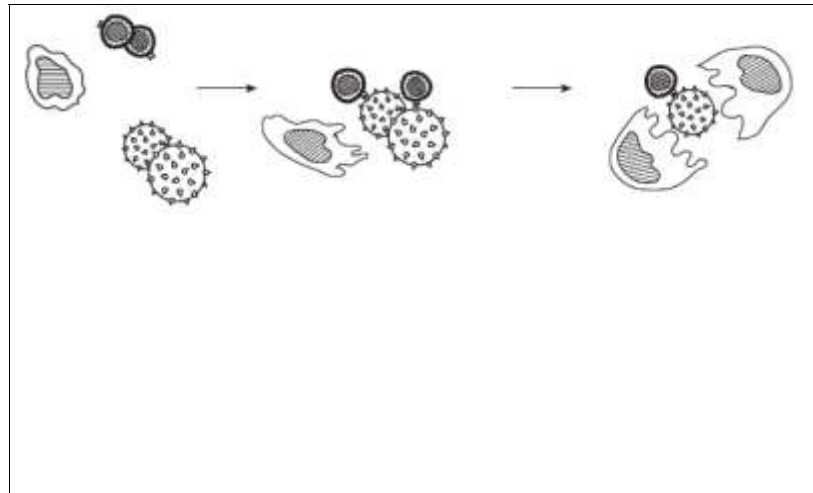
Data Base File Number: 665

Regents Date June2004-20.bmp

June2004

20 6/18/2004 S4K5

Answer 2



## immune system

159. The diagram shown represents how HIV, the virus that causes AIDS, interacts with a certain type of white blood cell called a helper T-cell. What is one possible result of the cellular activity represented in the diagram?

- (1) Immune responses of an infected individual will be weakened.
- (2) The red blood cells of a person infected with AIDS will no longer be able to make antibodies.
- (3) This virus will strengthen future immune responses against blood-related diseases.
- (4) Immune responses will prevent the spread of AIDS in humans.

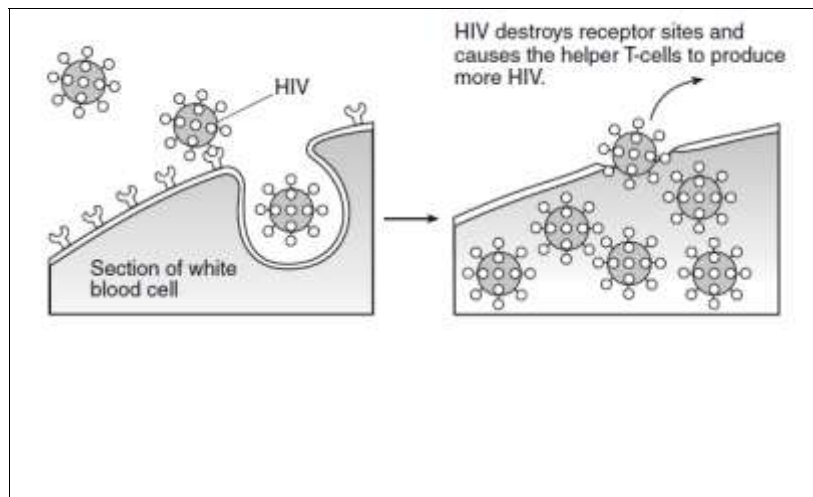
Data Base File Number: 617

Regents Date Jan2013-38.bmp

Jan2013

38 1/23/2013 S4K5

Answer 1



## immune system

160. Base your answer to this question on the information and data table shown and on your knowledge of biology.

### White Nose Syndrome Found in Bats

White nose syndrome (WNS) is a disease found in bats. The disease, first detected in bats during the winter of 2006, is characterized by the appearance of a white fungus on the nose, skin, and wings of some bats, which live in and around caves and mines. It affects the cycle of hibernation and is responsible for the deaths of large numbers of bats of certain species. In some areas, 80-90% of bats have died. Not all bats in an area are affected, and certain bats that are susceptible in one area are not affected in other areas. The roles of temperature and humidity in the environment of the bats are two of the many factors being investigated to help control the disease. Over the past few years, the Conserve Wildlife Foundation of New Jersey conducted summer bat counts of two bat species at 22 different sites, totaled the number, and reported the results. The approximate numbers of bats counted (to the nearest hundred) are listed in the table shown. Biologists in New York and Vermont have noted that, in recent years, a higher percentage of the little brown bats are now surviving. Which statement best explains this increased survival rate?

- (1) A few of the bats possessed an immunity to the WNS disease and produced offspring that were immune.
- (2) The bats needed to reproduce in greater numbers, otherwise they would have died out completely.
- (3) The people that performed the recent counts did not identify the bats correctly and were counting bats of a different species.
- (4) The original decline in the bat population due to WNS was a natural occurrence and is part of a natural cycle.

Data Base File Number: 1376

Regents Date Aug2019-44.bmp

Aug2019

44 8/14/2019 S4K3

Answer 1

Summer Bat Count (Total Number of Bats)

Year	Big Brown Bats ( <i>Eptesicus fuscus</i> )	Little Brown Bats ( <i>Myotis lucifugus</i> )
2009	900	6100
2010	1000	1700
2011	1000	500
2012	1000	400
2013	1300	300

## immune system

161. Itching and other skin problems are signs that a cat or dog may have fleas. Fleas are parasites known for their biting and blood-sucking abilities. When they bite, flea saliva enters the pet's circulatory system, sometimes causing an allergic response commonly seen as a "hot spot" on the pet's neck or the base of its tail. These observations are best explained by the fact that
- (1) flea saliva may stimulate an immune response in cats and dogs
  - (2) fleas are microbes whose bites cause a decreased blood flow
  - (3) flea saliva is a toxic substance that is released when fleas prey on cats and dogs
  - (4) fleas are host organisms whose saliva digests cat and dog fur, leaving "hot spots"

Data Base 1330  
File Number:

Regents Date June2019-2.bmp

June2019

2 6/18/2019 S4K5

Answer 1



## immune system

162. Base your answer to this question on the information given and on your knowledge of biology. **Beware of Dust Mites.** Quietly lurking within our mattresses, under our beds, and inside sofas and carpets are creatures too small to be seen without a microscope. Dust mites are arthropods closely related to spiders, scorpions, and ticks. They feed on the dead skin cells regularly shed by humans and their animal pets. The average human sheds about 10 grams of dead skin a week. Cats and dogs create even more dander for dust mites to eat. The mites also eat pollen, fungi, and bacteria. They do not drink water but absorb it from the air. Dust mites do not carry diseases and are harmless to most people. It's their bathroom habits that make some of us itch and sneeze. Many people develop severe allergies to dust mite feces (wastes). If you lie on a rug where dust mites live, you might develop itchy red bumps on your skin. Breathe in dust containing their feces and you might have more serious symptoms, such as difficulty breathing or a severe asthma attack. Dust mites thrive in warm, humid environments -- eating and nesting in dust-collecting bedding, fabric, and carpet. Think about this! A typical mattress can contain anywhere from 100,000 to 10 million dust mites. Nearly 100,000 dust mites can live in one square yard of carpet. During a process called sensitization, a person's immune system mistakenly identifies the inhaled dust mite waste as an invader. The next time the person is exposed to the dust mite waste, the immune system launches an allergic reaction. An allergic reaction occurs when the immune system

- (1) does not respond to pathogens
- (2) maintains homeostasis
- (3) responds to usually harmless environmental substances
- (4) undergoes rapid, uncontrolled cell division

Data Base 422  
File Number:

Regents Date June2012-49.bmp

June2012

49 6/19/2012 S4K5

Answer 3



## immune system

163. The diagram shown represents one possible immune response that can occur in the human body. The structures that are part of the immune system are represented by

- (1) A, only  
 (2) A and C, only  
 (3) B and C, only  
 (4) A, B, and C.

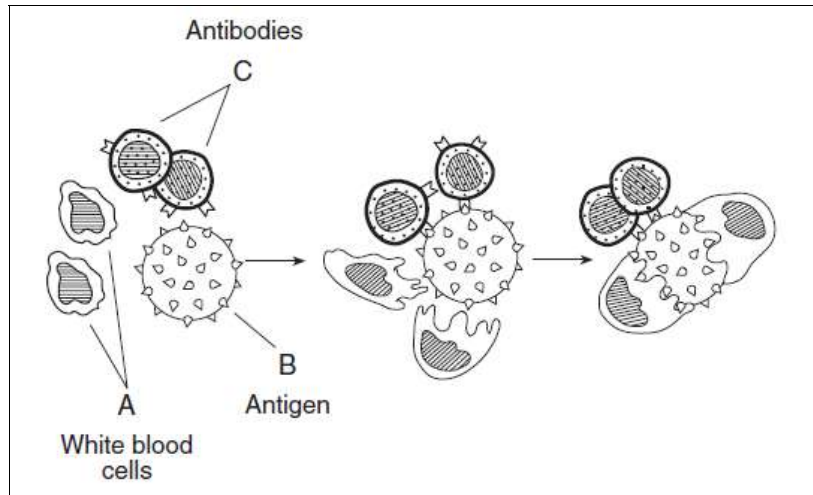
Data Base File Number: 761

Regents Date Aug2003-29.bmp

Aug2003

29 8/13/2003 S4K5

Answer 2



## independent variable

164. Base your answer to this question on the information given and on your knowledge of biology. Three students each added equal volumes of pond water to four beakers and placed each beaker in a different water bath. Each student maintained the water baths at temperatures shown in the data table. The students then added an equal number of water fleas to each of their four beakers. After one hour, the students used microscopes to determine the average heart rate of the water fleas. The procedure was repeated for a total of three trials at each temperature. The results of the investigation are summarized in the data table. The independent variable in this investigation is the

- (1) number of trials  
 (2) number of water fleas  
 (3) temperature of the water  
 (4) average heart rate

Data Base File Number: 676

Regents Date June2004-45.bmp

June2004

43 6/18/2004 S1K3

Answer 3

Water Temperature (°C)	Average Water Flea Heart Rate (beats/minute)
5	40
15	119
25	205
35	280

## independent variable

165. Base your answer to this question on the information given, the data table shown, and on your knowledge of biology. A student wanted to investigate the effect of light on the rate of ripening of tomatoes. She set up four pots of the same size with identical amounts of soil, water, and type of tomato plants. Each plant was exposed to a different intensity of light as shown in the table. The independent variable in this experiment is the

- (1) type of tomato plant
- (2) amount of soil provided
- (3) color of tomatoes
- (4) light intensity

Data Base File Number: 1210

Regents Date Aug2017-36.bmp

Aug2017

37 8/17/2017 S1K2

Answer 4

Plant	Light Intensity (lumens)	
1	0	
2	1000	
3	5000	
4	10,000	

## indicator

166. In the experimental setup shown, which substance would be used to prove that the gas produced by the yeast in the vacuum bottle could change the pH of the liquid in the flask?

- (1) an indicator
- (2) a chemical messenger
- (3) an enzyme
- (4) a salt solution

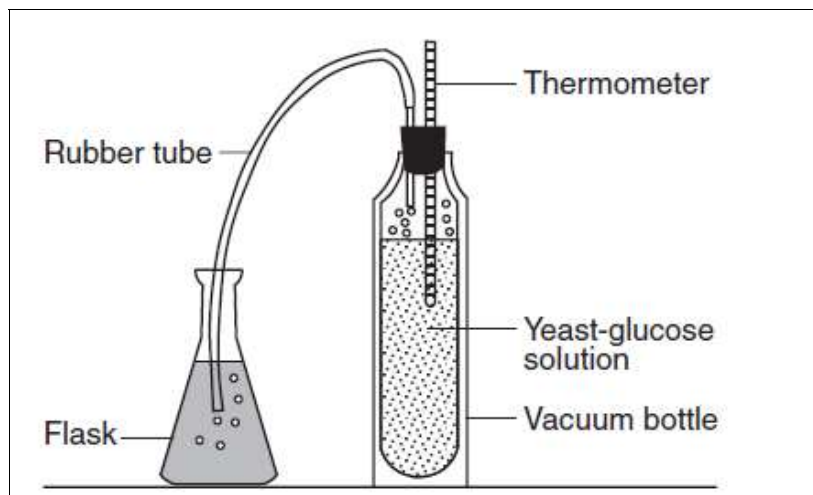
Data Base File Number: 1129

Regents Date August2016-32.b

Aug2016

32 8/18/2016 LABA

Answer 1





## Industrialization

### 167. Mercury Levels in Various Fish or Seafood Types

Industrialization has contributed to unsafe levels of mercury compounds building up in aquatic ecosystems, including in the tissues of many predatory fish species. As a result, many people have concerns about eating any seafood. The mercury, at relatively high levels, can be especially harmful during development of a fetus and of young children. It can also affect adult health in various ways. However, seafood is also an important part of a healthy diet. The omega-3 fats in seafood are essential to the proper functioning of the circulatory system. They are also important for optimal development of a baby's brain and nervous system. The table as shown contains data about mercury levels in several kinds of seafood. Based on the information given, which statement concerning the eating of fish and seafood is most accurate?

- (1) People should avoid eating seafood because the negative effects of the mercury in seafood are far worse than any benefits that eating seafood may provide. Even shrimp and tilapia contain high levels of mercury.
- (2) The normal development of a baby's nervous system requires that the mother be more concerned with eating enough seafood and less concerned with the side effects of higher levels of mercury on the child.
- (3) Eating certain selected species of seafood can provide health benefits without the negative effects of high mercury intake.
- (4) It is important that pregnant women eat a regular diet of seafood, including swordfish, halibut, and cod.

Data Base File Number: 1666

Regents Date June2024-31.bmp

June2024

31 6/14/2024 S1K1

Answer 3

Fish or Seafood Type	Mercury Content (ppm/oz.)
Swordfish	0.995
King mackerel	0.73
Cod	0.11
Trout	0.07
Halibut	0.024
Tilapia	0.013
Shrimp	0.009

Source: Adapted from [www.zmescience.com](http://www.zmescience.com)

## inference

168. Base your answer to this question on the information and chart shown and on your knowledge of biology. It has been hypothesized that a chemical known as BW prevents colds. To test this hypothesis, 20,000 volunteers were divided into four groups. Each volunteer took a white pill every morning for one year. The contents of the pill taken by the members of each group are shown in the chart. Which statement is a valid inference based on the results?

- (1) Sugar reduced the number of colds.                      (3) BW is always effective in the prevention of colds.
- (2) Sugar increased the number of colds.                      (4) BW may not be effective in the prevention of colds.

Data Base                      690  
File Number:

Regents Date                      Aug2004-31.bmp

Aug2004

32                      8/17/2004                      S1K1

Answer                      4

Group	Number of Volunteers	Contents of Pill	% Developing Colds
1	5,000	5 grams of sugar	20
2	5,000	5 grams of sugar 1 gram of BW	19
3	5,000	5 grams of sugar 3 grams of BW	21
4	5,000	5 grams of sugar 9 grams of BW	15

## inference

169. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the level of gene expression of five different genes in normal and cancerous cells. Which statement is a valid inference that can be made based on the data in this graph?

- (1) The change in the level of gene expression in gene 4 could indicate it plays a major role in the development of cancer.
- (2) Slight decreases in gene expression will always result in the formation of cancer cells.
- (3) Cells will develop cancer if the gene expression of these five genes remains below four peptides per second.
- (4) An increase in the level of gene expression in these five genes is necessary for cancer to develop in cells.

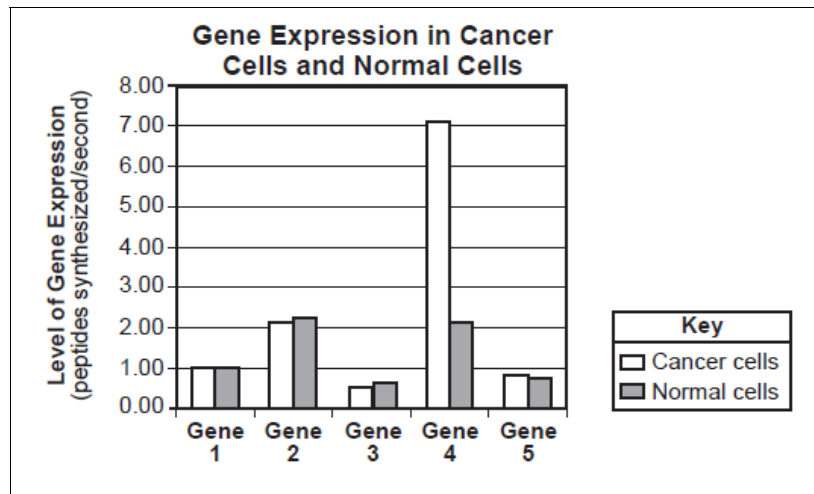
Data Base File Number: 944

Regents Date June2014-35.bmp

June2014

35 6/17/2014 S4K2

Answer 1



## inference

170. Base your answer to this question on the information and table shown and on your knowledge of biology. Prey selection in a species of California garter snake depends upon where the snake lives. Snakes living inland feed on frogs, leeches, and fish while coastal snakes have added banana slugs to their diet. Banana slugs are found only in coastal areas. Researchers performed an experiment to determine what prey newly born snakes preferred. The table shown summarizes the findings. Which inference best explains these differences?

- (1) The coastal snakes have been selectively bred for slug-eating behavior.
- (2) Genetic manipulation has enabled the coastal snakes to recognize slugs as prey.
- (3) The coastal snakes evolved a new organ so that they could recognize and feed on slugs.
- (4) An adaptation enabled coastal snakes to use slugs as food source.

Data Base File Number: 1167

Regents Date Jan2017-50.nmp

Jan2017

50 1/25/2017 S4K3

Answer 4

	Newborn Coastal Snakes	Newborn Inland Snakes
Percentage of Snakes Eating Banana Slugs	60%	20%

## inference

171. Which statement can best be inferred based on the information in the diagram shown?

- (1) Natural selection occurs only as a result of mutations.
- (2) Natural selection requires a minimum of 5 million years to occur.
- (3) Each new species that develops continues to exist through present time.
- (4) Some species that are no longer successful in their environment may become extinct.

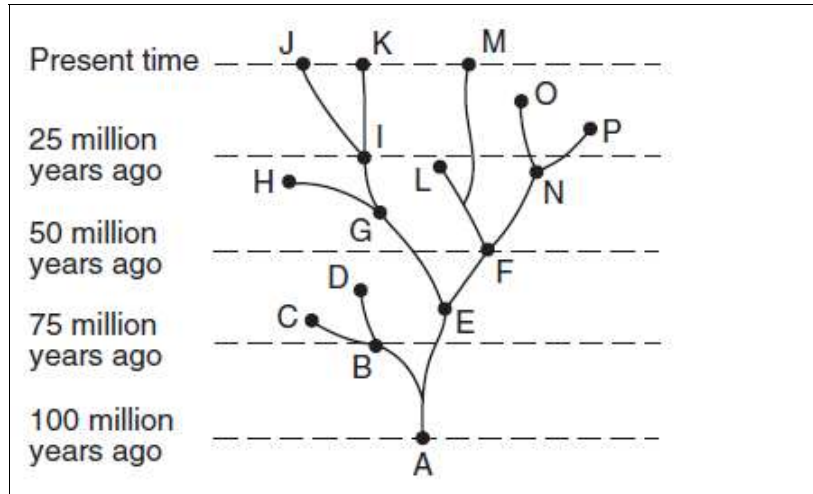
Data Base File Number: 369

Regents Date Aug2011-39.bmp

Aug2011

40 8/18/2011 S4K3

Answer 4



## inference

172. Base your answer to this question on the data table and your knowledge of biology. To determine which colors of light are best used by plants for photosynthesis, three types of underwater green plants of similar mass were subjected to the same intensity of light of different colors for the same amount of time. All other environmental conditions were kept the same. After 15 minutes, a video camera was used to record the number of bubbles of gas each plant gave off in a 30-second period of time. Each type of plant was tested six times. The average of the data for each plant type is shown in the table. Which statement is a valid inference based on the data?

- (1) Each plant carried on photosynthesis best in a different color of light.
- (2) Red light is better for photosynthesis than blue light.
- (3) These types of plants make food at the fastest rates with red and blue light.
- (4) Water must filter out red and green light.

Data Base File Number: 673

Regents Date June2004-40.bmp

June2004

40 6/18/2004 S1K3

Answer 3

Plant Type	Red Light	Yellow Light	Green Light	Blue Light
<i>Elodea</i>	35	11	5	47
<i>Potamogeton</i>	48	8	2	63
<i>Utricularia</i>	28	9	6	39

## inheritance

173. The lioness (female lion) and cub shown in the photo have similar characteristics. In order for some of the genetic information in the lioness to be present in the cub, the genetic information from the mother must have been

- (1) copied and present in the egg cell of the lioness
- (2) combined with genetic information from another lioness
- (3) contained in half of the DNA found in the sperm cells of the father
- (4) able to make enzymes to produce all of the carbohydrates found in the mother

Data Base File Number: 1658

Regents Date June2024-11.bmp

June2024

11 6/14/2024 S4K2

Answer 1



Source: Kids Discover

## insulin

174. Base your answer to this question on the information and data table shown and on your knowledge of biology. The results of blood tests for two individuals are shown in the data table. The blood glucose level before breakfast is normally 80-90 mg/100 mL of blood. A blood glucose level above 110 mg/100 mL of blood indicates a failure in a feedback mechanism. Injection of chemical X, a chemical normally produced in the body, may be required to correct this problem. What is chemical "X"?

- (1) glucose
- (2) ATP
- (3) DNA
- (4) insulin

Data Base File Number: 466

Regents Date Jan2006-39.bmp

Jan2006

39 1/27/2006 S4K1

Answer 4

Data Table

Time	Blood Glucose (mg/100 mL)	
	Individual 1	Individual 2
7:00 a.m.	90	150
7:30 a.m.	120	180
8:00 a.m.	140	220
8:30 a.m.	110	250
9:00 a.m.	90	240
9:30 a.m.	85	230
10:00 a.m.	90	210
10:30 a.m.	85	190
11:00 a.m.	90	170

## insulin

175. The graph shows changes in the concentrations of glucose and insulin in the blood of a human over a period of time. Which statement correctly explains these changes?
- (1) High glucose levels cause more insulin to be released.
  - (2) High insulin levels cause more glucose to be released.
  - (3) Low glucose levels cause more insulin to be released.
  - (4) Low insulin levels cause more glucose to be released.

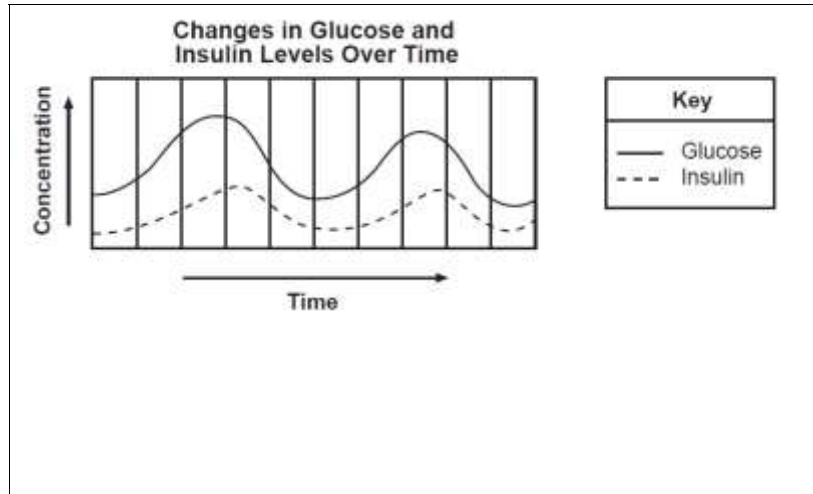
Data Base File Number: 927

Regents Date Jan2014-42.bmp

Jan2014

42 1/27/2014 S4K5

Answer 1



## interdependence

176. The diagram shows the relationship between the snowshoe hare and the lynx. The snowshoe hare is prey of the lynx. The populations of the two species increase and decrease based on the numbers of each species present. This relationship is an example of
- (1) ecological succession
  - (2) an energy pyramid
  - (3) interdependency
  - (4) competition

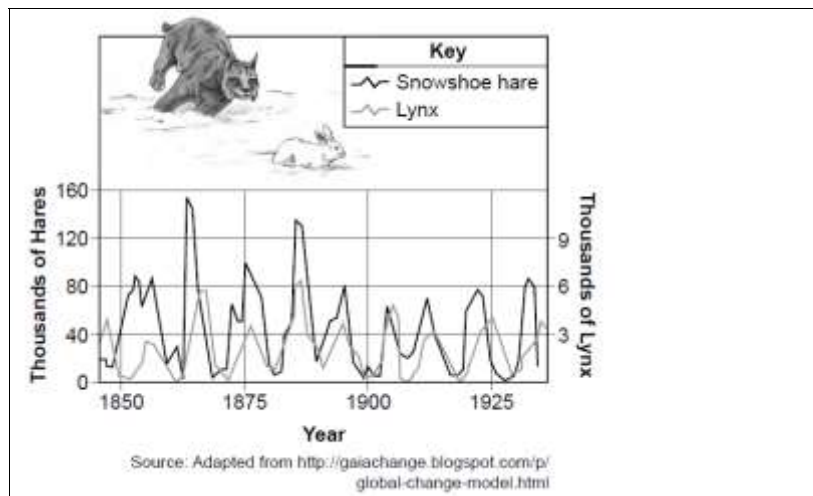
Data Base File Number: 1396

Regents Date Jan2020-28.bmp

Jan2020

28 1/21/2020 S4K6

Answer 3





## interrelationships

177. Currently, turtle populations are decreasing. In September 2018, a scientist stated that turtles contribute to the health of many environments, and the decline of the turtles may lead to negative effects on other species. Which statement best summarizes the scientist's statement?

- (1) Living organisms interact with and are dependent on their environment and each other.
- (2) Turtles are very large animals and thus have a negative effect on their environment wherever they live.
- (3) If organisms have a negative effect on their environment, there is probably a technological fix available.
- (4) The decline of the turtles will not really matter because relatively few humans rely on them for food.

Data Base File Number: 1626

Regents Date Jan2024-6.bmp

Jan2024

6 1/23/2024 S4K6

Answer 1



Source: <http://mdc.mo.gov/conmag/2018-08/three-toed-box-turtle>

## key

178. A series of investigations was performed on four different plant species. The results of these investigations are recorded in the data table shown. Based on these data, which two plant species appear to be most closely related?

- (1) A and B
- (2) A and C
- (3) A and D
- (4) B and C

Data Base File Number: 111

Regents Date June08-71.bmp

June2008

71 6/24/2008 LABS

Answer 2

Characteristics of Four Plant Species

Plant Species	Seeds	Leaves	Pattern of Vascular Bundles (structures in stem)	Type of Chlorophyll Present
A	round/small	needle-like	scattered bundles	chlorophyll a and b
B	long/pointed	needle-like	circular bundles	chlorophyll a and c
C	round/small	needle-like	scattered bundles	chlorophyll a and b
D	round/small	needle-like	scattered bundles	chlorophyll b

## lab

179. Which laboratory procedure is represented in the diagram shown?

- (1) placing a coverslip over a specimen
- (2) removing a coverslip from a slide
- (3) adding stain to a slide without removing the coverslip
- (4) reducing the size of air bubbles under a coverslip

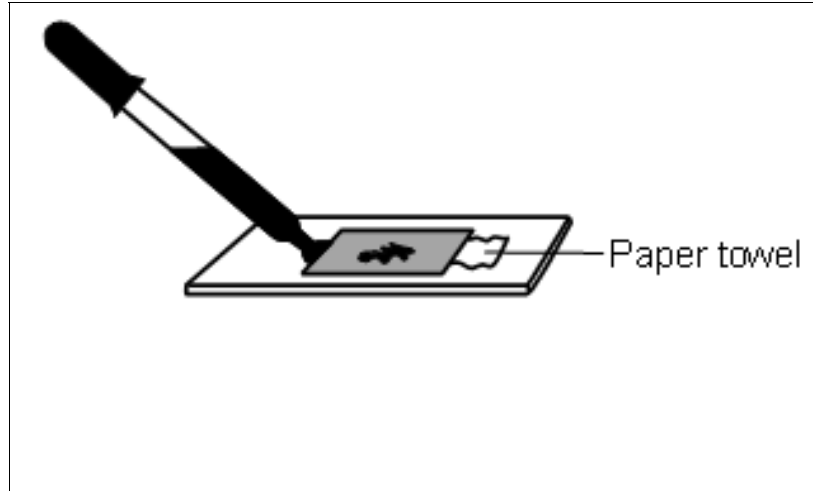
Data Base File Number: 99

Regents Date June08-31.bmp

June2008

31 6/24/2008 LABS

Answer 3



## lab technique

180. The diagram shown represents a laboratory technique. Why would this technique be used during a scientific investigation?

- (1) to add a solution to a slide without removing the coverslip.
- (2) to remove a solution from a slide without removing the coverslip.
- (3) to prevent air bubbles from forming under the coverslip
- (4) to add water bubbles under the coverslip

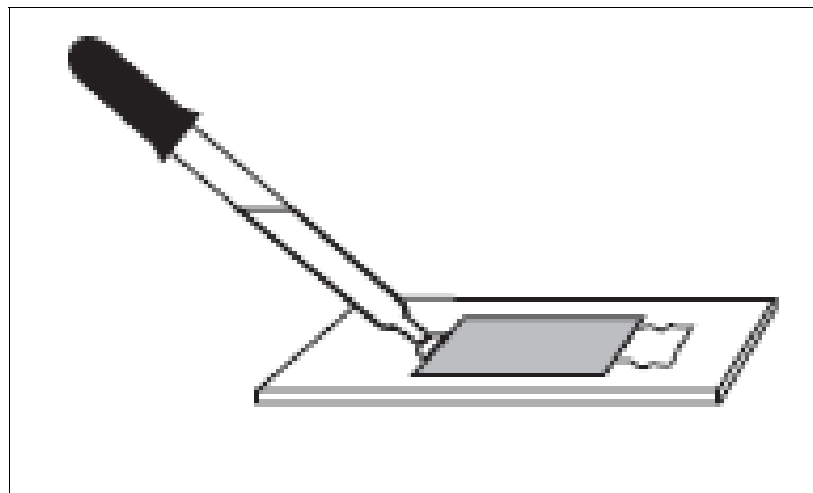
Data Base File Number: 1088

Regents Date Jan2016-78.bmp

Jan2016

78 1/27/2016 LAB5

Answer 1



## lab technique

181. Base your answer to this question on the diagram shown and on your knowledge of biology. A laboratory procedure involving a microscope slide is represented in the diagram shown. One purpose for this procedure is most likely.

- (1) To add a liquid to a slide without removing the coverslip.
- (2) To complete paper chromatography
- (3) To complete electrophoresis
- (4) To complete diffusion

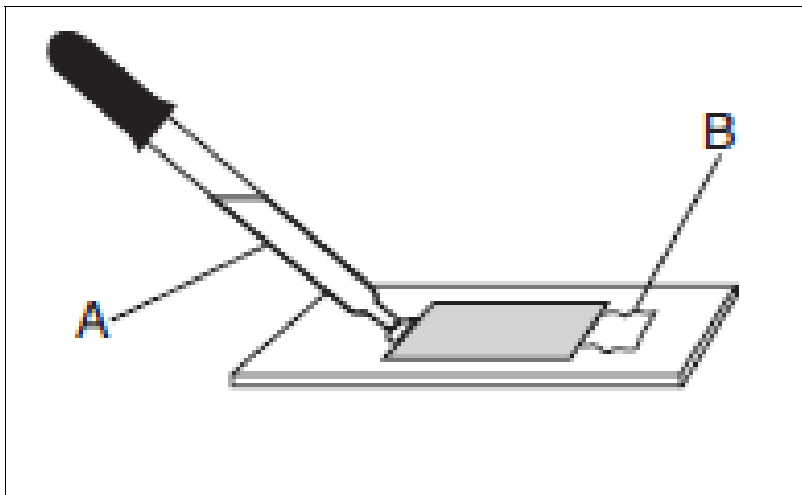
Data Base File Number: 980

Regents Date Aug2014-78.bmp

Aug2014

78 8/14/2014 LAB5

Answer 1



## lab technique

182. The diagram shows a student heating some test tubes with chemicals in them during a laboratory activity. Why would putting stoppers in the test tubes be dangerous?

- (1) The stoppers could "pop" out of the heated tubes and possibly injure someone.
- (2) One or more test tubes could explode.
- (3) Pressure "build up" in the test tubes could cause an explosion in which pieces of glass from the test tubes could injure the student.
- (4) All of the above are correct.

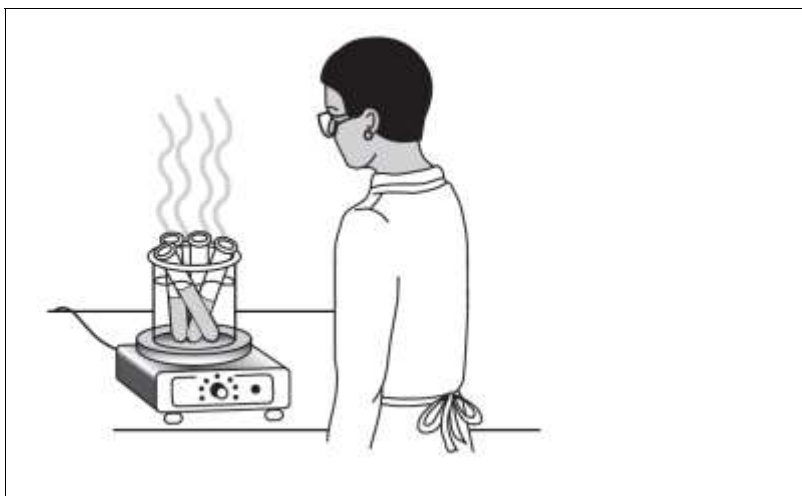
Data Base File Number: 357

Regents Date June2011-85.bmp

June2011

85 6/21/2011 LAB5

Answer 4



## lab technique

183. A laboratory technique is illustrated in the diagram shown. The technique of lowering the coverslip at an angle is used to

- (1) make organelles more visible
- (2) reduce the formation of air bubbles
- (3) make the specimen transparent
- (4) reduce the size of the specimen

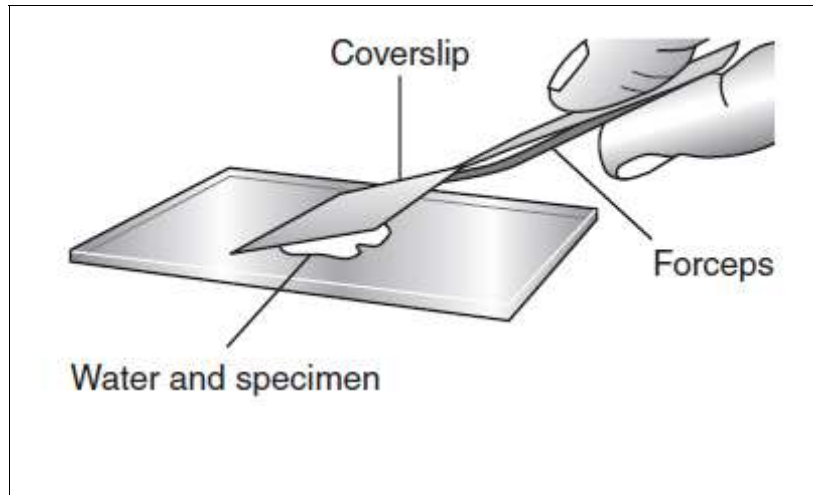
Data Base File Number: 250

Regents Date Jan2010-75.bmp

Jan2010

75 1/26/2010 LABS

Answer 2



## LAB1

184. Several days after a litter of three purebred puppies was born, a breeder noticed one extra puppy in the litter. The diagram shows the results of electrophoresis of DNA fragments from all of the dogs. The puppies are labeled 1, 2, 5, and 6. The parent dogs are labeled 3 and 4. Which puppy might have been placed into this litter by mistake?

- (1) 1
- (2) 2
- (3) 5
- (4) 6

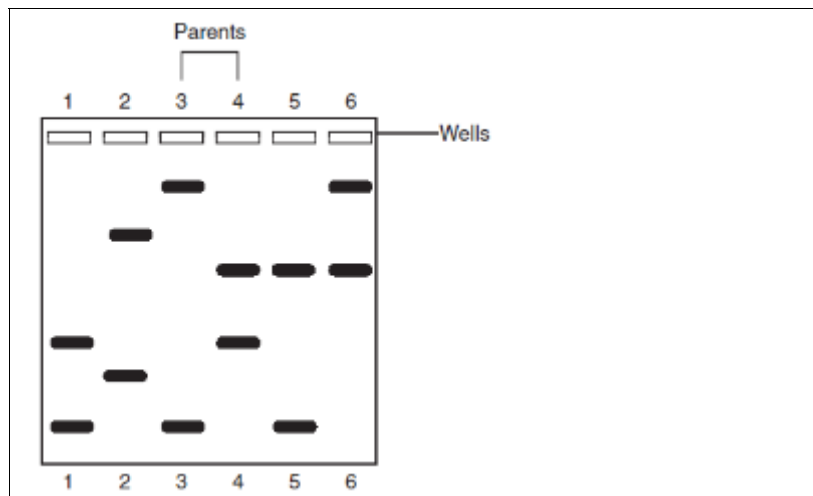
Data Base File Number: 1009

Regents Date Jan2015-85.bmp

Jan2015

85 2/26/2015 LAB1

Answer 2



## LAB1

185. The diagram shows the evolutionary relationships among several types of mammals. Which mammal would be most closely related to a hippopotamus?

- (1) deer (2) whale (3) pig (4) cow

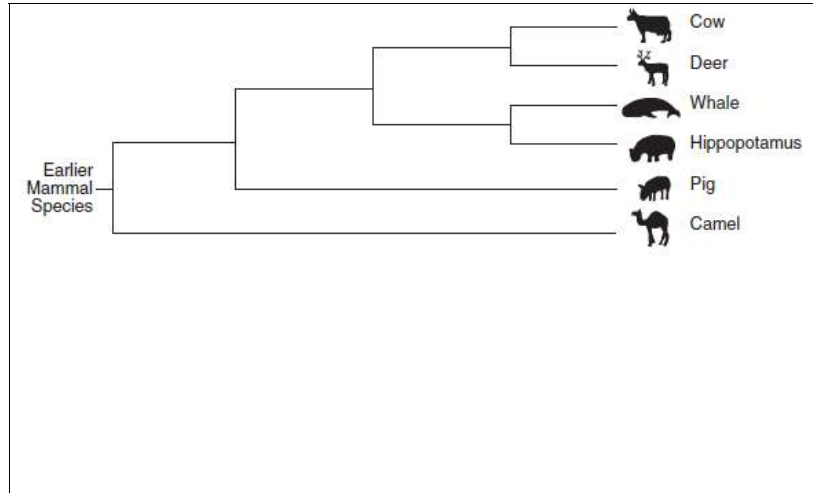
Data Base File Number: 1037

Regents Date June2015-74.bmp

June2015

74 6/16/2015 LAB1

Answer 2



## LAB5

186. The diagram shown represents the distribution of some molecules inside and outside of an artificial cell over a period of time. Which statement is best supported by the diagram?

- (1) Oxygen molecules entered the cell over time by active transport. (2) Water molecules are too large to enter or leave the cell, so they remained where they were at the start of the investigation. (3) Protein molecules are kept inside of the cell because the cell needs them. (4) The protein molecules are too large to diffuse out of the cell.

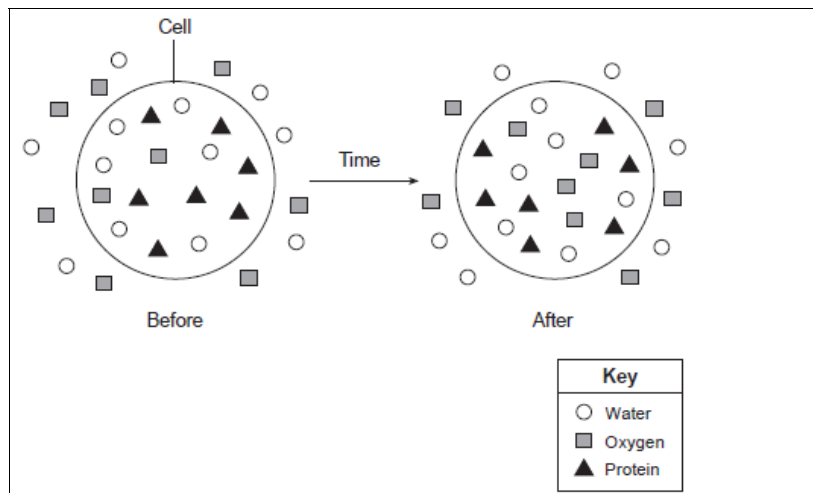
Data Base File Number: 1086

Regents Date Jan2016-75.bmp

Jan2016

75 1/27/2016 LAB5

Answer 4



## LABA

187. Base your answer to this question on the information and the diagram shown and on your knowledge of biology. A student used a microscope like the one represented below to observe cell division in onion cells. The part of the microscope that should be adjusted in order to better view the onion cells while using high power is

(1) A

(3) C

(2) B

(4) D

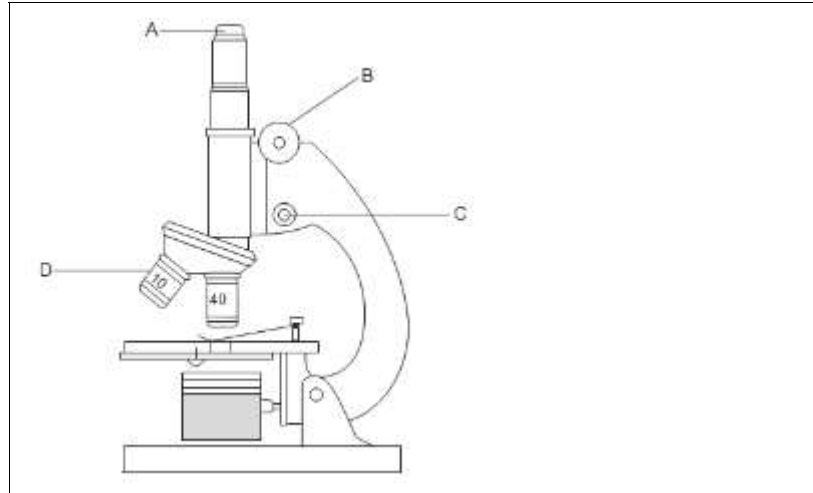
Data Base 1185  
File Number:

Regents Date June2017-40.bmp

June2017

40 6/14/2017 LabA

Answer 3



## LABA

188. Base your answer to this question on the information and data table shown and on your knowledge of biology. West Nile virus (WNV) has been detected in a variety of bird species. Crows and jays are known to get sick and die when infected. WNV also infects other animals, including horses, cats, dogs, chipmunks, alligators, and humans. The Centers for Disease Control and Prevention (CDC) recorded the number of cases of WNV per 100,000 people in the U.S. from 2002-2014. These data are recorded in the table as shown. Based on the data shown, is it possible to predict what the number of cases per 100,000 people will be for the year 2020?

- (1) no, there is no trend pattern  
(2) yes, there is a definite trend pattern  
(3) both 1 and 2 are correct  
(4) yes, the trend pattern can be extended mathematically.

Data Base File Number: 1520

Regents Date Aug2022-44.bmp

Aug2022

46 8/17/2022 LABA

Answer 1

Incidence of West Nile Virus in the U.S. per 100,000 People	
Year	Cases per 100,000 People
2002	1.02
2004	0.39
2006	0.50
2008	0.23
2010	0.20
2012	0.91
2014	0.42

Source: <https://www.epa.gov/climate-indicators/climate-change-indicators-west-nile-virus>

## laboratory procedure

189. A diagram of a peppered moth is shown. A student wants to measure the length of the wingspan. Which measurement, of those given, could be an estimate of the length of the wingspan?

- (1) 3 centimeters  
(2) 3 grams  
(3) 3 milliliters  
(4) 3 kilometers

Data Base File Number: 434

Regents Date Aug2012-31.bmp

Aug2012

31 8/17/2012 LABA

Answer 1



## laboratory procedure

190. The diagram shows how a coverslip should be placed on a drop of pond water during the preparation of a wet mount. One reason why this is the recommended procedure for placing a coverslip is

- (1) The procedure reduces the chance of trapping air bubbles.
- (2) The procedure reduces the chance of trapping water bubbles.
- (3) The procedure reduces the chance of breaking the coverslip..
- (4) The procedure reduces the chance of placing fingerprints on the slide..

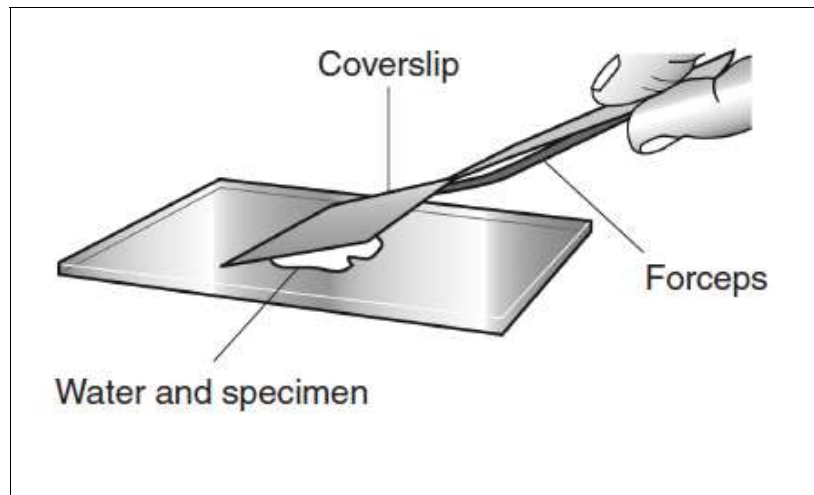
Data Base File Number: 1065

Regents Date August2015-80.b

Aug2015

80 8/12/2015 LAB5

Answer 1



## leaf / guard cells

191. The graph shows the daily rates of water loss in various plant species. Even though these plants grow in different environments, they most likely control water loss through

- (1) the synthesis of proteins in their roots
- (2) the functioning of the cell membranes in their flowers
- (3) the actions of the guard cells in their leaves
- (4) the storage of glucose in the vacuoles in their stems

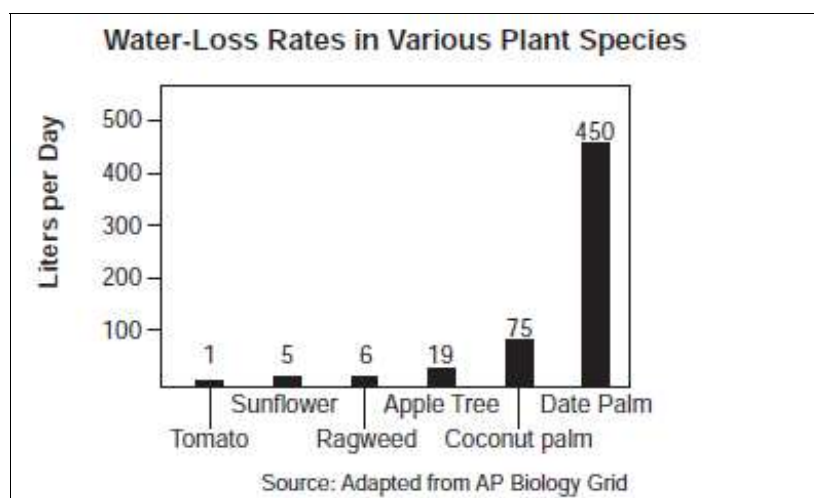
Data Base File Number: 1638

Regents Date Jan2024-42.bmp

Jan2024

42 1/23/2024 S4K5

Answer 3





## leaf / starch content

192. Which statement best describes the starch content of two leaves taken from the same plant shown in the chart?

- (1) Neither leaf contains starch  
 (2) Both leaves contain the same amount of starch.  
 (3) Leaf A contains more starch than leaf B.  
 (4) Leaf B contains more starch than leaf A.

Data Base File Number: 222

Regents Date August2009-41.b

Aug2009

41 8/13/2009 S4K6

Answer 4

Leaf A	taken from plant in the dark for 48 hours
Leaf B	taken from plant in bright light for 48 hours

## limiting factors

193. A graph is shown. The graph contains information about

- (1) finite resources  
 (2) limiting factors  
 (3) biotic factors  
 (4) mineral availability

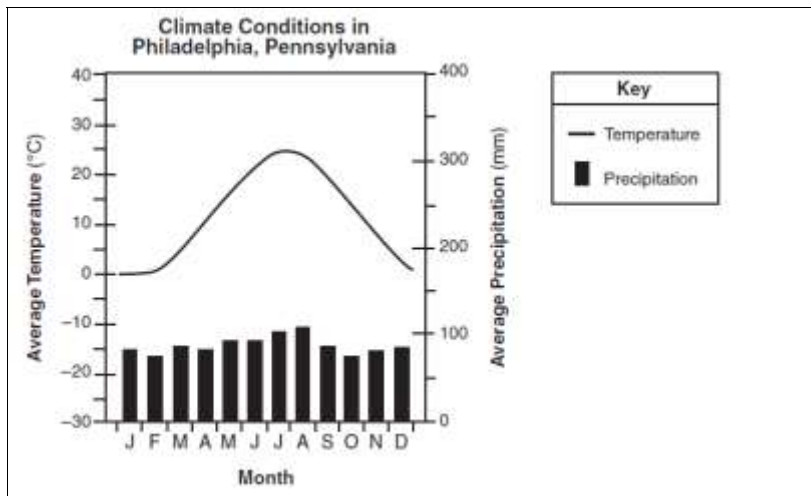
Data Base File Number: 991

Regents Date Jan2015-24.bmp

Jan2015

24 2/26/2015 S4K6

Answer 2



**male reproduction**

194. The diagram shown represents a human reproductive system. Meiosis occurs within structure

- (1) A
- (2) B
- (3) C
- (4) D

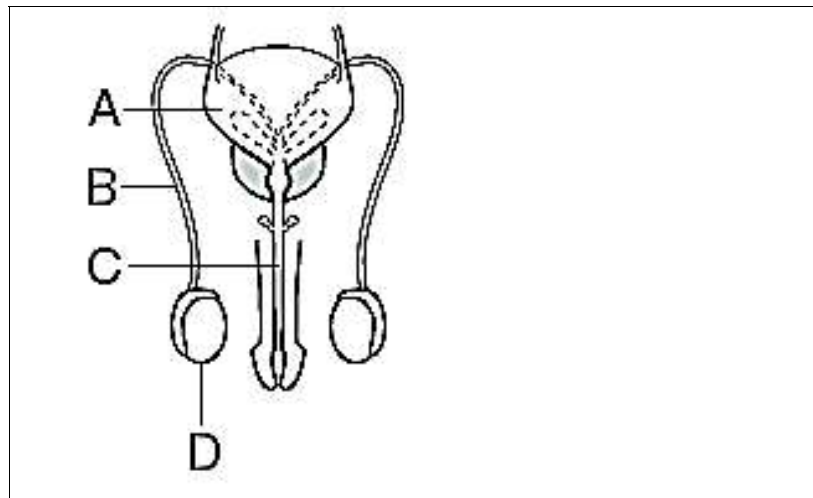
Data Base File Number: 50

Regents Date Jan07-17.bmp

Jan2007

17 1/26/2007 S4K4

Answer 4



**male reproduction**

195. The diagram shows a system in the human male. Base your answer on the diagram and on your knowledge of biology. Which structures aid in the transport of sperm by secreting fluid?

- (1) A and H
- (2) B and E
- (3) C and D
- (4) D and H

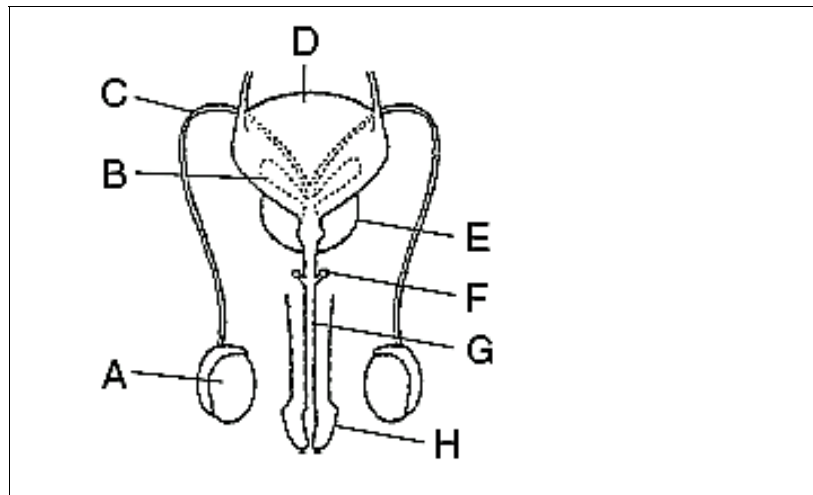
Data Base File Number: 41

Regents Date June07-39.bmp

June2007

40 6/20/2007 S4K4

Answer 2



**male sex organs**

196. The human male reproductive system is represented in the diagram shown. Which structure produces cells that have the potential to become gametes?

- (1) A
- (2) B
- (3) C
- (4) D

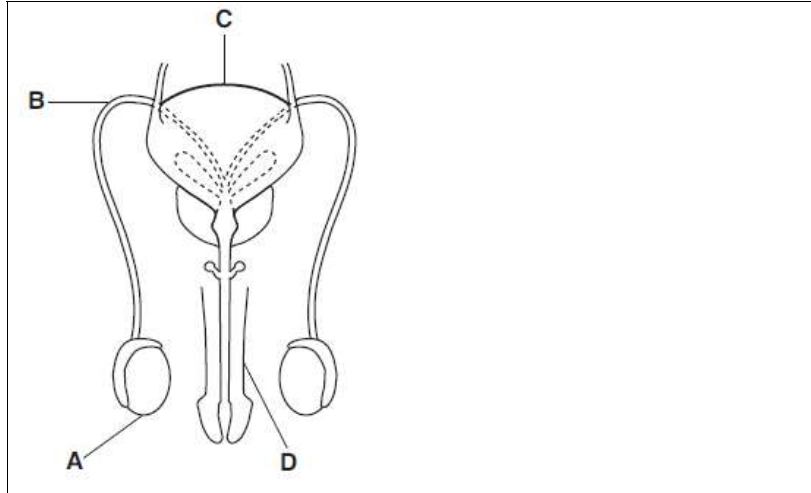
Data Base File Number: 1027

Regents Date June2015-39.bmp

June2015

39 6/16/2015 S4K4

Answer 1



**male sex organs**

197. A reproductive system is represented in the diagram shown. Which structure is correctly paired with its reproductive function?

- (1) A - pathway of gametes
- (2) B - synthesis of progesterone
- (3) C - production of sperm
- (4) D - regulation of homeostasis

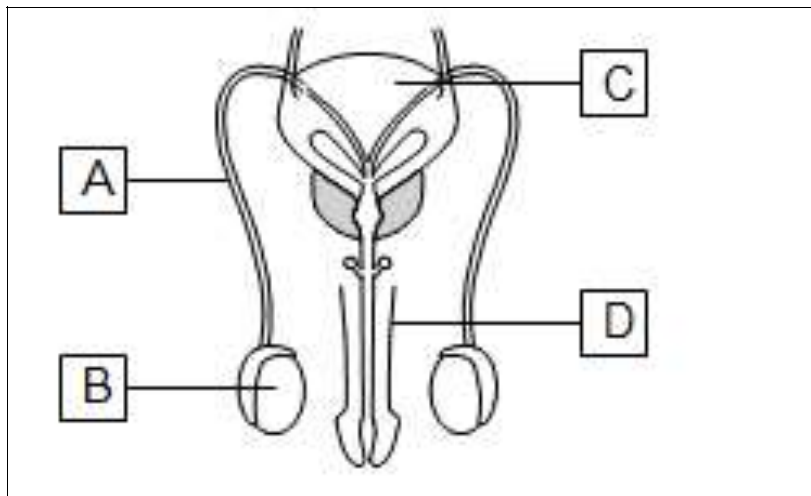
Data Base File Number: 1203

Regents Date Aug2017-18.bmp

Aug2017

18 8/17/2017 S4K4

Answer 1



## male sex organs

198. The diagram shown represents the human male reproductive system. Which pair of letters indicates a structure that produces gametes and a structure that makes possible the delivery of gametes for internal fertilization, respectively?

- (1) A and D
- (2) B and D
- (3) C and A
- (4) D and C

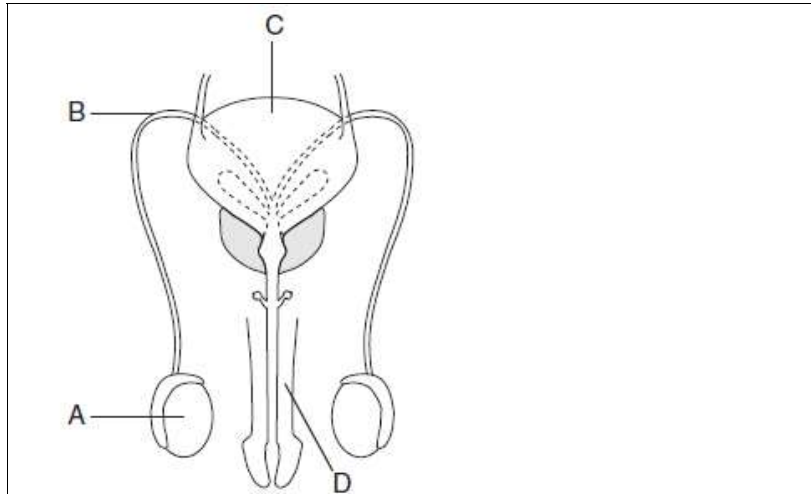
Data Base 807  
File Number:

Regents Date June2002-22.bmp

June2002

22 6/19/2002 S4K4

Answer 1



## male sex organs

199. The diagram shown represents a system in the human body. The primary function of structure X is to

- (1) produce energy needed for sperm to move
- (2) provide food for the sperm to carry to the egg
- (3) produce and store urine
- (4) form gametes that may be involved in fertilization

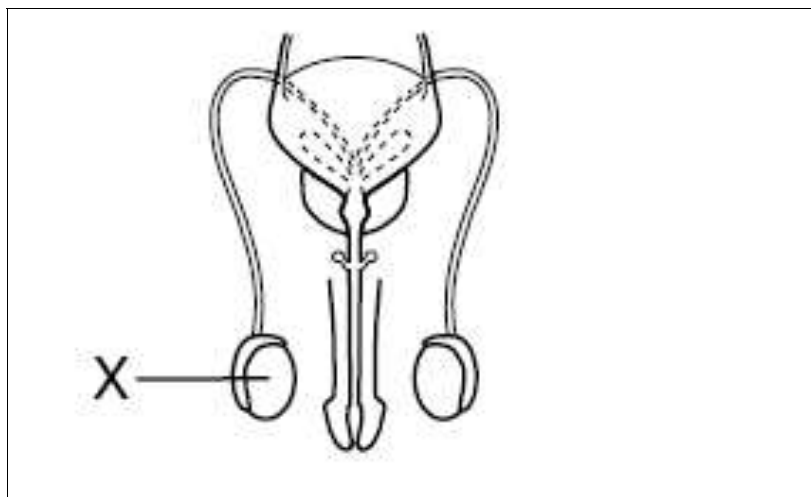
Data Base 152  
File Number:

Regents Date Jan09-19.bmp

Jan2009

19 1/27/2009 S4K2

Answer 4



## male sex organs

200. Some body structures of a human male are represented in the diagram shown. An obstruction in the structures labeled X would directly interfere with

- (1) transfer of sperm to a female
- (2) production of sperm
- (3) production of urine
- (4) transfer of urine to the external environment

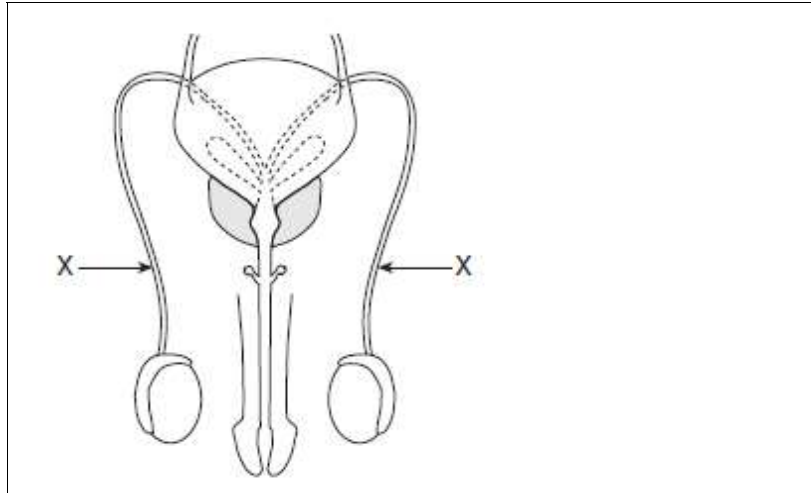
Data Base File Number: 662

Regents Date June2004-17.bmp

June2004

17 6/18/2004 S4K4

Answer 1



## measurement

201. A student observed five living cells in the field of view of a microscope as represented in the diagram shown. What is the approximate diameter of one cell?

- (1) 10  $\mu\text{m}$
- (2) 50  $\mu\text{m}$
- (3) 250  $\mu\text{m}$
- (4) 500  $\mu\text{m}$

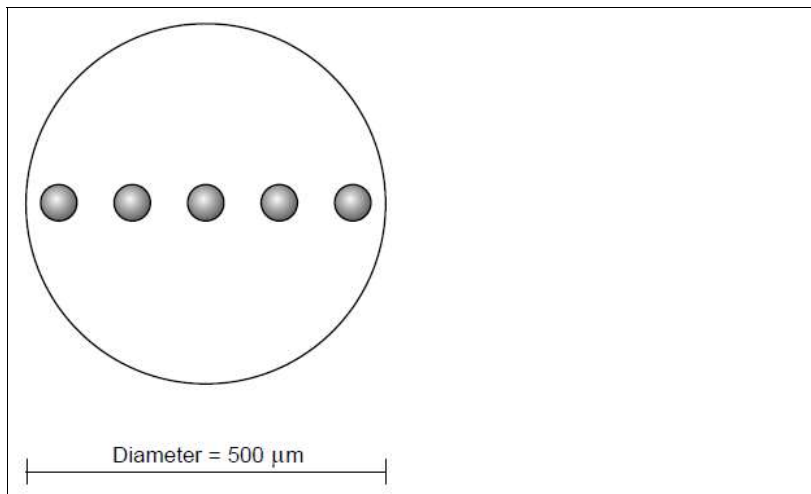
Data Base File Number: 1258

Regents Date June2018-33.bmp

June2018

33 6/13/2018 LABA

Answer 2



## measurement

202. The diagram shown represents the measurement of a biological specimen. What is the approximate length of the specimen in millimeters?

- (1) 25 mm
- (2) 30 mm
- (3) 35 mm
- (4) 40 mm

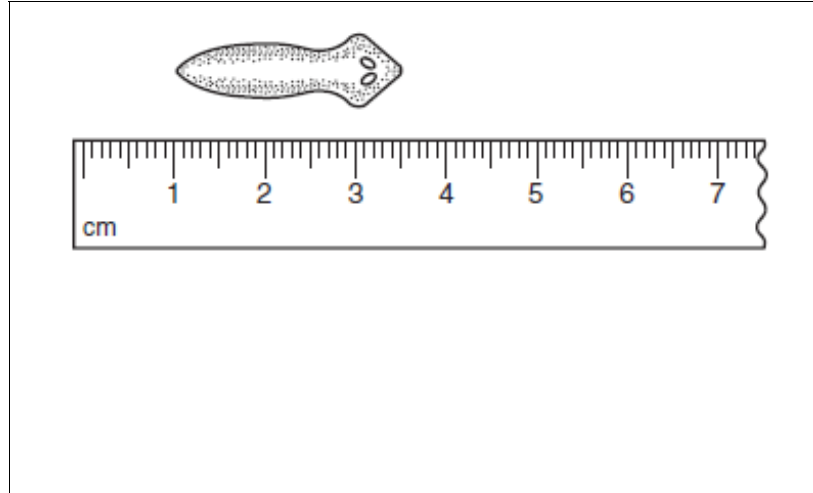
Data Base File Number: 391

Regents Date Jan2012-43.bmp

Jan2012

43 1/25/2012 LABA

Answer 1



## meiosis

203. The diagram shown represents the genetic contents of cells before and after a specific reproductive process. This process is considered a mechanism of evolution because it

- (1) decreases the chance for new combinations of inheritable traits in a species
- (2) decreases the probability that genes can be passed on to other body cells
- (3) increases the chance for variations in offspring
- (4) increases the number of offspring an organism can produce

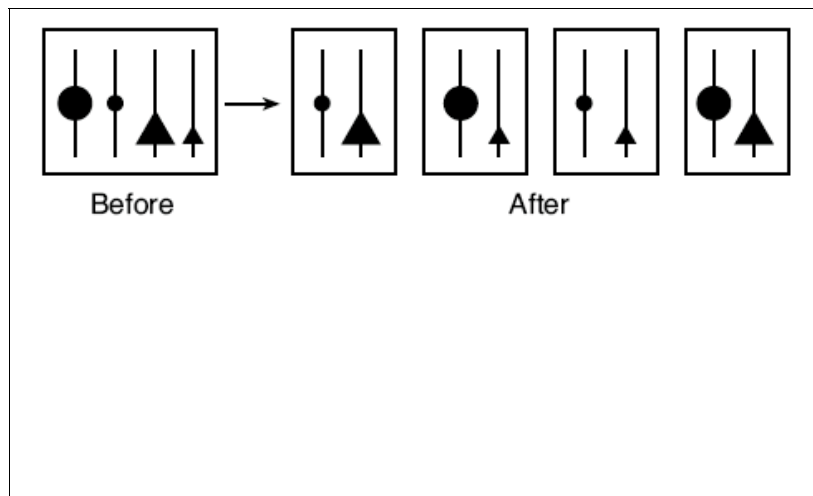
Data Base File Number: 119

Regents Date Aug08-11.bmp

Aug2008

11 8/13/2008 S4K3

Answer 3



**meiosis**

204. Which row in the chart below indicates the correct process for each event indicated?

- (1) 1
- (2) 2

- (3) 3
- (4) 4

Data Base File Number: 364

Regents Date Aug2011-16.bmp

Aug2011

16 8/18/2011 S4K4

Answer 4

Row	Formation of Egg	Formation of Sperm	Growth of Embryo
(1)	mitosis	mitosis	meiosis
(2)	mitosis	meiosis	mitosis
(3)	meiosis	mitosis	meiosis
(4)	meiosis	meiosis	mitosis

**meiosis**

205. The diagram shown represents stages in the process of reproduction and development in an animal. Cells containing only half of the genetic information characteristic of this species are found at

- (1) A
- (2) B

- (3) C
- (4) D

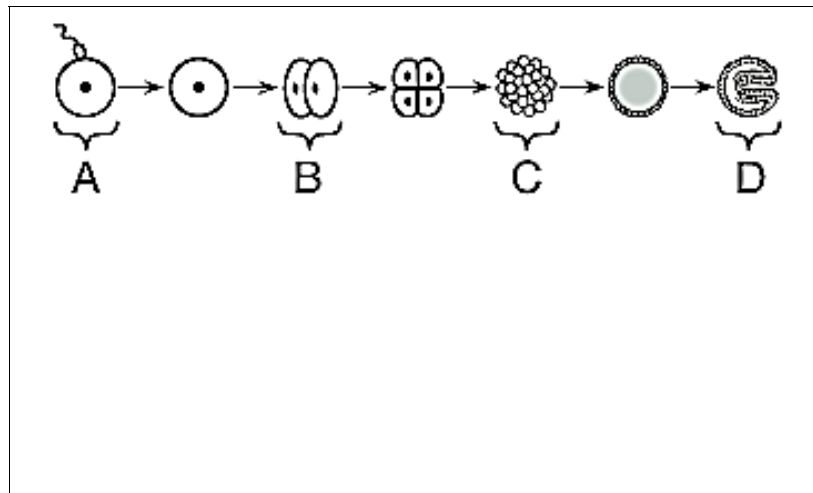
Data Base File Number: 67

Regents Date Jan08-18.bmp

Jan2008

18 1/25/2008 S4K4

Answer 1



**meiosis**

206. Some cells involved in the process of reproduction are represented in the diagram shown. The process of meiosis formed

- (1) cell 1, only
- (2) cells 1 and 2
- (3) cell 3, only
- (4) cells 2 and 3

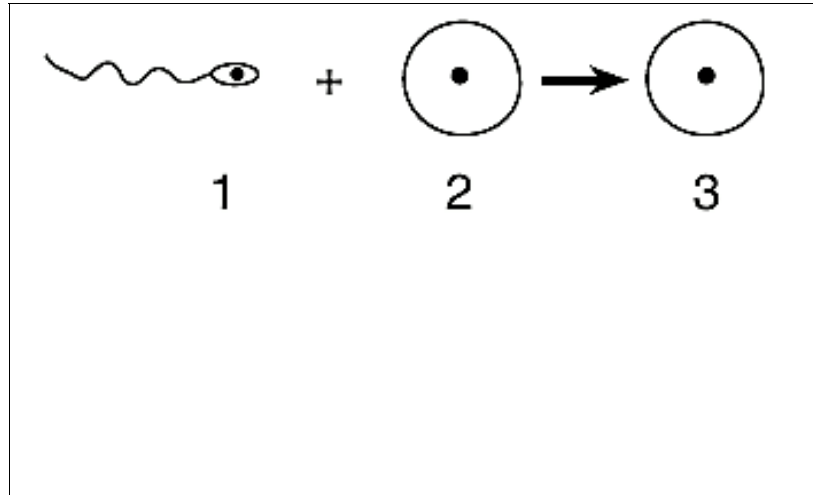
Data Base File Number: 93

Regents Date June08-17.bmp

June2008

17 6/24/2008 S4K4

Answer 2



**meiosis**

207. Which diagram best represents part of the process of sperm formation in an organism that has a normal chromosome number of eight?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

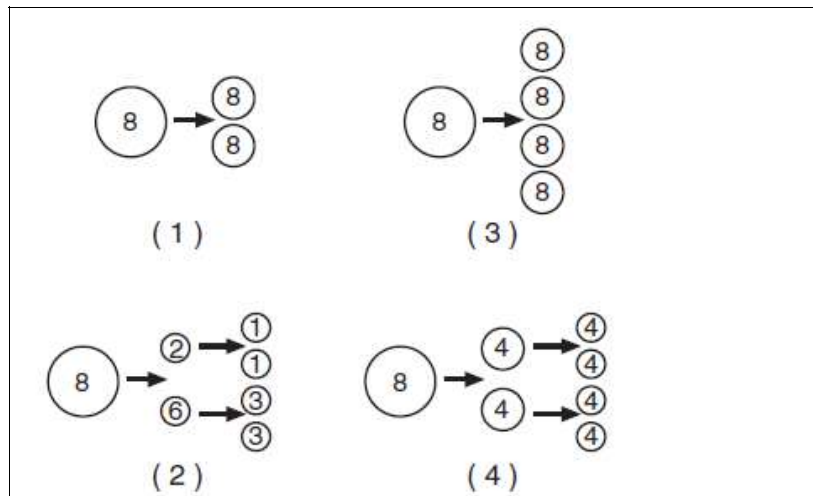
Data Base File Number: 806

Regents Date June2002-19.bmp

June2002

19 6/19/2002 S4K4

Answer 4





## meiosis

208. A dog gave birth to the three puppies shown in the photograph. One of the puppies has darker fur on its face than the other two. Which two biological processes account for this difference between the puppies?

- (1) meiosis and recombination
- (2) meiosis and cloning
- (3) mitosis and differentiation
- (4) mitosis and cloning

Data Base File Number: 1176

Regents Date June2017-26.bmp

June2017

26 6/14/2017 S4K3

Answer 1



Source: <http://germanshepherdsatsdikennels.blogspot.com>

## meiosis

209. An incomplete diagram of meiosis in the ovary of an animal is shown. How many chromosomes are in the cell labeled "A"?

- (1) 6
- (2) 12
- (3) 3
- (4) 4

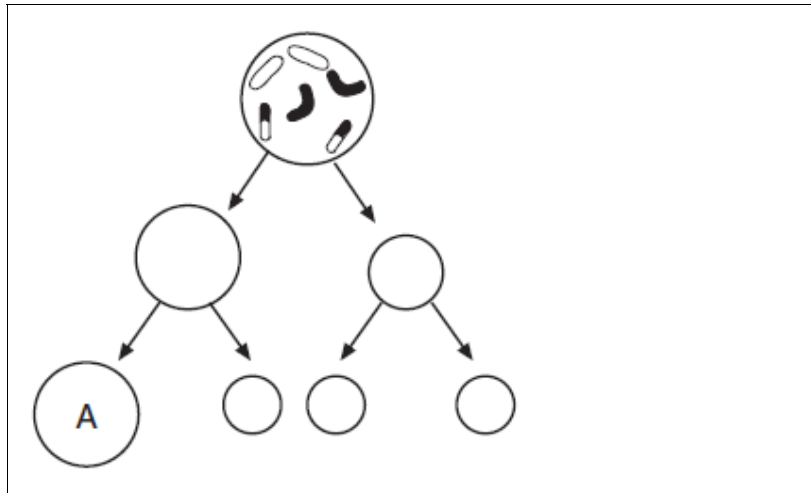
Data Base File Number: 795

Regents Date Aug2002-61.bmp

Aug2002

61 8/13/2002 S4K4

Answer 3



meiosis

210. A cellular process that produces sex cells in fruit flies is represented in the diagram as shown. Based on the information in the diagram, how many chromosomes will be present in each of the sex cells of the fruit fly?

- (1) 2
- (2) 4
- (3) 6
- (4) 8

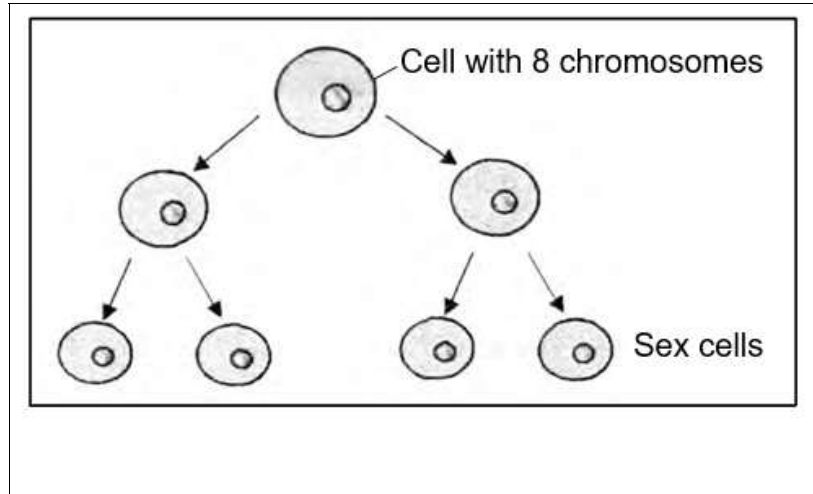
Data Base File Number: 1674

Regents Date June2024-52.bmp

June2024

52 6/14/2024 S4K2

Answer 2



meiosis

211. The diagram shown represents structures found in a human female. Which process results in the formation of structure X?

- (1) mitosis
- (2) meiosis
- (3) recombination
- (4) cloning

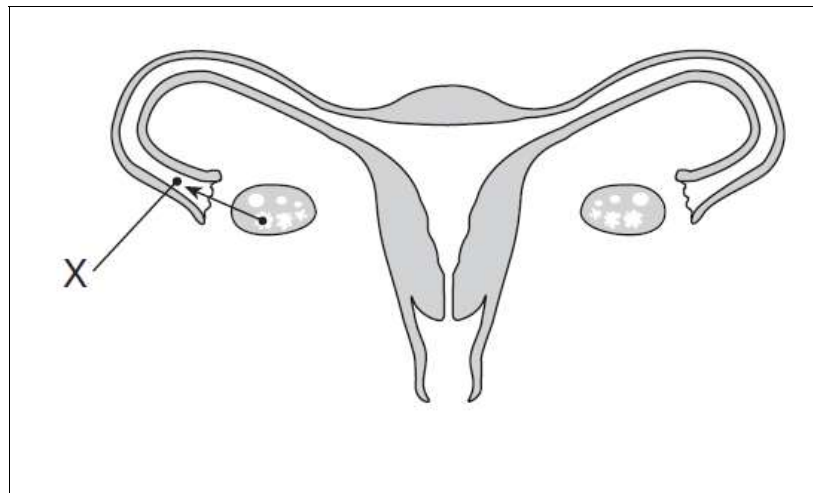
Data Base File Number: 284

Regents Date Aug2010-34.bmp

Aug2010

34 8/18/2010 S4K4

Answer 2



**meiosis**

212. The process of meiotic division in human males is represented in the diagram shown. This process produces four sperm cells, each with

- (1) all of the genetic information contained in the diploid germ cell
- (2) one-quarter of the genetic information contained in the diploid germ cell
- (3) twice the genetic information found in the diploid germ cell
- (4) one-half of the genetic information found in the diploid germ cell

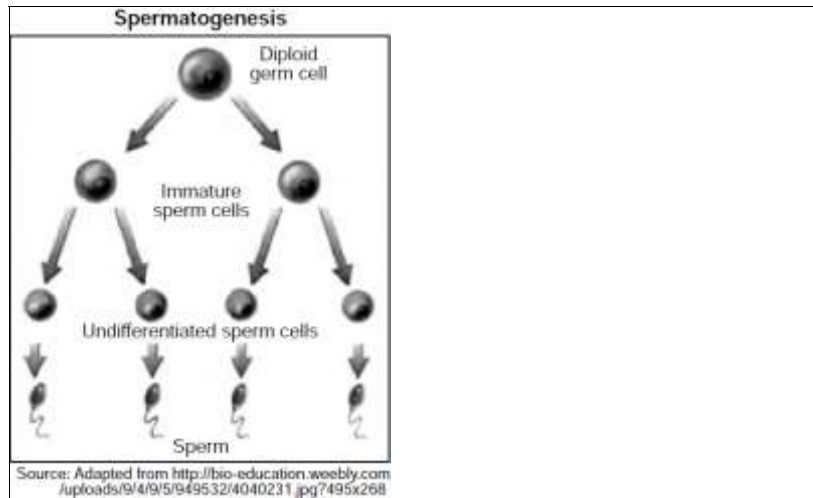
Data Base File Number: 1577

Regents Date June2023-40.bmp

June2023

40 6/14/2023 S4K4

Answer 4



**meiosis**

213. Part of a process necessary for reproduction in complex organisms is represented in the diagram. Step C results in the production of

- (1) four zygotes that will develop into embryos
- (2) embryonic cells that could unite and develop into an organism
- (3) four cells that will recombine to form two offspring
- (4) gametes that could be involved in the formation of a zygote.

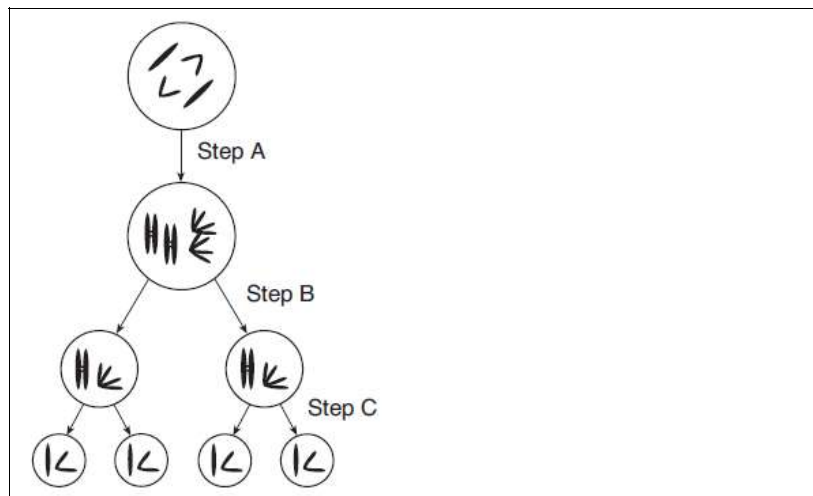
Data Base File Number: 904

Regents Date Aug2013-32.bmp

Aug2013

32 8/14/2013 S4K4

Answer 4



## meiosis

214. The process of meiotic division in human females is represented in the diagram as shown. This process normally produces

- |  |  |
|--|--|
| (1) one functional gamete with one-quarter of the genetic information found in the diploid germ cell | (3) four functional gametes, each with one-quarter of the genetic information found in the diploid germ cell |
| (2) one functional gamete with one-half of the genetic information found in the diploid germ cell    | (4) four functional gametes, each with one-half of the genetic information found in the diploid germ cell    |

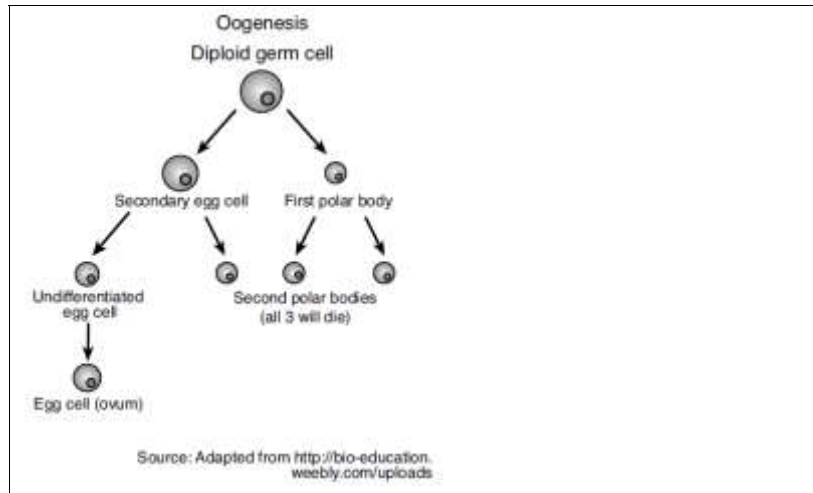
Data Base File Number: 1477

Regents Date June2022-31.bmp

June2022

31 6/15/2022 S4K4

Answer 2



## meniscus

215. Refer to the diagram shown. How much water should be removed from the graduated cylinder to leave 5 milliliters of water in the cylinder?

- |          |           |
|----------|-----------|
| (1) 6 mL | (3) 11 mL |
| (2) 7 mL | (4) 12 mL |

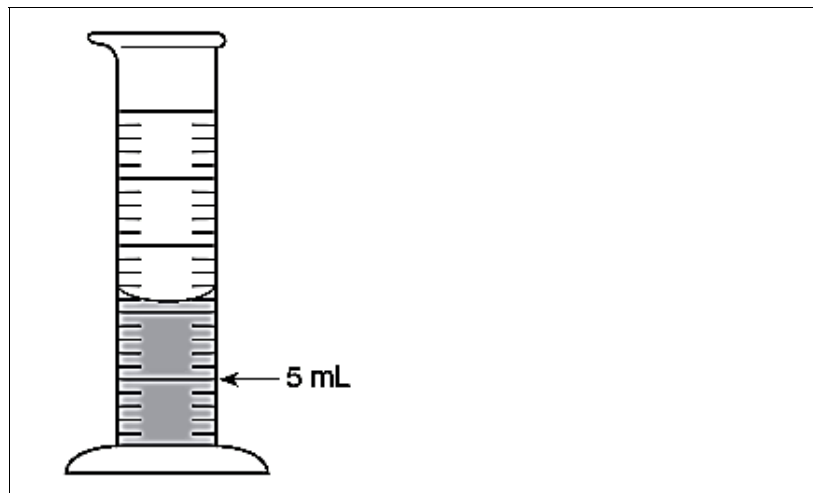
Data Base File Number: 56

Regents Date Jan07-35.bmp

Jan2007

35 1/26/2007 LABS

Answer 1



**meniscus**

216. How much water should be added to the graduated cylinder shown in the diagram to increase the volume to 15 milliliters?

- (1) 11 mL
- (2) 10 mL
- (3) 3 mL
- (4) 4 mL

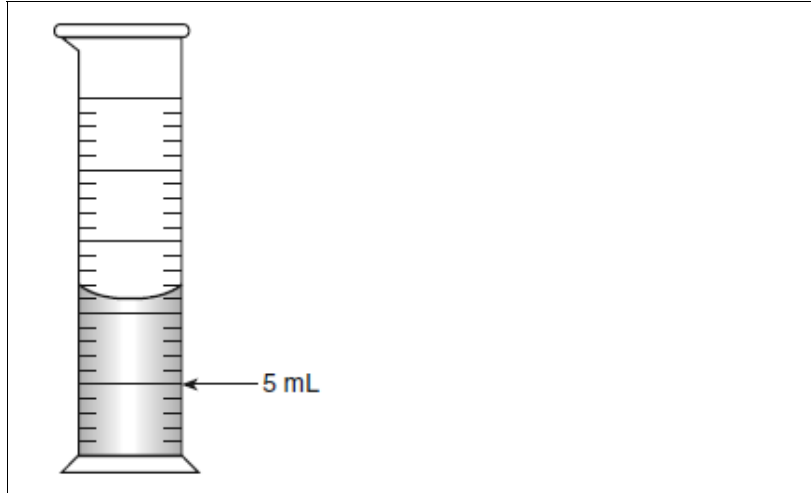
Data Base File Number: 613

Regents Date Jan2013-31.bmp

Jan2013

31 1/23/2013 LABA

Answer 4



**meniscus**

217. What is the volume of the liquid in the graduated cylinder shown in the diagram?

- (1) 23 mL
- (2) 26 mL
- (3) 27 mL
- (4) 28 mL

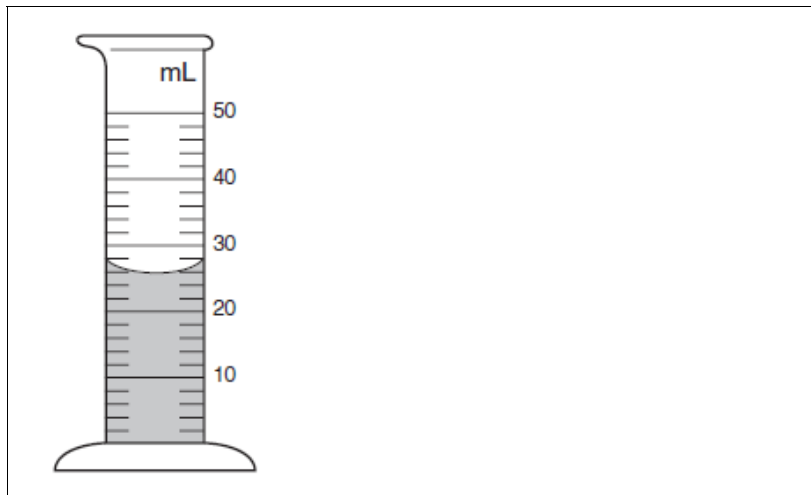
Data Base File Number: 541

Regents Date Jan2005-34.bmp

Jan2005

34 1/28/2005 LABA

Answer 2



meniscus

218. What is the volume of water represented in the graduated cylinder shown in the diagram?

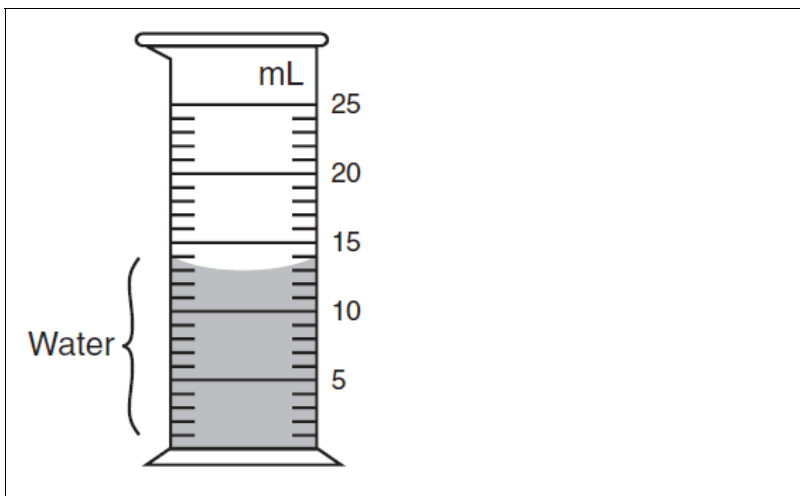
- (1) 10.3 mL
- (2) 13.0 mL
- (3) 14.0 mL
- (4) 15.0 mL

Data Base File Number: 316

Regents Date Jan2011-36.bmp

Jan2011  
36 1/25/2011 LABS

Answer 2



meniscus

219. The diagram shows a portion of a graduated cylinder. What is the volume of the liquid in this cylinder?

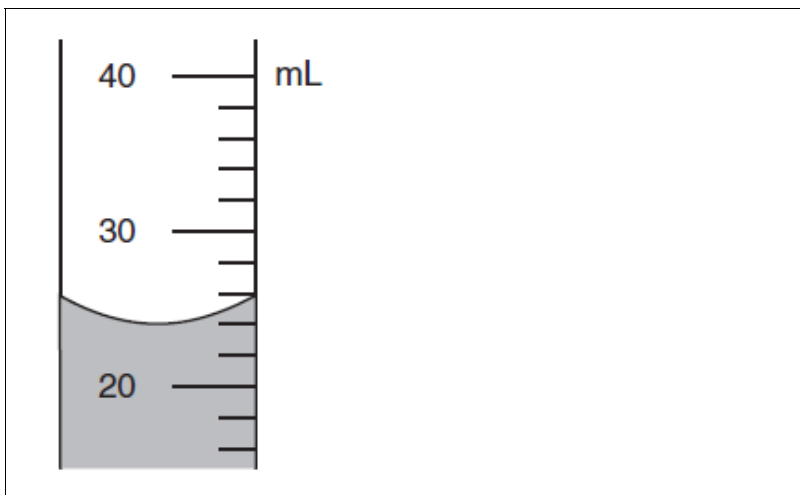
- (1) 22 mL
- (2) 24 mL
- (3) 25 mL
- (4) 26 mL

Data Base File Number: 646

Regents Date Jan2004-37.bmp

Jan2004  
37 1/29/2004 LABA

Answer 2



## metric measurement

220. A peppered moth and part of a metric ruler are represented in the diagram shown. What is the ratio of body length to wingspan of the peppered moth?

(1) 1:1

(3) 1:2

(2) 2:1

(4) 2:2

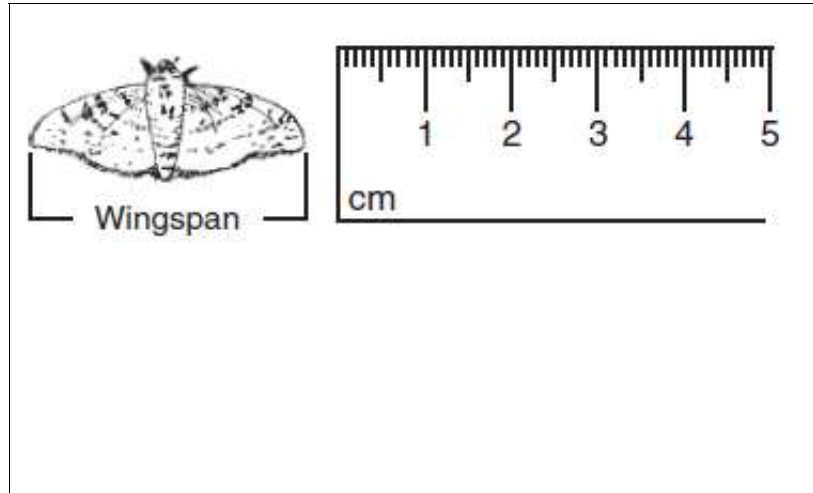
Data Base File Number: 672

Regents Date June2004-38.bmp

June2004

38 6/18/2004 LABA

Answer 3



## metric measurement

221. A student, using a metric ruler, measured a larva as represented in the diagram shown. What is the length of the larva, in millimeters?

(1) 15 mm

(3) 1.5 cm

(2) 15 cm

(4) 1.5 inches

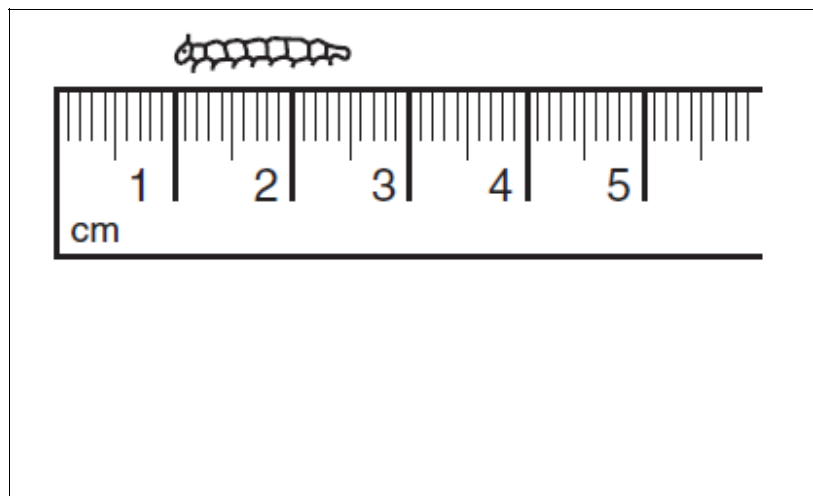
Data Base File Number: 293

Regents Date Aug2010-51.bmp

Aug2010

51 8/18/2010 LABS

Answer 1



## metric measurement

222. Base your answer to this question on the information given and on your knowledge of biology. Scientists will often grow bacteria in prepared petri dishes. In some experiments, the petri dish will also contain paper disks soaked in a particular antibiotic. The area where the bacteria do not grow is called the zone of inhibition, or ZOI. The diameter of the ZOI indicates the effectiveness of the antibiotic.

The ZOI data collected by one scientist while trying to determine which disk (A, B, C, or D) is most effective at killing *Streptococcus* bacteria are: Disk D-9 mm, Disk B-8 mm, Disk C-0 mm. Using the metric ruler represented in the diagram, determine the diameter in millimeters (mm) of the ZOI for antibiotic disk A as shown in the diagram is

- (1) 5 mm (3) 9 mm  
(2) 7 mm (4) 13 mm

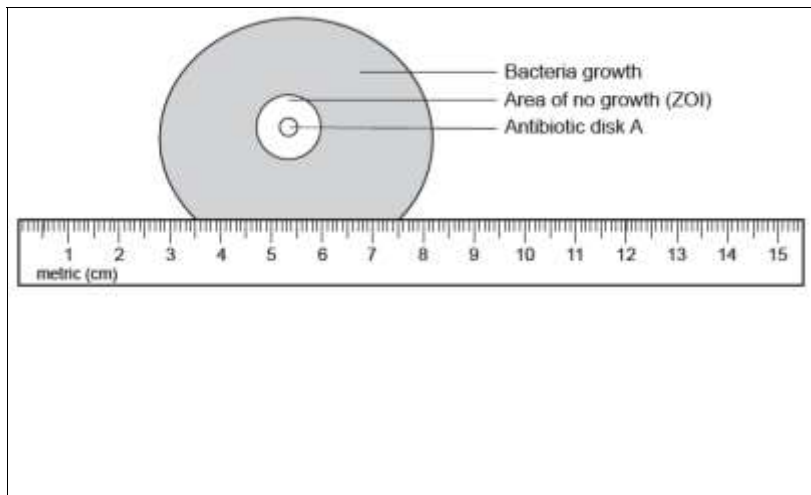
Data Base File Number: 1082

Regents Date: Jan2016-51.bmp

Jan2016

51 1/27/2016 APPA

Answer: 4



## microscope

223. A student is viewing a plant stem cross section using a compound light microscope as shown in the diagram. What parts of the microscope should the student use to bring the image into focus?

- (1) A and F (3) C and D  
(2) B and E (4) D and F

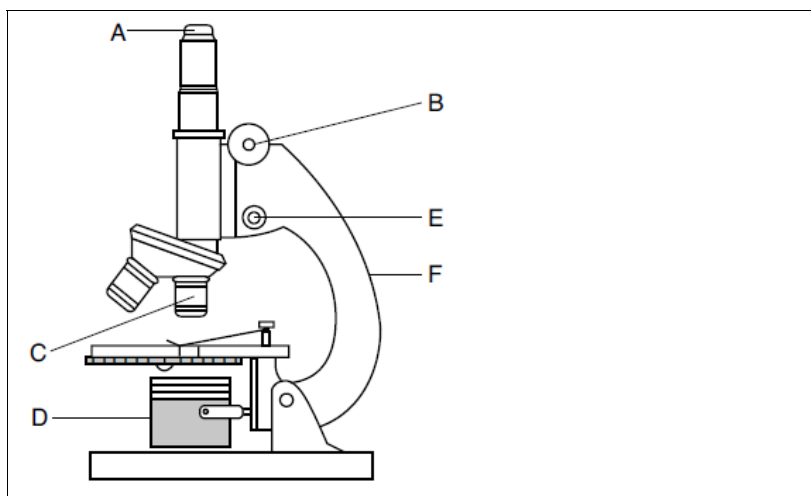
Data Base File Number: 1327

Regents Date: Jan2019-81.bmp

Jan2019

81 1/22/2019 LAB1

Answer: 2





## microscope

224. The diagrams show four different onecelled organisms (shaded) in the field of view of the same microscope using different magnifications. Which illustration shows the largest onecelled organism?

(1) 1

(3) 3

(2) 2

(4) 4

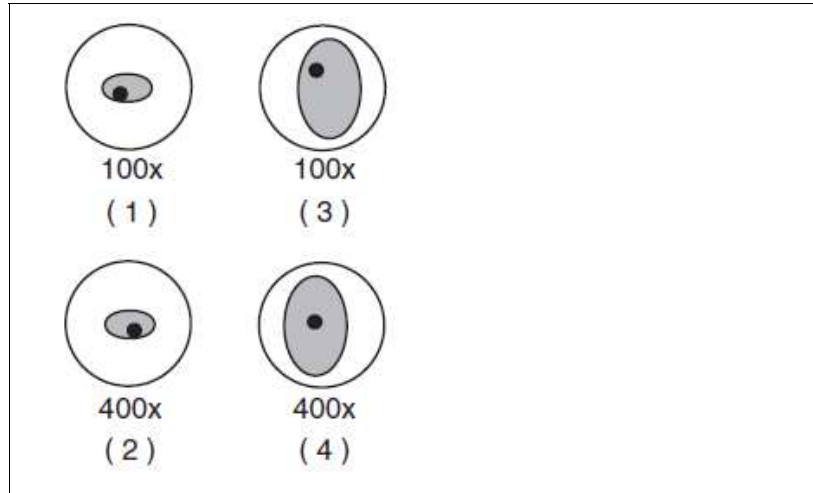
Data Base File Number: 542

Regents Date Jan2005-35.bmp

Jan2005

35 1/28/2005 LABA

Answer 3



## microscope

225. A plant cell in a microscopic field of view is represented in the diagram shown. The width (w) of this plant cell is closest to

(1) 200  $\mu\text{m}$

(3) 1200  $\mu\text{m}$

(2) 800  $\mu\text{m}$

(4) 1600  $\mu\text{m}$

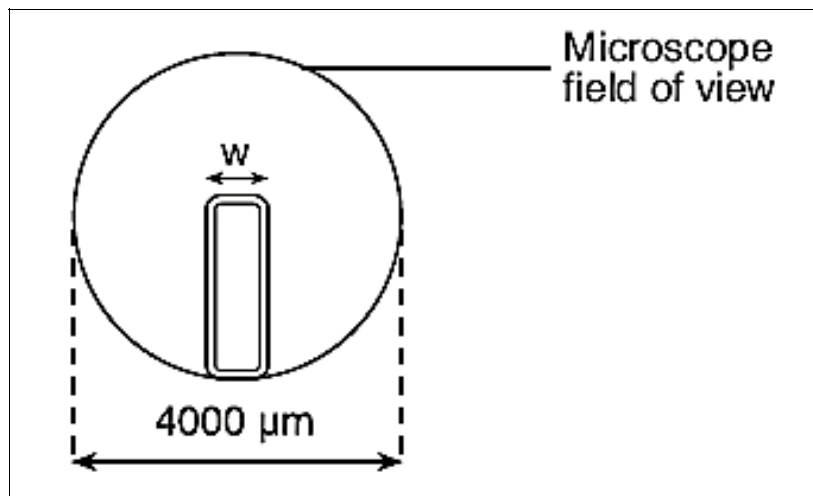
Data Base File Number: 115

Regents Date June08-79.bmp

June2008

79 6/24/2008 LABS

Answer 2



## microscope

226. Base your answer to this question on the diagram of the microscope, as shown, and on your knowledge of biology. Information about which TWO lettered parts is needed in order to determine the total magnification of an object viewed with the microscope in the position shown?

- (1) E and F
- (2) B and C
- (3) A and D
- (4) A and C

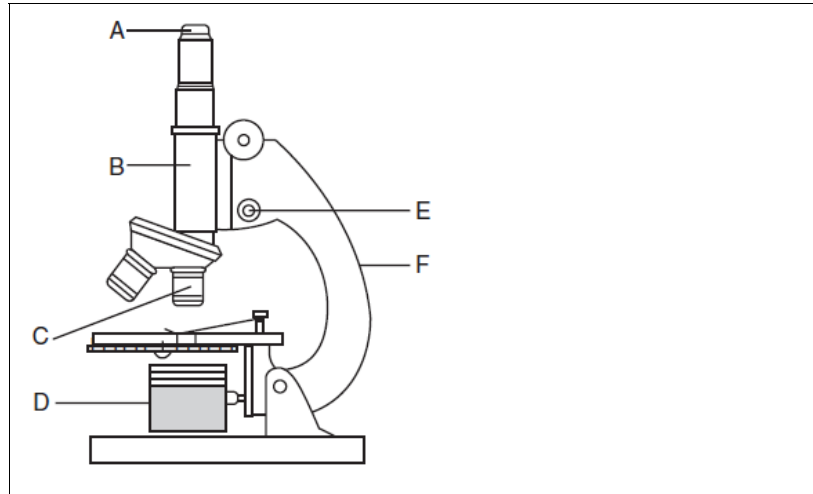
Data Base File Number: 251

Regents Date Jan2010-76.bmp

Jan2010

75 1/26/2010 LABS

Answer 4



## microscope

227. A student used the low-power objective of a compound light microscope and observed a single-celled organism as shown in the diagram. When he switched to high power, the organism was no longer visible. This most likely happened because switching to high power made the

- (1) field too bright to see the organism
- (2) image too small to be seen
- (3) area of the slide being viewed smaller
- (4) fine-adjustment knob no longer functional

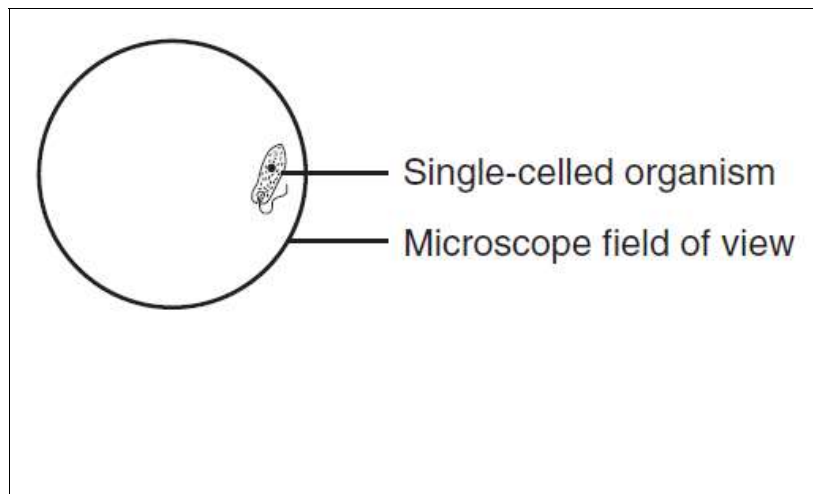
Data Base File Number: 317

Regents Date Jan2011-38.bmp

Jan2011

38 1/25/2011 LABS

Answer 3



## microscope

1228. Using microscopes he constructed in the 1600s, Antonie van Leeuwenhoek discovered a new microscopic world. His discoveries paved the way for the development of the microscopes used today and for many important biological breakthroughs. Which statement best describes van Leeuwenhoek's work?
- (1) His observations alone provided enough information to form modern biological theories.
  - (2) The microscopes he made were used by all scientists and have remained unchanged over the years.
  - (3) Knowledge gained by his work has led to the improvement and development of modern scientific concepts.
  - (4) Explanations of the microscopic world today are solely based on his observations and conclusions.

Data Base 1399  
File Number:

Regents Date Jan2020-32.bmp

Jan2020

32 1/21/2020 S4K1

Answer 3



Source: <http://famousbiologists.org/antonie-van-leeuwenhoek/>

## microscope

229. Base your answer to this question on the information given, the diagrams shown and on your knowledge of biology. The drawings shown were made during a laboratory exercise in which a microscope was used to view slides of preserved protozoa. The microscope had a 10× eyepiece and two different objectives. Which statement about the size of the organisms is correct?

- (1) Organism A is larger than organism B.
- (2) Organism B is larger than organism A.
- (3) Organisms A and B are both the same size.
- (4) The relative size of the organisms cannot be determined from the information given.

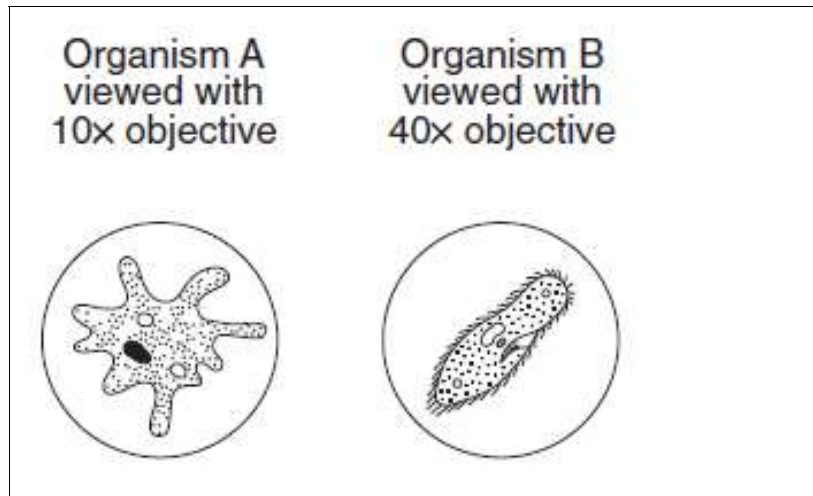
Data Base File Number: 397

Regents Date Jan2012-81.bmp

Jan2012

81 1/25/2012 LAB5

Answer 1



## microscope

230. The diagram illustrates what happens when a particular solution is added to a wet-mount slide containing red onion cells being observed using a compound light microscope. Base your answer to this question on the diagram shown and on your knowledge of biology. Identify a process that caused the change in the cells

- (1) osmosis
- (2) diffusion
- (3) passive transport
- (4) All the choices are correct.

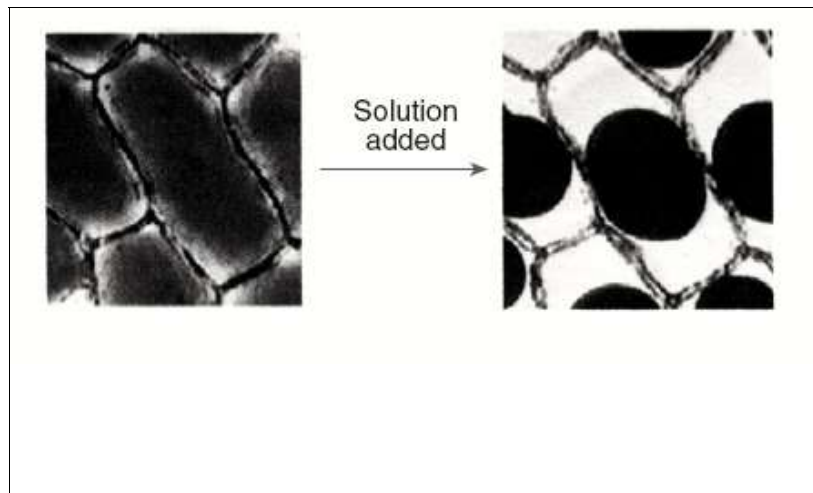
Data Base File Number: 172

Regents Date Jan09-78.bmp

Jan2009

79 1/27/2009 LABS

Answer 4



## microscope

231. Base your answer to this question on the diagram of a compound light microscope shown and on your knowledge of biology. What is the total magnification of this microscope using the high-power objective lens?

(1) 43x

(3) 100x

(2) 53x

(4) 430x

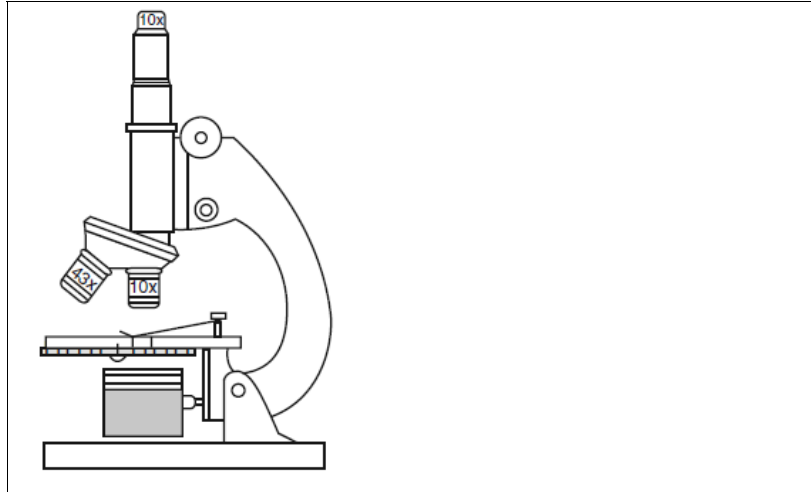
Data Base File Number: 624

Regents Date Jan2013-48.bmp

Jan2013

49 1/23/2013 LABA

Answer 4



## microscope

232. The diagram shown represents a compound light microscope. Several parts have been labeled. In order to make an image brighter, which labeled part of the microscope would most likely be adjusted?

(1) A

(3) C

(2) B

(4) D

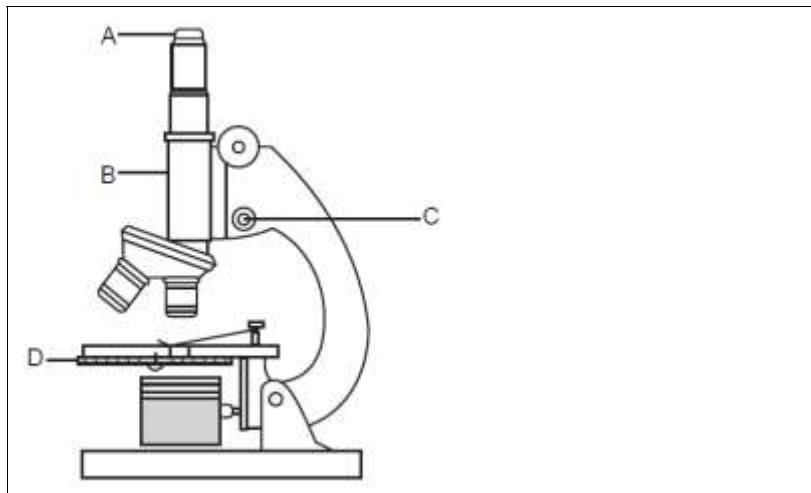
Data Base File Number: 933

Regents Date Jan2014-74.bmp

Jan2014

74 1/27/2014 LAB5

Answer 4



## microscope technique

233. The photos show two red onion cells viewed with the high power of a compound light microscope. Describe the steps that could be used to make cell A resemble cell B using a piece of paper towel and an eyedropper or a pipette **WITHOUT REMOVING THE COVERSLIP**.

- (1) The water (liquid) should be placed along the edge of the coverslip on the same side as the paper towel.
- (2) The water (liquid) should be placed on top of the coverslip.
- (3) The water (liquid) should be placed along the edge of the coverslip opposite the paper towel.
- (4) The water (liquid) should be placed any place on the slide.

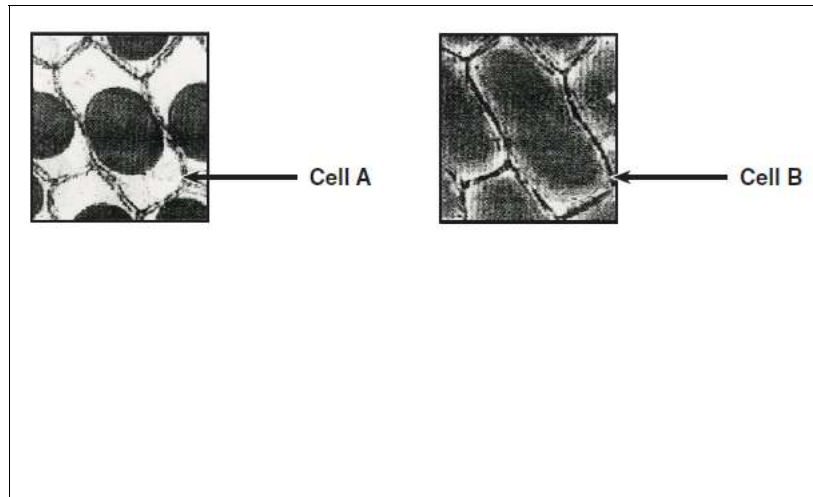
Data Base File Number: 553

Regents Date Jan2005-73.bmp

Jan2005

73 1/28/2005 LAB3

Answer 3



## microscope technique

234. Two views through a compound light microscope of a wet-mount slide preparation of cells are shown in the photographs as VIEW A and VIEW B. Which procedure was most likely followed to obtain view B?

- (1) increasing the light
- (2) staining
- (3) increasing magnification
- (4) decreasing magnification

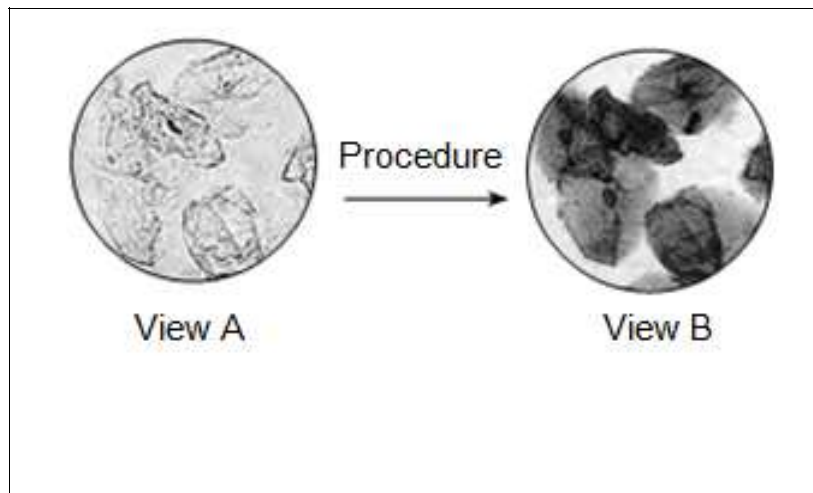
Data Base File Number: 950

Regents Date June2014-44.bmp

June2014

44 6/17/2014 LABA

Answer 2



microscope technique

235. The diagram shown represents a specimen in the low-power field of view of a compound light microscope. If the slide is not moved, which view best represents the way the specimen will look when the high-power objective lens is switched into place?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

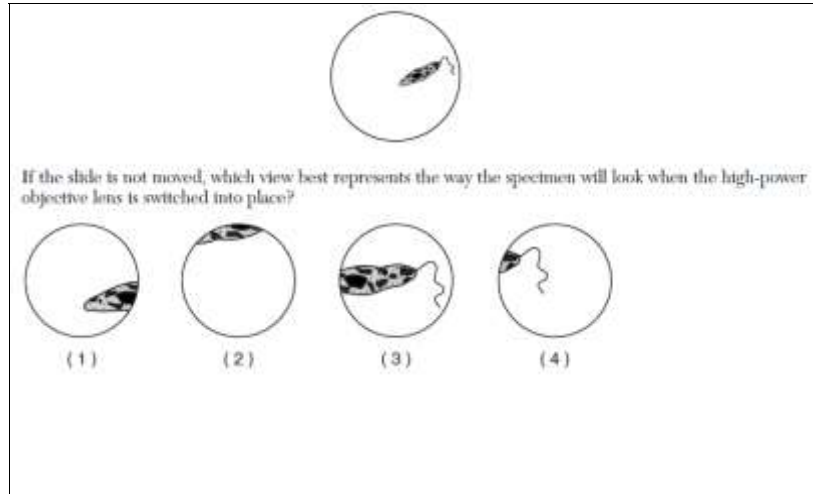
Data Base File Number: 998

Regents Date Jan2015-41.bmp

Jan2015

41 2/26/2015 LABA

Answer 1



microscope technique

236. Base your answer to this question on the information shown and on your knowledge of biology. A student observes a red onion cell with a compound light microscope using low, then high power. The two views are represented in the diagram as "A". In diagram "B", which cell position represents where the cell should be located in the low-power field of view to be sure the entire cell will be visible after switching to high power?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

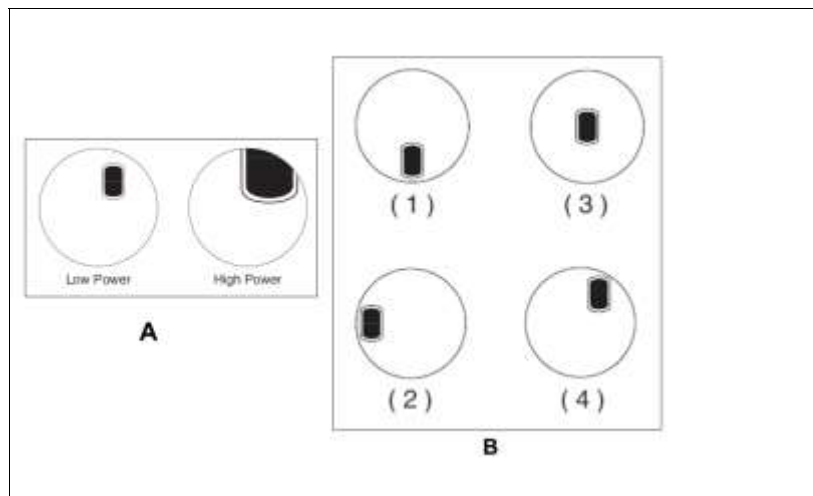
Data Base File Number: 893

Regents Date June2013-73C.b

June2013

73 6/11/2013 LAB5

Answer 3



## mitochondria

237. The diagram shown represents a plant cell. Which process takes place in structure A?

- (1) cellular respiration
- (2) heterotrophic nutrition
- (3) digestion of fats
- (4) protein synthesis

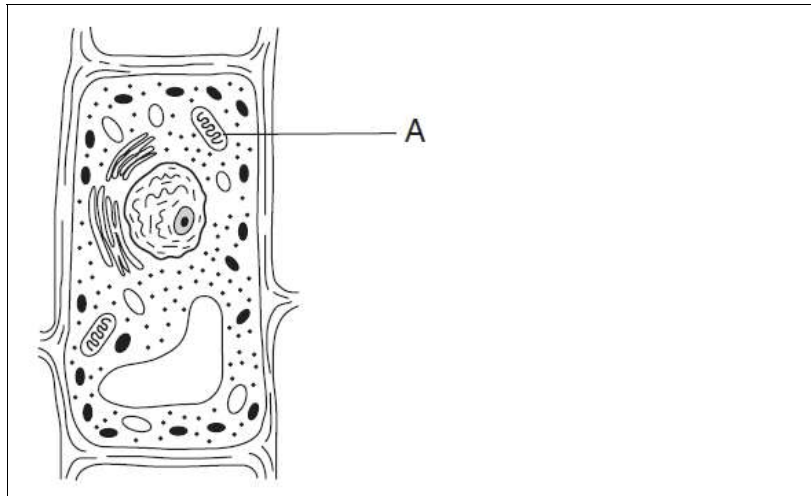
Data Base File Number: 237

Regents Date Jan2010-34.bmp

Jan2010

34 1/26/2010 S4K5

Answer 1



## mitochondria

238. Research has shown that treadmill training increases the number of certain energy-releasing structures in the brain cells of rats. The cellular structures referred to in this study are most likely

- (1) mitochondria
- (2) nuclei
- (3) vacuoles
- (4) ribosomes

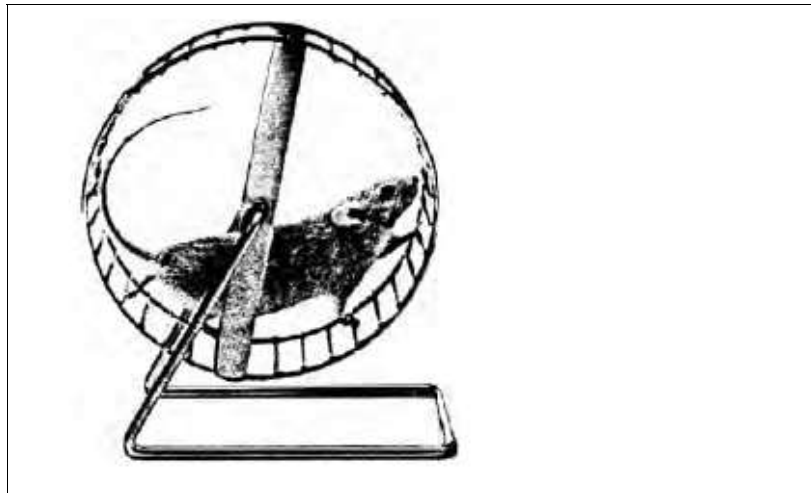
Data Base File Number: 1245

Regents Date June2018-7.bmp

June2018

7 6/13/2018 S4K1

Answer 1





## mitochondria

239. The diagram shown represents a cell found in some complex organisms. The enlarged section represents an organelle, labeled X, found in this cell. The function of the organelle labeled as X is most closely associated with

- (1) respiration
- (2) storage of fats
- (3) photosynthesis
- (4) water elimination

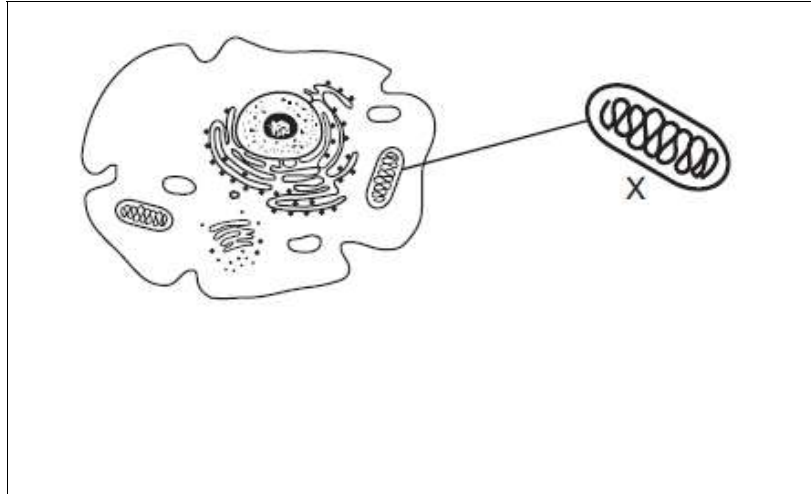
Data Base File Number: 271

Regents Date June2010-63.bmp

June2010

63 6/16/2010 S4K5

Answer 1



## mitochondria

240. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents a cell. Which structure is responsible for the synthesis of ATP?

- (1) A
- (2) B
- (3) C
- (4) D

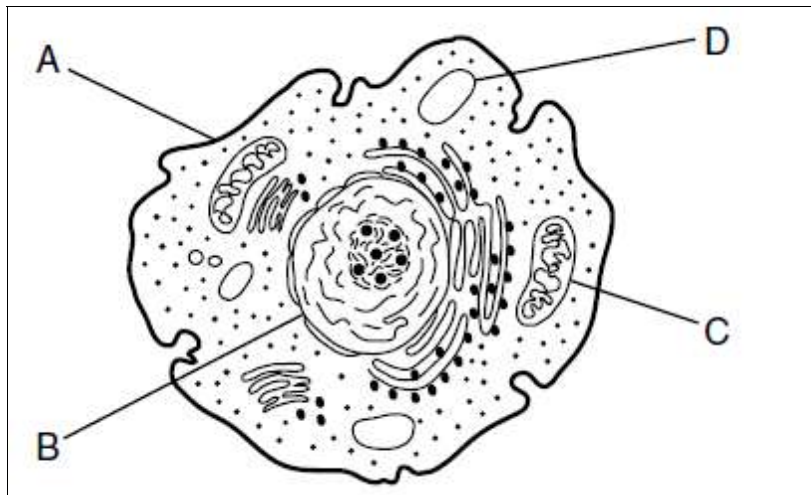
Data Base File Number: 1166

Regents Date Jan2017-42.bmp

Jan2017

43 1/25/2017 S4K1

Answer 3



## mitochondria

241. Base your answer to this question on the information given and your knowledge of biology. Examine the table as shown. The table shows a TYPE of cell in the human body and the NUMBER of mitochondria per cell for that cell type. What conclusion can be made on the number of mitochondria per cell based on the table?

- (1) Cells with lower metabolic activity have a larger number of mitochondria per cell
- (2) Cell metabolic activity is not related to the number of mitochondria per cell.
- (3) Cells with higher metabolic activity have a larger number of mitochondria per cell.
- (4) No conclusion can be made regarding the number of mitochondria per cell type.

Data Base 1462  
File Number:

Regents Date MitochondriaNu

June2021

1 9/10/2021 RBS

Answer 3

CELL TYPE	MITOCHONDRIA / CELL
skin Cells	100 – 200/cell
Platelets	0/cell
Red Blood Cells	0/cell
Nerve Cells	2,000,000/cell
Heart Cells	5,000/cell
Liver Cells	1,000—2,000/cell

**mitochondria**

242. NOTE: TURN your paper to the left to PROPERLY orient the diagram. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram compares cell functions with jobs in a factory. What chemical substance produced by the mitochondrion is represented by arrow A?

- (1) DPN
- (2) ATP
- (3) cytochrome-a
- (4) chlorophyll

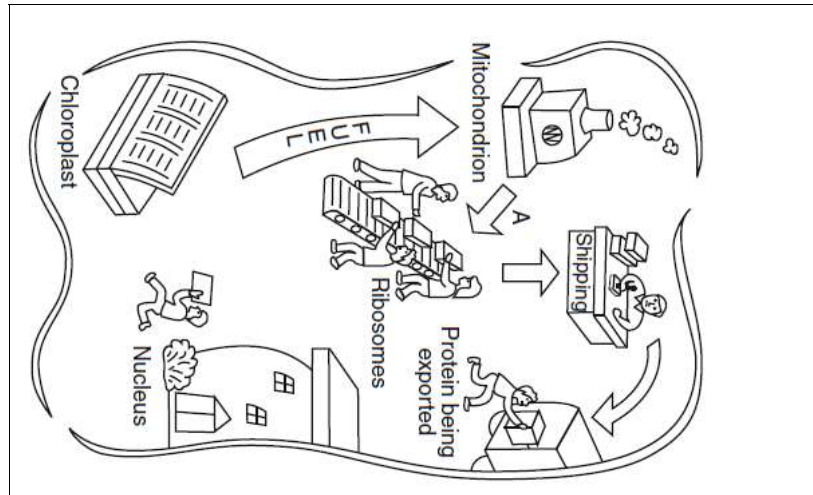
Data Base File Number: 447

Regents Date Aug2012-53B.bm

Aug2012

53 8/17/2012 S4K5

Answer 2



**mitochondria**

243. The chart shows some cell organelles. Which organelle is most closely associated with cellular respiration?

- (1) ribosome
- (2) nucleus
- (3) mitochondrion
- (4) cell membrane

Data Base File Number: 769

Regents Date Aug2003-44.bmp

Aug2003

44 8/13/2003 S4K1

Answer 3

	Set A	Set B
Organelle 1	Ribosome	Mitochondrion
Organelle 2	Nucleus	Cell membrane

## mitochondria

244. The diagram shown represents a cell in the human body. Which statement concerning the structures within this cell is accurate?
- (1) Structure 1 is a chloroplast that carries out photosynthesis.
  - (2) Structure 2 is a vacuole that contains DNA.
  - (3) Structure 3 is a mitochondrion, where respiration takes place.
  - (4) Structure 4 is the cell membrane, which provides rigid support for the cell.

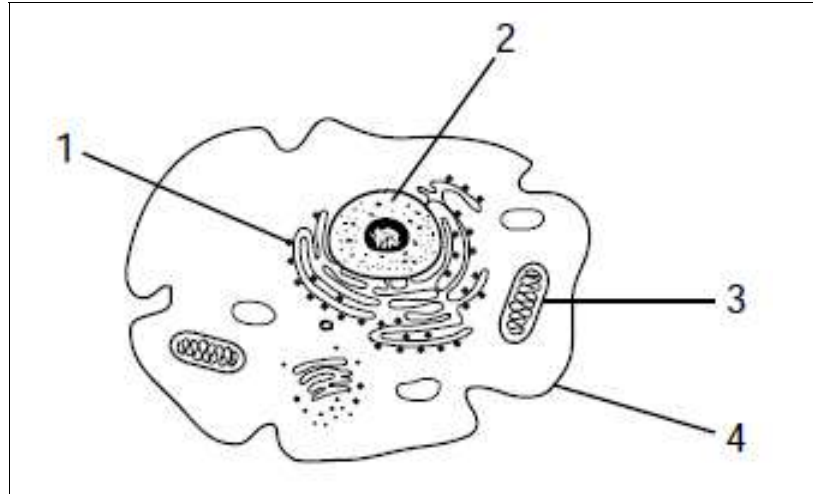
Data Base File Number: 1342

Regents Date June2019-33.bmp

June2019

33 6/18/2019 S4K1

Answer 3



## mitochondria

245. The diagram shown represents a longitudinal section of an organelle. The organelle is most likely a
- (1) nucleus
  - (2) mitochondrion
  - (3) vacuole
  - (4) nucleolus

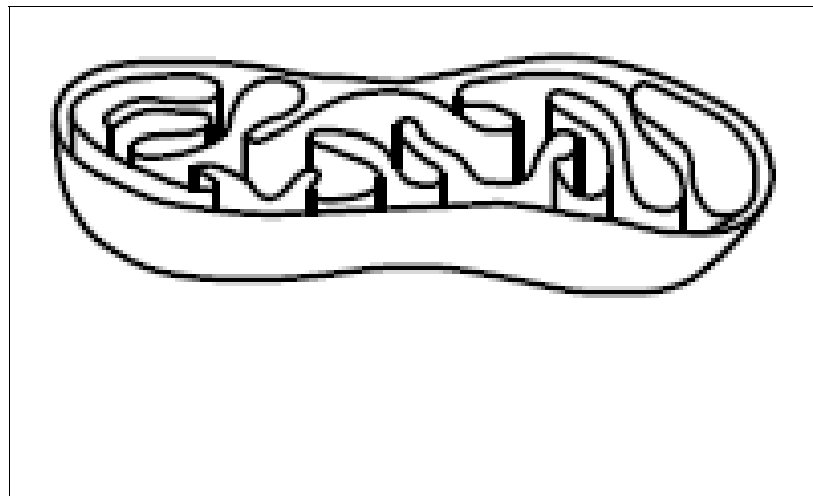
Data Base File Number: 1295

Regents Date Aug2018-53.bmp

Aug2018

53 8/17/2018 S4K1

Answer 2



## mitochondria

246. The diagram shown represents a structure involved in cellular respiration. The release of which structure is represented by the arrows?

- (1) glucose
- (2) oxygen
- (3) carbon dioxide
- (4) DNA

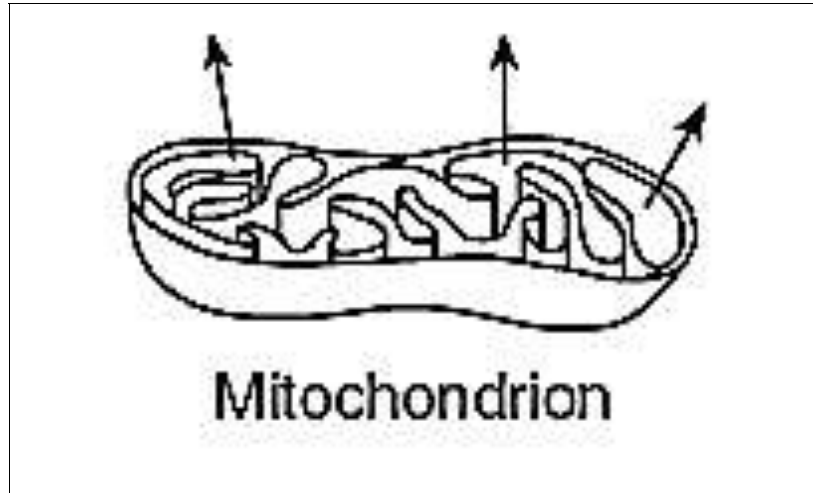
Data Base File Number: 51

Regents Date Jan07-20.bmp

Jan2007

20 1/26/2007 S4K5

Answer 3



## mitochondria

247. The diagram shown represents a cell organelle involved in the transfer of energy from organic compounds. The arrows in the diagram could represent the release of

- (1) ATP from a chloroplast carrying out photosynthesis
- (2) oxygen from a mitochondrion carrying out photosynthesis
- (3) glucose from a chloroplast carrying out respiration
- (4) carbon dioxide from a mitochondrion carrying out respiration

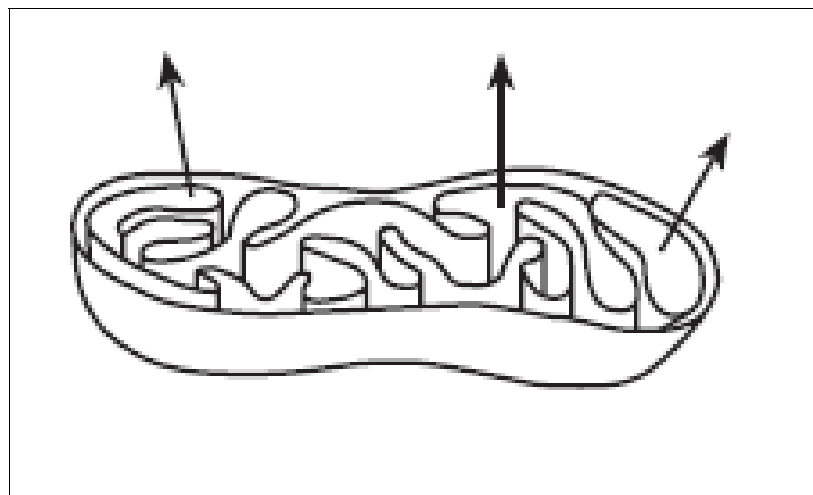
Data Base File Number: 483

Regents Date June2006-20.bmp

June2006

20 6/21/2006 S4K5

Answer 4



## mitochondria

248. Base your answer to this question on the information given and your knowledge of biology. Mitochondria are the POWER HOUSES of cells. They generate ATP. In human inheritance, the DNA code of only the mother's mitochondrial DNA is inherited by her decedents (offspring). Examine the Human Pedigree showing the decedents of a male (father) and a female (mother). What do the decedents numbered 1, 2, 3 and 4 have in common regarding their mitochondrial DNA ?

- (1) They all have different DNA genetic code.
- (2) They all have related but not equal DNA genetic code.
- (3) They all have the same DNA genetic code.
- (4) Their DNA genetic codes have nothing in common.

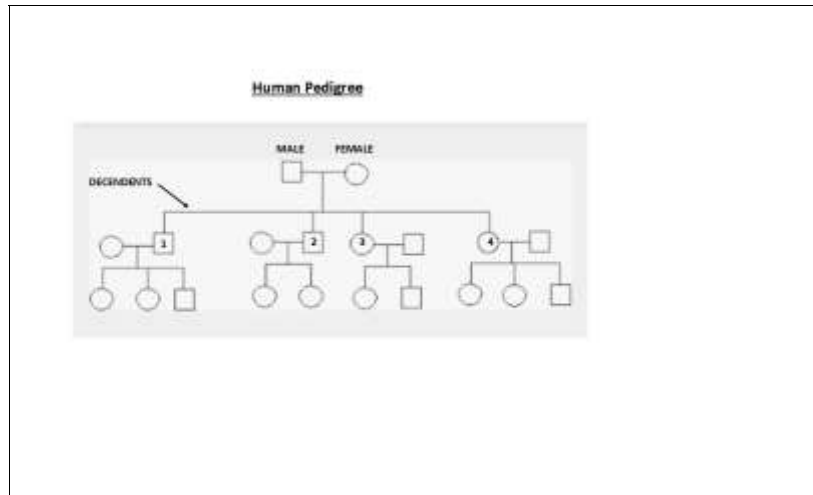
Data Base File Number: 1457

Regents Date HumanPedigree2

RBS2021

1 6/22/2021 RBS

Answer 3



## mitochondria

249. The diagram shown represents a cell structure involved in converting energy stored in organic molecules into a form used by animal cells. The arrows represent the movement of which substances?

- (1) carbon dioxide and sugar
- (2) oxygen and ATP
- (3) ATP and carbon dioxide
- (4) oxygen and sugar

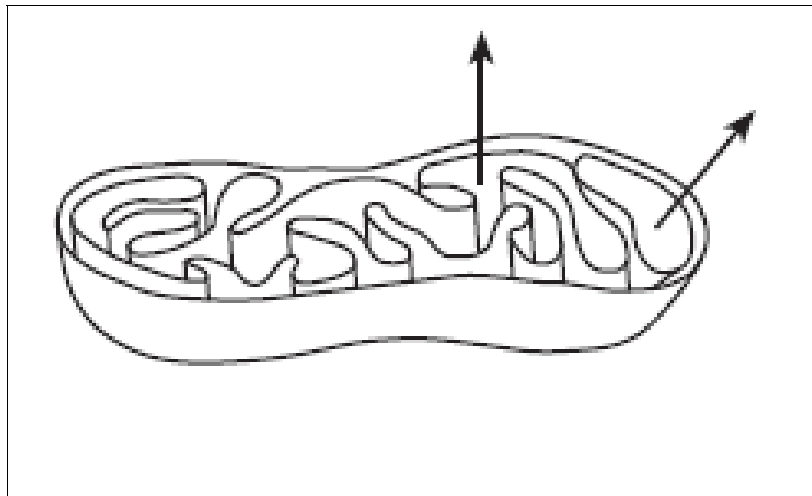
Data Base File Number: 1015

Regents Date June2015-21.bmp

June2015

21 6/16/2015 S4K1

Answer 3



## mitochondria

250. Within which structure shown in the diagram are energy-rich organic compounds used to produce ATP?

(1) 1

(3) 3

(2) 2

(4) 4

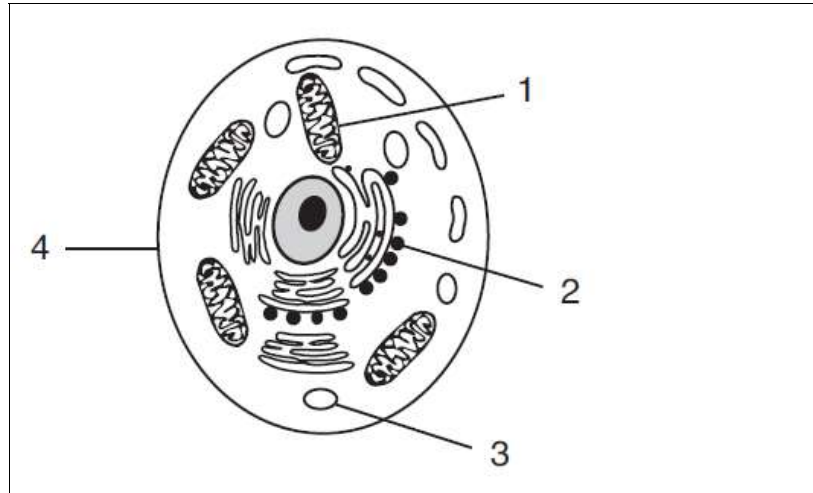
Data Base File Number: 220

Regents Date August2009-39.b

Aug2009

39 8/13/2009 S4K5

Answer 1



## mitosis

251. The diagram shown represents a cell nucleus. How many chromosomes are in EACH of the two new cells that are produced by mitosis.

(1) 2

(3) 8

(2) 4

(4) 16

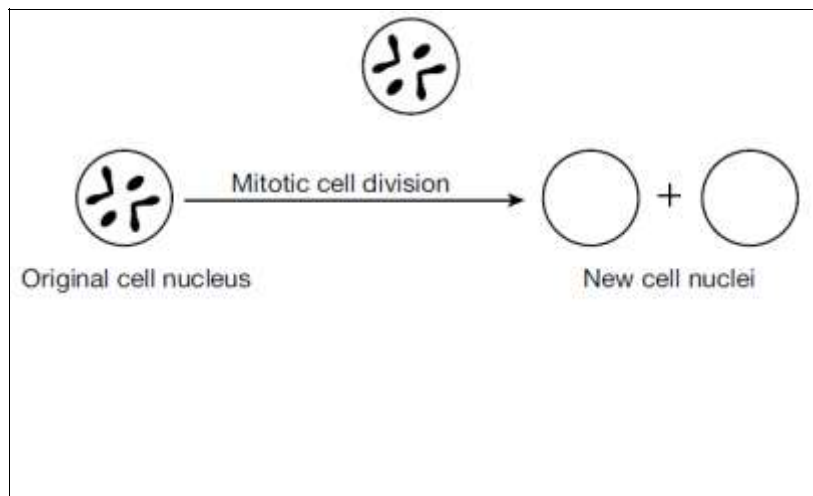
Data Base File Number: 1439

Regents Date June2021-54.bmp

June2021

53 6/22/2021 S1K1

Answer 2



## mitosis

252. The diagram shown represents some processes in the early development of a multicellular organism. Which statement describing this diagram is correct?
- (1) The cell represented by structure 3 has the same genetic content as structure 2.
  - (2) Process A represents the process of meiosis.
  - (3) Each cell in structure 4 has the same genetic content as that in structure 3.
  - (4) Processes A and B both occur in the placenta.

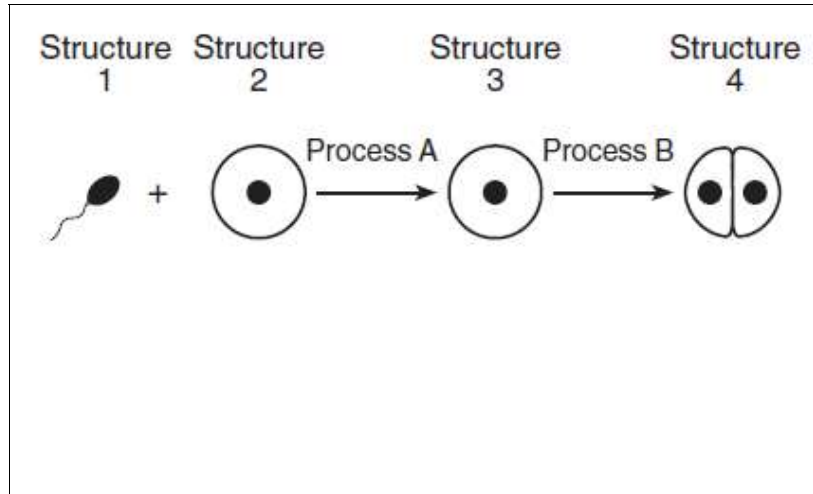
Data Base File Number: 1044

Regents Date August2015-17.b

Aug2015

17 8/12/2015 S4K4

Answer 3



## mitosis

253. Sheets of skin are grown in a culture in order to replace the skin of victims with severe burns or frostbite. Undamaged skin cells are obtained from the victim, put in a Petri dish with the proper growth materials, and incubated, as represented in the diagram shown. These new skin cells form as a result of
- (1) meiotic cell division
  - (2) sexual reproduction
  - (3) mitotic cell division
  - (4) gene recombination

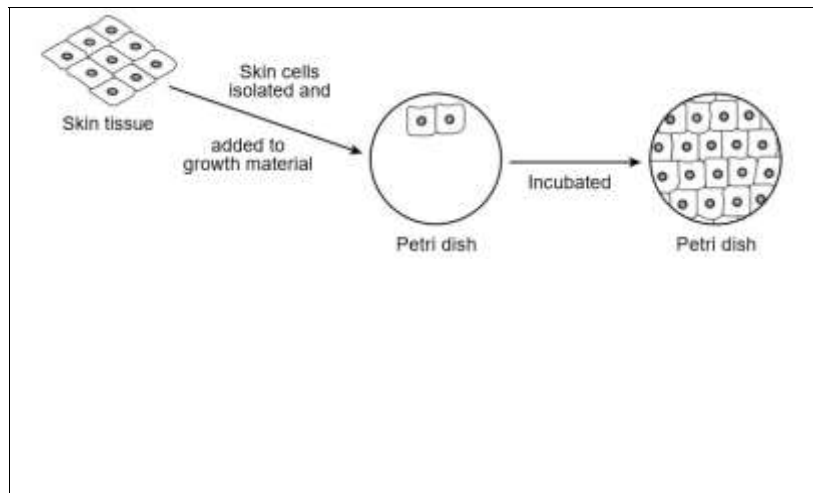
Data Base File Number: 1506

Regents Date Aug2022-27.bmp

Aug2022

27 8/17/2022 S4K4

Answer 3





**mitosis**

254. The diagram at the LEFT represents chromosomes in a zygote. Which diagrams at the RIGHT best illustrate the daughter cells that result from normal mitotic cell division of this zygote?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

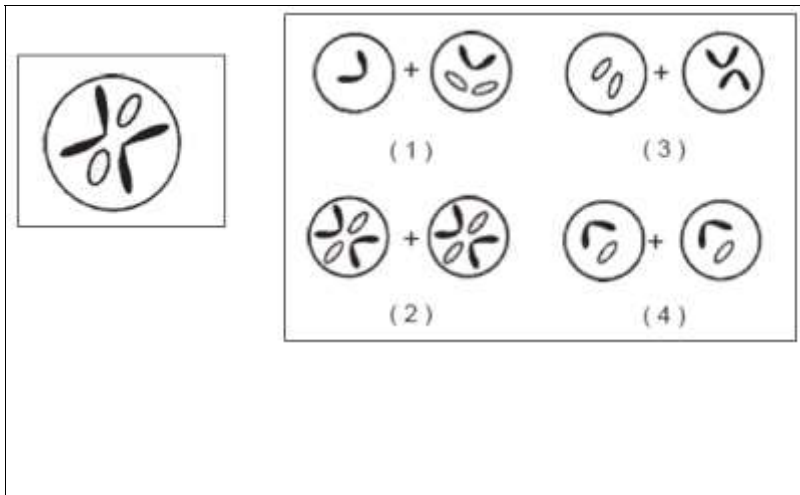
Data Base File Number: 846

Regents Date June2001-20C.b

June2001

20 6/15/2001 S4K4

Answer 2



**mitosis**

255. Base your answer to this question on the diagram shown and your knowledge of biology. The diagram represents a single-celled organism, such as an amoeba, undergoing the changes shown. Process 1 and process 2 are directly involved in

- (1) meiotic cell division
- (2) mitotic cell division
- (3) fertilization
- (4) recombination

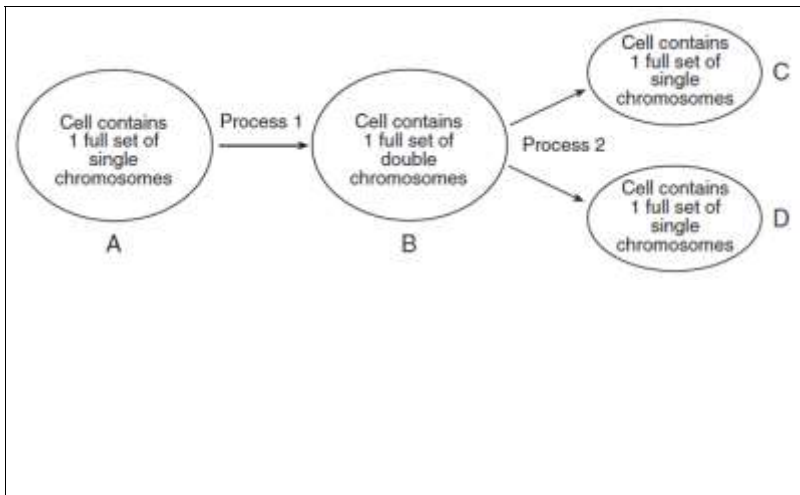
Data Base File Number: 516

Regents Date Aug2006-31.bmp

Aug2006

33 8/16/2006 S4K2

Answer 2



## mitosis

256. The diagram shown represents single-celled organism A dividing by mitosis to form cells B and C. Cells A, B, and C all produced protein X. What can best be inferred from this observation?
- (1) Protein X is found in all organisms.
  - (2) The gene for protein X is found in single celled organisms, only.
  - (3) Cells A, B, and C ingested food containing the gene to produce protein X.
  - (4) The gene to produce protein X was passed from cell A to cells B and C.

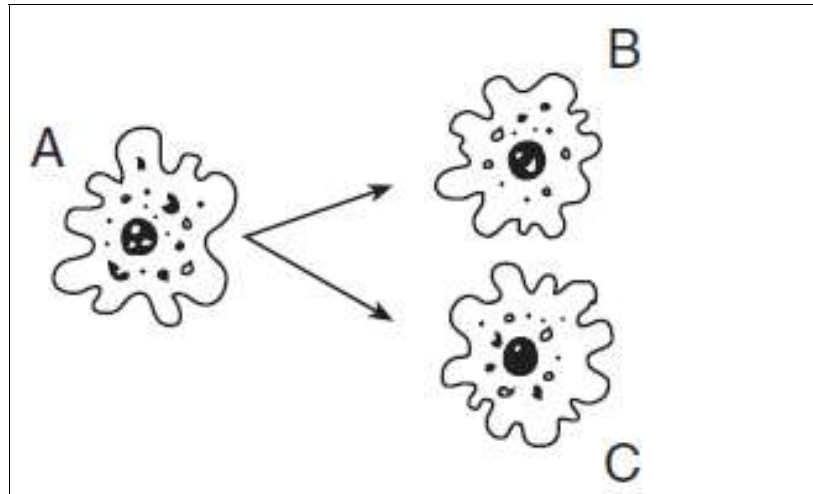
Data Base File Number: 490

Regents Date June2006-35.bmp

June2006

35 6/21/2006 S4K2

Answer 4



## mitosis

257. The diagram shown represents reproduction of a single-celled organism A, which has a normal chromosome number of 8. The circles represent offspring 1 and offspring 2. What is the number of chromosomes that offspring 1 and offspring 2 have from the normal asexual reproduction of organism A?
- (1) 2
  - (2) 4
  - (3) 6
  - (4) 8

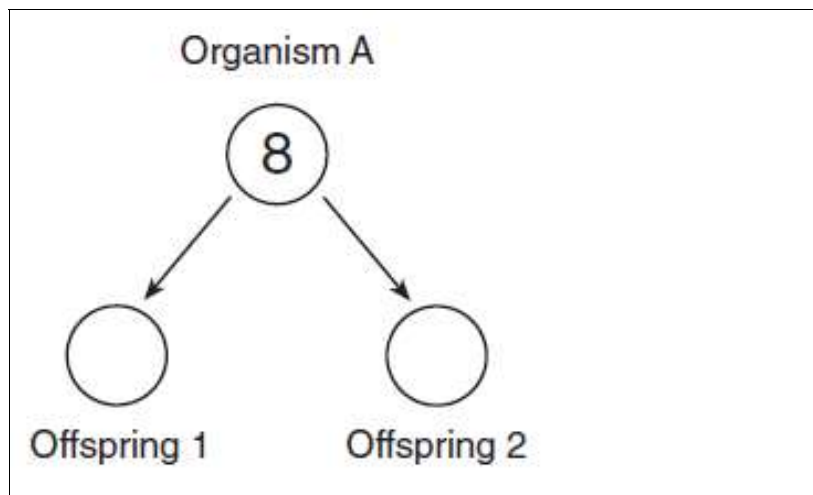
Data Base File Number: 747

Regents Date June2003-52.bmp

June2003

52 6/19/2003 S4K2

Answer 4



## mitosis

258. Base your answer to this question the information given and on the diagram shown and on your knowledge of biology. The diagram represents a biological process. A student made a wet mount slide of living onion root cells to observe with a microscope. The diagram shown represents what the student saw. What cell process is shown in several cells?

- (1) mitosis
- (2) photosynthesis
- (3) respiration
- (4) transpiration

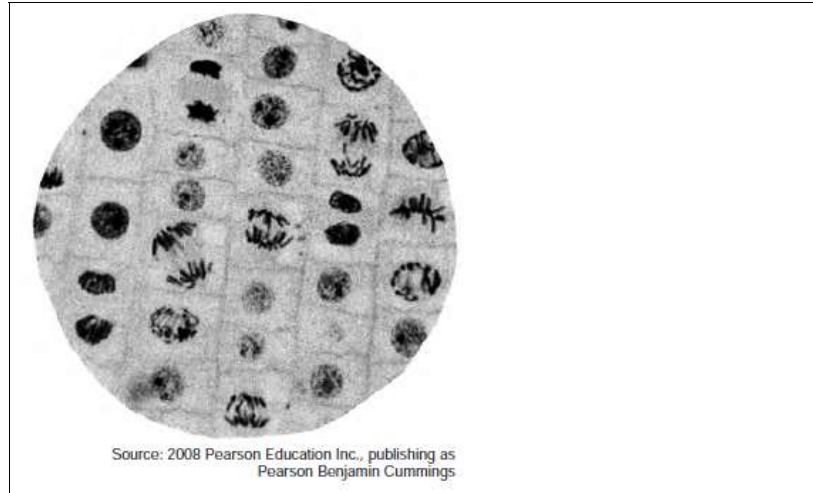
Data Base File Number: 1619

Regents Date Aug2023-55.bmp

Aug2023

55 8/17/2023 LABA

Answer 1



## mitosis

259. The process of embryonic development is represented in the diagram as shown. The three arrows in the diagram each represent a process known as

- (1) mitotic cell division
- (2) meiotic cell division
- (3) fertilization of gamete cells
- (4) differentiation of tissues

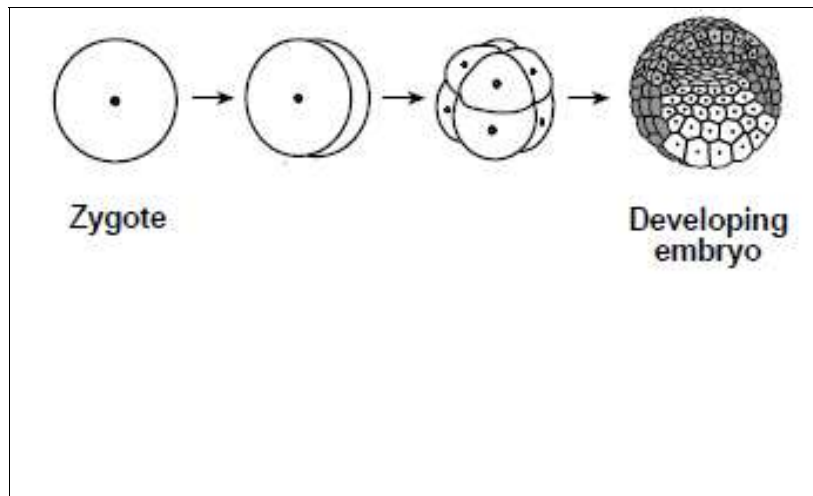
Data Base File Number: 1371

Regents Date Aug2019-34.bmp

Aug2019

34 8/14/2019 S4K4

Answer 1



## mitosis

260. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents events that occur during embryonic development. Letters A through E represent structures. Between which two letters does mitosis occur?

(1) A and B

(3) A and C

(2) B and C

(4) C and D

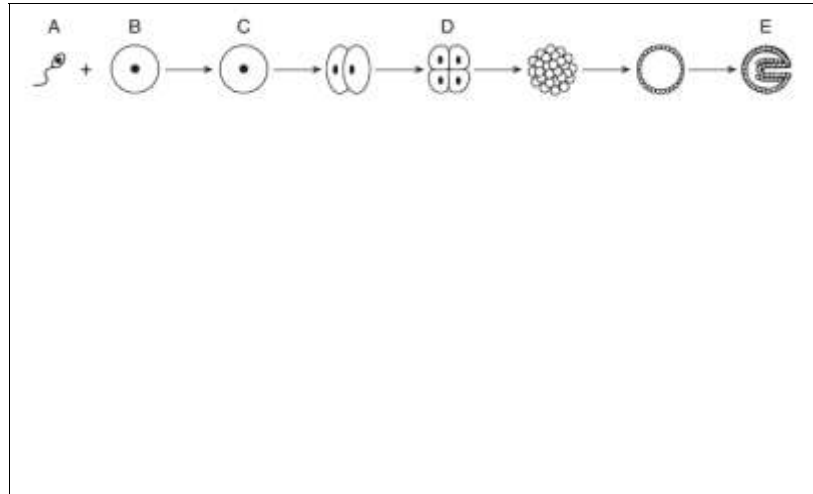
Data Base File Number: 971

Regents Date Aug2014-40.bmp

Aug2014

40 8/14/2014 S4K4

Answer 4



## mitosis

261. Which activity most directly involves the process represented in the diagram?

(1) a gamete reproducing sexually

(3) a zygote being produced in an ovary

(2) a white blood cell engulfing bacteria

(4) an animal repairing damaged tissue

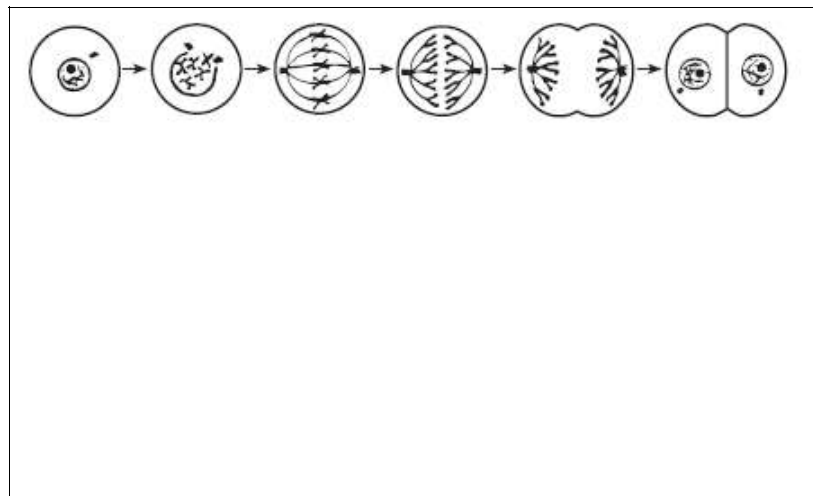
Data Base File Number: 765

Regents Date Aug2003-37.bmp

Aug2003

37 8/13/2003 S4K4

Answer 4



**mitosis**

262. The chromosome content of a skin cell, shown as diagram "A", is about to form two new skin cells. Which diagram, shown in "B" best represents the chromosomes that would be found in the two new skin cells produced as a result of this process?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

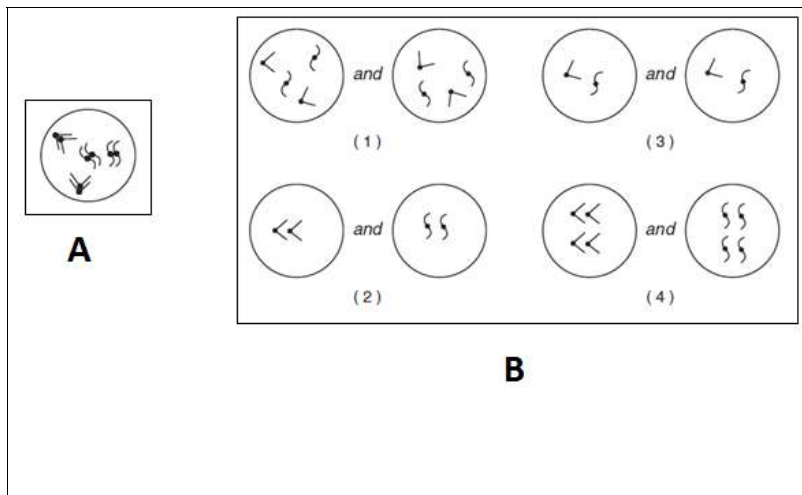
Data Base File Number: 689

Regents Date Aug2004-30C.bm

Aug2004

30 8/17/2004 S4K4

Answer 1



**mitosis**

263. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the reproductive cycle of a squirrel species with 40 chromosomes in each zygote. A process that could be represented by A is

- (1) fertilization
- (2) meiosis
- (3) mitosis
- (4) mutation

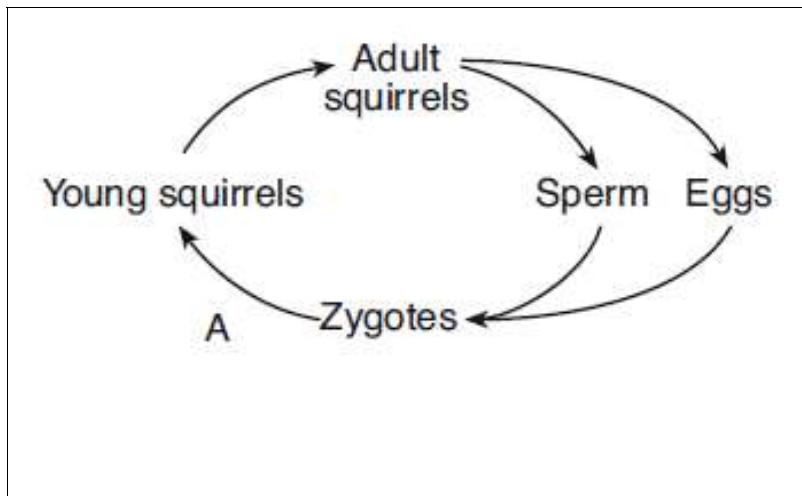
Data Base File Number: 415

Regents Date June2012-38.bmp

June2012

38 6/19/2012 S4K4

Answer 3



## molecular motion

264. The diagram shown represents two processes that occur in organisms. A characteristic represented by X is common to both of these processes. A characteristic that the two processes have in common is that each process

- (1) uses ATP
- (2) requires enzymes
- (3) uses oxygen
- (4) moves molecules

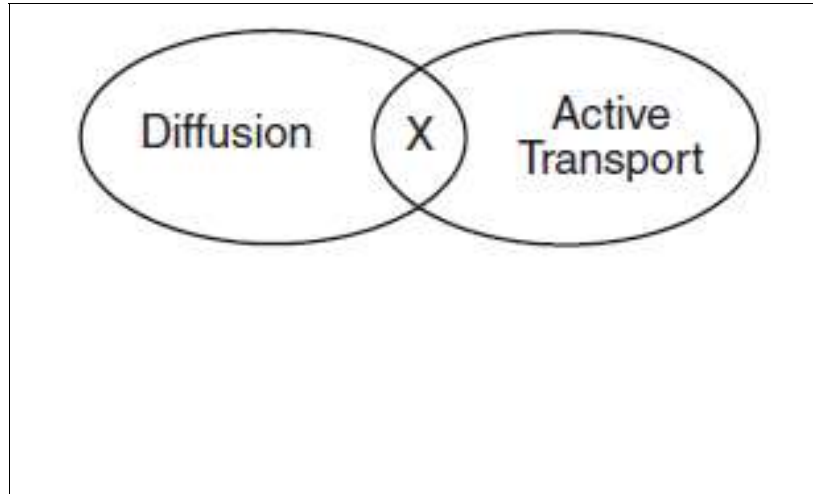
Data Base File Number: 984

Regents Date Jan2015-5.bmp

Jan2015

5 2/26/2015 S4K1

Answer 4



## mRNA

265. The diagram shows some of the steps in protein synthesis. The section of DNA being used to make the strand of mRNA is known as a

- (1) carbohydrate
- (2) gene
- (3) ribosome
- (4) chromosome

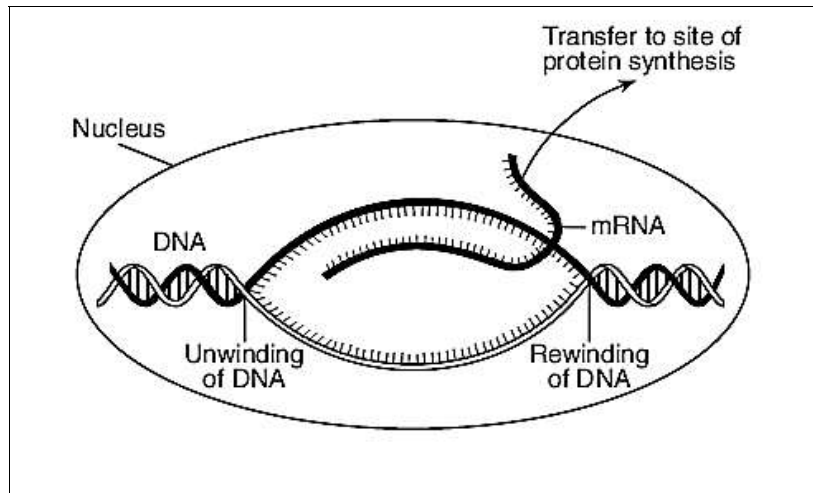
Data Base File Number: 103

Regents Date June08-38.bmp

June2008

38 6/24/2008 S4K2

Answer 2



## mRNA codon

266. Base your answer to this question on the DNA base sequence shown in the diagram and on your knowledge of biology. What are the mRNA codons that would be produced using the DNA base sequence shown in the diagram?

- (1) UUU CAG TAA UCC ATC                      (3) TAA GAA CAA TAG GGC  
(2) UUG CGG CAG GCG AUC                      (4) AAT UUT AGC CAG GCA

Data Base File Number: 894

Regents Date June2013-77.bmp

June2013

77 6/11/2013 LAB1

Answer 2

AAC-GCC-GTC-CGC-TAG

## mRNA Codon

267. Series I represents three mRNA codons. Series II includes a mutation of series I. How would the amino acid sequence produced by the mutant strand (series II) compare to the amino acid sequence produced by series I?

- (1) The amino acid sequence would be shorter.                      (3) The amino acid sequence would remain unchanged.  
(2) One amino acid in the sequence would change.                      (4) More than one amino acid in the sequence would change.

Data Base File Number: 604

Regents Date Aug2005-73B.bm

Aug2005

73 8/16/2005 LAB1

Answer 2

Series I AGAUCGAGU

Series II ACAUCGAGU

## mRNA codon

268. Base your answer to this question on the chart shown, which represents an example of some mRNA codons, and on your knowledge of biology. How many different codons can code for the amino acid threonine (THR)?

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

Data Base File Number: 252

Regents Date Jan2010-79.bmp

Jan2010

78 1/26/2010 LABS

Answer 4

AUU AUC AUA	ILE	ACU ACC ACA ACG	THR	AAU AAC	ASN	AGU AGC	SER
AUG	MET			AAA AAG	LYS	AGA AGG	ARG

## muscle fatigue

269. A student is opening and closing clothespins as part of a lab activity. The student begins to experience muscle fatigue, and the rate at which the student is opening and closing the clothespins slows. Which graph best represents the relationship between time and number of clothespin squeezes?

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

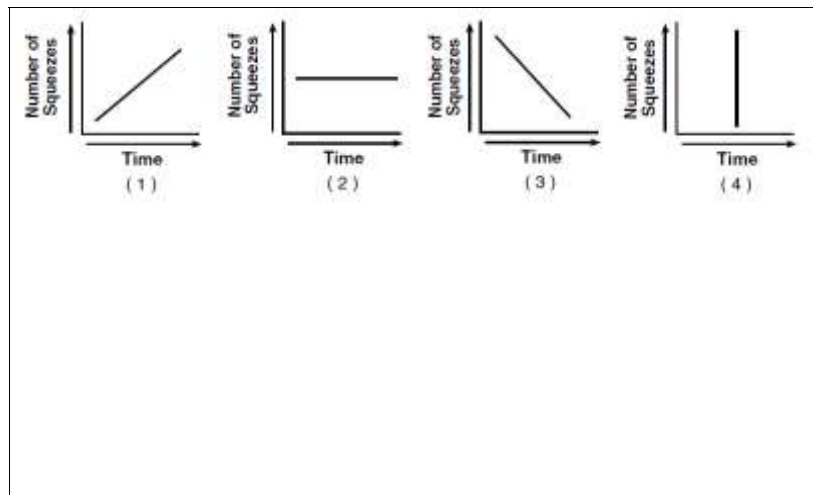
Data Base File Number: 1242

Regents Date Jan2018-76.bmp

Jan2018

76 1/22/2018 LAB2

Answer 3





mutation

270. The diagram as shown represents one of a number of different types of mutations that can occur in DNA. This mutation can best be described as the

- (1) pairing of an adenine (A) base with thymine (T)
- (2) the insertion of an adenine (A) base into both strands of the DNA molecule
- (3) the substitution of an adenine (A) base for guanine (G)
- (4) deletion of an adenine (A) base from the DNA molecule

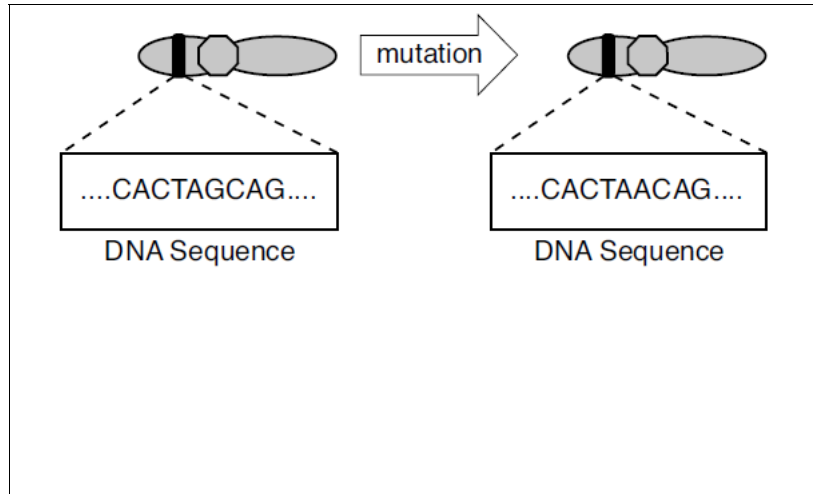
Data Base File Number: 1468

Regents Date June2022-12.bmp

June2022

12 6/15/2022 S4K2

Answer 3



mutation

271. The diagram shown can be used to illustrate cellular changes. Which row of terms in the chart below best completes the diagram?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 362

Regents Date Aug2011-9.bmp

Aug2011

9 8/18/2011 S4K5

Answer 2

Cells exposed to A  
↓  
Can develop B and C

Which row of terms in the chart below best completes the diagram?

Row	A	B	C
(1)	atmospheric oxygen	mutations	increased mitochondria
(2)	radiation	cancer	mutations
(3)	salt water	more cytoplasm	two nuclei
(4)	less sunlight	extra genes	decreased mutations

**mutation**

272. Some steps involved in DNA replication and protein synthesis are summarized in the table shown. In which step would a mutation lead directly to the formation of an altered gene?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 72

Regents Date Jan08-34.bmp

Jan2008

34 1/25/2008 S4K3

Answer 1

Step A	DNA is copied and each new cell gets a full copy.
Step B	Information copied from DNA moves to the cytoplasm.
Step C	Proteins are assembled at the ribosomes.
Step D	Proteins fold and begin functioning.

**mutation**

273. Many domestic plants that are currently used for food by humans share a wild plant ancestor. The changes that have occurred in four common plants and the results are shown in the chart. What event most likely produced the changes that occurred in the wild plant ancestor?

- (1) Mutations in wild mustard sex cells were passed on to offspring.
- (2) Humans did not like to eat wild mustard.
- (3) Competition for survival occurred in all ecosystems of the world.
- (4) Ancient herbivores overgrazed wild mustard.

Data Base File Number: 1095

Regents Date June2016-9.bmp

June2016

9 6/15/2016 S4K3

Answer 1

Wild Plant Ancestor	Change That Occurred	Resulting Modern Plant
wild mustard	reduced flower development	broccoli
wild mustard	sterile flowers	cauliflower
wild mustard	enlargement of leaves	kale
wild mustard	shortened stem length	cabbage

mutation

274. Base your answer to this question on the information given and on your knowledge of biology. ----- Butterfly Mutations ----- A Japanese nuclear power plant was damaged by an earthquake and tsunami, causing it to leak radioactive materials. Pale grass blue butterflies near the damaged power plant have been found with mutations affecting their eyes and size of their wings. What factor most likely caused these mutations?

- (1) radiation
- (2) ozone layer
- (3) global warming
- (4) change in atmospheric oxygen levels

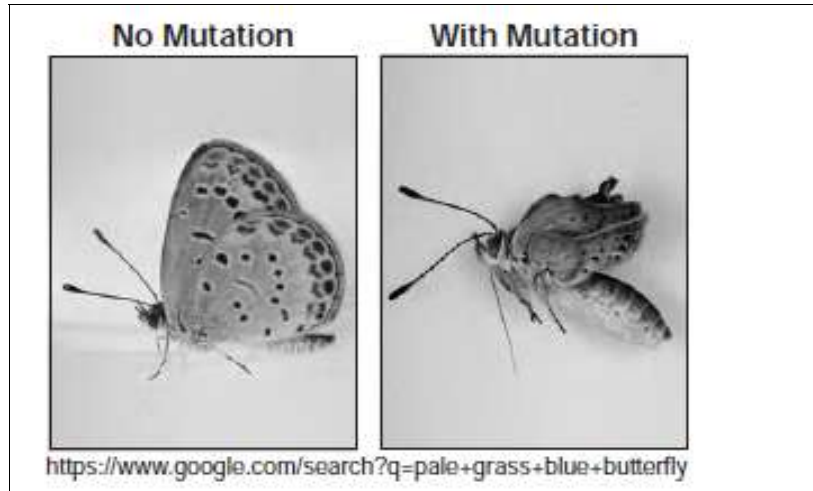
Data Base 1618  
File Number:

Regents Date Aug2023-54.bmp

Aug2023

54 8/17/2023 S4K3

Answer 1



## mutation

275. Base your answer to this question on the information and graph shown and on your knowledge of biology. A farmer growing potatoes notices aphids, a type of insect, feeding on the plants. An insecticide was sprayed on the plants several times over a two-year period. The graph represents samples of three different generations of insecticide-resistant and nonresistant aphids over this time period. The resistance gene was present in the aphid population as a result of

- (1) the need of the potatoes to become resistant to the insecticide
- (2) changes in the aphids' local habitat by the insecticide
- (3) a recombination of the proteins in the potato cells
- (4) a random change in the aphids' DNA sequence

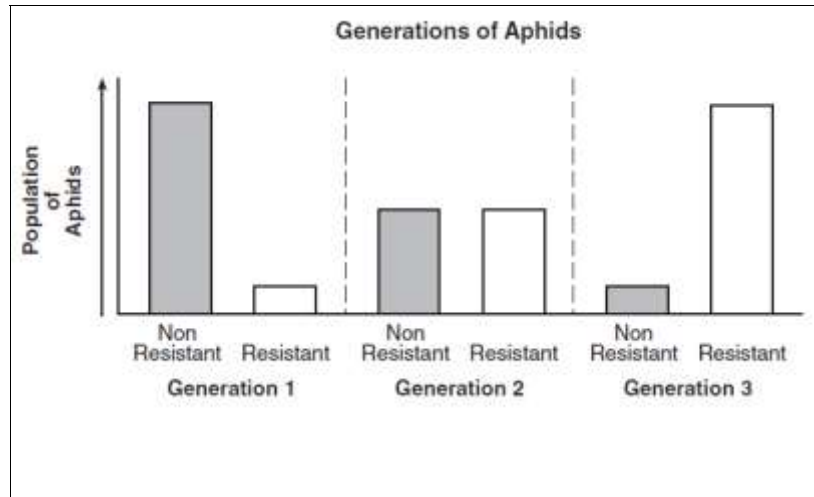
Data Base File Number: 1131

Regents Date August2016-35.b

Aug2016

35 8/18/2016 S4K2

Answer 4



mutation

276. Base your answer to this question on the information given, the Universal Genetic Code Chart as shown and on your knowledge of biology. IF YOU HAVE TROUBLE READING THE CHART, YOUR TEACHER WILL SUPPLY YOU WITH A FULL SIZE COPY OF THE CHART. The Original DNA code for Protein X is: TAC-GGC-TTA-GCT-CCC-GCG-CTA-AAA. The DNA code of Protein X undergoes a mutation.

The MUTATED DNA code for Protein X is now: TAC-GGC-TTG-GCT-CCT-GCG-CTA-AAA. Would the mutated DNA code affect the functioning of Protein X?

- (1) No
- (2) Yes
- (3) Cannot determine based on the information given.
- (4) Such a mutation cannot occur.

Data Base File Number: 1447

Regents Date June2021-78.bmp

June2021

78 6/22/2021 LAB1

Answer 1

Universal Genetic Code Chart  
Messenger RNA Codons and the Amino Acids for Which They Code

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } STOP UGA } UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

## mutation

1277. Icefish Evolution.

Over the last 50 million years, icefish evolved many adaptations that contributed to their success in surviving the decreasing water temperatures of the ocean surrounding Antarctica. For example, they have the ability to produce an antifreeze protein that prevents their blood from freezing in waters that are now below the normal freezing point of fresh water. Scientists have analyzed the icefish DNA and documented genetic changes that gave rise to the antifreeze gene. Their findings are represented in the diagram shown. Process X is referred to as

- (1) mitosis
- (2) mutation
- (3) differentiation
- (4) meiosis

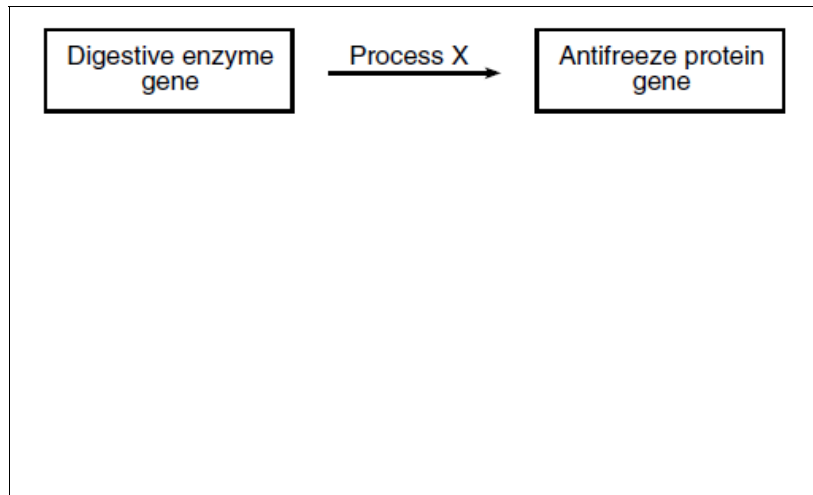
Data Base File Number: 1294

Regents Date Aug2018-47.bmp

Aug2018

47 8/17/2018 S4K2

Answer 2



## mutation

1278. The diagram shown represents the locations of two mutations in a strand of a DNA molecule. If this DNA is located in the nucleus of a skin cell, the cell will

- (1) pass the mutations on to only half the cells that develop from it
- (2) delete all of the DNA in the nucleus and synthesize new DNA
- (3) correct the mutations after several generations
- (4) pass the mutations on to the cells that develop from it

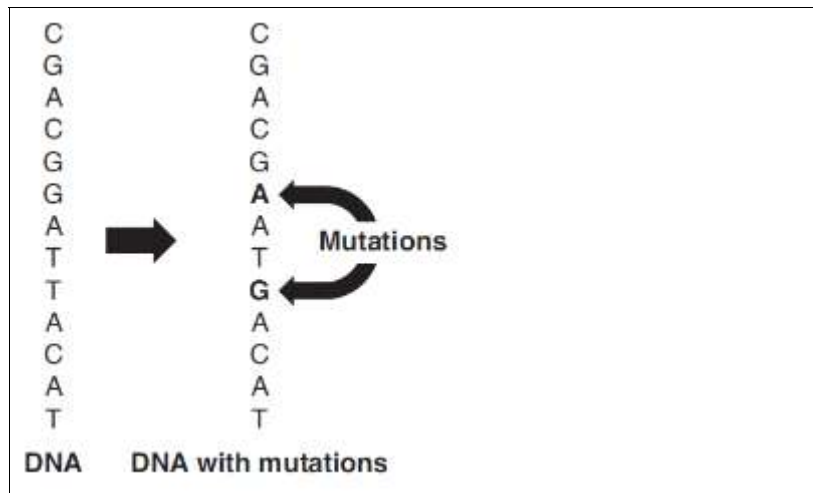
Data Base File Number: 960

Regents Date Aug2014-8.bmp

Aug2014

8 8/14/2014 S4K2

Answer 4



mutation

279. The diagram shown represents one process that might occur in cells. Which process is represented in the diagram?

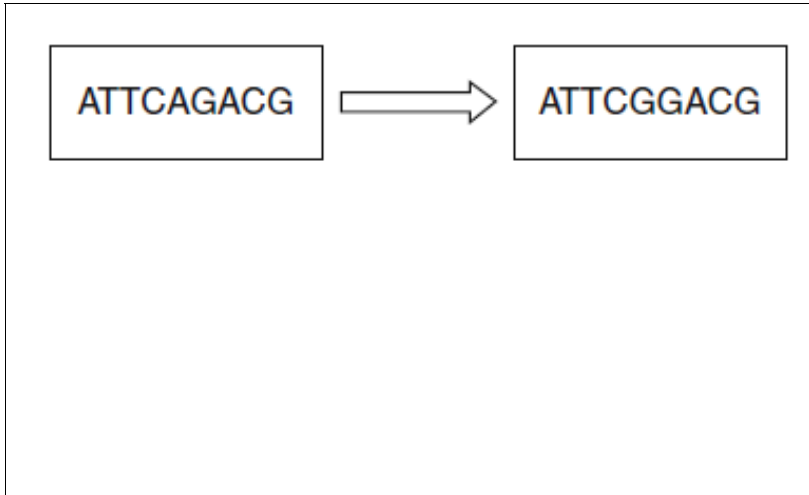
- (1) cell reproduction
- (2) meiosis
- (3) mutation
- (4) gene replication

Data Base 432  
File Number:

Regents Date Aug2012-8.bmp

Aug2012  
8 8/17/2012 S4K2

Answer 3



mutation

280. Base your answer to this question on the illustration and passage shown and on your knowledge of biology. A few breeds of cat have no tails. Manx cats have extremely short tails and may even appear to have no tail at all. Manx cats were first discovered several hundred years ago. Scientists have determined that a certain mutation in a group of genes (called T-box genes) interferes with the development of the spine in the cat embryo. Mutations in these T-box genes can cause abnormalities in the number, shape, and/or size of bones in the spines of Manx cats, which results in smaller spines and shorter tails. If a Manx cat inherits one copy of the mutated T-box gene and one copy of the normal gene, it will have a very short tail or no tail at all. If the cat embryo inherits two copies of these mutated genes, it will stop developing and die. Therefore, all surviving Manx cats have only one copy of the mutated gene. What is the reason that the mutation in Manx cat embryos causes them to have such very short tails?

- (1) The mutation interferes with the development of the spine.
- (2) The mutation interferes with the X chromosome.
- (3) The mutation interferes with the Y chromosome
- (4) The mutation interferes with the sperm and egg cell development.

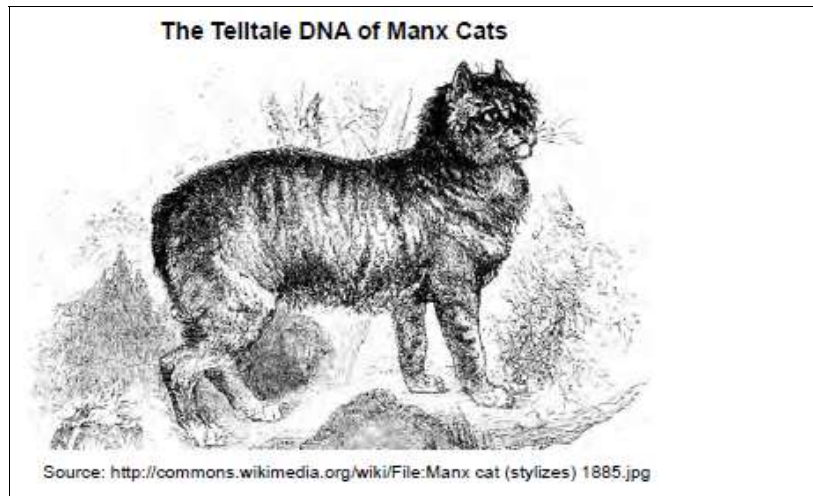
Data Base File Number: 1379

Regents Date Aug2019-62.bmp

Aug2019

62 8/14/2019 S4K2

Answer 1





## mutation

281. Which row in the chart shown accurately identifies two causes of mutations and the cells that must be affected in order for the mutations to be passed on to offspring?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1363

Regents Date Aug2019-15.bmp

Aug2019

15 8/14/2019 S4K5

Answer 4

Row	Cause of Mutations	Cells Affected
(1)	infections and antigens	body cells
(2)	meiosis and mitosis	body cells
(3)	disease and differentiation	sex cells
(4)	chemicals and radiation	sex cells

## mutation / deletion

282. An alteration of genetic information is shown in the diagram. This type of alteration of the genetic information is an example of

(1) deletion

(3) substitution

(2) insertion

(4) recombination

Data Base File Number: 402

Regents Date June2012-8.bmp

June2012

8 6/19/2012 S4K2

Answer 1

A-G-T-A-C-C-G-A-T → A-G-T-G-A-T

## natural predators

283. Base your answer to this question on the information given and the illustration shown and on your knowledge of biology.

### Mimicry in Snakes

Mimicry is an evolved resemblance between two species. The harmless scarlet king snake mimics the Eastern coral snake. The king snake has evolved red, yellow, and black bands that make it look very similar to the venomous coral snake. In some areas, both snakes are found together and consume some of the same organisms for food. How is mimicry a benefit to the King snake species?

- (1) The King Snake looks like the venomous CoralSnake so snake predators would avoid the King Snake?  
(2) The King Snake can hide more easily.  
(3) The King Snake is non-venomous.  
(4) The King Snake is larger.

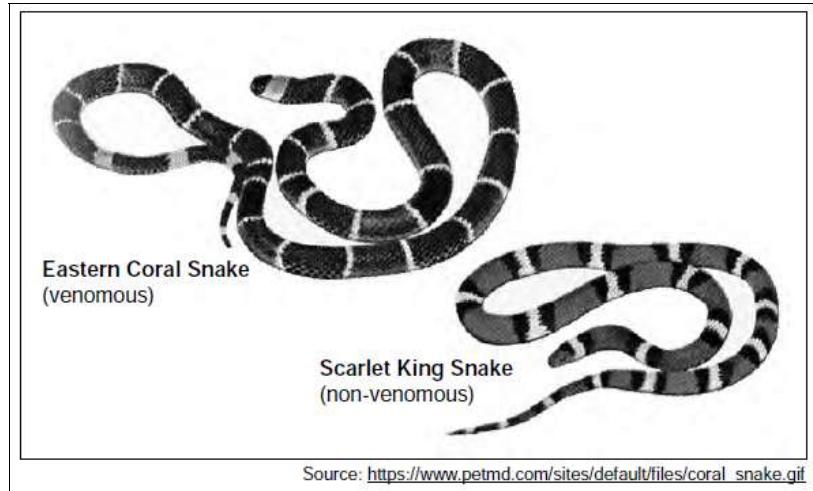
Data Base File Number: 1679

Regents Date June2024-62.bmp

June2024

62 6/14/2024 S4K3

Answer 1



## natural selection

284. The diagram shown illustrates activities taking place with some bacteria. Individuals who contract a disease caused by a strain of a drug-resistant bacteria are at risk. This is because, when they are treated with certain antibiotics,

- (1) the resistant bacteria survive in greater numbers and pass the trait to their offspring
- (2) the beneficial bacteria are unaffected, rapidly reproduce, and destroy the resistant bacteria
- (3) the resistant bacteria are killed only by increasing the dose of antibiotics
- (4) the beneficial bacteria survive but do not pass their traits to their offspring

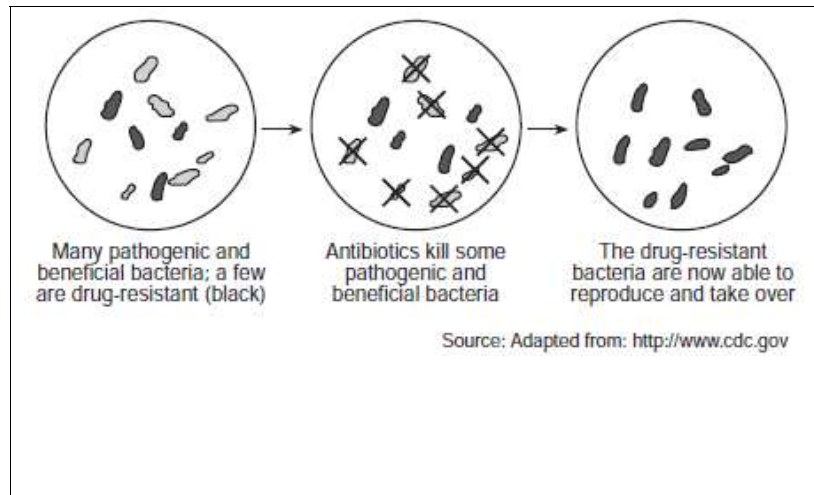
Data Base File Number: 1612

Regents Date Aug2023-38.bmp

Aug2023

38 8/17/2023 S1K1

Answer 1



## natural selection

285. The graph shows the changes in the number of individuals in a population who have a specific trait. Which statement concerning this trait is a valid inference?

- (1) As time passed, an increasing number of individuals with this trait survived and reproduced.
- (2) Individuals can acquire new survival characteristics over time and pass them on to their offspring.
- (3) The longer a species is in an environment, the less likely it is that mutations will occur within the species.
- (4) The number of traits a species possesses has a direct relationship to the amount of time the species will exist.

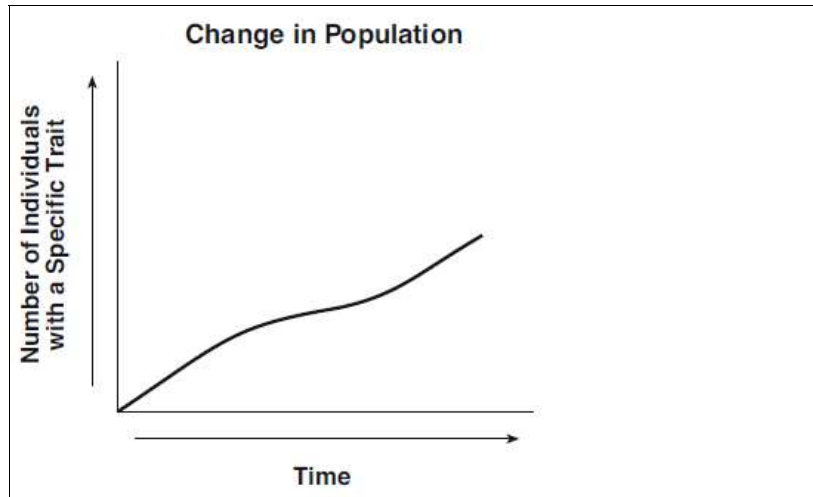
Data Base File Number: 614

Regents Date Jan2013-34.bmp

Jan2013

34 1/23/2013 S4K3

Answer 1



## natural selection

286. The graph shown represents the number of brown and green beetles collected in a particular ecosystem. The change observed in the number of green and brown beetles in the population is most likely due to

- (1) natural selection
- (2) selective breeding
- (3) gene manipulation
- (4) a common ancestor

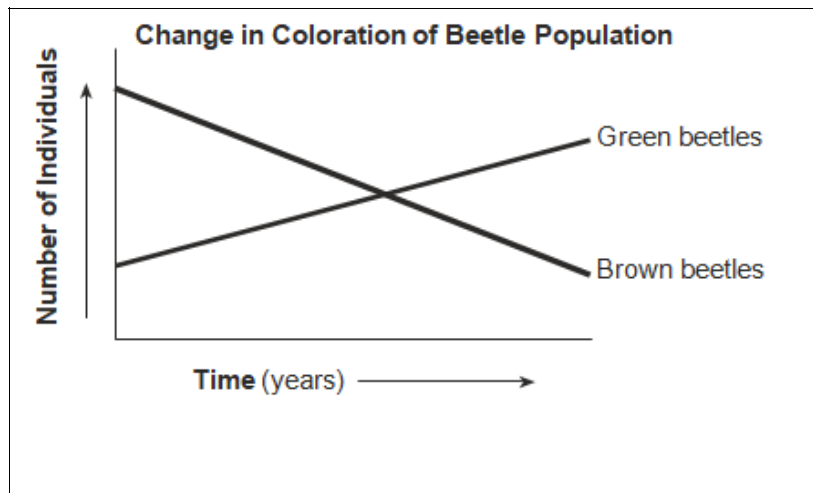
Data Base File Number: 1202

Regents Date Aug2017-17.bmp

Aug2017

17 8/17/2017 S4K3

Answer 1



**natural selection**

287. Which concept is best illustrated in the flowchart shown?

- (1) natural selection
- (2) genetic manipulation
- (3) dynamic equilibrium
- (4) natural cycles

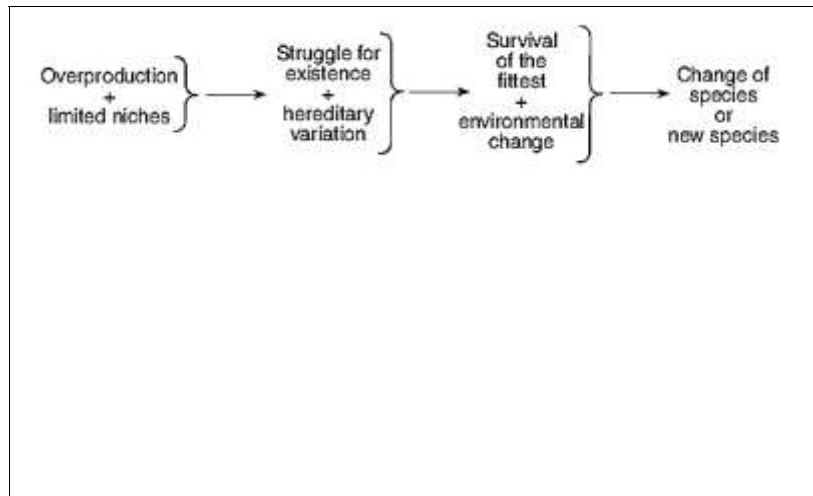
Data Base File Number: 64

Regents Date Jan08-10.bmp

Jan2008

10 1/25/2008 S4K3

Answer 1



**natural selection**

288. Base your answer to this question on the information and graph shown and on your knowledge of biology. A farmer growing potatoes notices aphids, a type of insect, feeding on the plants. An insecticide was sprayed on the plants several times over a two-year period. The graph represents samples of three different generations of insecticide-resistant and nonresistant aphids over this time period. In year three, the farmer discontinued the use of the insecticide. Which statement would best predict the population in generation 4?

- (1) The nonresistant aphid would become extinct.
- (2) The nonresistant aphid population would likely increase.
- (3) The resistant aphid would mutate to a nonresistant aphid.
- (4) The plants would be free of insect populations.

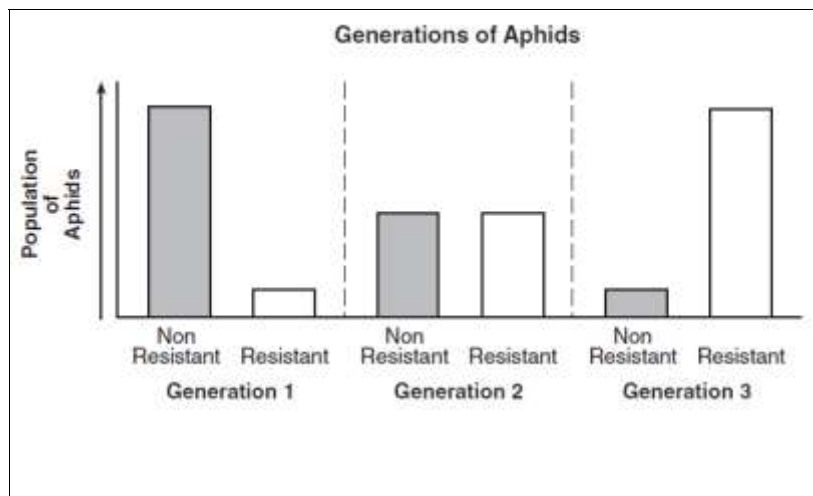
Data Base File Number: 1132

Regents Date August2016-35.b

Aug2016

36 8/18/2016 S1K3

Answer 2



**natural selection**

289. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows the heads of four different species of Galapagos Islands finches. The four different types of beaks shown are most likely the result of

- (1) gene manipulation
- (2) natural selection
- (3) unchanging environmental conditions
- (4) patterns of behavior learned from parents

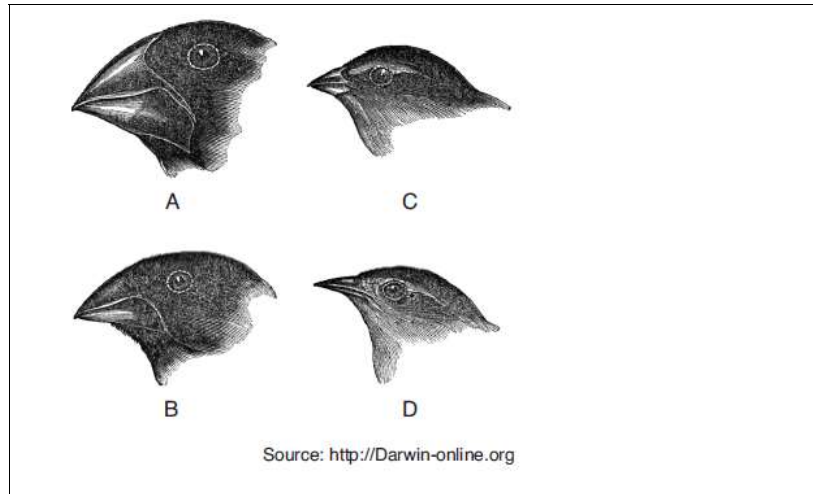
Data Base File Number: 274

Regents Date June2010-76.bmp

June2010

76 6/16/2010 LABS

Answer 2



**natural selection**

290. The characteristics of four finches that inhabit the same island are represented in the chart shown. Studies of the finches of the Galapagos Islands have shown that

- (1) DNA will change to produce structures needed by birds to survive intense competition
- (2) a bird's beak changes annually in response to the type of food that is most abundant each year
- (3) natural selection occurs when there are scarce resources and intense competition
- (4) the beak of a finch will change if the environment of the bird remains stable

Data Base File Number: 330

Regents Date Jan2011-74.bmp

Jan2011

74 1/25/2011 LABS

Answer 3

<p>Large Ground Finch</p> <p>Beak: crushing</p> <p>Food: mainly plant</p>	<p>Warbler Finch</p> <p>Beak: probing</p> <p>Food: 100% animal</p>
<p>Small Ground Finch</p> <p>Beak: crushing</p> <p>Food: mainly plant</p>	<p>Large Tree Finch</p> <p>Beak: grasping</p> <p>Food: mainly animal</p>

natural selection

291. ROTATE your test paper to the LEFT so the cartoon is in its correct orientation. The diagram shown represents an important biological concept. The concept being represented is

- (1) overproduction
- (2) natural selection
- (3) homeostasis
- (4) ecological succession

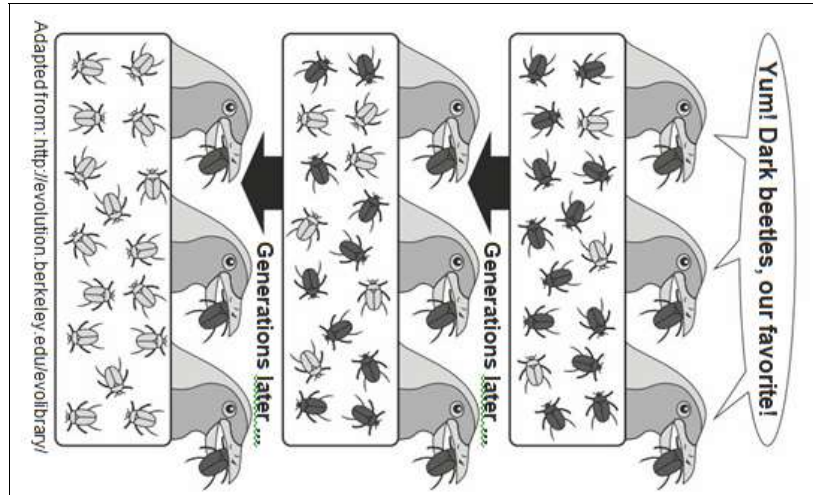
Data Base File Number: 1178

Regents Date June2017-31B.b

June2017

31 6/14/2017 S4K3

Answer 2



## natural selection

292. Base your answers to this question on the information given and photo shown and on your knowledge of biology. Burmese pythons are an invasive species in the Everglades National Park. In 2010, there was a rare "hard freeze" which residents hoped would eliminate these pests that were originally from very warm areas in Asia. Roughly 40% to 90% of the pythons were killed by the freeze event. Since not all of the pythons were killed during the freeze event, the members of the current large python population in the Everglades might differ from the members of the python population from before 2010. Which statement best describes a likely cause for the changes that might exist in the present python population?

- (1) The python species needed cold-tolerant genes, and they appeared in 2010 by rapid mutation.
- (2) The freeze event served as a selecting agent, and a higher percentage of the pythons existing today are cold-tolerant.
- (3) Many individual pythons were unable to reproduce during the freeze event and did not pass on their cold-tolerant genes.
- (4) There was no actual change in the population, and if a similar freeze event occurred again, 40-90% of the snakes would die.

Data Base 1671  
File Number:

Regents Date June2024-40.bmp

June2024

40 6/14/2024 S4K3

Answer 2



Source: Associated Press, August 18, 2017



**natural selection**

293. The table shows adaptations in two organisms. The presence of these adaptations is most likely the result of

- (1) reproductive technology
- (2) natural selection
- (3) asexual reproduction
- (4) human interference

Data Base File Number: 403

Regents Date June2012-9.bmp

June2012

9 6/19/2012 S4K3

Answer 2

Environmental Adaptations		
Organism	Environment	Adaptation
desert rat	hot and dry	comes out of burrow only at night
Arctic poppy plant	cold and windy	grows low to ground next to rocks

**natural selection**

294. The diagram shown represents four different species of wild birds. Each species has feet with different structural adaptations. The development of these adaptations can best be explained by the concept of

- (1) inheritance of resistance to diseases that affect all these species
- (2) inheritance of characteristics acquired after the birds hatched from the egg
- (3) natural selection
- (4) selective breeding

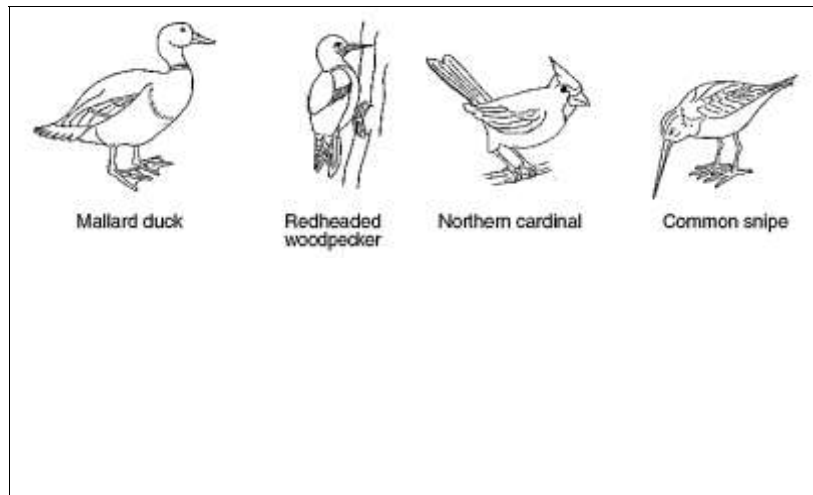
Data Base File Number: 27

Regents Date June07-22.bmp

June2007

22 6/20/2007 S4K3

Answer 3



## natural selection

295. Shown are two tools that students used as models of finch beaks during the "Beaks of Finches" lab investigation. Which important concept of natural selection do these model beaks represent?

- (1) dynamic equilibrium
- (2) limiting factor
- (3) environment
- (4) variation

Data Base File Number: 1684

Regents Date June2024-81.bmp

June2024

81 6/14/2024 LAB3

Answer 4



## natural selection

296. Hummingbirds, with their long beaks and tongues, are attracted to long, tubular flowers with a lot of nectar. When a hummingbird consumes the nectar from a flower, pollen sticks to the hummingbird and is transferred when the hummingbird feeds from other flowers. This relationship between the flowers and hummingbirds is a result of

- (1) changes in hummingbirds and flowers in response to their needs
- (2) inheritance of characteristics acquired during their lifetime
- (3) natural selection of beneficial variations
- (4) the environment modifying gene expression

Data Base File Number: 1699

Regents Date Aug2024-38.bmp

Aug2024

38 8/20/2024 S4K3

Answer 3



**natural selection**

297. Base your answer to this question on the information and graph shown and on your knowledge of biology. A farmer growing potatoes notices aphids, a type of insect, feeding on the plants. An insecticide was sprayed on the plants several times over a two-year period. The graph represents samples of three different generations of insecticide-resistant and nonresistant aphids over this time period. In year three, the farmer discontinued the use of the insecticide. One negative consequence of using an insecticide is that it

- (1) selects for insecticide-resistant organisms
- (2) keeps a balance of organic compounds
- (3) encourages biodiversity in plants
- (4) gives the nonresistant aphids a survival advantage

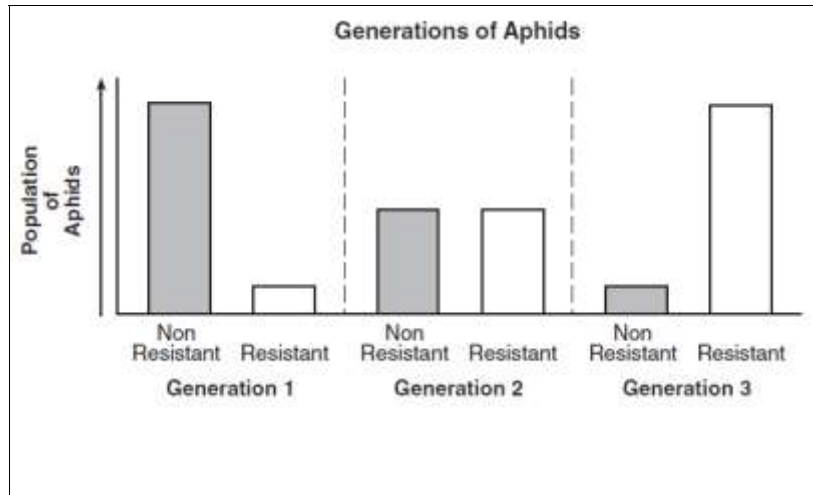
Data Base File Number: 1133

Regents Date August2016-35.b

Aug2016

37 8/18/2016 S4K3

Answer 1



**natural selection**

298. Base your answer to this question on the cartoons as shown, which refer to certain concepts of natural selection, and on your knowledge of biology. Which major part of the "Theory of Natural Selection" is illustrated by both cartoons?

- (1) Survival of the fittest.
- (2) Development of new mutations.
- (3) Superiority of predators.
- (4) Genetic engineering.

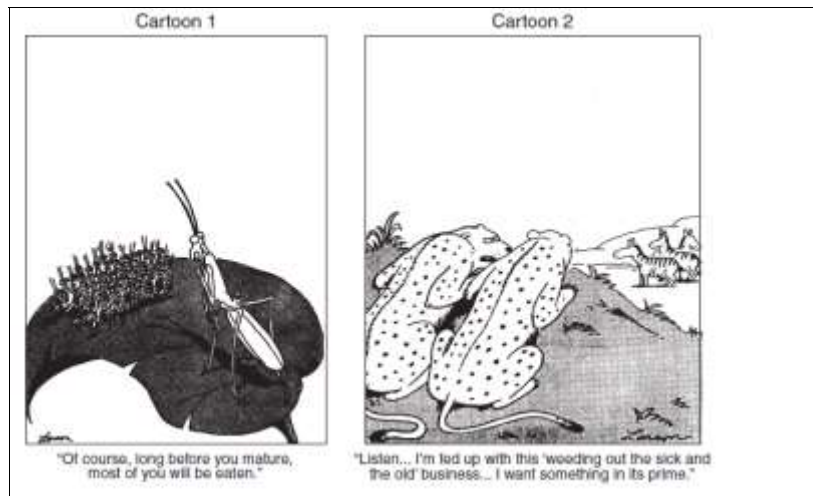
Data Base File Number: 825

Regents Date June2002-69.bmp

June2002

69 6/19/2002 S4K3

Answer 1



**natural selection**

299. The diagram shown represents the same field of mice hunted by a hawk over a period of three months. The overall changes in the population of mice can be explained best by

- (1) natural selection
- (2) succession
- (3) reproduction
- (4) mouse extinction

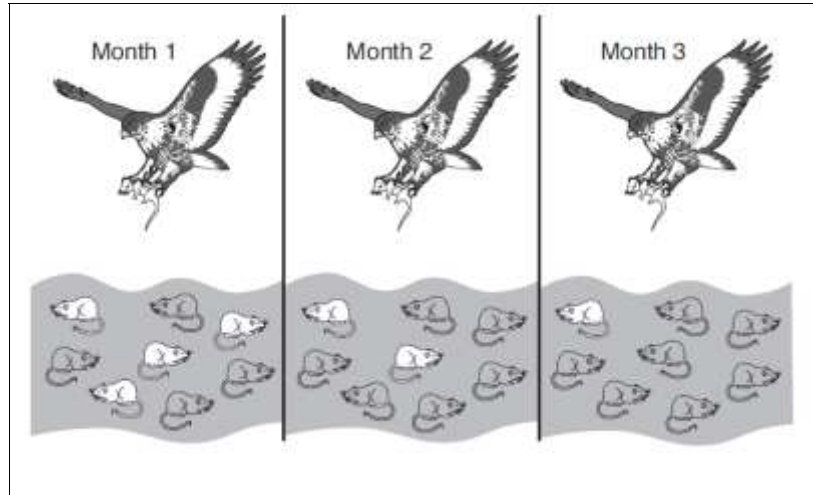
Data Base File Number: 879

Regents Date June2013-30.bmp

June2013

30 6/11/2013 S4K3

Answer 1



**natural selection**

300. The diagram shown represents the relationship between natural selection and variation. The arrow between them is labeled X. Which phrase best indicates the meaning of the arrow labeled X?

- (1) is dependent on
- (2) increases the rate of
- (3) decreases the rate of
- (4) is independent of

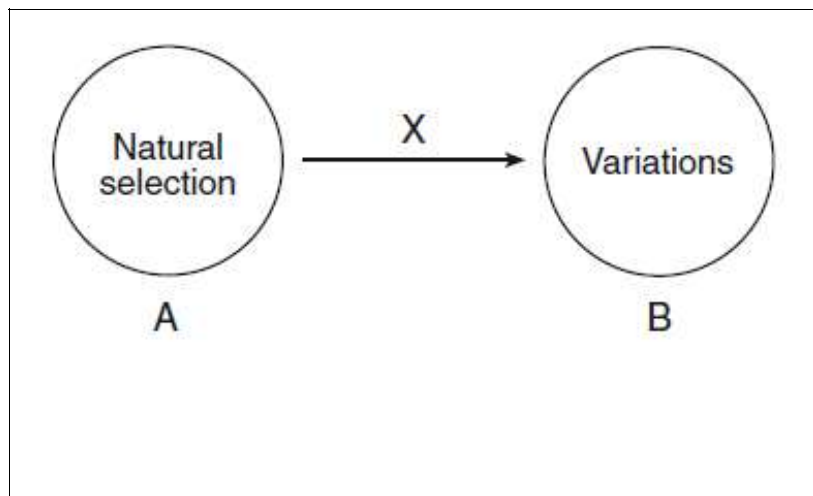
Data Base File Number: 618

Regents Date Jan2013-39.bmp

Jan2013

39 1/23/2013 S4K3

Answer 1



## natural selection

301. Base your answer to this question on the information and diagram given and on your knowledge of biology. The circled areas in the diagram represent bird species that are in the same genus, a classification group that includes closely related species. These birds are found on the Hawaiian Islands. Which processes are directly responsible for the presence of the different species of birds shown in the diagram?

- (1) mitosis and differentiation
- (2) gene manipulation and overpopulation
- (3) gene mutations and natural selection
- (4) competition and cloning

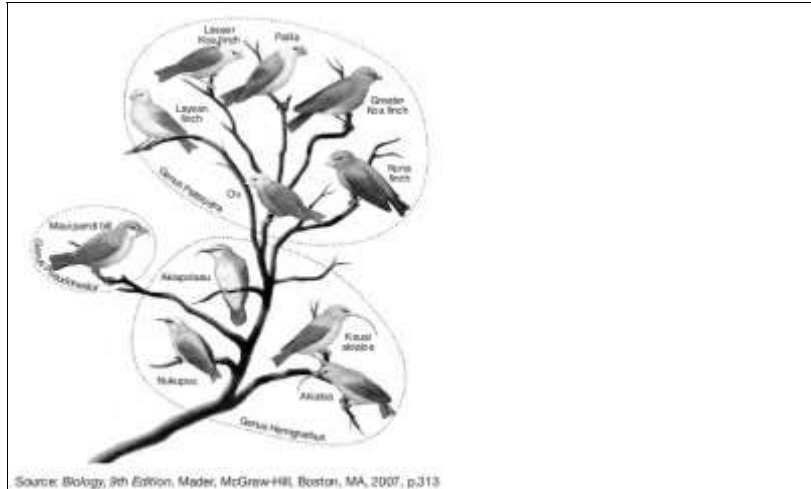
Data Base File Number: 896

Regents Date June2013-80.bmp

June2013

81 6/11/2013 LAB3

Answer 3



## natural selection

302. When it is disturbed, the bombardier beetle is able to produce and release a hot spray of irritating chemicals from the end of its body, as shown in the photo. As a result, most animals that have experienced this defense avoid the beetles in the future. The beetle's defense mechanism has developed as a result of

- (1) the need for an effective protection against its enemies
- (2) competition with its predators
- (3) natural selection over many generations
- (4) ecological succession over hundreds of years

Data Base File Number: 1422

Regents Date June2021-11.bmp

June2021

11 6/22/2021 S4K3

Answer 3



Source: <http://www.bbc.com/news/uk-england-leeds-11959381>

## natural selection

303. The diagram shown represents one possible evolutionary change that could have led lobe-finned fish to develop into the first amphibians. Amphibians are animals that live on land some of their life. This change from fins on the lobe-finned fish to legs and feet on the early amphibian is most likely due to

- (1) a sudden mutation that changed the gills of the lobe-finned fish to lungs
- (2) increased competition between animals that had adapted to living on the land
- (3) the need to move to land because of increased competition for food in the ocean
- (4) variations among offspring, followed by natural selection

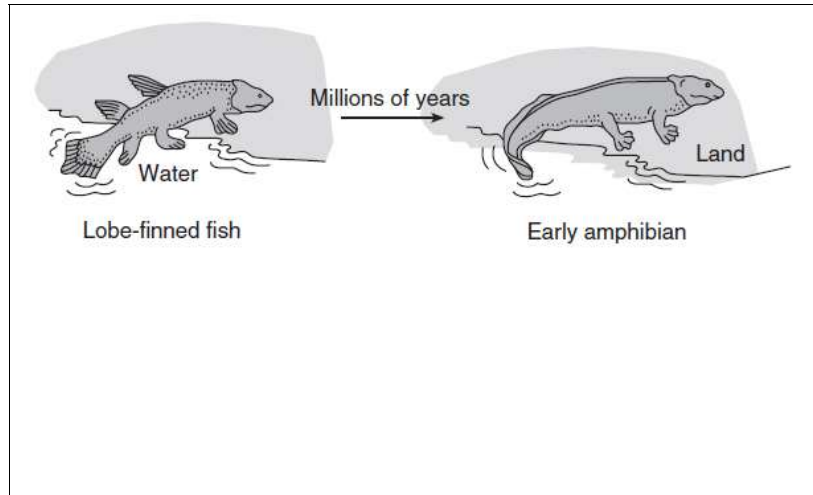
Data Base File Number: 443

Regents Date Aug2012-41.bmp

Aug2012

41 8/17/2012 S4K3

Answer 4



## natural selection

304. The diversity within the wild bird species in the diagram shown can best be explained by which process?

- (1) natural selection
- (2) asexual reproduction
- (3) ecological succession
- (4) mitotic cell division

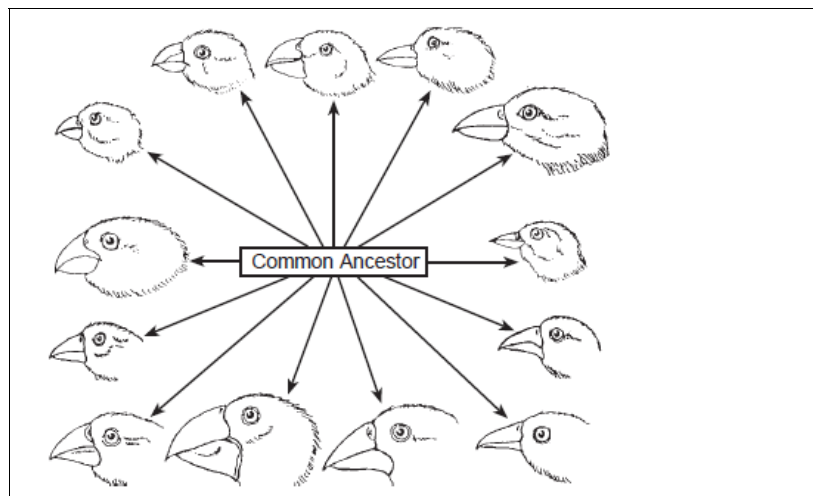
Data Base File Number: 829

Regents Date Jan2002-11.bmp

Jan2002

11 1/23/2002 S4K3

Answer 1



natural selection

1305. A small village was heavily infested with mosquitoes. The village was sprayed weekly with an insecticide for a period of several months. The results of daily counts of the mosquito population are shown in the graph. Which statement best explains why some mosquitoes survived after the first spraying?

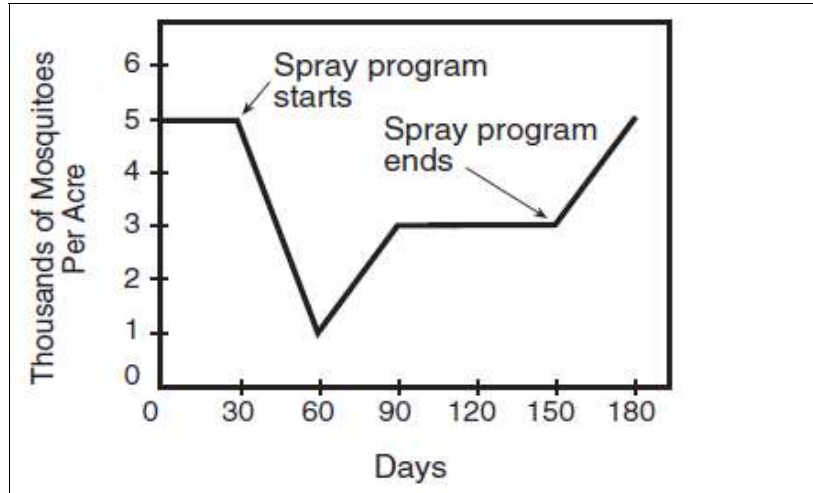
- (1) Some mosquitoes were adapted to the climatic change that occurred over the several-month period of spraying.
- (2) All of the mosquitoes contained DNA unique to the species.
- (3) The spraying of the insecticide represented a change in the environment to which all adult mosquitoes were adapted.
- (4) A natural variation existed within the mosquito population.

Data Base 767  
File Number:

Regents Date Aug2003-40.bmp

Aug2003  
40 8/13/2003 S4K3

Answer 4



natural selection

306. *Helicobacter pylori* (*H. pylori*) is the bacterium responsible for most ulcers and many cases of stomach inflammation. An antibiotic has been found to kill these bacteria. It works because *H. pylori* makes a particular enzyme that happens to react with the antibiotic and makes it poisonous to the bacterium. The sequences in the diagram, show the effects of antibiotic treatment on two strains of *H. pylori*, one of which does not produce the enzyme. The overall series of events best illustrates the process of

- (1) *H. pylori* control by the stomach
- (2) DNA replication in bacterial cells
- (3) mutation of the antibiotic used in the treatment
- (4) natural selection in *H. pylori* bacteria

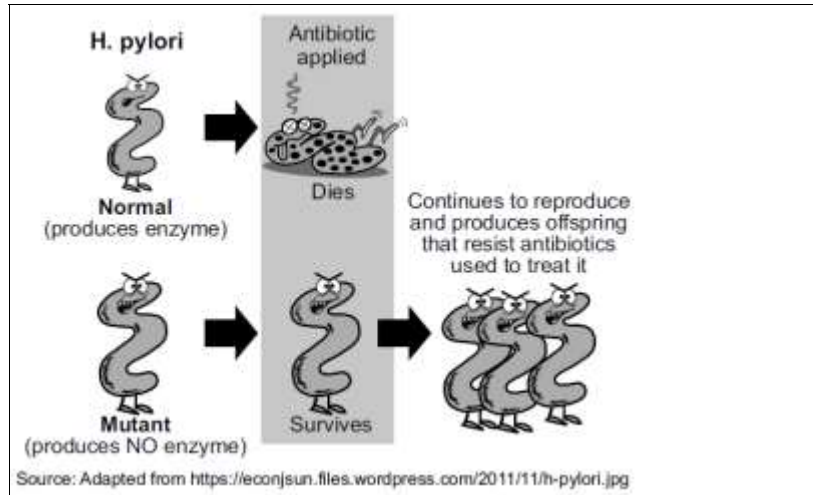
Data Base File Number: 1540

Regents Date Jan2023-22.bmp

Jan2023

22 1/24/2023 S4K3

Answer 4





## natural selection

307. Base your answer to this question on the information and graph shown and on your knowledge of biology. A population composed of tan snails and black snails inhabits the same sandy beach. A nearby volcano erupted, and black lava particles washed down to the beach. The once tan beach was now black. The graph shows the population of tan snails and black snails before and after the volcanic eruption. The increase in the number of black snails can best be explained by

- (1) natural selection after an environmental change
- (2) climatic change followed by ecological succession
- (3) increased stability due to a decrease in variation
- (4) an increase in mutation rate

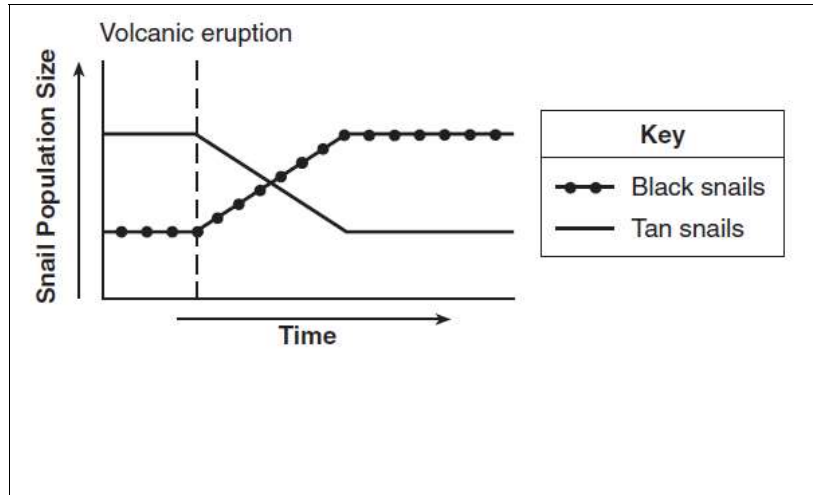
Data Base File Number: 1047

Regents Date August2015-31.b

Aug2015

32 8/12/2015 S4K3

Answer 1



## natural selection

1308. Base your answer to this question on the passage given and on your knowledge of biology. Most humans enjoy candy, cake, and ice cream. As a result of evolutionary history, we have a wide variety of tastes. This is not true of all animals. Cats do not seek sweets. Over the course of their evolutionary history, the cat family tree lost a gene to detect sweet flavors. Most birds also lack this gene, with a few exceptions. Hummingbirds are sugar junkies. Hummingbirds evolved from an insect-eating ancestor. The genes that detect the savory flavor of insects underwent changes, making hummingbirds more sensitive to sugars. These new sweet-sensing genes give hummingbirds a preference for high-calorie flower nectar. Hummingbirds actually reject certain flowers whose nectar is not sweet enough! How has the presence of the sweet-sensing gene increased in the hummingbird population over time?

- (1) Birds selecting for sweeter nectar survived and produced many offspring with the trait.
- (2) Flower nectar became sweeter.
- (3) Hummingbirds prefer insects.
- (4) Hummingbirds are random mutations.

Data Base 1380  
File Number:

Regents Date Aug2019-64.bmp

Aug2019

64 8/14/2019 S4K3

Answer 1



**natural selection**

309. The diagram shown represents a woolly mammoth, a relative of the modern elephant. Woolly mammoths lived during the Ice Age and eventually became extinct. What is a possible reason that this species died out?

- (1) The environment changed and the woolly mammoth could no longer adapt.
- (2) The number of predators of the woolly mammoth increased.
- (3) The woolly mammoth was overhunted.
- (4) Any of these answers could be correct.

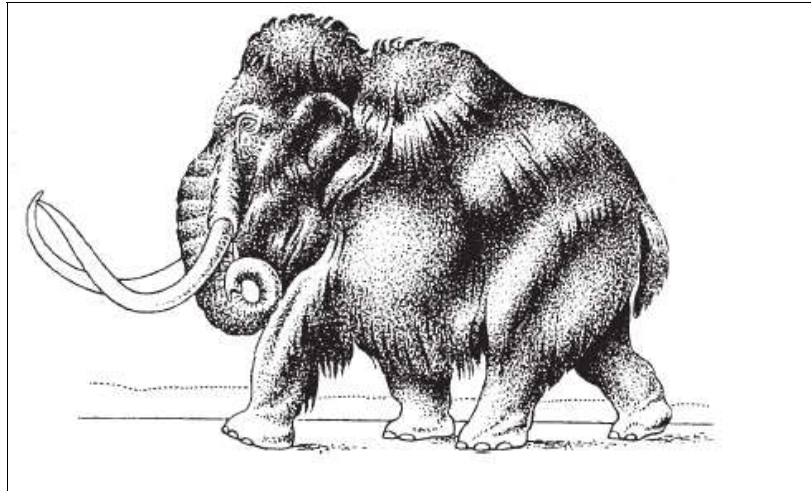
Data Base 794  
File Number:

Regents Date Aug2002-60.bmp

Aug2002

60 8/13/2002 S4K3

Answer 4



## natural selection

310. The endangered Everglade snail kite is a predatory bird which usually feeds on small snails. Conservationists feared the snail kite would face a greater decline when the Everglades was invaded by a species of larger snail that the birds had historically struggled to eat. But the snail kite population increased over several years, and the snail kites now have larger beaks and bodies. This change in the snail kite can best be explained by

- (1) selective breeding with larger kites
- (2) natural selection after an environmental change
- (3) genetic engineering to modify specific genes
- (4) ecological succession due to random mutation

Data Base File Number: 1564

Regents Date June2023-8.bmp

June2023

8 6/14/2023 S4K3

Answer 2



Source: <https://www.nytimes.com/2017/11/28>

nerve cells

311. Base your answer to this question on the diagram of the nerve cells shown and on your knowledge of biology. What would happen if a drug molecule shaped like a BOX were introduced into this nerve pathway at AREA I?

- (1) the drug would bind only with NERVE CELL B
- (2) the drug would bind only with NERVE CELL A
- (3) the drug would bind with both NERVE CELL A and NERVE CELL B
- (4) the drug would not bind with either NERVE CELL A or NERVE CELL B

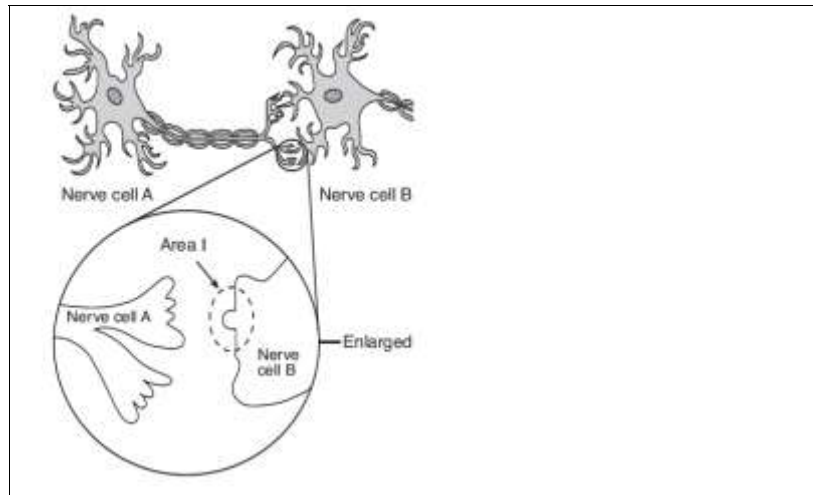
Data Base File Number: 225

Regents Date August2009-50.b

Aug2009

51 8/13/2009 S4K1

Answer 4



niche

312. Anoles are a group of lizards consisting of approximately 400 species. A scientist studying them on an island observed two species that live in different habitats and display different behaviors. His observations are listed in the table shown. Based on the scientist's observations, which statement best describes these two species of anoles?

- (1) Both species evolved through the process of ecological succession.
- (2) Each species is adapted to a different niche.
- (3) The two species can interbreed.
- (4) Species A is an herbivore and species B is a decomposer.

Data Base File Number: 1161

Regents Date Jan2017-34.bmp

Jan2017

34 1/25/2017 S4K3

Answer 2

Characteristics	Species A	Species B
length	130 – 191 mm	55 – 79 mm
toepad size	large	intermediate
color	usually green	brown
tail length	long	long

niche

1313. A scientist studied iguanas inhabiting a chain of small ocean islands. He discovered two species that live in different habitats and display different behaviors. His observations are listed in the table below. Which statement best describes these two species of iguanas?

- (1) Both species evolved through the process of ecological succession.
- (2) Each species occupies a different niche.
- (3) The two species can interbreed.
- (4) Species A is a scavenger and species B is a carnivore.

Data Base File Number: 521

Regents Date Aug2006-38.bmp

Aug2006

38 8/16/2006 S4K6

Answer 2

Observations of Two Species of Iguanas

Species A	Species B
spends most of its time in the ocean	spends most of its time on land
is rarely found more than 10 meters from shore	is found many meters inland from shore
eats algae	eats cactus and other land plants

niche

1314. The ecological niches of three bird species are shown in the diagram. What is the advantage of each bird species having a different niche?

- (1) As the birds feed higher in the tree, available energy increases.
- (2) More abiotic resources are available for each bird.
- (3) Predators are less likely to feed on birds in a variety of locations.
- (4) There is less competition for food.

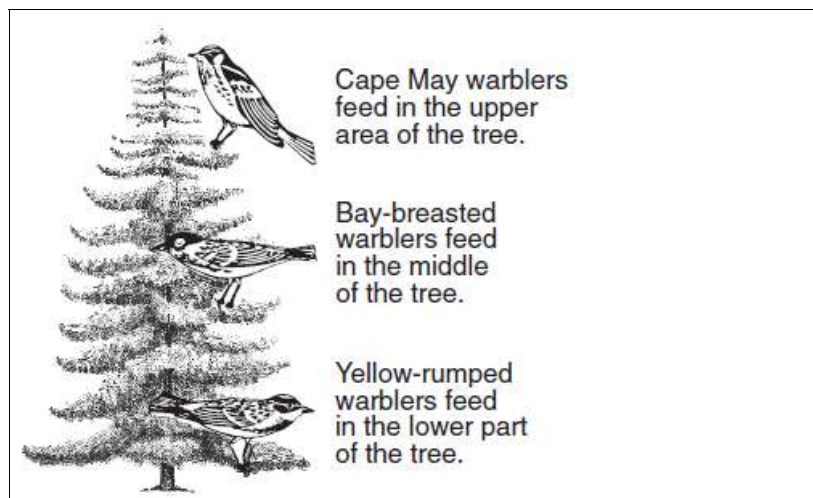
Data Base File Number: 561

Regents Date June2005-28.bmp

June2005

28 6/22/2005 S4K6

Answer 4



nucleus

315. A photograph of human cells as seen with a compound light microscope is shown. A cell structure is labeled A. Structure A is most likely a
- (1) mitochondrion that synthesizes food for the cell
  - (2) nucleus that is the site of food storage
  - (3) mitochondrion that absorbs energy from the Sun
  - (4) nucleus that is responsible for the storage of information

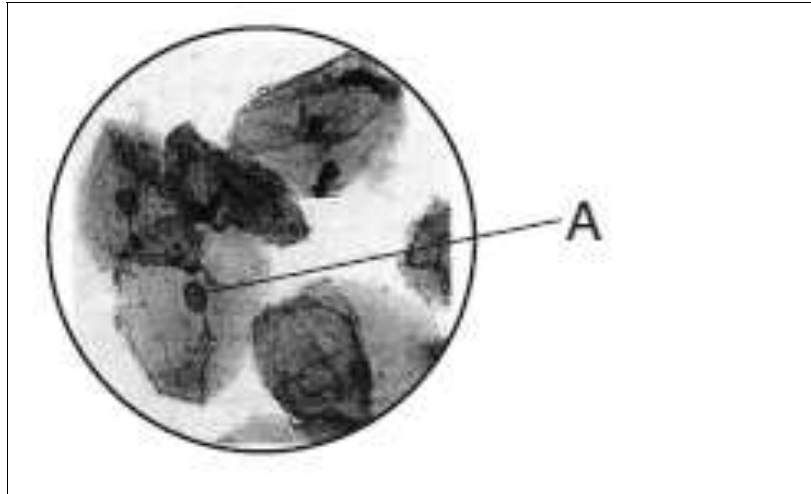
Data Base File Number: 1011

Regents Date June2015-6.bmp

June2015

6 6/16/2015 S4K1

Answer 4



nucleus

316. Base your answer to this question on the diagram shown and on your knowledge of biology. The nucleus contains molecules of A, which
- (1) recycle waste products
  - (2) remove water from the cell
  - (3) store hereditary information
  - (4) regulate the pH of cytoplasm

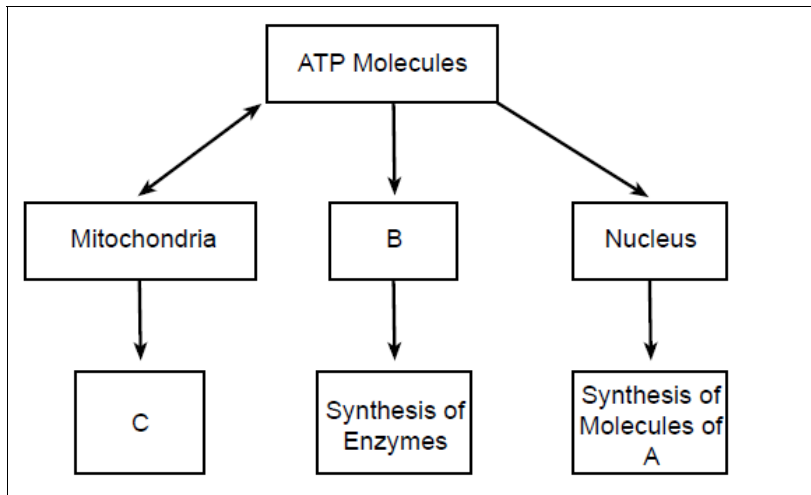
Data Base File Number: 1262

Regents Date June2018-42.bmp

June2018

43 6/13/2018 S4K1

Answer 3



nucleus

317. The diagram shown represents a cell. Which letter indicates the specific structure where most hereditary mutations occur?

- (1) A
- (2) B
- (3) C
- (4) D

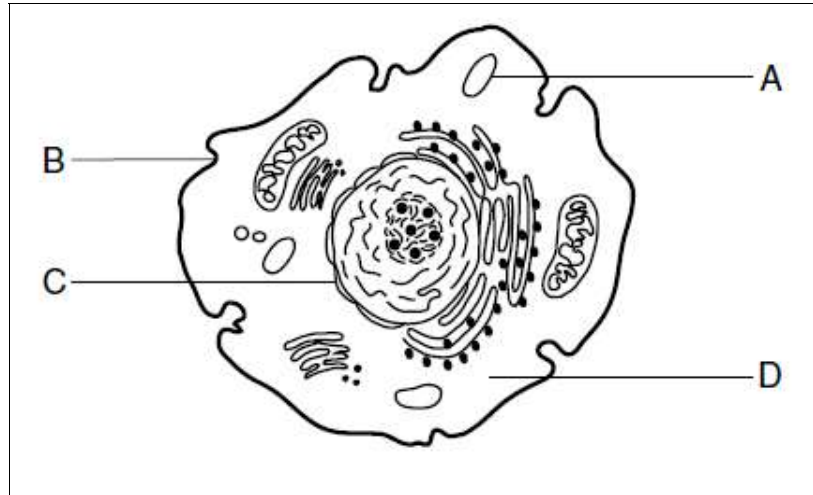
Data Base File Number: 1234

Regents Date Jan2018-30.bmp

Jan2018

30 1/22/2018 S4K2

Answer 3



nucleus

318. A cell is represented in the diagram shown. The coded information that the cell uses to synthesize many different proteins is stored in structure

- (1) A
- (2) B
- (3) C
- (4) D

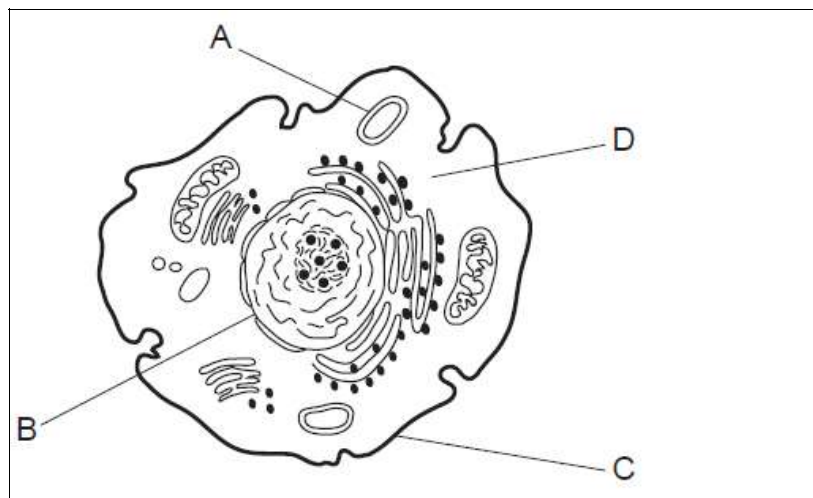
Data Base File Number: 1069

Regents Date Jan2016-13.bmp

Jan2016

13 1/27/2016 S4K2

Answer 2





## organ systems

319. The chart shows examples from two groups of organisms, multicellular and one-celled. The tissues and organs in group A perform functions that are

- (1) similar to those performed by the tissues and organs in group B
- (2) similar to those performed by the cell organelles in group B
- (3) different from those performed by the tissues and organs in group B
- (4) identical to those performed by the cell organelles in group B





Data Base File Number: 926

Regents Date Jan2014-41.bmp

Jan2014

41 1/27/2014 S4K1

Answer 2

Group A – Multicellular Organisms		Group B – One-celled Organisms	
 Cow	 Cat	 Paramecium	 Vorticella

## organ systems

320. The diagram below represents an incomplete sequence of levels of organization. This sequence can be completed correctly by inserting

- (1) "cells →" between organelles and tissues
- (2) "proteins →" between tissues and organs
- (3) "populations →" between organs and organ systems
- (4) "molecules →" between organ systems and organisms

Data Base File Number: 928

Regents Date Jan2014-43.bmp

Jan2014

43 1/27/2014 S4K1

Answer 1

organelles → tissues → organs → organ systems → organism

## organ systems

1321. The skeletal system of an animal is shown in the photograph. Which TWO systems are the MOST important in making the skeleton move when the animal is alive and functioning?

- (1) digestive and circulatory
- (2) nerve and muscle
- (3) excretory and digestive
- (4) circulatory and skin

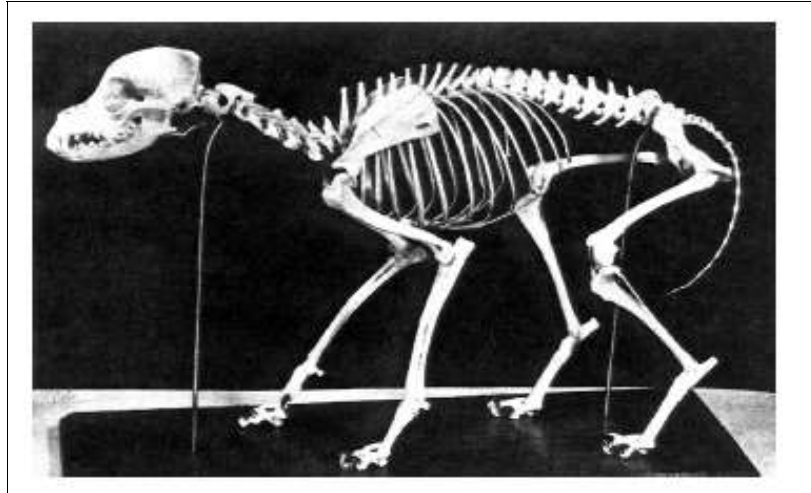
Data Base File Number: 774

Regents Date Aug2003-67.bmp

Aug2003

67 8/13/2003 S4K1

Answer 2



## organ systems

1322. The list below includes three organ systems that are directly used when a human runs. Which system should also be included in the list?

- (1) immune system
- (2) reproductive system
- (3) digestive system
- (4) nervous system

Data Base File Number: 959

Regents Date Aug2014-6.bmp

Aug2014

6 8/14/2014 S4K1

Answer 4

circulatory system  
muscular system  
skeletal system

## organelles

323. The table shown provides some information concerning organelles and organs. Based on this information, which statement accurately compares organelles to organs?

- (1) Functions are carried out more efficiently by organs than by organelles.
- (2) Organs maintain homeostasis while organelles do not.
- (3) Organelles carry out functions similar to those of organs.
- (4) Organelles function in multicellular organisms while organs function in single-celled organisms.

Data Base File Number: 62

Regents Date Jan08-6.bmp

Jan2008

6 1/25/2008 S4K1

Answer 3

Function	Organelle	Organ
gas exchange	cell membrane	lung
nutrition	food vacuole	stomach

## organelles

324. The diagram shown represents two single-celled organisms. These organisms carry out the activities needed to maintain homeostasis by using specialized internal

- (1) tissues
- (2) organelles
- (3) systems
- (4) organs

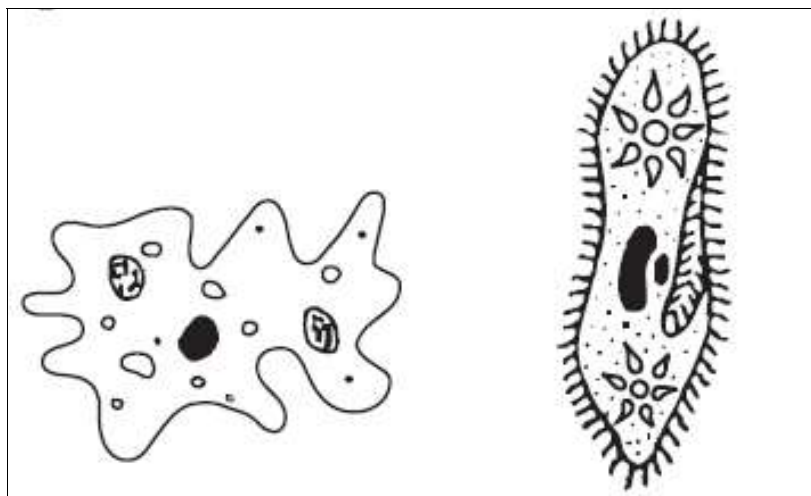
Data Base File Number: 636

Regents Date Jan2004-6.bmp

Jan2004

6 1/29/2004 S4K1

Answer 2



## organelles

325. The chart as shown includes structures found in a multicellular organism. Which row contains the structures that would be most numerous?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1657

Regents Date June2024-7.bmp

June2024

7 6/14/2024 S4K1

Answer 3

Row	Structures
(1)	organs
(2)	tissues
(3)	organelles
(4)	cells

## organism competition

326. Two interactions between organisms are shown in the table. X and Y do not represent the same organisms in the two interactions. Which statement best describes the relationship between organism X and organism Y in each interaction?

(1) Organism X is positively affected by the relationship and organism Y is negatively affected.

(3) Both organisms are positively affected by the relationship.

(2) Organism X is negatively affected by the relationship and organism Y is positively affected.

(4) Both organisms are negatively affected by the relationship.

Data Base File Number: 286

Regents Date Aug2010-35

Aug2010

36 8/18/2010 S4K6

Answer 1

	Organism X	Organism Y
Interaction 1	predator	prey
Interaction 2	parasite	host

## organization

327. Some levels of organization in a multicellular organism are shown in the sequence. Which terms represented by letters A and B would complete the sequence?

- (1) A - gametes; B - zygote  
 (2) A - zygote; B - gametes  
 (3) A - organs; B - organelles  
 (4) A - organelles; B - organs

Data Base File Number: 912

Regents Date Aug2013-49.bmp

Aug2013

49 8/14/2013 S4K1

Answer 4

A → cells → tissues → B → organ systems → organism

## organization

328. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagrams represent a single-celled organism and a multicellular organism. Which statement correctly identifies the levels of organization for the structures indicated?

- (1) A and B are tissues; E and G are organs.  
 (2) A and B are organs; E and G are systems.  
 (3) A and B are tissues; E and G are organelles.  
 (4) A and B are organelles; E and G are organs.

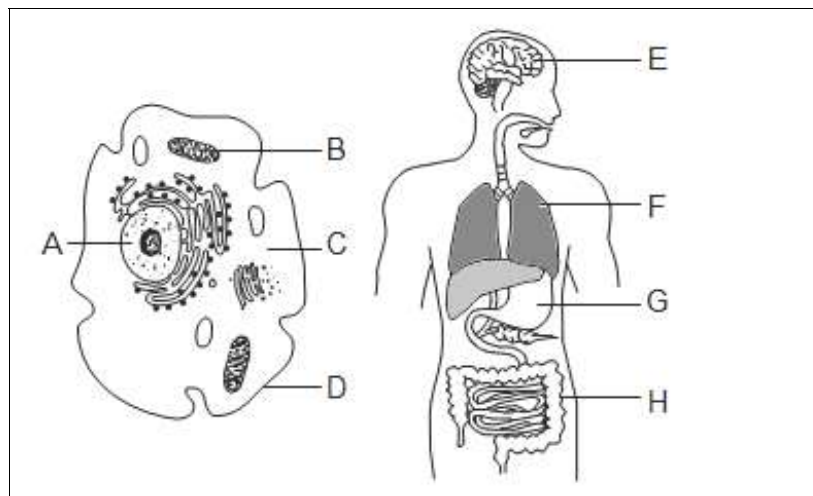
Data Base File Number: 1183

Regents Date June2017-37.bmp

June2017

37 6/14/2017 S4K1

Answer 4



## organization

329. The diagram shown represents the organization of genetic information within a cell nucleus. The circle labeled Z most likely represents

- (1) amino acids
- (2) chromosomes
- (3) vacuoles
- (4) molecular bases

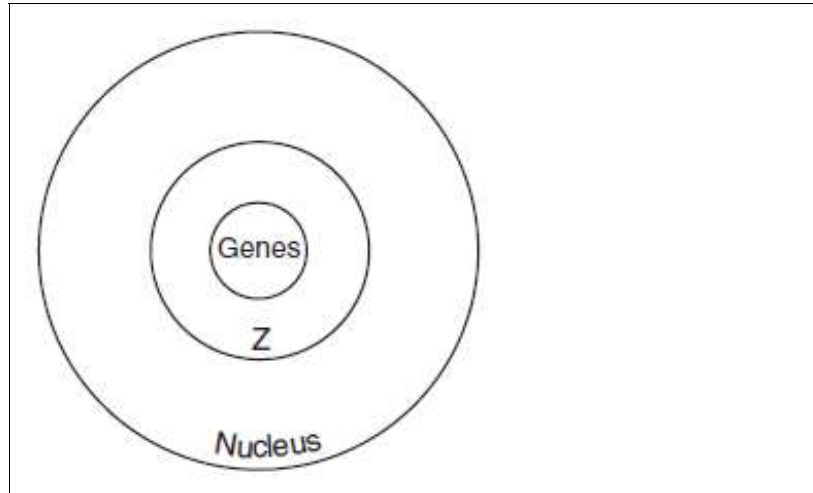
Data Base File Number: 801

Regents Date June2002-8.bmp

June2002

8 6/19/2002 S4K2

Answer 2



## organization

330. A single cell and a multicellular organism are represented as shown. Which structures are correctly paired with their primary function?

- (1) A and G---transmission of nerve impulses
- (2) B and E---photosynthesis
- (3) C and H---digestion of food
- (4) D and F---gas exchange

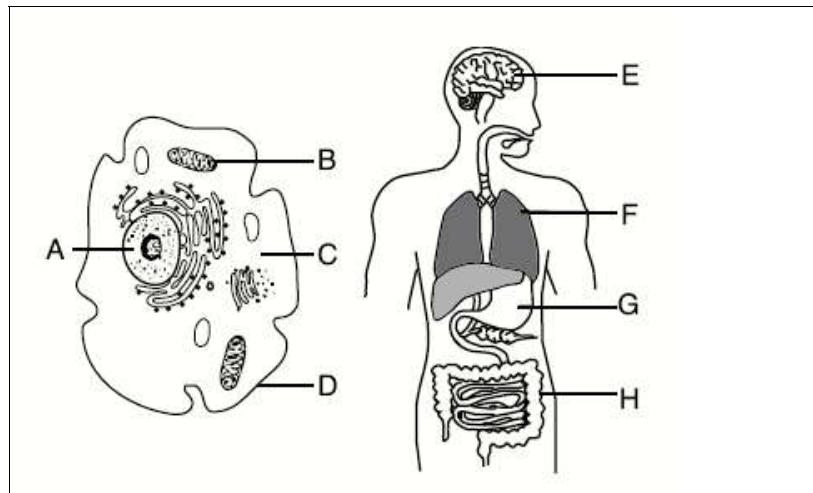
Data Base File Number: 128

Regents Date Aug08-33.bmp

Aug2008

33 8/13/2008 S4K1

Answer 4



## organization

331. Examine the levels of organization as shown in the diagram. The levels of organization for structure and function in the human body from least complex to most complex would be

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base 504  
File Number:

Regents Date Aug2006-1.bmp

Aug2006

1 8/16/2006 S4K1

Answer 4

(1) systems → organs → tissues → cells  
(2) cells → organs → tissues → systems  
(3) tissues → systems → cells → organs  
(4) cells → tissues → organs → systems

## organization

332. Which statement concerning organism A and organism B is correct?

- (1) Organism A contains organs, whereas organism B lacks organs.
- (2) Organism A and organism B have the same organ systems.
- (3) Organism A and organism B both have structures that perform life processes.
- (4) Organism A lacks structures that help maintain dynamic equilibrium.

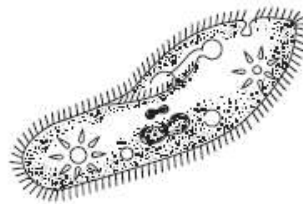
Data Base 958  
File Number:

Regents Date Aug2014-3.bmp

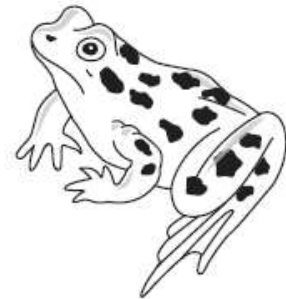
Aug2014

3 8/14/2014 S4K1

Answer 3



Organism A  
single-celled



Organism B  
multicellular

## organization / cell

333. The diagram shown represents levels of organization within a cell of a multicellular organism. Which statement is correct regarding the structure represented by X?

- (1) Structure X is composed of many different amino acids that determine the type of cell it will become in the organism.
- (2) Structure X has the same base sequence in all the body cells of the organism.
- (3) Structure X is a folded chain arrangement of carbohydrate found in all the body cells of the organism.
- (4) Structure X contains 20 different kinds of subunits that are present in all the cells of the organism.

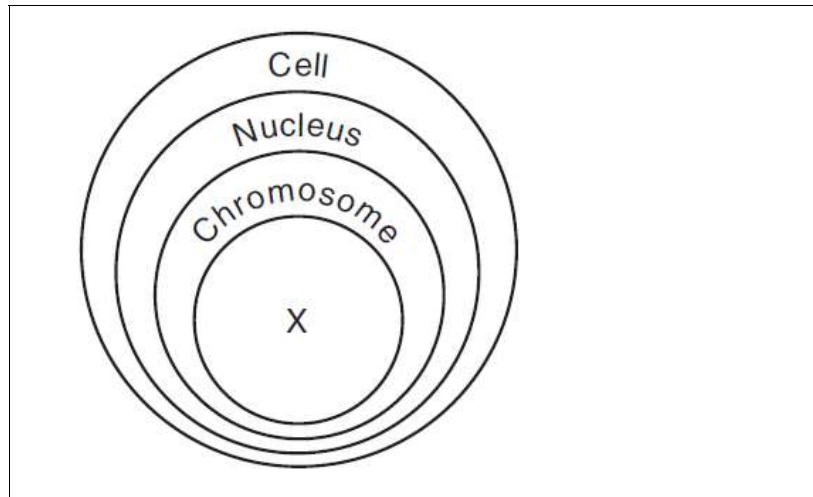
Data Base 308  
File Number:

Regents Date Jan2011-20.bmp

Jan2011

20 1/25/2011 S4K1

Answer 2





## osmosis

1334. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents a laboratory setup. A starch solution in a test tube was separated from the water in a beaker by a dialysis membrane. One hour later, it was observed that the liquid had risen in the test tube. The rise of the liquid in the test tube that was observed after one hour can be explained as a result of the

- (1) starch solution moving into the test tube and out of the beaker
- (2) water moving from the beaker into the test tube
- (3) large starch molecules blocking the dialysis membrane
- (4) dialysis membrane acting as a barrier to the water molecules

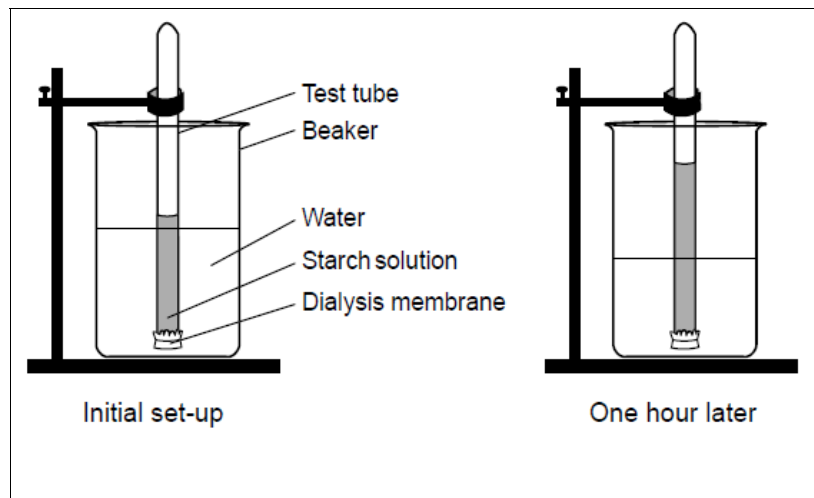
Data Base File Number: 1274

Regents Date June2018-82.bmp

June2018

82 6/13/2018 LAB5

Answer 2



## osmosis

1335. Base your answer to this question on the information given and on your knowledge of biology. Four model cells were prepared by using dialysis tubing and filling each of them with the same solution. Each of the model cells originally weighed 20 grams. Next, each model cell was placed in a beaker. Each of the four beakers contained a different concentration of water. After 24 hours, the mass of each model cell was measured and recorded in the data tables shown. Why did the model cell placed in 100% water increased in mass? .

- (1) water diffused into the cell due to osmosis  
(2) water entered the cell by active transport  
(3) sugar left the cell  
(4) sugar entered the cell

Data Base File Number: 1653

Regents Date Jan2024-78.bmp

Jan2024

78 1/23/2024 LAB5

Answer 1

Percentage of Concentration of Water in Beaker	Mass of Model Cell After 24 Hours (in grams)
100	22
90	21
80	20
70	19

## osmosis

1336. A red onion cell has undergone a change, as represented in the diagram shown. This change is most likely due to the cell being placed in

- (1) distilled water  
(2) light  
(3) salt water  
(4) darkness

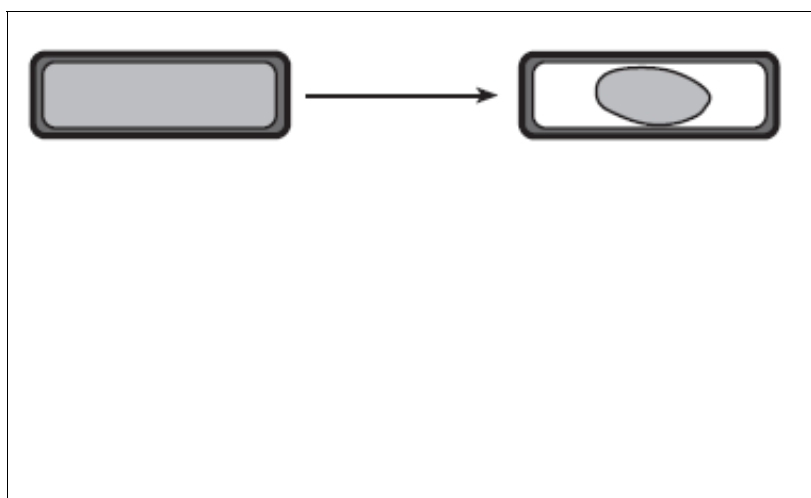
Data Base File Number: 502

Regents Date June2006-73.bmp

June2006

73 6/21/2006 LAB5

Answer 3



osmosis

1337. Base your answer to this question on the information given and on your knowledge of biology. Three potato slices with the same mass were each placed in three beakers, each labeled with its number and contents. After 30 minutes, the potato slices were removed from the solutions, dried with a paper towel, and the mass was determined. The results are shown in the table. Which process caused these changes in mass of each of the three slices.

- (1) osmosis
- (2) active transport
- (3) respiration
- (4) digestion

Data Base File Number: 1593

Regents Date June2023-79.bmp

June2023

79 6/14/2023 LAB5

Answer 1

Beaker	Solution	Change in Mass
1	distilled water	gained 4.0 grams
2	6% salt solution	lost 0.4 grams
3	16% salt solution	lost 4.7 grams

## osmosis

1338. The diagram shown represents a laboratory experiment involving sucrose and water molecules in a cellophane bag which functions in the same way as dialysis tubing. Which statement correctly explains the rise of liquid in the tube at the end of the experiment?

- (1) The concentration of sucrose molecules increased as water molecules entered the bag. This concentration increase pushed the liquid up the tube.
- (2) Water entered the bag due to the lower concentration of water inside. The extra water pushed the liquid up the tube as the bag filled.
- (3) Sucrose indicator entered the bag and reacted with the sucrose molecules. The reaction made the bag increase in size and pushed the liquid up the tube.
- (4) Sucrose molecules moved out of the bag and up the tube while water moved out, causing the rise of liquid in the tube.

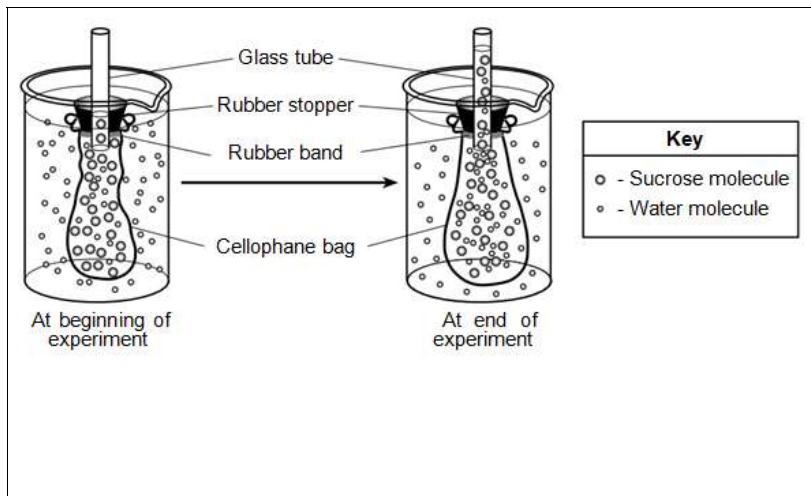
Data Base File Number: 1225

Regents Date Aug2017-75.bmp

Aug2017

75 8/17/2017 LAB5

Answer 2



osmosis

1339. Base your answer to this question on the information given and on your knowledge of biology. A student placed artificial cells, each containing a 25% sugar solution, into three different beakers containing sugar solution which varied in concentration from 0% to 25%. The setups are shown in the diagram.

The student collected data on the mass of each artificial cell. The student predicted that the cell in the beaker with 25% sugar solution would have the greatest change in mass after 24 hours. Would his prediction be correct?

- (1) no
- (2) yes
- (3) cannot predict the results from the setups shown
- (4) cannot predict the results because there is no control

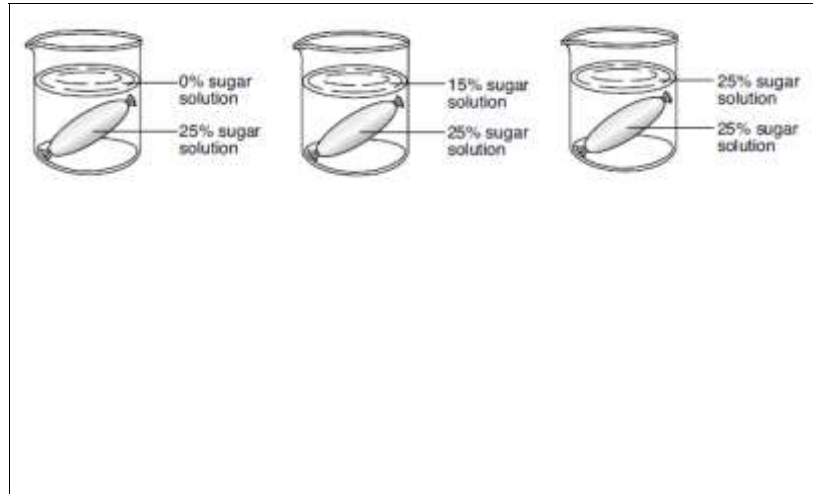
Data Base File Number: 1494

Regents Date June2022-78.bmp

June2022

78 6/15/2022 LAB5

Answer 1



## osmosis

340. A laboratory setup of a model cell is shown in the diagram below. Which observation would most likely be made 24 hours later?
- (1) The contents of the model cell have changed color.
  - (2) The diameter of the model cell has increased.
  - (3) The model cell has become smaller.
  - (4) The amount of distilled water in the beaker has increased.

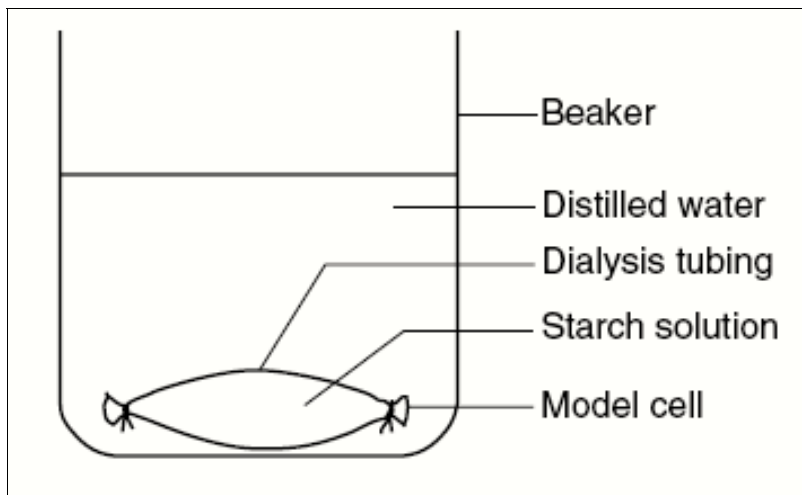
Data Base File Number: 171

Regents Date Jan09-76.bmp

Jan2009

77 1/27/2009 LABS

Answer 2



## osmosis

341. Base your answer to this questions on the diagram shown, which represents the shrinking of a cell in response to an increase in the concentration of a substance outside of the cell. Substance "A" in the diagram is
- (1) water
  - (2) salt
  - (3) sugar
  - (4) protein

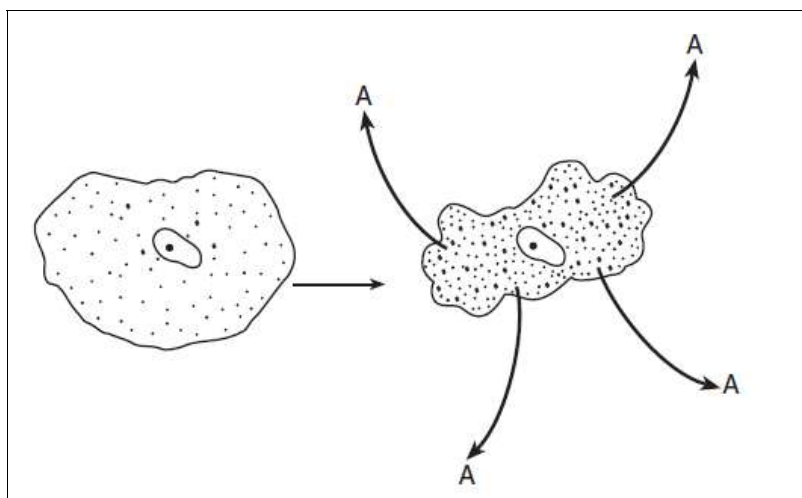
Data Base File Number: 1151

Regents Date August2016-79.b

Aug2016

79 8/18/2016 LAB5

Answer 1



ovary

342. Structures in a human female are represented in the diagram shown. A heavy dose of radiation would have the greatest impact on genetic information in future offspring if it reached gametes developing within structure

- (1) A
- (2) B
- (3) C
- (4) D

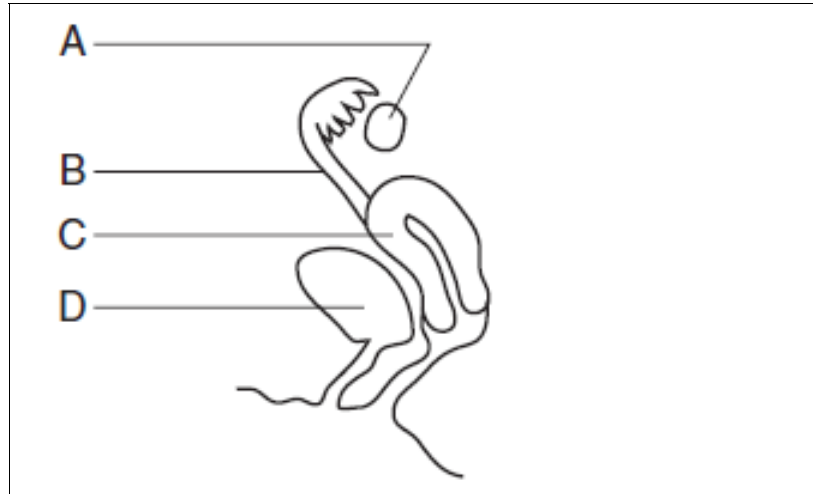
Data Base File Number: 733

Regents Date June2003-16.bmp

June2003

16 6/19/2003 S4K3

Answer 1



ovary

343. The diagram shown represents the human female reproductive system. Exposure to radiation or certain chemicals could alter the genetic information in the gametes that form in structure

- (1) A
- (2) B
- (3) C
- (4) D

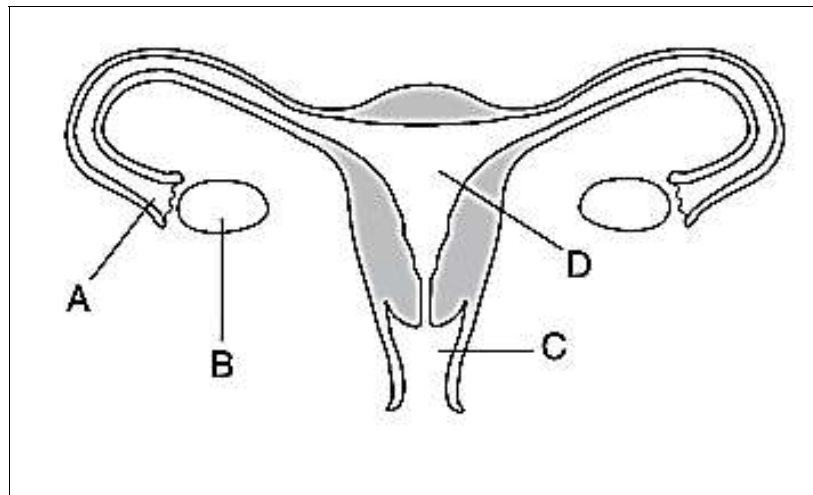
Data Base File Number: 68

Regents Date Jan08-20.bmp

Jan2008

20 1/25/2008 S4K4

Answer 2



ovary

344. A diagram of human female reproductive structures is shown. Which structure is correctly paired with its function?

- (1) A -- releases estrogen and progesterone
- (2) B -- produces and releases the egg
- (3) C -- provides the usual site for fertilization
- (4) D -- nourishes a developing embryo

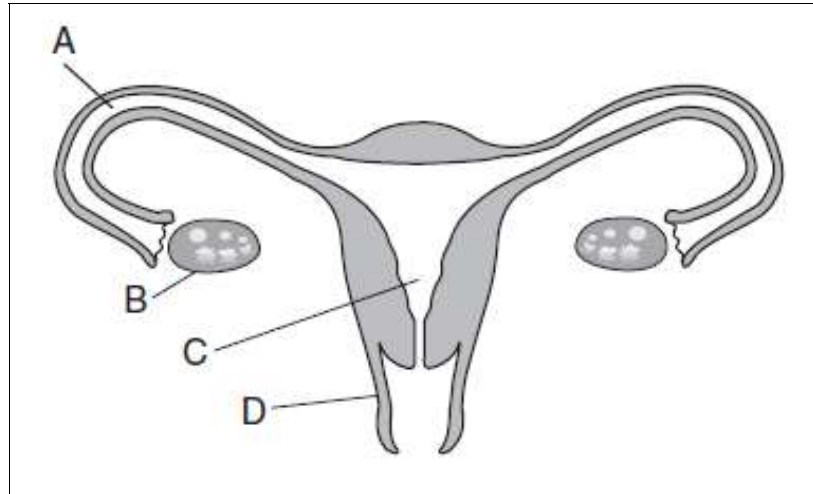
Data Base File Number: 688

Regents Date Aug2004-16.bmp

Aug2004

16 8/17/2004 S4K4

Answer 2



ovary

345. The human female reproductive system is represented in the diagram shown. Which structure produces chemicals that regulate the reproductive cycle?

- (1) A
- (2) B
- (3) C
- (4) D

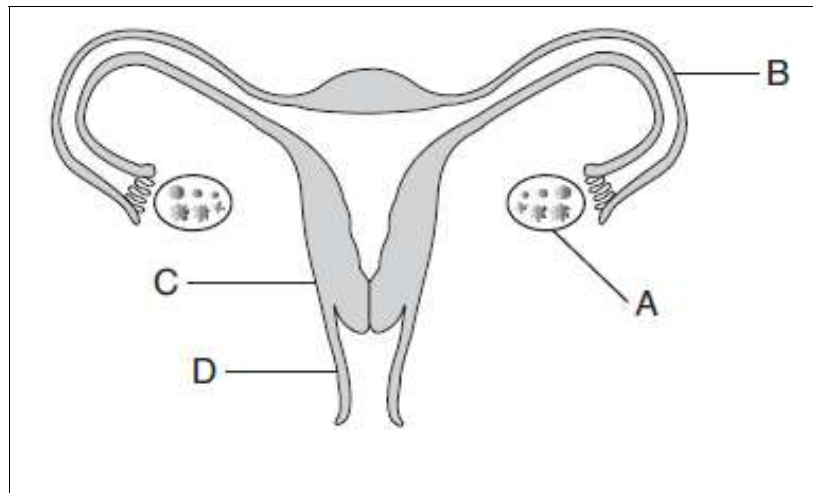
Data Base File Number: 1014

Regents Date June2015-20.bmp

June2015

20 6/16/2015 S4K4

Answer 1





ovary

346. Base your answer to this question on the diagram shown, which represents the human female reproductive system. New inherited characteristics may appear in offspring as a result of new combinations of existing genes or may result from mutations in genes contained in cells produced by structure

- (1) A
- (2) B
- (3) C
- (4) D

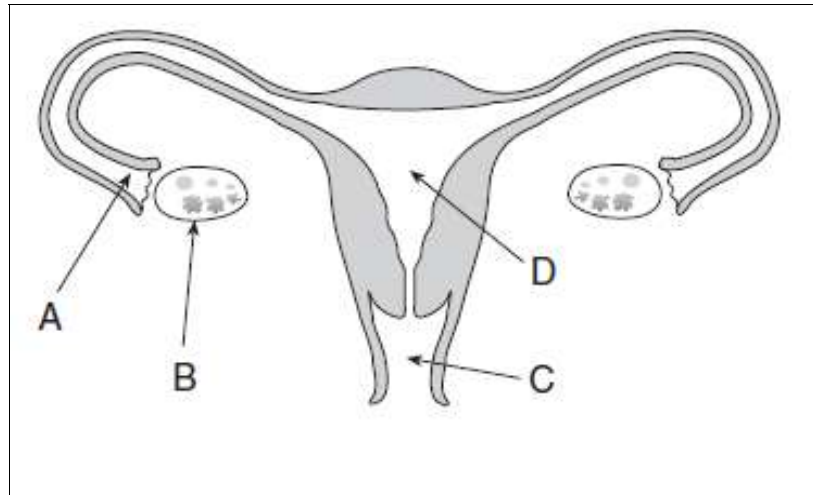
Data Base File Number: 638

Regents Date Jan2004-15.bmp

Jan2004

15 1/29/2004 S4K3

Answer 2



ovary

347. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the human female reproductive system. Structure A usually produces

- (1) sperm and eggs
- (2) testosterone and eggs
- (3) estrogen, progesterone, and eggs
- (4) estrogen, progesterone, and testosterone

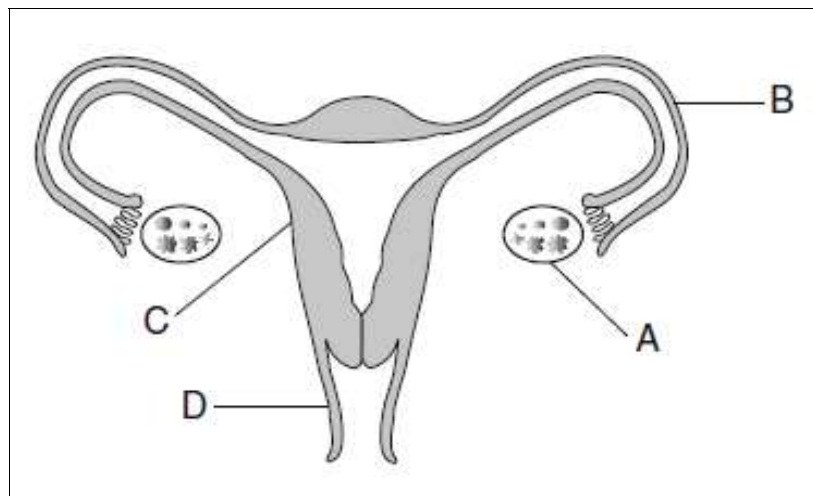
Data Base File Number: 607

Regents Date Jan2013-10.bmp

Jan2013

10 1/23/2013 S4K4

Answer 3



## ovary

348. Some organs in the human body are represented in the diagram shown. A sudden change in the DNA of cells developing in which organ could be passed to future generations?

- (1) A (3) C  
(2) B (4) D

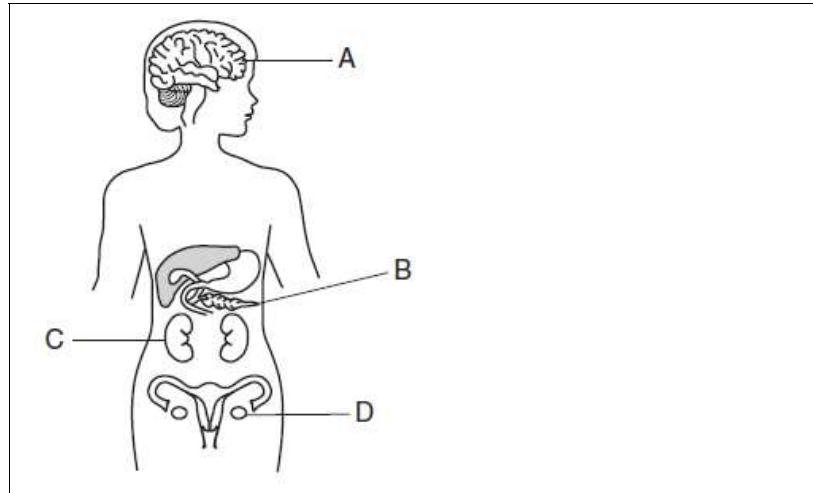
Data Base File Number: 988

Regents Date Jan2015-16.bmp

Jan2015

16 2/26/2015 S4K2

Answer 4



## oxygen concentration

349. Recent research findings suggest that algae production in Lake Ontario and several other Great Lakes will be affected as warmer weather leads to warmer lake water. An increase in water temperature reduces the ability of water to hold dissolved oxygen. Examine the graphs shown. Base your answer to this question on the information given and on your knowledge of biology. Which graph best shows the relationship between changes in temperature in the Great Lakes waters and the amount of dissolved oxygen those waters can hold?

- (1) 1 (3) 3  
(2) 2 (4) 4

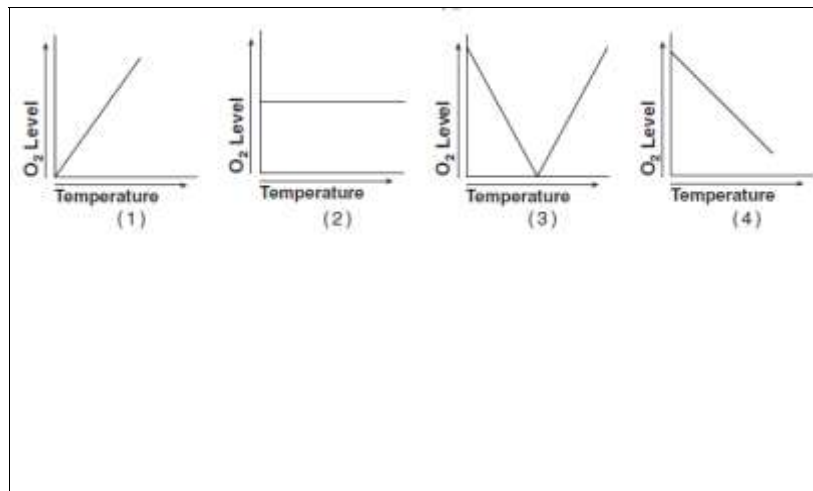
Data Base File Number: 549

Regents Date Jan2005-50.bmp

Jan2005

50 1/28/2005 S4K7

Answer 4



## oxygen concentration

350. Base your answer to this question on the information given and on your knowledge of biology. The graphs show changes in some biotic and abiotic factors in a lake in New York State. Based on the data in the graphs, why did the population of trout and whitefish disappear around the year 1960?

- (1) Trout and whitefish are not adapted to living in water with a low dissolved oxygen content.
- (2) Trout and whitefish were eaten by carp for food.
- (3) Trout and whitefish were eaten by walleye for food.
- (4) Trout and walleye thrive in warm water temperatures.

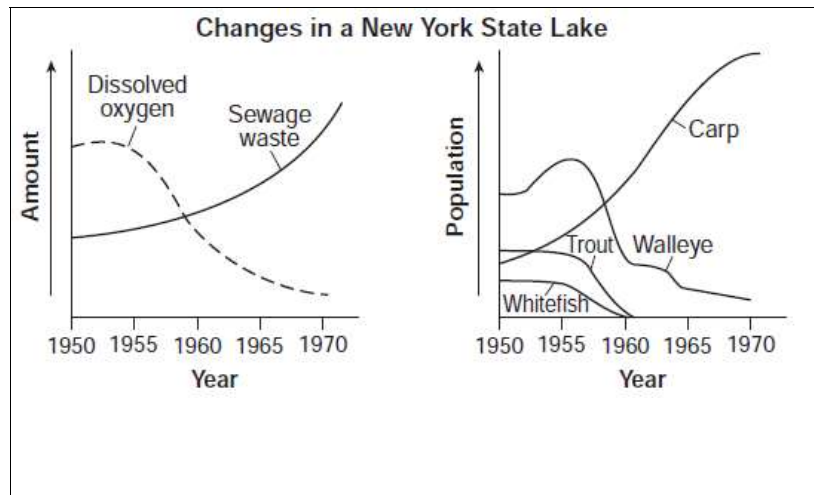
Data Base File Number: 1705

Regents Date Aug2024-58.bmp

Aug2024

58 8/20/2024 S4K7

Answer 1



## oxygen concentration

351. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the concentrations of oxygen in parts per million (ppm) present in freshwater and seawater at various temperatures. Predict the oxygen concentration in freshwater at 35 degrees C. in ppm.

- (1) 6 ppm
- (2) 7 ppm
- (3) 8 ppm
- (4) 9 ppm

Data Base File Number: 324

Regents Date Jan2011-45.bmp

Jan2011

46 1/25/2011 S1K3

Answer 1

**Concentration of Oxygen in Water**

Temperature (°C)	Oxygen Concentration in Freshwater (ppm)	Oxygen Concentration in Seawater (ppm)
1	14.0	11.0
10	11.5	9.0
15	10.0	8.0
20	9.0	7.5
25	8.0	7.0
30	7.5	6.0

**ozone**

352. Base your answer to this question on the data table given and on your knowledge of biology. In 1987 an agreement was reached called the "Montreal Protocol", which limited the world's production of chemicals that could damage the ozone shield. Which of the following is a risk associated with the destruction of the ozone shield?

- (1) The ozone shield protects living things from radiation.
- (2) The ozone shield supplies energy to animals.
- (3) Th ozone shield supplies ultra violet light to plants.
- (4) The ozone shield protects the atmoshere from destruction.

Data Base File Number: 1489

Regents Date June2022-56.bmp

June2022

56 6/15/2022 S4K7

Answer 1

**Changes in Size of the Ozone Hole**

Year	Ozone Hole Area (million km <sup>2</sup> )
1980	3.3
1985	18.8
1990	21.1
1996	26.9
2000	29.9
2005	27.2
2010	22.6
2017	19.6

Source: <https://ozonewatch.gsfc.nasa.gov>

**ozone**

353. The graph shows levels of a form of ultraviolet radiation (UV-B) and ozone thickness in Australia during December 1987 and January 1988. Which statement best describes the apparent relationship between ozone and UV-B?

- (1) When ozone levels are at 2550 Dobson units, the UV-B levels are at 250 Dobson unit
- (2) The increase in UV-B reduces the destruction of the ozone layer.
- (3) When the ozone layer is thinner, more UV-B gets through it.
- (4) If the ozone layer is thicker, UV-B levels on the ground increase

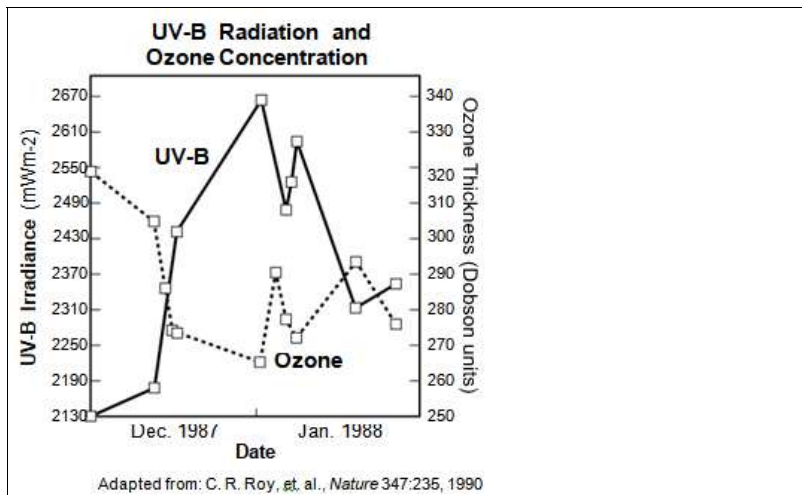
Data Base File Number: 1179

Regents Date June2017- 32.bm

June2017

32 6/14/2017 S4K7

Answer 3



**paper chromatography**

354. The materials represented in the diagram shown were used in a laboratory activity. These materials were used to carry out the technique known as

- (1) DNA staining
- (2) genetic engineering
- (3) paper chromatography
- (4) glucose testing

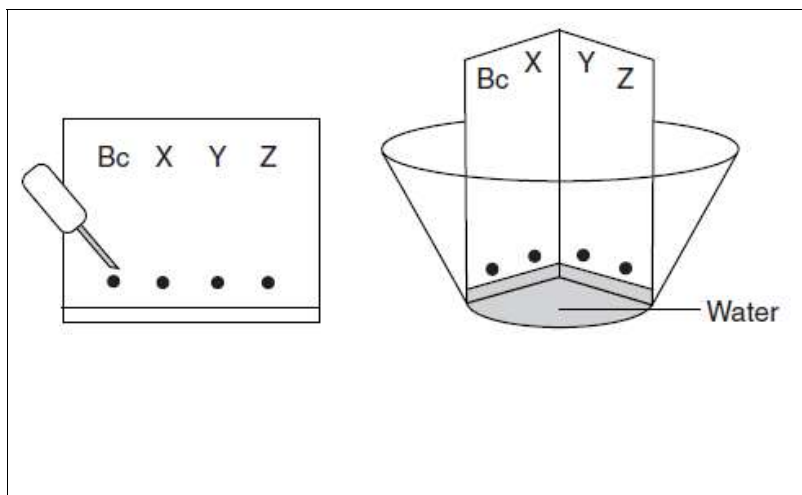
Data Base File Number: 394

Regents Date Jan2012-73.bmp

Jan2012

73 1/25/2012 LAB1

Answer 3



## paper chromatography

355. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the results of paper chromatography performed on extracts from five organisms. Which two organisms are most closely related?

- (1) cyanobacteria and green algae  
 (2) red algae and spinach  
 (3) brown algae and red algae  
 (4) red algae and cyanobacteria

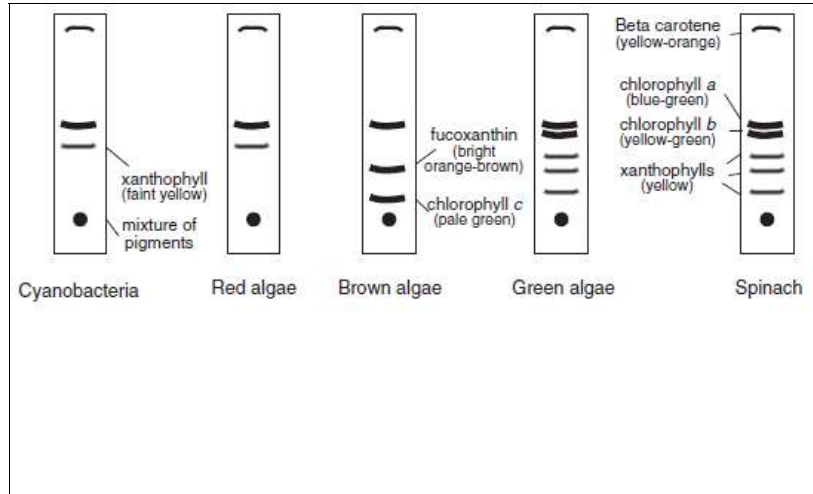
Data Base File Number: 1041

Regents Date June2015-81.bmp

June2015

81 6/16/2015 LAB1

Answer 4



## paper chromatography

356. A laboratory technique is illustrated in the diagram shown. The technique shown in the diagram is used to

- (1) determine volume  
 (2) separate molecules in a mixture  
 (3) measure length  
 (4) analyze data from an experiment

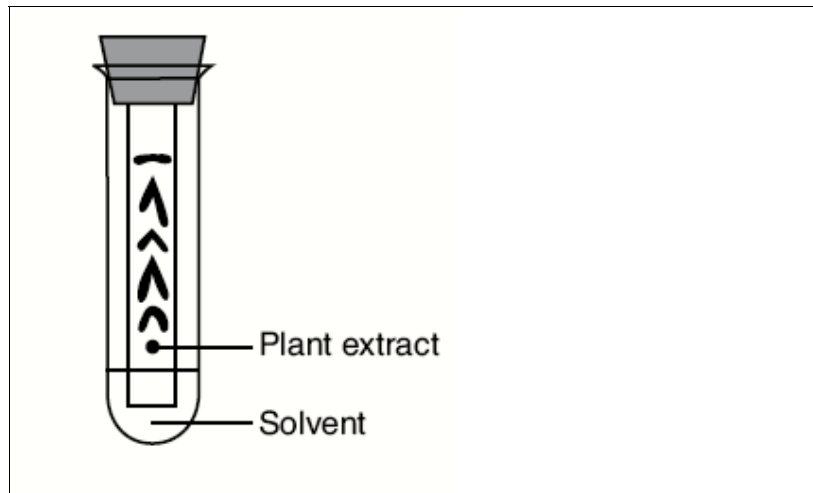
Data Base File Number: 142

Regents Date Aug08-72.bmp

Aug2008

72 8/13/2008 LABS

Answer 2



## paper chromatography

357. In an effort to determine how closely related several plant species are, a student performed the laboratory test as shown in the diagram. The method used by the student to compare plant extracts from the different species is

- (1) gel electrophoresis
- (2) DNA banding
- (3) a staining technique
- (4) paper chromatography

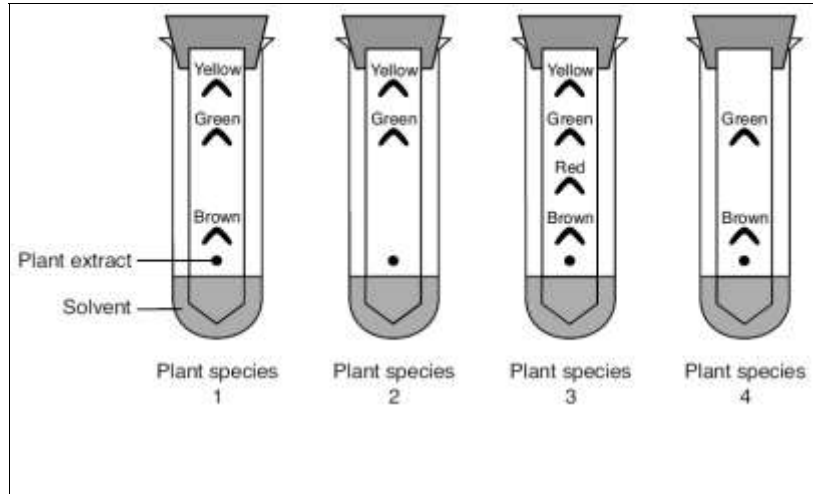
Data Base File Number: 1449

Regents Date June2021-82.bmp

June2021

82 6/22/2021 LAB1

Answer 4



## paper chromatography

1358. Base your answer to this question on the information given and on your knowledge of biology. Paper chromatography can be used to investigate evolutionary relationships. Leaves from a plant were ground and mixed with a solvent. The mixture of ground leaves and solvent was then filtered. Using a toothpick, twenty drops of the filtrate (material that passed through the filter) were placed at one spot on a strip of chromatography paper. This procedure was repeated using leaves from three other species of plants. A separate strip of chromatography paper was prepared for each plant species. Each of the four strips of chromatography paper was placed in a different beaker containing the same solvent for the same amount of time. One of the laboratory setups is shown in the diagram. How could a comparison of these resulting strips indicate evolutionary relationships?

- (1) The strips will not show any similar patterns of color.
- (2) The blue and yellow pigments will separate.
- (3) All four species of green plants will have exact patterns of color, since all the plant pigments are exactly the same.
- (4) The more similar the patterns of colors, the closer the relationships.

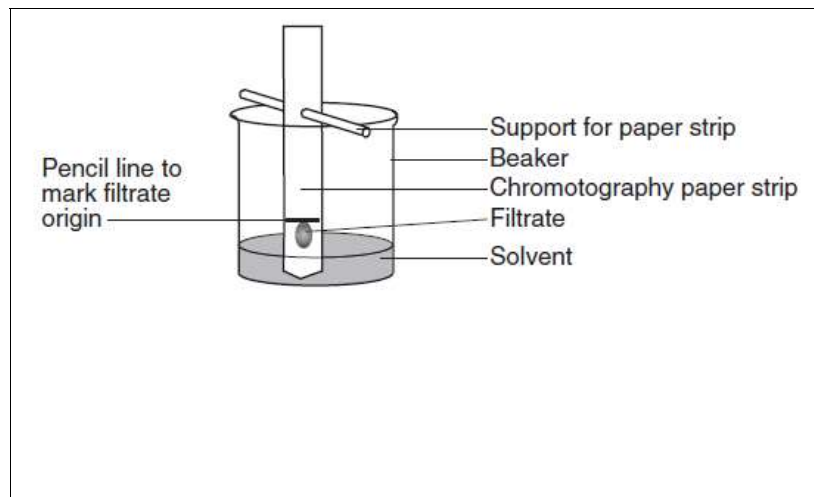
Data Base File Number: 601

Regents Date Aug2005-65.bmp

Aug2005

65 8/16/2005 LAB1

Answer 4





## paper chromatography

359. The diagram shown represents the results of a laboratory procedure. This procedure is used to

- (1) separate molecules in a liquid mixture
- (2) determine the rate of photosynthesis in plants
- (3) detect glucose in a solution
- (4) examine the gene sequences of organisms

Data Base File Number: 426

Regents Date June2012-74.bmp

June2012

74 6/19/2012 LAB1

Answer 1



## paper chromatography

360. Base your answer to this question on the information and diagram given and on your knowledge of biology.

During the Relationships and Biodiversity lab, simulated pigments from three plant species were compared to those in "Botana curus". The results were similar to those represented in the diagram shown. Based on the results of this comparison alone, is there enough information to conclude which of the other three species is most closely related to "Botana curus"?

- (1) Yes. Only species X has the same bands as "Botana curus".
- (2) Yes. Species Z has only two of the bands that "Botana curus" has
- (3) No. Additional tests should be done to test for other chemical similarities.
- (4) No. Other rainforest plant species should be tested.

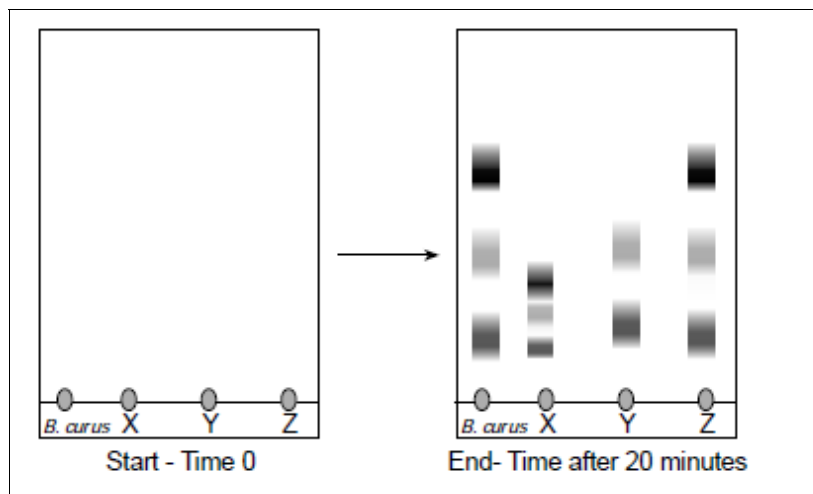
Data Base File Number: 1382

Regents Date Aug2019-73.bmp

Aug2019

73 8/14/2019 LAB1

Answer 3



## paper chromatography

361. A procedure used in paper chromatography is represented as shown in the diagram. The student is preparing two strips of paper for a chromatography activity. After adding a dot of the ink from the marker pen to the line on the paper on the right, the next step should be to place the strips in a beaker of solvent with the solvent level

- (1) between the bottom of the paper and the dot of ink
- (2) even with the dot of ink on the paper
- (3) just below the bottom edge of the paper
- (4) slightly above the dot of ink on the paper

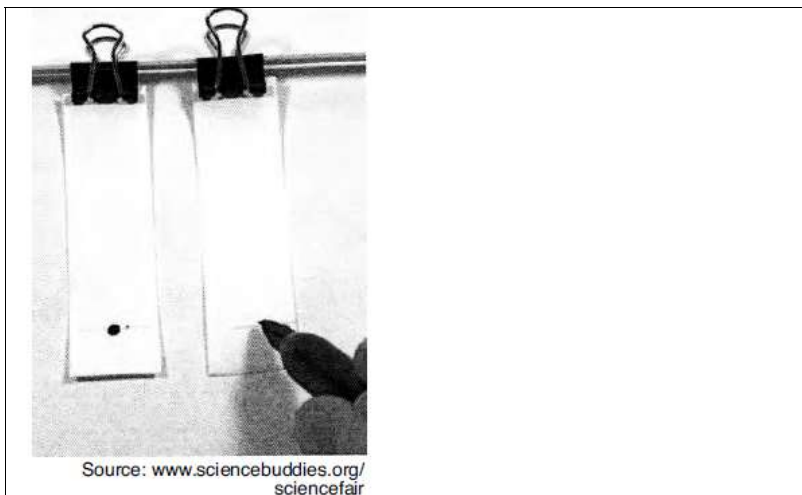
Data Base File Number: 1323

Regents Date Jan2019-73.bmp

Jan2019

73 1/22/2019 LAB1

Answer 1



Source: www.sciencebuddies.org/sciencefair

## paper chromatography

362. The diagram shown represents a laboratory apparatus. This apparatus is used to

- (1) identify the molecular bases in DNA
- (2) detect chemical toxins in the air
- (3) stain specimens before observing them with a microscope
- (4) separate a mixture of plant pigments

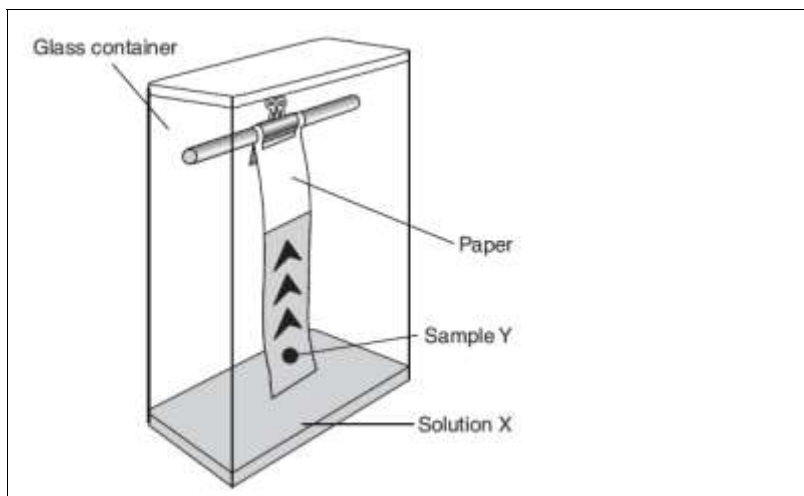
Data Base File Number: 227

Regents Date August2009-66-b

Aug2009

66 8/13/2009 LABS

Answer 4



## paper chromatography

363. The diagram shown represents the results of chromatography of leaf pigments from four plant species, A, B, C, and D. Which plant species has pigments most similar to those in A?

- (1) B (2) C (3) D (4) No conclusion can be reached on the basis of the data given.

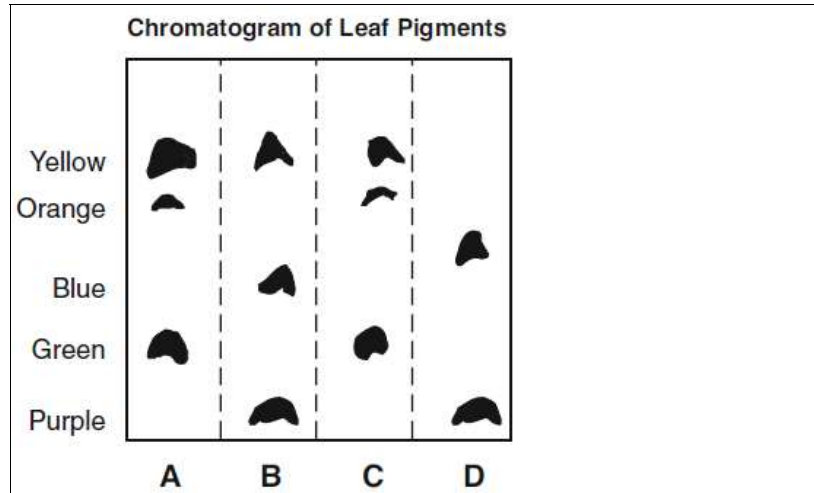
Data Base File Number: 634

Regents Date Jan2013-80.bmp

Jan2013

80 1/23/2013 LAB1

Answer 2



## paper chromatography

364. A technique used to analyze pigments in spinach leaves is shown in the diagram. This technique is known as.

- (1) paper chromatography (2) gene manipulation (3) dissection (4) staining

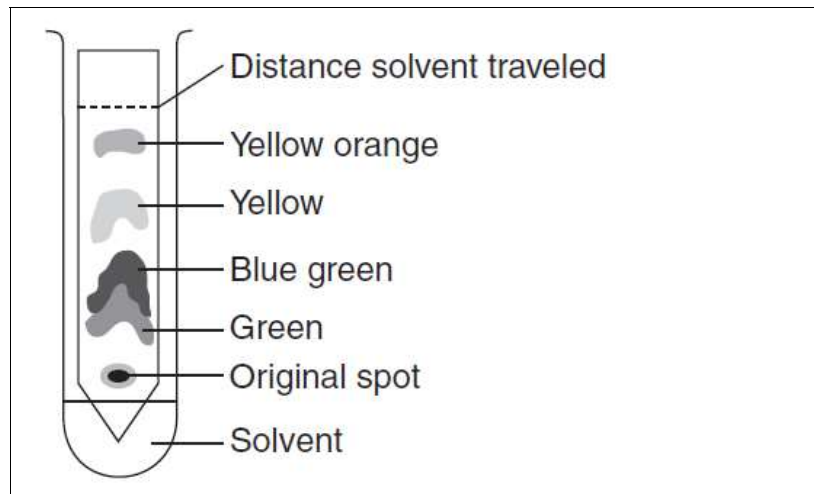
Data Base File Number: 298

Regents Date Aug2010-67.bmp

Aug2010

67 8/18/2010 LABS

Answer 1



## parasite / host

365. Mistletoe is an evergreen shrub that can produce most of its own food. Often, mistletoe can be found living on trees and taking water and nutrients away from the tissues of the trees. The relationship between mistletoe and trees is an example of

- (1) consumer/herbivore
- (2) predator/prey
- (3) scavenger/decomposer
- (4) parasite/host

Data Base 1255  
File Number:

Regents Date **June2018-25.bmp**

June2018

25 6/13/2018 S4K6

Answer **4**



## parasite / host

1366. Base your answer to this question on the information given and on your knowledge of biology. -----  
**Roundworm Parasite Causes Tropical Ant to Look Like a Berry -----** Scientists have discovered a parasitic roundworm that makes its ant host look like a juicy, red, ripe berry. Worker ants collect materials from the soil to feed the larval ants. Often, the soil also contains roundworm eggs that are consumed by the ant larvae.

The roundworms develop from the eggs within the ant larvae, mate, and produce hundreds of roundworms. As the roundworms develop, they cause increased reddening of the developing ant's abdomen and take nutrients from the ant. Just as a fruit reaches peak color when its seeds are ready for dispersal, the infected ant's abdomen reaches peak redness as the roundworm eggs mature. Birds don't normally eat the foul-tasting ants, but are thought to eat the ants infected with roundworms since they look like red berries. The roundworm eggs move through the bird's digestive system unaffected and pass to the soil in the bird's feces. Why is the roundworm considered a parasite?

- (1) The roundworm lives in the ant and benefits, but the ant is harmed.
- (2) The roundworm lives in the ant and both ant and roundworm benefit.
- (3) The ant, only, benefits from the relationship.
- (4) There is insufficient information to support the idea that the roundworm is a parasite.

Data Base 1529  
File Number:

Regents Date Aug2022-71.bmp

Aug2022

71 8/17/2022 S4K6

Answer 1

Tropical worker ant (*Cephalotes atratus*)



Swollen red abdomen

Source: The American Naturalist, 2008, 171:4, 536-544

## parasite / host

367. Base your answer to this question on the information given, the diagram shown, and your knowledge of biology.

### HIV Infection

The human immunodeficiency virus (HIV), which can lead to AIDS, is a type of virus that adds its genetic material to the DNA of the host cell. HIV reproduces within the host cell and exits through a process called budding.

In the process of budding, the newly forming virus merges with the host cell membrane and pinches off, taking with it a section of the host-cell membrane. It then enters into circulation. The HIV virus is regarded as a

- (1) parasite
- (2) carnivore
- (3) herbivore
- (4) omnivore

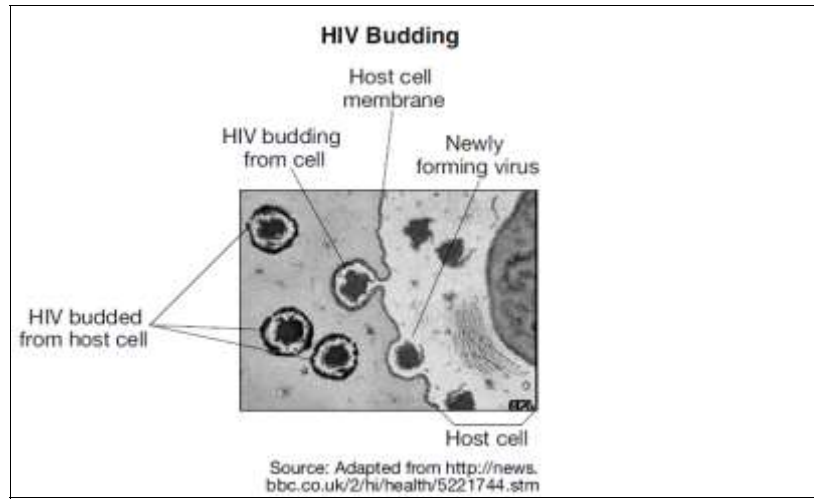
Data Base File Number: 1443

Regents Date June2021-67.bmp

June2021

67 6/22/2021 S4K5

Answer 1



## passive transport / diffusion

368. A laboratory setup using an artificial cell made from dialysis tubing is shown in the diagram. Which process would most likely be responsible for the movement of glucose from inside the artificial cell to the solution outside of the cell.

- (1) passive transport
- (2) active transport
- (3) cyclosis
- (4) respiration

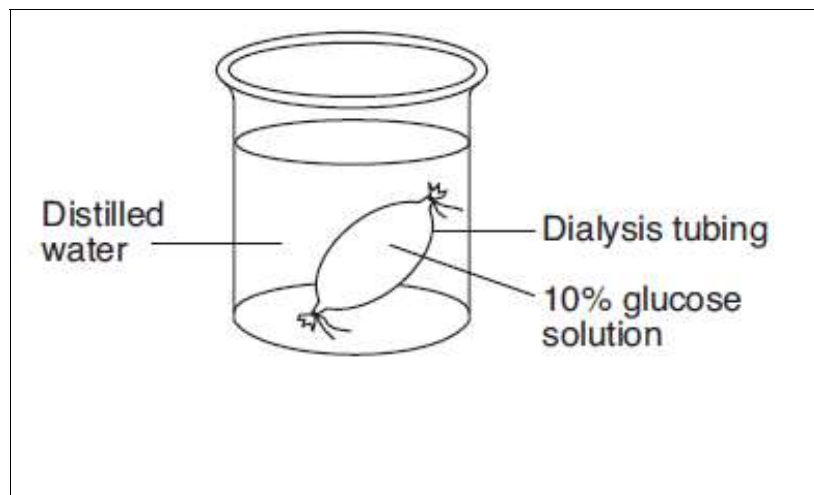
Data Base File Number: 273

Regents Date June2010-67.bmp

June2010

67 6/16/2010 LABS

Answer 1



## pH level

369. Base your answers to this question on the information and data table below and on your knowledge of biology. The table shows data collected on the pH level of an Adirondack lake from 1980 to 1996. What happened to the pH level of the lake from 1980 to 1996?

- (1) The pH level of the lake dropped.
- (2) The pH level of the lake increased.
- (3) The pH level of the lake stayed the same.
- (4) There is insufficient data to support any conclusion.

Data Base 139  
File Number:

Regents Date Aug08-50.bmp

Aug2008

50 8/13/2008 LABS

Answer 1

Lake pH Level

Year	pH Level
1980	6.7
1984	6.3
1986	6.4
1988	6.2
1990	5.9
1992	5.6
1994	5.4
1996	5.1

## pH level

1370. Base your answer to this question on the graph shown and on your knowledge of biology. The graph illustrates a single species of bacteria grown at various pH levels. The most likely reason there are no colonies in cultures of this species at pH 4 and at pH 10 is that

- (1) these bacteria could successfully compete with other species of bacteria at these pH values
- (2) there are more predators feeding on these bacteria at pH 4 and pH 10 than at other pH levels
- (3) at pH 4 and pH 10 the environment is too acidic or too basic for the bacteria to grow
- (4) fertilization cannot occur in these bacteria at pH 4 or pH 10

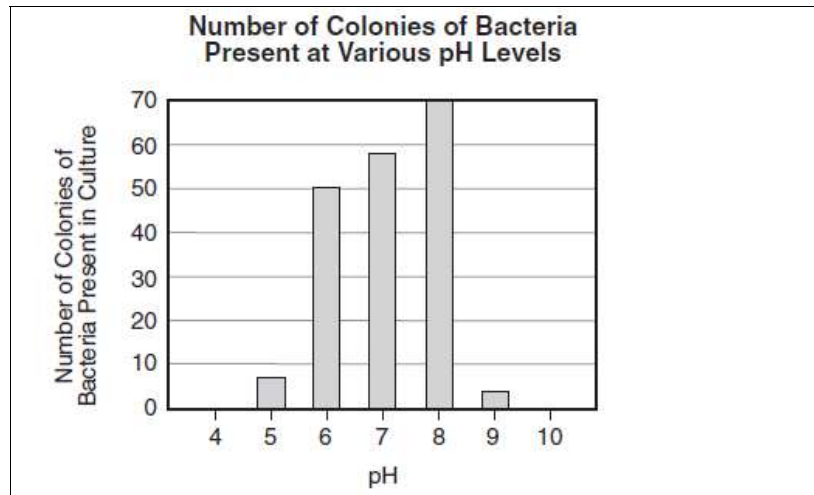
Data Base File Number: 740

Regents Date June2003-37.bmp

June2003

37 6/19/2003 S4K6

Answer 3





## phagocytosis

1371. The diagram below represents an event that occurs in the blood. Which statement best describes this event?

- (1) Cell A is a white blood cell releasing antigens to destroy bacteria.
- (2) Cell A is a cancer cell produced by the immune system and it is helping to prevent disease.
- (3) Cell A is a white blood cell engulfing disease-causing organisms.
- (4) Cell A is protecting bacteria so they can reproduce without being destroyed by predators.

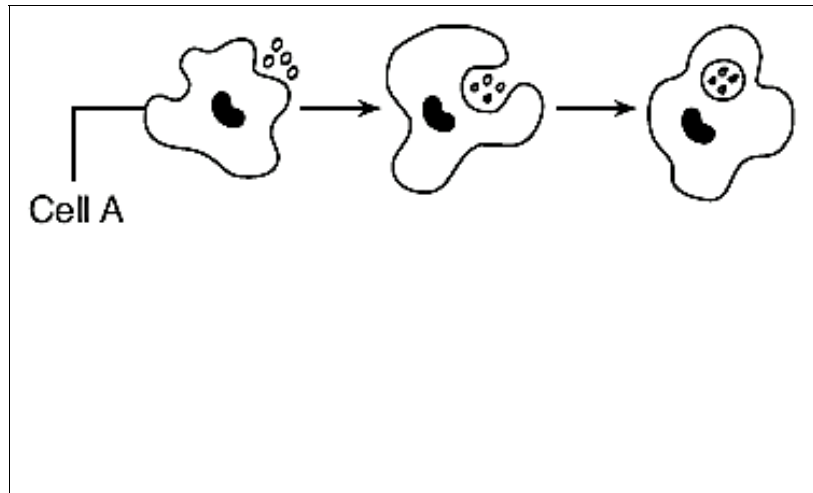
Data Base File Number: 96

Regents Date June08-23.bmp

June2008

6/24/2008 S4K5

Answer 3



## phagocytosis

1372. Base your answer to this question on the diagram shown and your knowledge of biology. The diagram represents an ameba, a single-celled organism, carrying out an essential life process. This process represents a step in

- (1) asexual reproduction
- (2) heterotrophic nutrition
- (3) photosynthesis
- (4) diffusion

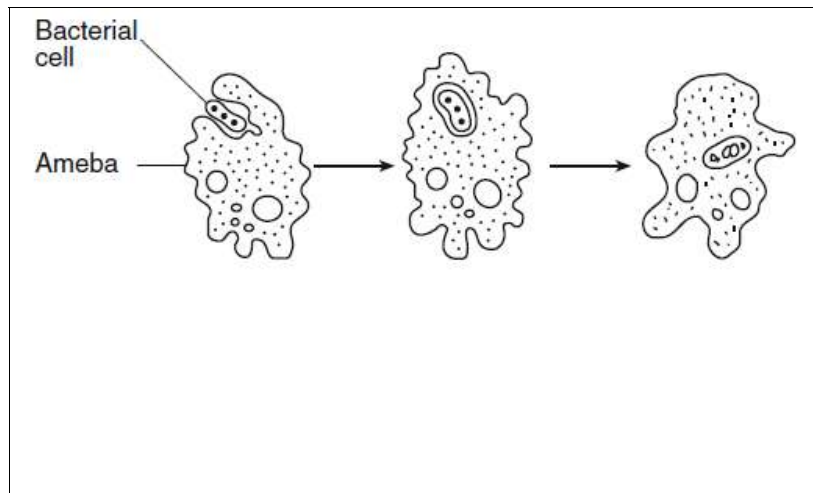
Data Base File Number: 615

Regents Date Jan2013-35.bmp

Jan2013

35 1/23/2013 S4K1

Answer 2



## phagocytosis

1373. Base your answer to this question on the diagram shown and your knowledge of biology. The diagram represents an ameba, a single-celled organism, carrying out an essential life process. This process is essential to the survival of the ameba because it

- (1) provides materials used in cellular respiration
- (2) removes pathogens from the environment
- (3) supplies the raw materials for photosynthesis
- (4) protects the organism during development

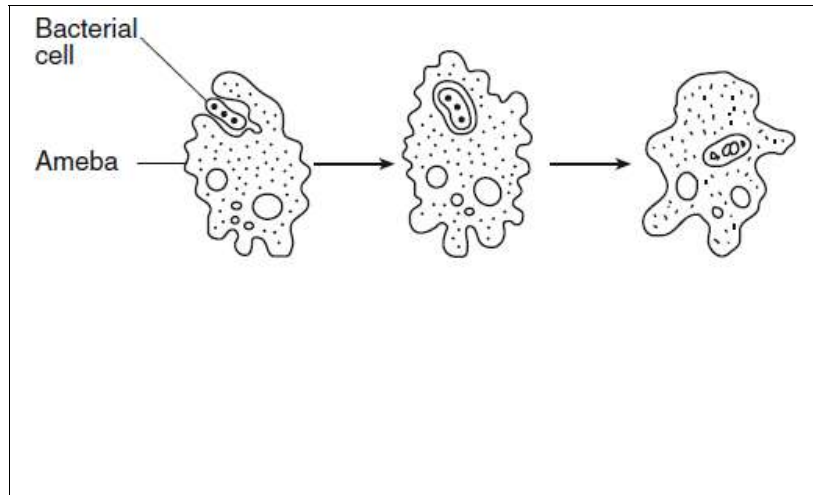
Data Base  
File Number: 616

Regents Date Jan2013-35.bmp

Jan2013

36 1/23/2013 S4K1

Answer 1



## photosynthesis

1374. In 1883, Thomas Engelmann, a German botanist, exposed a strand of algae to different wavelengths of light. Engelmann used bacteria that concentrate near an oxygen source to determine which sections of the algae were releasing the most O<sub>2</sub>. The results are shown in the graph. Which statement is a valid inference based on this information?

- (1) Oxygen production decreases as the wavelength of light increases from 550 to 650 nm.
- (2) Respiration rate in the bacteria is greatest at 550 nm.
- (3) Photosynthetic rate in the algae is greatest in blue light.
- (4) The algae absorb the greatest amount of oxygen in red light.

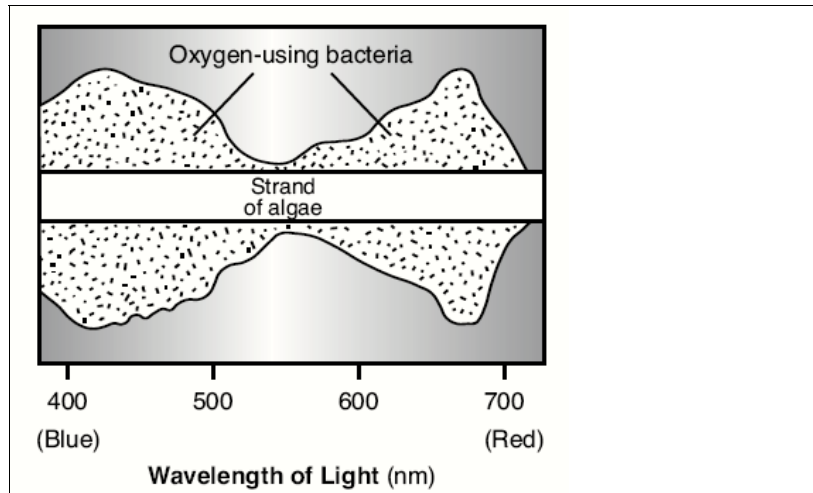
Data Base File Number: 126

Regents Date Aug08-31.bmp

Aug2008

31 8/13/2008 S1K3

Answer 3



## photosynthesis

1375. The chart shown lists substances involved in the process of photosynthesis. Which statement best describes how these substances interact in photosynthesis?

- (1) A and B combine to produce C and D.
- (2) B and C combine to produce A and D.
- (3) C and D combine to produce A and B.
- (4) A and C combine to produce B and D.

Data Base File Number: 1054

Regents Date August2015-41.b

Aug2015

41 8/12/2015 S4K5

Answer 3

Substance	
A	glucose
B	oxygen
C	carbon dioxide
D	water

## photosynthesis

376. The diagram shown represents a single-celled organism known as "Euglena". This organism lives in fresh water and chloroplasts are present. Which process can this organism carry out to obtain food?

- (1) ingestion
- (2) digestion
- (3) photosynthesis
- (4) respiration

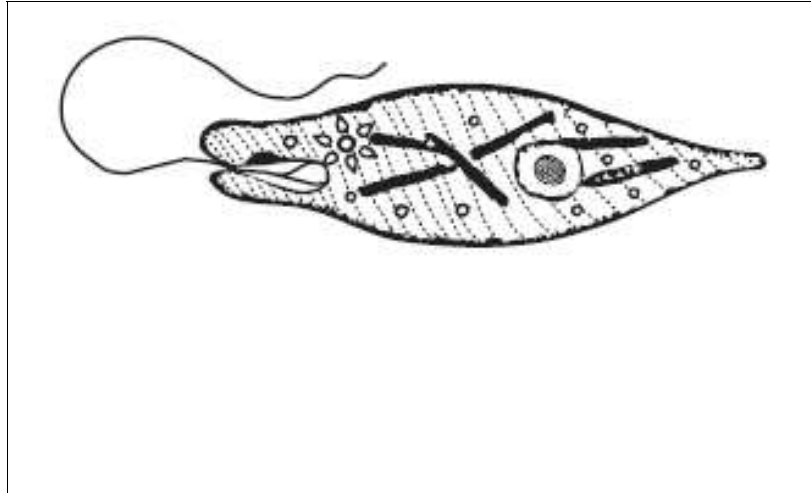
Data Base File Number: 772

Regents Date Aug2003-53.bmp

Aug2003

53 8/13/2003 S4K1

Answer 3



## photosynthesis

377. The cell shown in the diagram is a green plant cell which produces oxygen. The biochemical process occurring in this cell that produces oxygen is

- (1) active transport
- (2) digestion
- (3) transpiration
- (4) photosynthesis

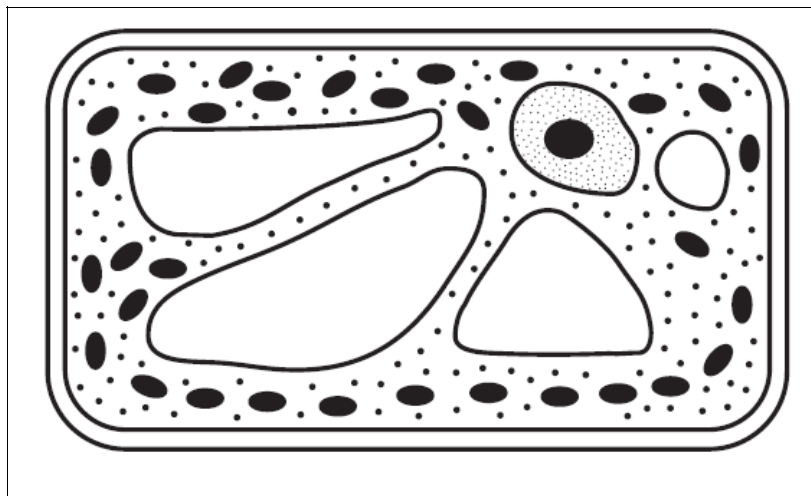
Data Base File Number: 888

Regents Date June2013-51.bmp

June2013

51 6/11/2013 S4K5

Answer 4



## photosynthesis

1378. Base your answer to this question on the information, diagram, and data table shown and on your knowledge of biology. The laboratory setup represented in the diagram was used to investigate the effect of light on aquatic plants. Equal amounts of a green water plant were placed in beakers with gas-collecting tubes. The beakers were placed in a temperature-controlled environment. The light source was placed at different distances from the beakers. After an hour, the amount of gas collected from the plants in each tube was measured and recorded in the data table. Which distance of the light from the plant set-up collected the largest amount of gas?

(1) 25 cm

(3) 10 cm

(2) 15 cm

(4) 5 cm

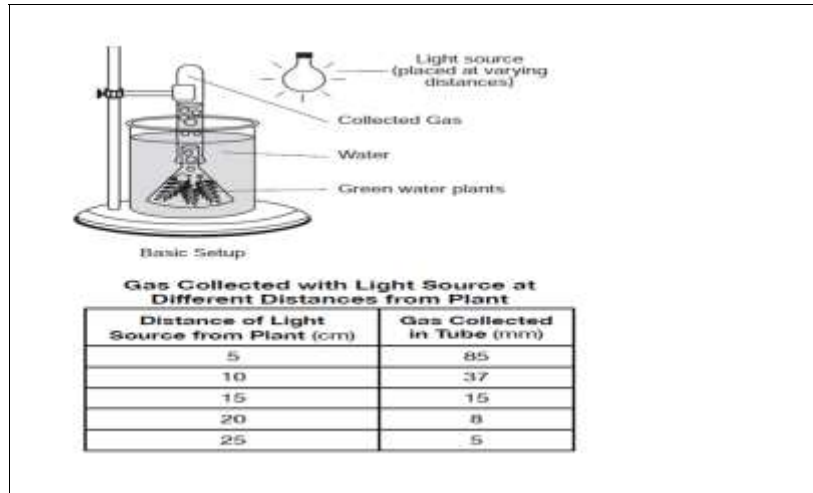
Data Base File Number: 1239

Regents Date Jan2018-44C-bm

Jan2018

44 1/22/2018 S1K3

Answer 4



## photosynthesis

1379. Base your answer to this question on the information and graph shown and on your knowledge of biology.

A student conducts an experiment to determine how the amount of light affects the rate of oxygen production in a plant. The graph represents the rate of oxygen produced for one trial, X, in the experiment. By the end of the experiment, the plant had not reached maximum oxygen production. If a student supplies more light than was received during trial X, a bar placed on the graph to represent the results would most likely be

- (1) shorter than bar X and placed to the left of bar X
- (2) shorter than bar X and placed to the right of bar X
- (3) taller than bar X and placed to the left of bar X
- (4) taller than bar X and placed to the right of bar X

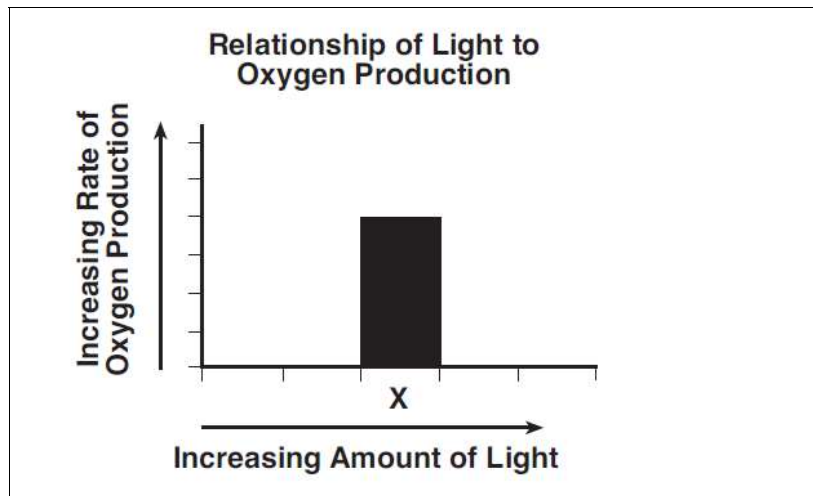
Data Base 887  
File Number:

Regents Date June2013-50.bmp

June2013

50 6/11/2013 S1K3

Answer 4



photosynthesis

380. Organisms living in a forest ecosystem rely on the Sun as a source of energy for metabolic processes. The following events occur as energy is captured by a plant and used in the metabolic processes of an herbivore. The most likely order in which these events occur is

- (1) [A] - [D] - [B] - [C]
- (2) [B] - [A] - [C] - [D]
- (3) [D] - [A] - [B] - [C]
- (4) [D] - [B] - [A] - [C]

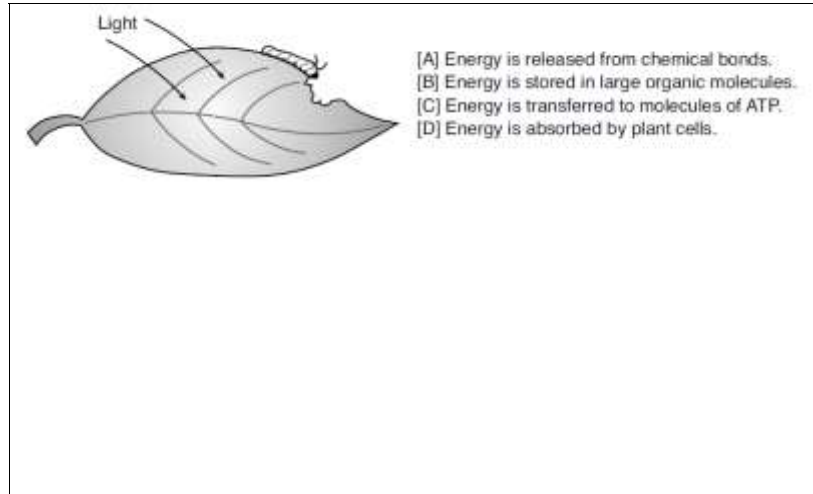
Data Base File Number: 1481

Regents Date June2022-36.bmp

June2022

36 6/15/2022 S4K5

Answer 4



photosynthesis

381. The diagram shown represents a process that occurs in a structure of a specialized cell. Which row in the chart correctly identifies the letters in the diagram?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 243

Regents Date Jan2010-42.bmp

Jan2010

42 1/26/2010 S4K5

Answer 4

The diagram below represents a process that occurs in a structure of a specialized cell.

The diagram shows a circular structure labeled 'Structure A'. Two arrows labeled 'Substance B' and 'Substance C' enter from the top. Five wavy arrows labeled 'Light energy' enter from the top. An arrow labeled 'Substance D' exits from the bottom. An arrow labeled 'Metabolic activity' points to the right from the bottom of the structure.

Which row in the chart correctly identifies the letters in the diagram?

Row	A	B	C	D
(1)	ribosome	oxygen	carbon dioxide	water
(2)	mitochondrion	water	oxygen	protein
(3)	nucleus	nitrogen	carbon	starch
(4)	chloroplast	carbon dioxide	water	glucose

## photosynthesis

382. Which set of terms best identifies the letters in the diagram below?

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

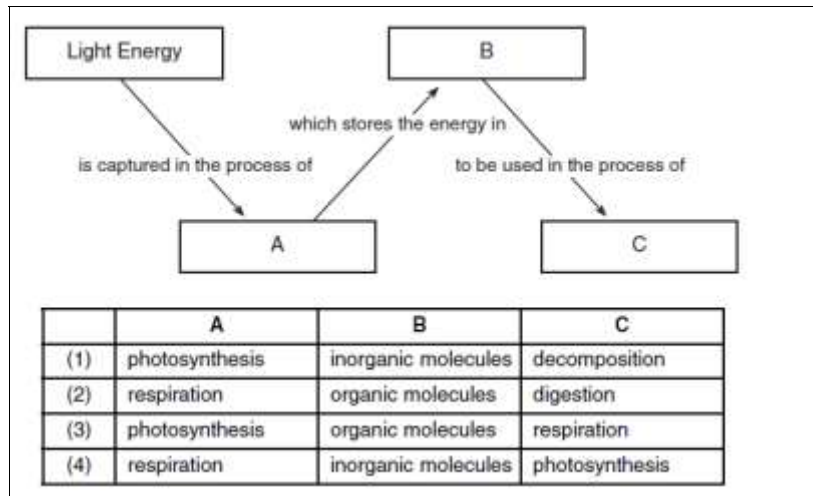
Data Base File Number: 485

Regents Date June2006-27.bmp

June2006

27 6/21/2006 S4K5

Answer 3



## photosynthesis

383. Base your answer to this question on the information and graph shown and on your knowledge of biology. The graph shows changes in dissolved oxygen in a pond in the summertime over a 24-hour period. What is the most likely reason for the variation in the dissolved oxygen levels in the pond over the 24-hour period?

- (1) The increased light during the day decreases the oxygen produced by photosynthesis.  
 (2) Photosynthesis produces more oxygen during the day than is used by respiration.  
 (3) Respiration is reduced at night, so the oxygen produced by photosynthesis increases.  
 (4) More producers are active at night, so the dissolved oxygen increases.

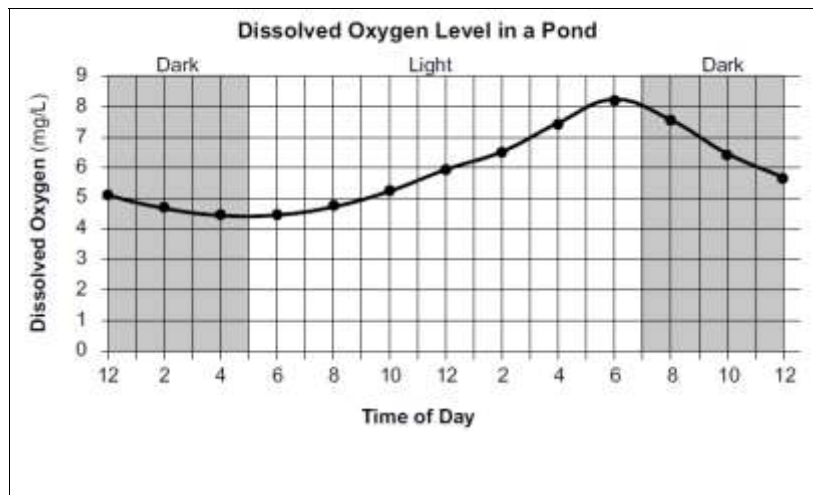
Data Base File Number: 1546

Regents Date Jan2023-31.bmp

Jan2023

31 1/24/2023 S4K5

Answer 2





## photosynthesis

384. The diagram shown represents two processes that occur in some living organisms. " X " most likely represents

- (1) the nucleus
- (2) the mitochondrion
- (3) sunlight
- (4) carbohydrates

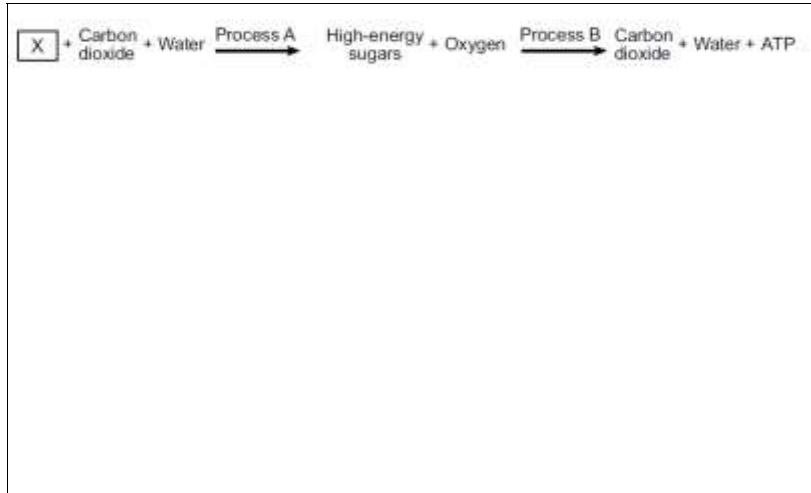
Data Base File Number: 1537

Regents Date Jan2023-20.bmp

Jan2023

20 1/24/2023 S4K5

Answer 3



## photosynthesis

385. Base your answers to this question on the information and diagram shown and on your knowledge of biology. A small water plant (elodea) was placed in bright sunlight for five hours as shown in the diagram. Bubbles of oxygen gas were observed being released from the plant. Since oxygen gas is being released, it can be inferred that the plant is

- (1) producing glucose
- (2) making protein
- (3) releasing energy from water
- (4) carrying on active transport

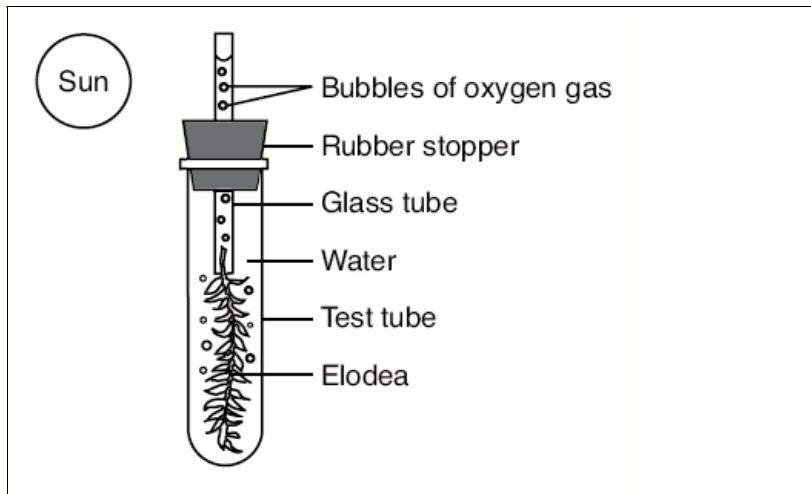
Data Base File Number: 136

Regents Date Aug08-41.bmp

Aug2008

41 8/13/2008 S4K5

Answer 1



## photosynthesis

386. The diagram shown represents the setup for an experiment. Two black paper discs are opposite each other on both sides of each of two leaves. This experimental setup would most likely be used to show that

- (1) glucose is necessary for photosynthesis
- (2) protein is a product of photosynthesis
- (3) light is necessary for photosynthesis
- (4) carbon dioxide is a product of photosynthesis

Data Base File Number: 461

Regents Date Jan2006-32.bmp

Jan2006

32 1/27/2006 S4K5

Answer 3



## photosynthesis

387. An experiment was set up to test the effect of light intensity on the rate of photosynthesis, as shown in the diagram. Data were collected by counting gas bubbles released in a 5-minute period when the light source was placed at various distances from the experimental setup. Which distance, in cm., would most likely produce the most bubbles in a 5-minute period?

- (1) 15
- (2) 23
- (3) 30
- (4) 45

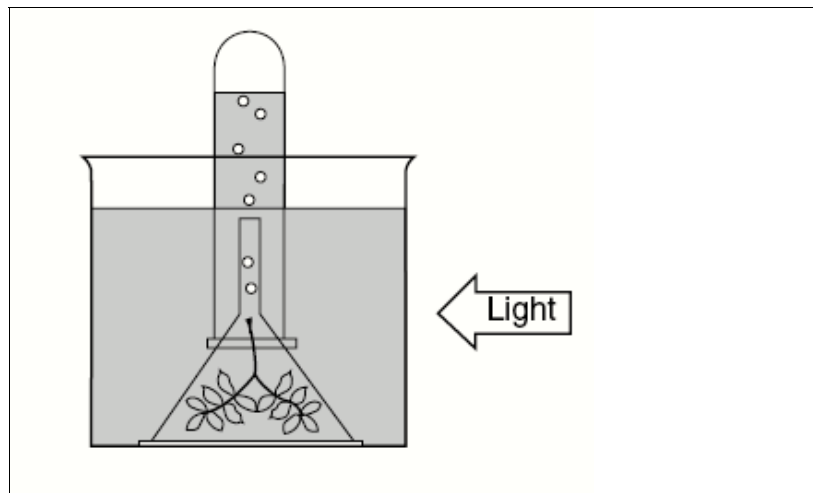
Data Base File Number: 156

Regents Date Jan09-31.bmp

Jan2009

31 1/27/2009 S1K3

Answer 1



## photosynthesis

388. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents a plant leaf cell and two different molecules used in the process of glucose synthesis. Molecules 1 and 2 are most likely

- (1) carbon dioxide and oxygen  
 (2) carbon dioxide and water  
 (3) nitrogen and oxygen  
 (4) nitrogen and water

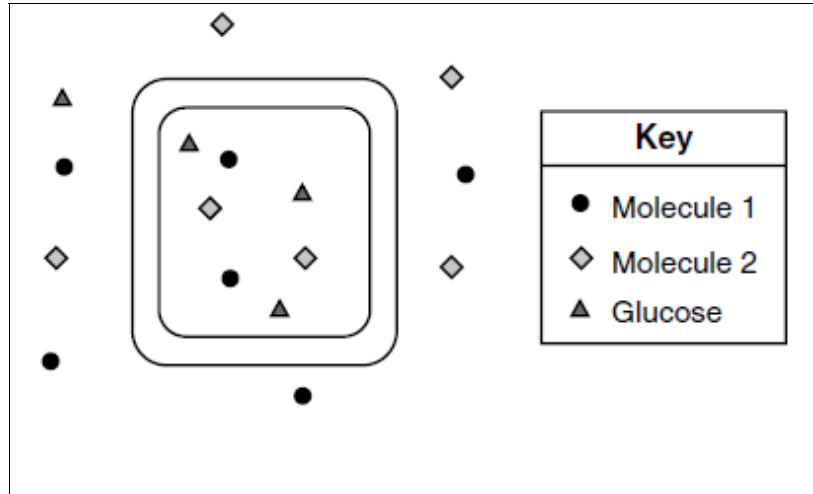
Data Base File Number: 1162

Regents Date Jan2017-36.bmp

Jan2017

31 1/25/2017 S4K5

Answer 2



## photosynthesis

389. A student placed a test tube containing elodea (an aquatic plant) and pond water 10 cm from a light source. He observed that the plant gave off bubbles of a gas and counted how many bubbles were released in one minute. He moved the plant farther away from the light source to see if distance from the source made a difference. The data table below shows his results. The gas that was being produced was most likely

- (1) carbon dioxide as a product of the process of respiration  
 (2) carbon dioxide as a product of the process of photosynthesis  
 (3) oxygen as a product of the process of respiration  
 (4) oxygen as a product of the process of photosynthesis

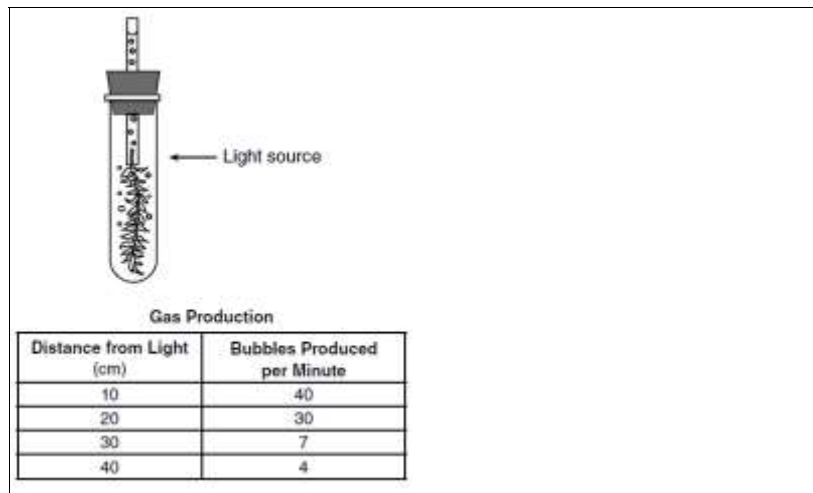
Data Base File Number: 1292

Regents Date Aug2018-43.bmp

Aug2018

43 8/17/2018 S4K5

Answer 4



## photosynthesis

390. Base your answer to this question on the information given and on your knowledge of biology. A small green plant was placed in a flask as shown AT THE LEFT in the diagram. A sensor that measures the CO<sub>2</sub> content of the air in the flask was inserted, and then the flask was sealed with a rubber stopper. The other end of the sensor was connected to a computer to monitor and record CO<sub>2</sub> levels in the flask over a period of time. For part of the time the flask was placed in bright light and for part of the time it was placed in total darkness. The graph AT THE RIGHT shows data that were recorded by the sensor over a period of time. Which condition most likely produced the effect on CO<sub>2</sub> level over the first 23 minutes?

- (1) The light was on for the entire 23 minutes.
- (2) The light was off for the entire 23 minutes.
- (3) The light was off at the start and turned on after 10 minutes.
- (4) The light could have been either on or off because it would have had no effect on the CO<sub>2</sub> level.

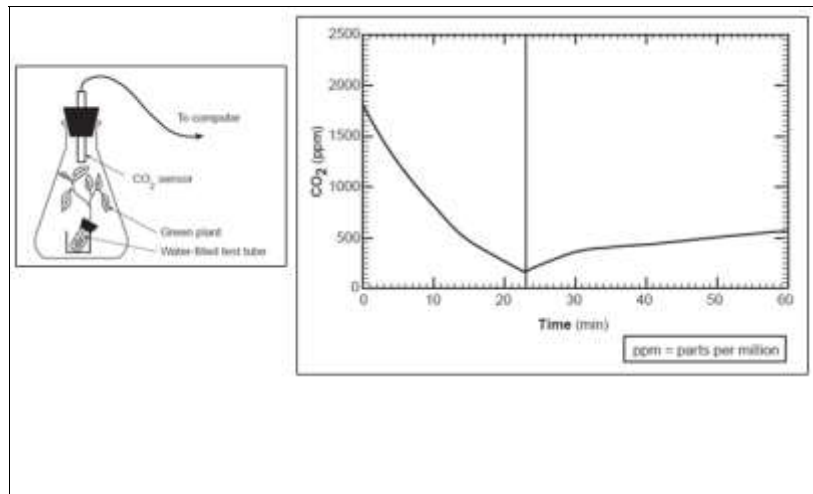
Data Base File Number: 858

Regents Date June2001-60C.b

June2001

61 6/15/2001 S1K3

Answer 1



## photosynthesis

391. Base your answers to this question on the information and diagram shown and on your knowledge of biology. A small water plant (elodea) was placed in bright sunlight for five hours as shown in the diagram. Bubbles of oxygen gas were observed being released from the plant. What substance did the plant most likely absorb from the water for the process that produces the oxygen gas?

- (1) dissolved nitrogen
- (2) carbon dioxide
- (3) an enzyme
- (4) a hormone

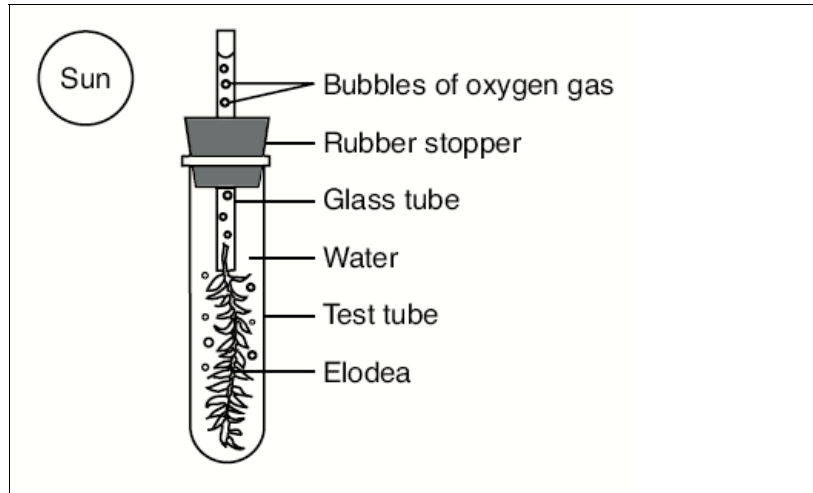
Data Base File Number: 137

Regents Date Aug08-41.bmp

Aug2008

42 8/13/2008 S4K5

Answer 2



## photosynthesis

392. The diagram shown represents part of a life process in a leaf chloroplast. If the process illustrated in the diagram is interrupted by a chemical at point X, there would be an immediate effect on the release of

- (1) chlorophyll
- (2) nitrogen
- (3) carbon dioxide
- (4) oxygen

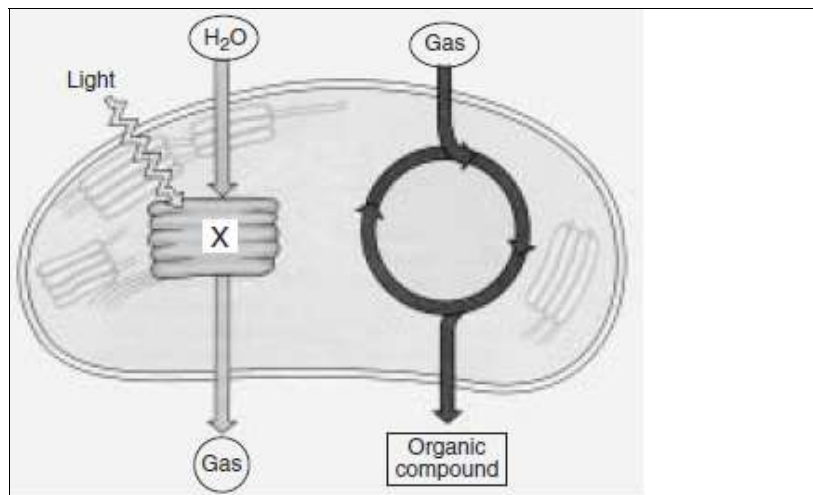
Data Base File Number: 808

Regents Date June2002-27.bmp

June2002

27 6/19/2002 S4K5

Answer 4



## photosynthesis

393. Base your answer to this question on the information and diagram shown. An investigation was carried out using the two setups shown in the diagram. Other than the difference shown in the diagram, all other conditions were identical. State one possible hypothesis that could be tested using these setups.

- (1) The lily grows faster at 15 degrees C. than at 20 degrees C.
- (2) The lily grows faster under blue light.
- (3) The lily grows faster at 20 degrees C. than at 15 degrees C.
- (4) The lily grows faster under green-yellow light.

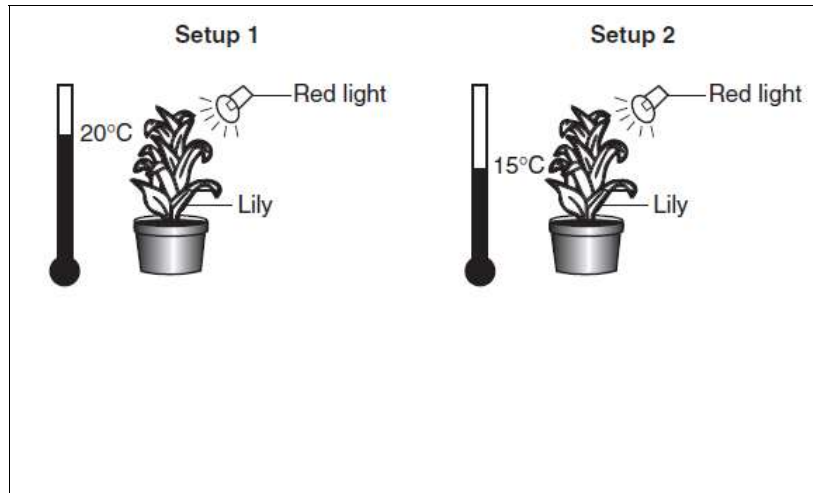
Data Base File Number: 702

Regents Date Aug2004-68.bmp

Aug2004

68 8/17/2004 LAB2

Answer 3



## photosynthesis

394. Base your answer to this question on the information given, and on the graph shown, and on your knowledge of biology. The graph represents the results of an investigation using leaf disks from spinach plants. Small disks were cut from spinach leaves that had been treated to remove any air from inside the leaf. The disks were placed in a solution that allowed them to carry out photosynthesis. At first, all the disks sank to the bottom of the container. The disks were divided into five groups. Each group was exposed to light of a different intensity, measured in watts per meter squared ( $W/m^2$ ). Some of the disks began to float. The results of the investigation are shown in the graph. The substance produced inside the leaf disks that caused them to float to the surface of the solution is

- (1) ozone
- (2) oxygen
- (3) water
- (4) nitrogen

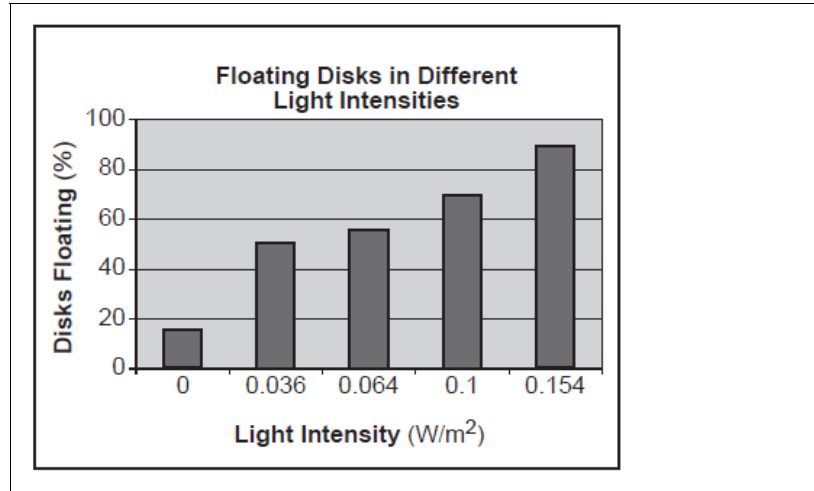
Data Base File Number: 1112

Regents Date June2016-48.bmp

June2016

49 6/15/2016 S1K1

Answer 2



## photosynthesis

395. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The diagram represents a system in a space station that includes a tank containing algae. An astronaut from a spaceship boards the space station. What process is being controlled in the setup shown in the diagram?

- (1) photosynthesis
- (2) digestion
- (3) dehydration synthesis
- (4) phosphorylation

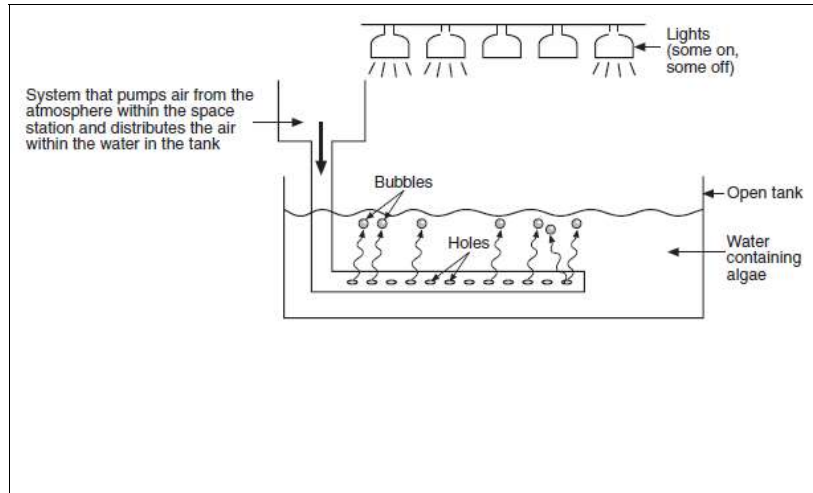
Data Base File Number: 727

Regents Date Jan2003-71.bmp

Jan2003

71 1/30/2003 S1K2

Answer 1



## photosynthesis

396. Which phrase, if placed in box X, would correctly complete the flowchart shown?

- (1) Increased use of starch in root cells
- (2) Increased concentration of glucose in leaf cells
- (3) Decreased ATP in root cells
- (4) Decreased concentration of oxygen in leaf cells

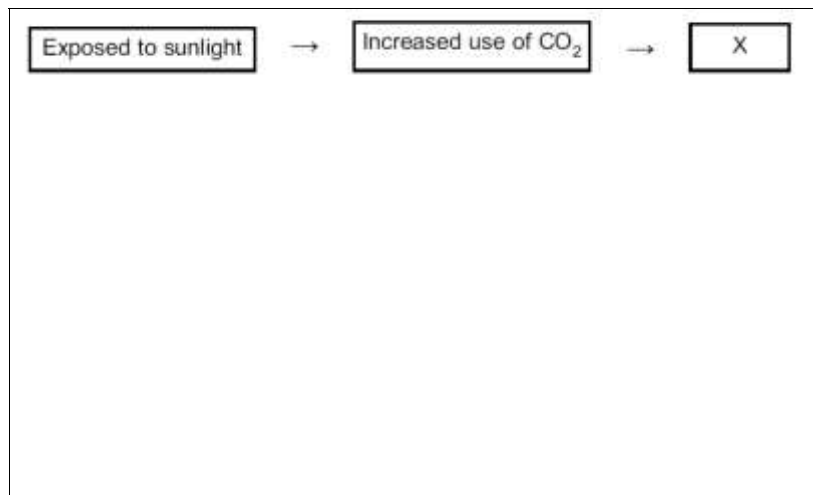
Data Base File Number: 278

Regents Date Aug2010-11.bmp

Aug2010

11 8/18/2010 S4K5

Answer 2





## photosynthesis

397. The diagram shown represents a biological process. Which set of molecules is best represented by letters A and B?

- (1) A: oxygen and water B: glucose  
(2) A: glucose B: carbon dioxide and water  
(3) A: carbon dioxide and water B: glucose  
(4) A: glucose B: oxygen and water

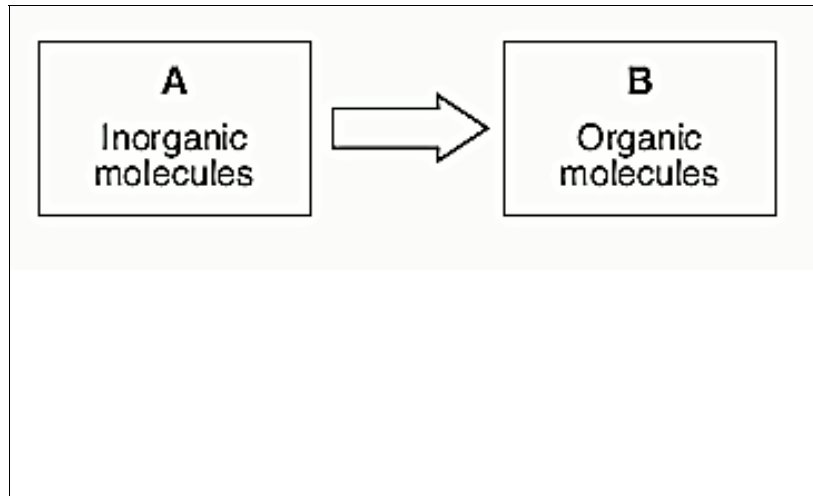
Data Base File Number: 70

Regents Date Jan08-30.bmp

Jan2008

30 1/25/2008 S4K5

Answer 3



## photosynthesis

398. An experimental setup is shown in the diagram. Which hypothesis would most likely be tested using this setup?

- (1) Light is needed for the process of reproduction.  
(2) Glucose is not synthesized by plants in the dark.  
(3) Protein synthesis takes place in leaves.  
(4) Plants need fertilizers for proper growth.

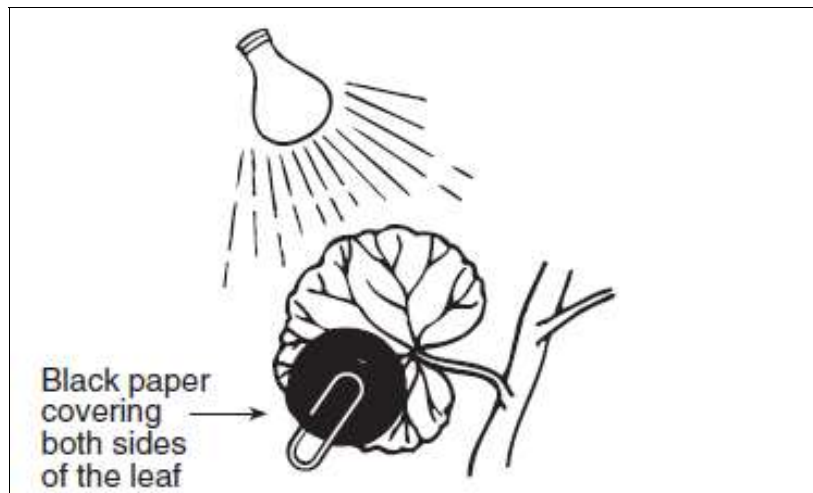
Data Base File Number: 564

Regents Date June2005-31.bmp

June2005

31 6/22/2005 S1K2

Answer 2



## photosynthesis

399. The green aquatic plant represented in the diagram shown was exposed to light for several hours. Which gas would most likely be found in the greatest amount in the bubbles?

- (1) oxygen  
 (2) nitrogen  
 (3) ozone  
 (4) carbon dioxide

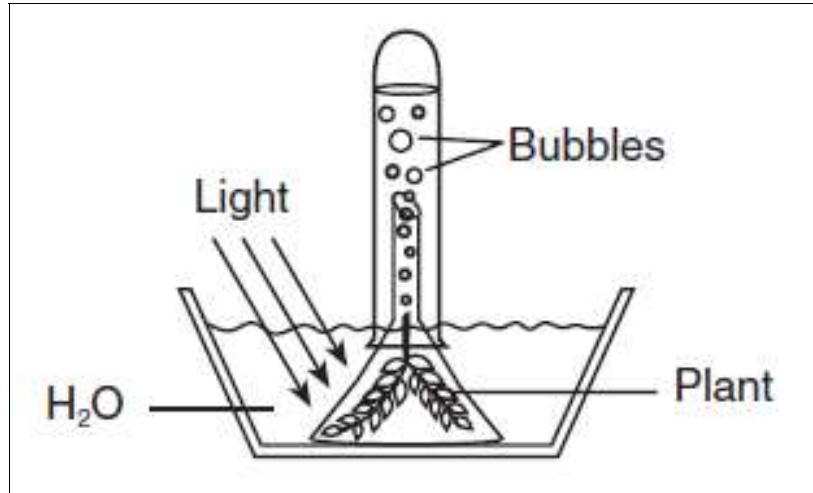
Data Base File Number: 559

Regents Date June2005-22.bmp

June2005

22 6/22/2005 S4K5

Answer 1



## photosynthesis

400. As the depth of the ocean increases, the amount of light that penetrates to that depth decreases. At about 200 meters, little, if any, light is present. The graph shown illustrates the population size of four different species at different water depths. Which species most likely performs photosynthesis?

- (1) A  
 (2) B  
 (3) C  
 (4) D

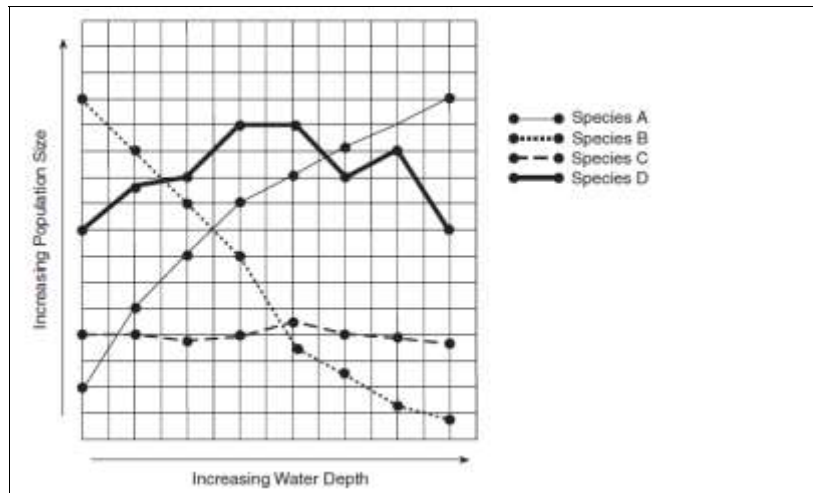
Data Base File Number: 717

Regents Date Jan2003-36.bmp

Jan2003

36 1/30/2003 S1K3

Answer 2



## photosynthesis

401. Base your answer to this question on the information given, and on the graph shown, and on your knowledge of biology. The graph represents the results of an investigation using leaf disks from spinach plants. Small disks were cut from spinach leaves. A number of freshly prepared disks were placed in five containers. These containers were then each exposed to light of a different color. The results of the investigation are shown in the graph. Which color of light appears to be LEAST effective for photosynthesis in spinach leaves?

- (1) white (3) green  
(2) blue (4) red

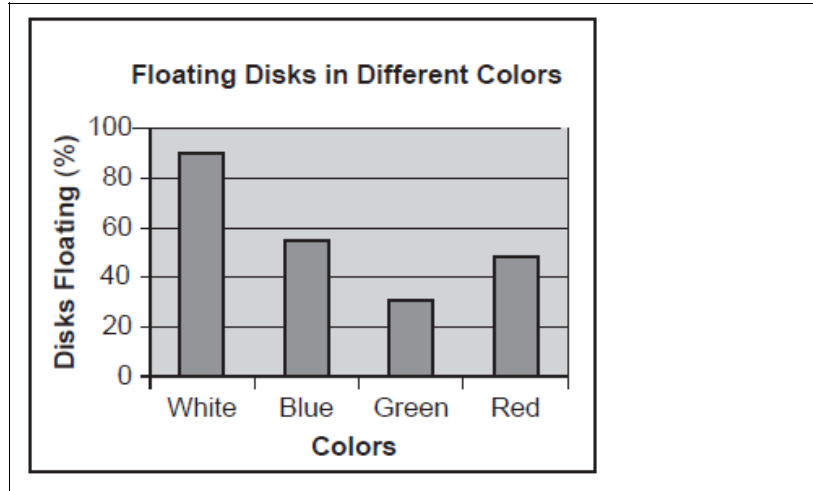
Data Base File Number: 1113

Regents Date June2016-50.bmp

June2016

50 6/15/2016 S1K1

Answer 3



## photosynthesis

402. The equation shown represents a summary of a biological process. This process is completed in

- (1) mitochondria (3) cell membranes  
(2) ribosomes (4) chloroplasts

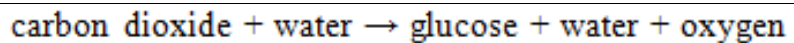
Data Base File Number: 712

Regents Date Jan2003-20.bmp

Jan2003

20 1/30/2003 S4K5

Answer 4



## photosynthesis

403. The arrows in the diagram below represent the movement of materials. This movement of materials indicated by the arrows is most directly involved in the processes of

- (1) respiration and replication
- (2) photosynthesis and excretion
- (3) digestion and recycling
- (4) circulation and coordination

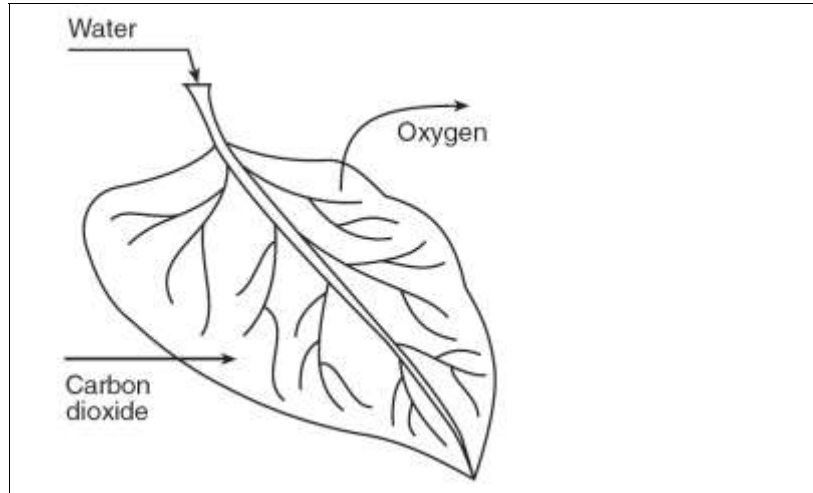
Data Base File Number: 342

Regents Date June2011-35.bmp

June2011

35 6/21/2011 S4K5

Answer 2



## photosynthesis

404. Base your answer to this question on the two different cells shown in the diagram. Only cell A produces substance X. Both cells A and B use substance X. What is substance X?

- (1) oxygen
- (2) proteins
- (3) fatty acids
- (4) alcohol

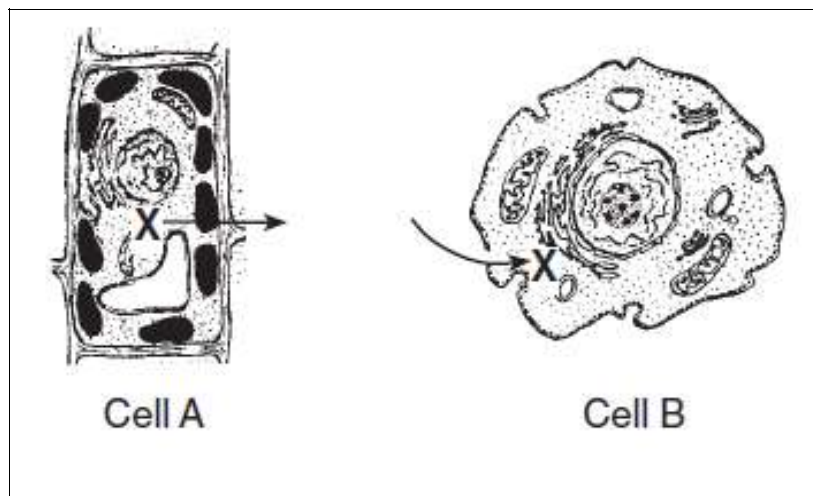
Data Base File Number: 694

Regents Date Aug2004-37.bmp

Aug2004

37 8/17/2004 S4K1

Answer 1



## photosynthesis

405. The chart shown is a summary of the net number of atoms in the molecules used and produced during the process of photosynthesis. Is there a gain, loss, or no change in matter during photosynthesis?

- (1) gain in matter
- (2) loss in matter
- (3) no change in matter
- (4) gain and loss in matter

Data Base File Number: 1678

Regents Date June2024-57.bmp

June2024

57 6/14/2024 S4K6

Answer 3

Type of Atom	Number of Atoms in the Molecules Used for Photosynthesis	Number of Atoms in the Molecules Produced by Photosynthesis
Carbon (C)	6	6
Hydrogen (H)	12	12
Oxygen (O)	18	18

## photosynthesis

406. The diagram shown represents events associated with a biochemical process that occurs in some organisms. Which statement concerning this process is correct?

- (1) The process represented is respiration and the primary source of energy for the process is the Sun
- (2) The process represented is photosynthesis and the primary source of energy for the process is the Sun.
- (3) This process converts energy in organic compounds into solar energy which is released into the atmosphere.
- (4) This process uses solar energy to convert oxygen into carbon dioxide.

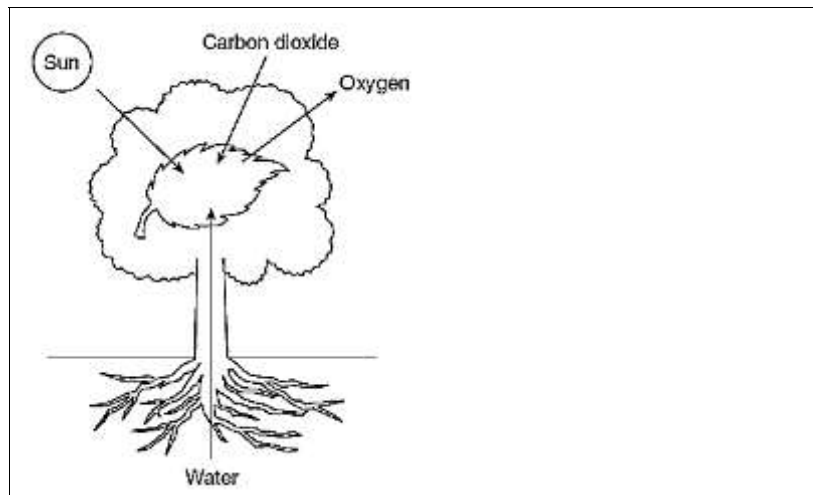
Data Base File Number: 28

Regents Date June07-24.bmp

June2007

24 6/20/2007 S4K5

Answer 2



## photosynthesis

407. The diagram shown represents a process in certain organisms. Which process is involved?

- (1) respiration
- (2) photosynthesis
- (3) active transport
- (4) excretion

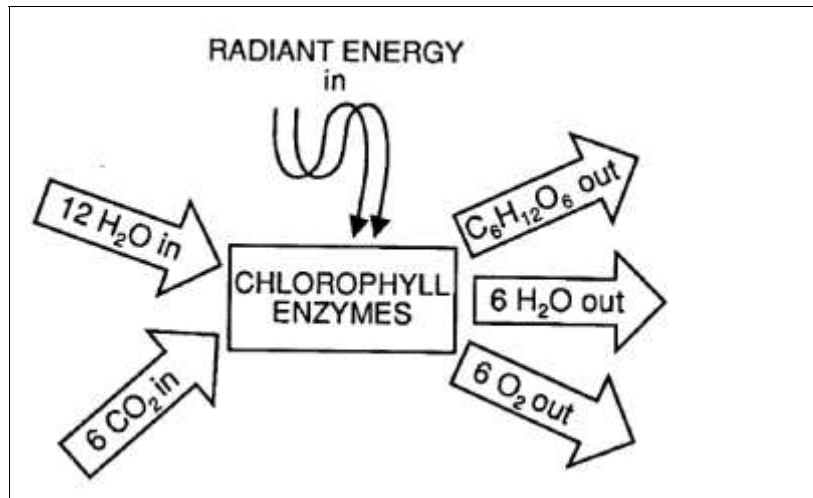
Data Base File Number: 24

Regents Date RBS-Pix

UNKNOWN

RBS 9/16/2007 S4K5

Answer 2



## photosynthesis

408. Tourists travel to the Adirondacks in the fall to see the changing colors in the leaves of the trees. The leaves turn from green to many shades of red, yellow, and orange, as the chlorophyll slowly breaks down. A DECREASE in green chlorophyll in the chloroplasts will directly result in

- (1) an increase in the glucose and oxygen produced
- (2) a decrease in the glucose and oxygen produced
- (3) an increase in the glucose and a decrease in the carbon dioxide produced
- (4) a decrease in the glucose and an increase in the carbon dioxide produced

Data Base File Number: 1600

Regents Date Aug2023-15.bmp

Aug2023

15 8/17/2023 S4K5

Answer 2



## photosynthesis

409. A biological process that occurs in plants is represented in the diagram shown. Which row in the chart identifies the lettered substances in this process?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base  
File Number:

323

Regents Date

Jan2011-45.bmp

Jan2011

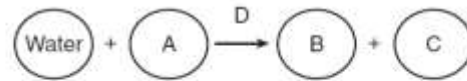
45

1/25/2011

S4K5

Answer

2



Which row in the chart below identifies the lettered substances in this process?

Row	A	B	C	D
(1)	enzymes	oxygen	carbon dioxide	glucose
(2)	carbon dioxide	glucose	oxygen	enzymes
(3)	glucose	enzymes	oxygen	carbon dioxide
(4)	oxygen	glucose	carbon dioxide	enzymes

## photosynthesis

410. Base your answer to this question on the information given, the diagram, and your knowledge of biology. ----- Green Roofs ----- People in Albany and New York City are using "green roofs" to improve the environment. A green roof can be added to many buildings that have large, flat roofs. Green roofs have three parts: a protective layer to separate plant roots from the roof of the building, an absorptive layer to catch and hold rainwater, and a layer of plants. Often, green roofs use Sedum, a short, desert plant, because it is efficient at storing water in its leaves and can withstand the colder climate. A green roof saves energy, reduces carbon dioxide in the atmosphere, and prevents rainwater and melting snow from overloading sewer systems. It can also protect the roof of a building from damage. However, green roofs can be expensive to install, and require care and maintenance. Why does a green roof reduce the amount of carbon dioxide in the atmosphere?

- (1) The green plants take in oxygen.
- (2) The green plants give off oxygen.
- (3) The green plants take in carbon dioxide to perform photosynthesis.
- (4) The green plants give off water.

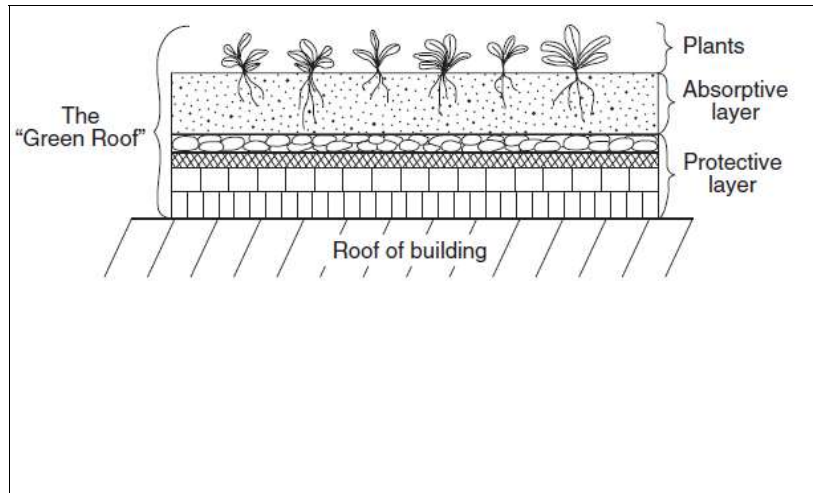
Data Base File Number: 1145

Regents Date August2016-58.b

Aug2016

59 8/18/2016 S4K7

Answer 3





## photosynthesis

411. The graph shows the results of an experiment in which a container of oxygen-using bacteria and strands of a green alga were exposed to light of different colors. Which statement best explains the results of this experiment?

- (1) The rate of photosynthesis is affected by variations in the light.
- (2) In all environments light is a vital resource.
- (3) The activities of bacteria and algae are not related.
- (4) Uneven numbers and types of species can upset ecosystem stability.

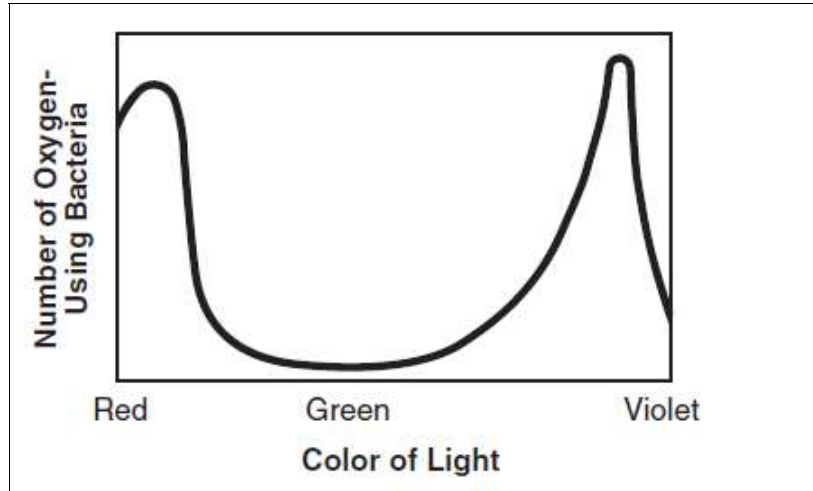
Data Base 532  
File Number:

Regents Date Jan2005-1.bmp

Jan2005

1 1/28/2005 S4K1

Answer 1



## photosynthetic microbes

412. Base your answer to this question on the information and data in the table and on your knowledge of biology. A student studied the location of single-celled photosynthetic organisms in a lake for a period of several weeks. The depth at which these organisms were found at different times of the day varied greatly. Some of the data collected are shown in the table. A valid inference based on these data is that

- (1) most photosynthetic organisms live below a depth of 150 centimeters
- (2) oxygen production increases as photosynthetic organisms move deeper into the lake.
- (3) photosynthetic organisms respond to changing light levels
- (4) photosynthetic organisms move up and down to increase their rate of carbon dioxide production

Data Base File Number: 15

Regents Date Aug07-34.bmp

Aug2007

34 8/16/2007 S4K5

Answer 3

Light Conditions at Different Times of the Day	Average Depth of Photosynthetic Organisms (cm)
full light	150
moderate light	15
no light	10

## placenta

413. The human female reproductive system is represented in the diagram shown. Within which structure does the placenta normally develop?

- (1) A
- (2) B
- (3) C
- (4) D

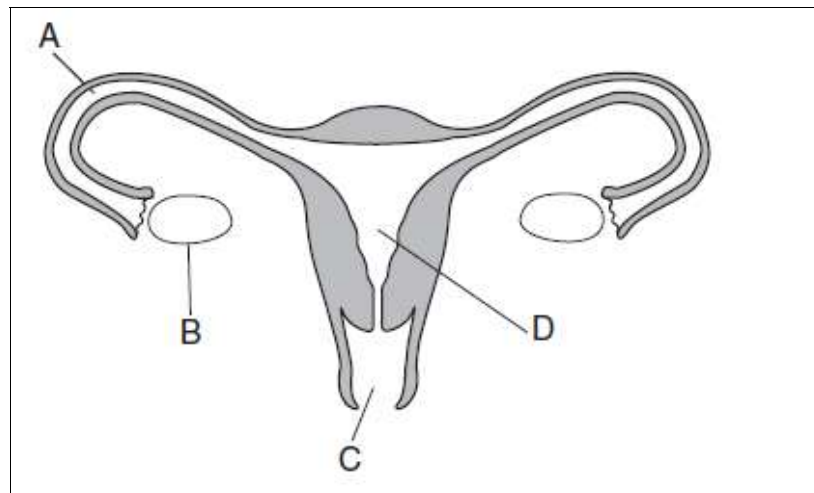
Data Base File Number: 1128

Regents Date August2016-22.b

Aug2016

22 8/18/2016 S4K4

Answer 4



## placenta

414. The diagram shown represents one stage during the human reproductive process. A function of structure A is to

- (1) remove nutrients from the fetus
- (2) provide the fetus with metabolic wastes
- (3) remove all toxins from the blood of the mother
- (4) provide for the exchange of oxygen and carbon dioxide

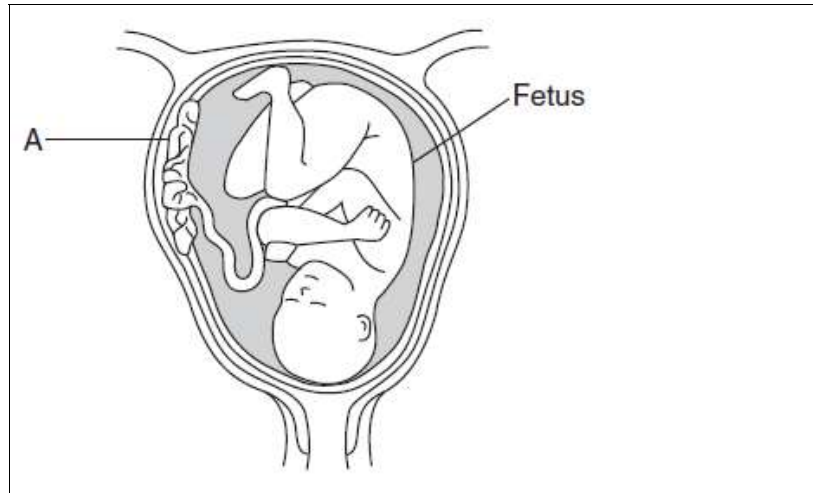
Data Base File Number: 994

Regents Date Jan2015-37.bmp

Jan2015

37 2/26/2015 S4K4

Answer 4



## placenta

415. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows part of a human female reproductive system. Identify the structure labeled A.

- (1) oviduct
- (2) placentas
- (3) uterus
- (4) amnion

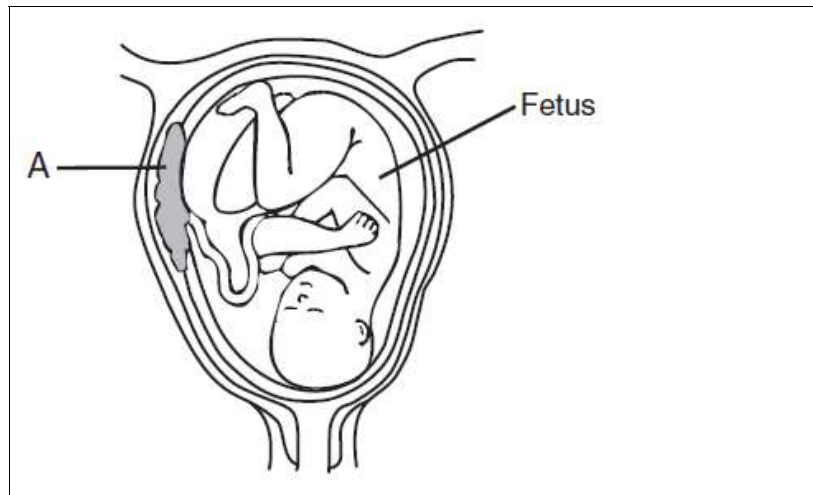
Data Base File Number: 498

Regents Date June2006-58.bmp

June2006

58 6/21/2006 S4K4

Answer 2



## placenta

416. The diagram shown represents a stage in the development of a fetus.  
A major function of structure X is to

- (1) produce gametes by meiosis
- (2) protect the fetus from physical injury
- (3) exchange materials between the mother and the fetus
- (4) store food to provide the fetus with nutrients

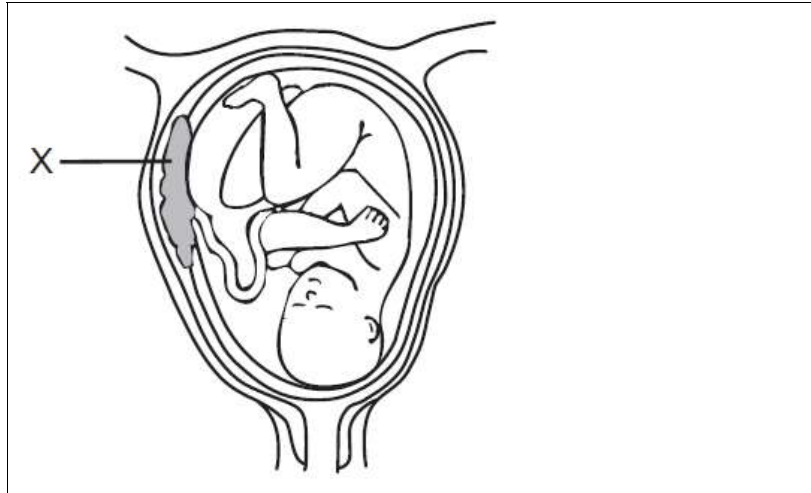
Data Base File Number: 1070

Regents Date Jan2016-16.bmp

Jan2016

16 1/27/2016 S4K4

Answer 3



## placenta

417. The diagram shown represents a developing fetus in a human. What would most likely happen if structure X were damaged in the early stages of pregnancy?

- (1) The genes from the mother would not be turned on in the fetus.
- (2) The nutrients necessary for development would not be able to reach the fetus.
- (3) The fertilized egg would not be able to travel from the ovary to the uterus
- (4) Development would take longer since the fetus would have to synthesize nutrients.

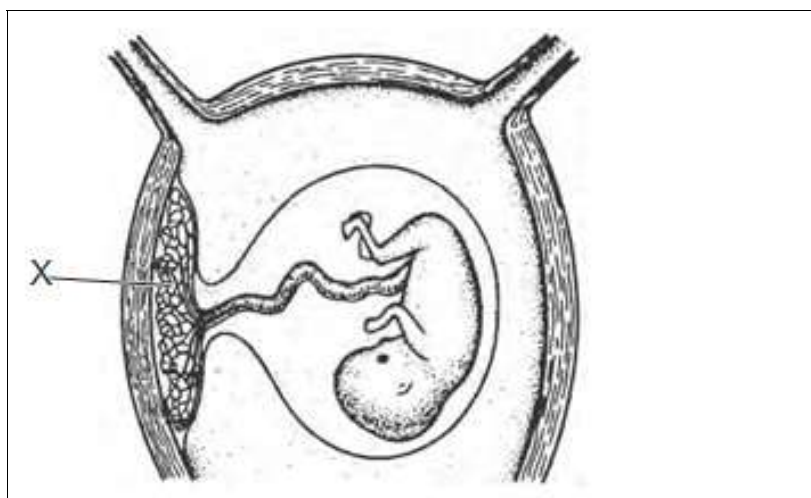
Data Base File Number: 1206

Regents Date Aug2017-27.bmp

Aug2017

27 8/17/2017 S4K4

Answer 2



## placenta

418. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the human female reproductive system. The placenta forms from the combination of fetal tissue and tissue from structure

- (1) A
- (2) B
- (3) C
- (4) D

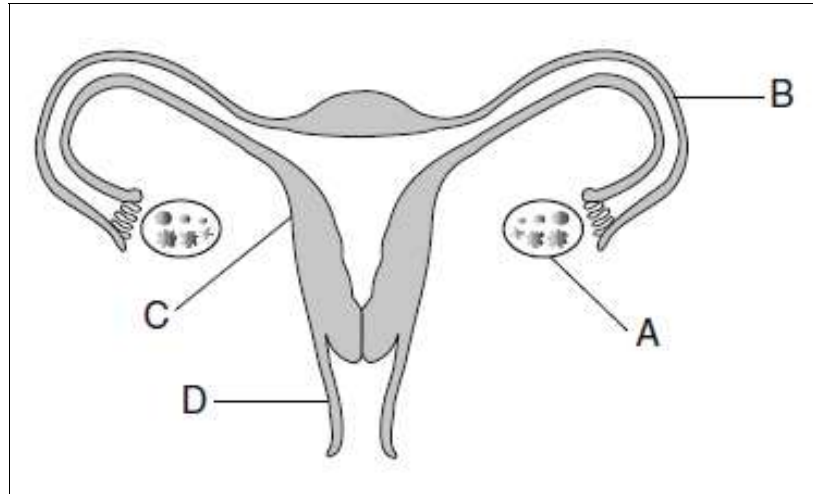
Data Base File Number: 608

Regents Date Jan2013--10.bmp

Jan2013

11 1/23/2013 S4K4

Answer 3



## placenta

419. Which statement best describes an important process carried out by structure X?

- (1) Milk passes from the mother to the fetus.
- (2) Materials are exchanged between fetal and maternal blood.
- (3) Maternal blood is converted into fetal blood.
- (4) Oxygen diffuses from fetal blood to maternal blood.

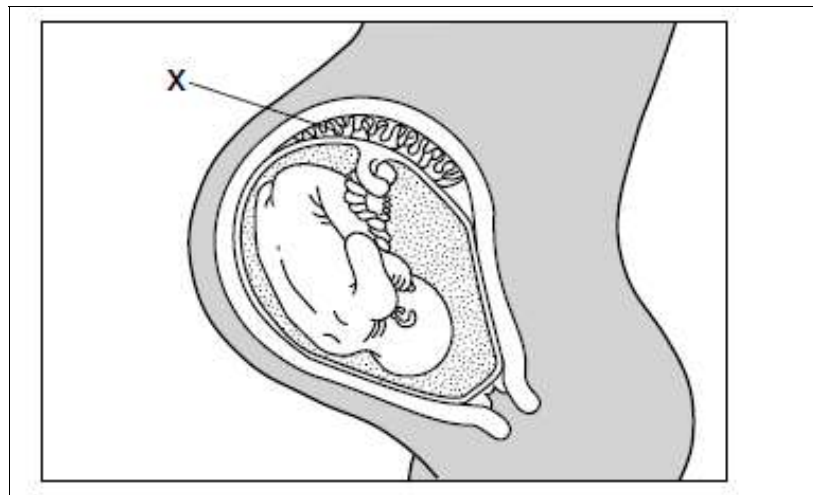
Data Base File Number: 1228

Regents Date Jan2018-8.bmp

Jan2018

8 1/22/2018 S4K4

Answer 2



plant cell

420. A student examines the diagram of a plant cell as shown. ONE part of the plant cell that would NOT be found in an animal is

- (1) the cell wall
- (2) the central vacuole
- (3) the chloroplasts
- (4) all of the above choices are correct

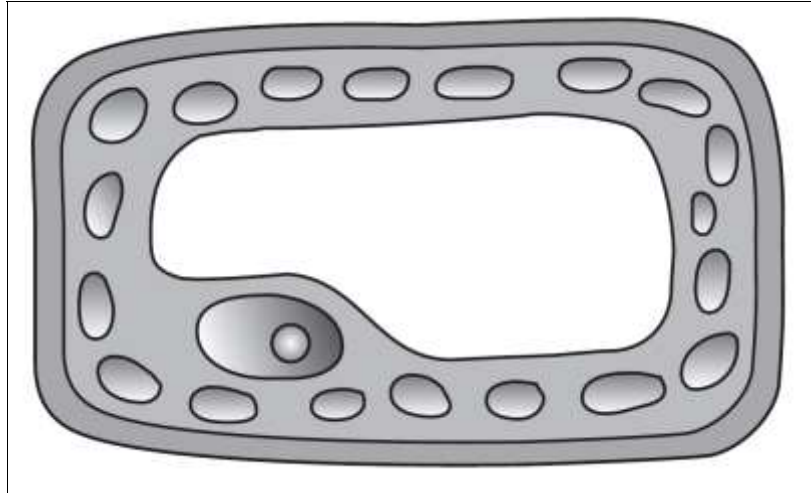
Data Base File Number: 346

Regents Date: June2011-46.bmp

June2011

46 6/21/2011 S4K1

Answer: 4



plant cell

421. Which cell is most likely a plant cell?

- (1) cell 1
- (2) cell 2
- (3) cell 1 and cell 2
- (4) No cells are plant cells

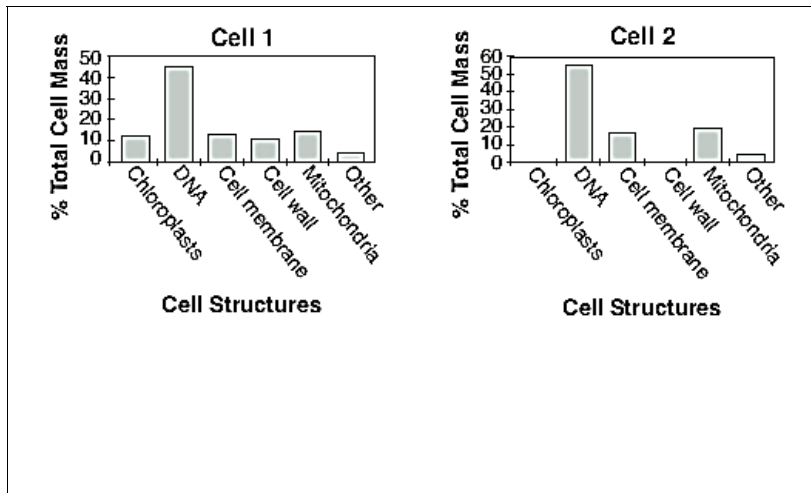
Data Base File Number: 80

Regents Date: Jan08-50.bmp

Jan2008

50 1/25/2008 S4K1

Answer: 1



## plasmolysis

422. Base your answer to this question the information and diagram shown and on your knowledge of biology. The diagram represents red blood cells placed in three test tubes, each containing a different salt solution. Which statement best describes solution C?

- (1) The concentration of dissolved salt in the solution is greater than the concentration in the cells
- (2) The concentration of dissolved salt in the solution is less than the concentration in the cells.
- (3) The concentration of water in the solution is greater than the concentration in the cells.
- (4) The concentration of water in the solution is equal to the concentration in the cells.

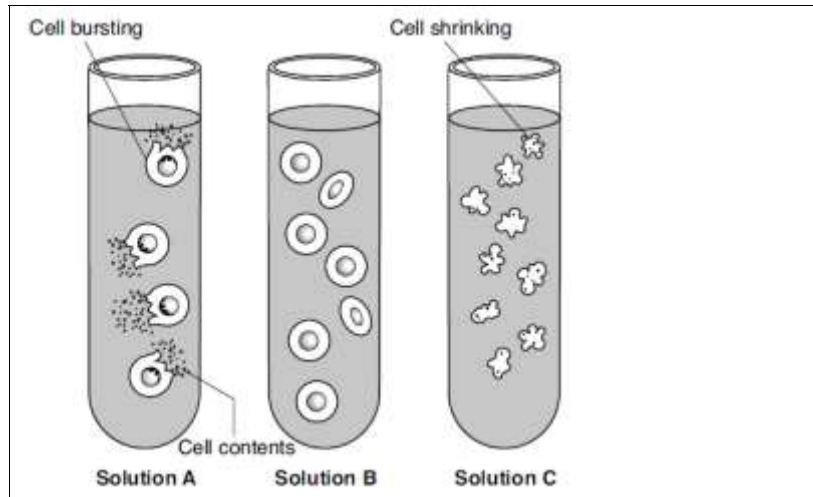
Data Base File Number: 1325

Regents Date Jan2019-75.bmp

Jan2019

75 1/22/2019 LAB5

Answer 1



## plasmolysis

423. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a cell and its changes as a result of two laboratory procedures, A and B. In procedure A, a 2% salt solution is added to the cell. In procedure "B", distilled water is added to the cell. What is the name of process A?

- (1) plasmolysis
- (2) plasmoptysis
- (3) electrophoresis
- (4) chromatography

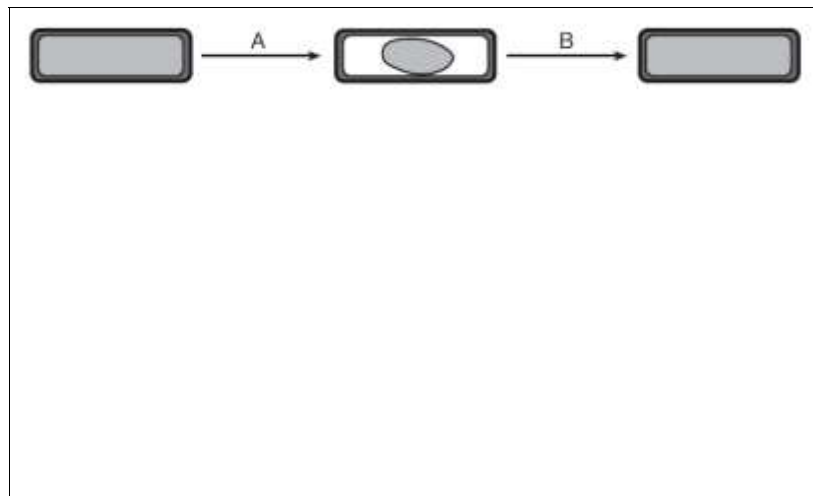
Data Base File Number: 895

Regents Date June2013-79.bmp

June2013

79 6/11/2013 LAB5

Answer 1



## plasmolysis

424. Cell (1) in the diagram shown represents a plant cell in tap water as seen with a compound light microscope. Which diagram best represents the appearance of the cell after it has been placed in a 15% salt solution for two minutes?

(1) (1)

(3) (3)

(2) (2)

(4) (4)

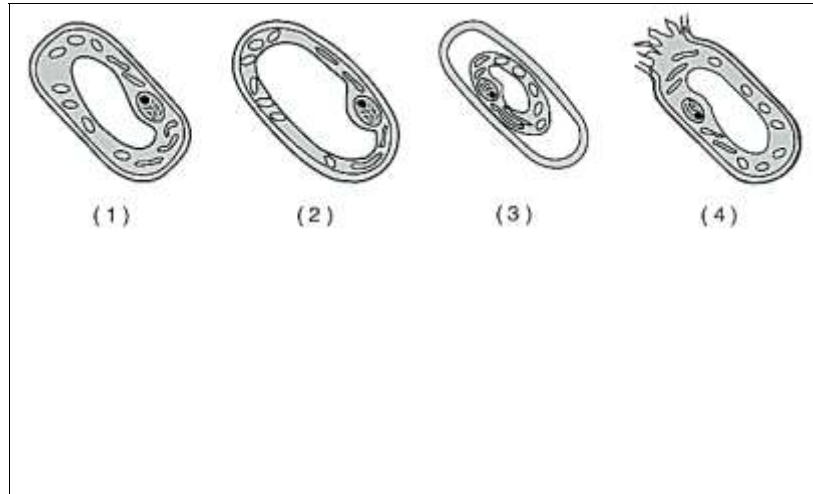
Data Base File Number: 116

Regents Date June08-80.bmp

June2008

80 6/24/2008 LABS

Answer 3



## plasmolysis

425. Red onion cells undergo the change represented in the diagram shown. This change is most likely caused by the cell being transferred from

(1) distilled water to starch indicator

(3) salt water to tap water

(2) distilled water to salt water

(4) salt water to distilled water

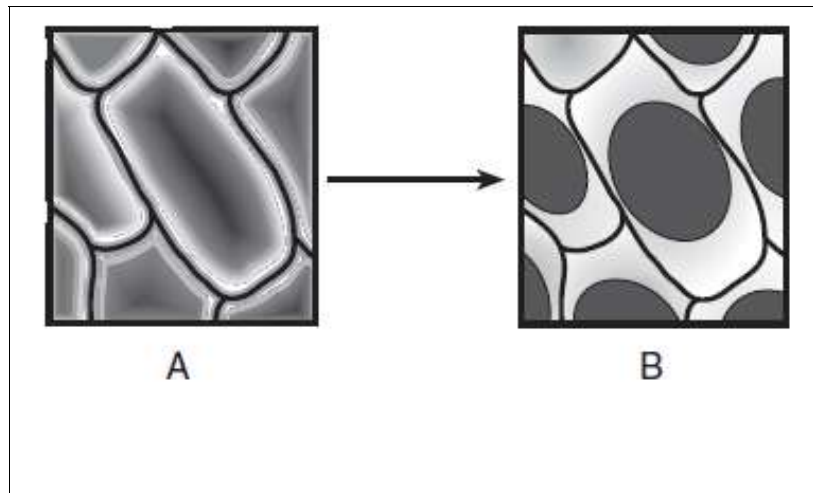
Data Base File Number: 1005

Regents Date Jan2015-75.bmp

Jan2015

75 2/26/2015 LAB5

Answer 2





## plasmolysis

426. A student prepared a wet-mount slide of some red onion cells and then added some salt water to the slide. The student observed the slide using a compound light microscope. Diagram A is typical of what the student observed after adding salt water. What would be the appearance of the cell in diagram B if the cell were then rinsed with distilled water for several minutes?

- (1) The shaded area in B would be the same size as the shaded area in A.
- (2) The shaded area in B would be larger than the shaded area in A.
- (3) There would be no shaded area in B.
- (4) Cell B would die.

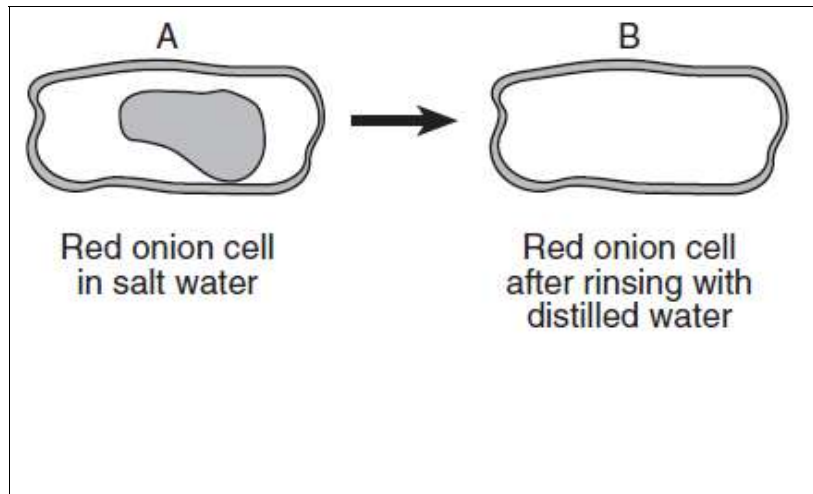
Data Base File Number: 579

Regents Date June2005-73.bmp

June2005

73 6/22/2005 LAB5

Answer 2



## plasmolysis

427. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents three groups of red blood cells. Groups A and B were each placed in different solutions for the same period of time. Which group of cells had most likely been placed in distilled water?

- (1) A
- (2) B
- (3) normal
- (4) both A and B

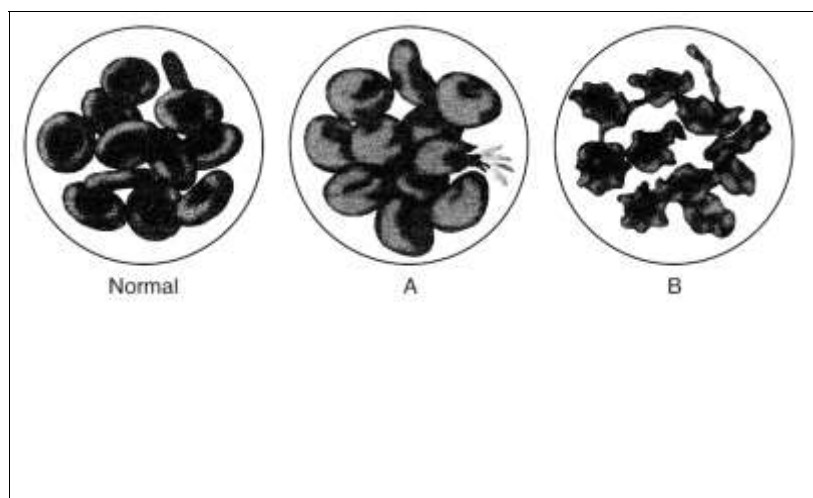
Data Base File Number: 1493

Regents Date June2022-77.bmp

June2022

77 6/15/2022 LAB5

Answer 1



## plasmolysis

428. The diagram shown represents what occurred when an onion cell and a red blood cell were placed in distilled water. The best explanation for why the onion cells do not burst, while red blood cells often do, is that

- (1) the red blood cells have only a cell membrane, which does not protect them from bursting
- (2) the onion cells do not have a cell wall that could protect them from bursting
- (3) the onion cells have a cell membrane, which can protect them from bursting
- (4) the red blood cells have a cell wall, which does not protect them from bursting

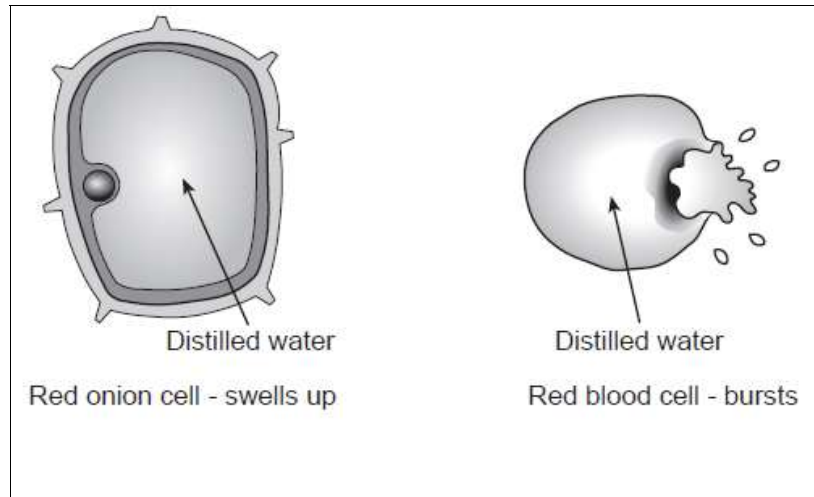
Data Base File Number: 1085

Regents Date Jan2016-74.bmp

Jan2016

74 1/27/2016 LAB5

Answer 1



## plasmolysis

429. A and B shown in the diagram represent two different slide preparations of elodea leaves. Elodea is a plant found in streams and ponds in New York State. The water used on slide A contained 1% salt and 99% water. The salt solution used on slide B contained 6% salt and 94% water. Elodea cells normally contain 1% salt. Five minutes after the slides were prepared, a student using a compound light microscope to observe the cells in leaves A and B would most likely see that

- (1) water had moved out of the cells of the leaf on slide A
- (2) salt had moved into the cells of the leaf on slide A
- (3) water had moved out of the cells of the leaf on slide B
- (4) salt had moved out of the cells of the leaf on slide B

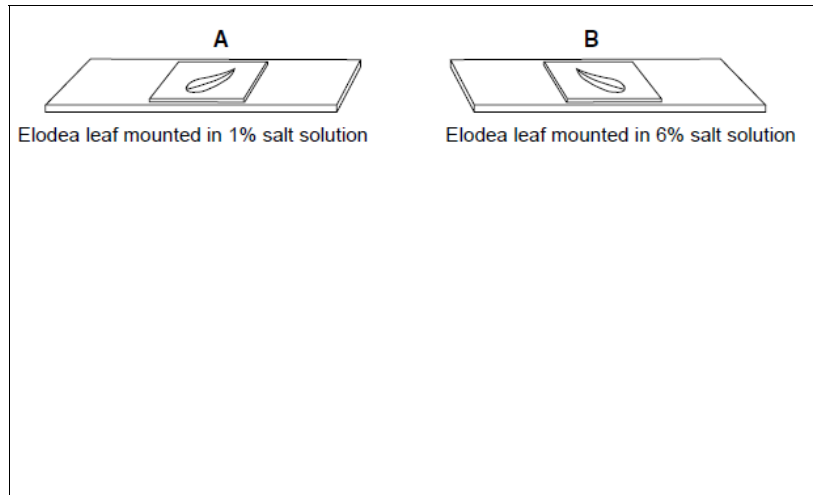
Data Base File Number: 1270

Regents Date June2018-76.bmp

June2018

76 6/13/2018 LAB5

Answer 3



## plasmolysis

430. The diagram shown represents a green plant cell viewed with the high power of a compound light microscope before and after a particular substance was added. Identify a substance that could have been added to the slide to bring about the change shown.

- (1) salt solution
- (2) distilled water
- (3) tap water
- (4) rain water

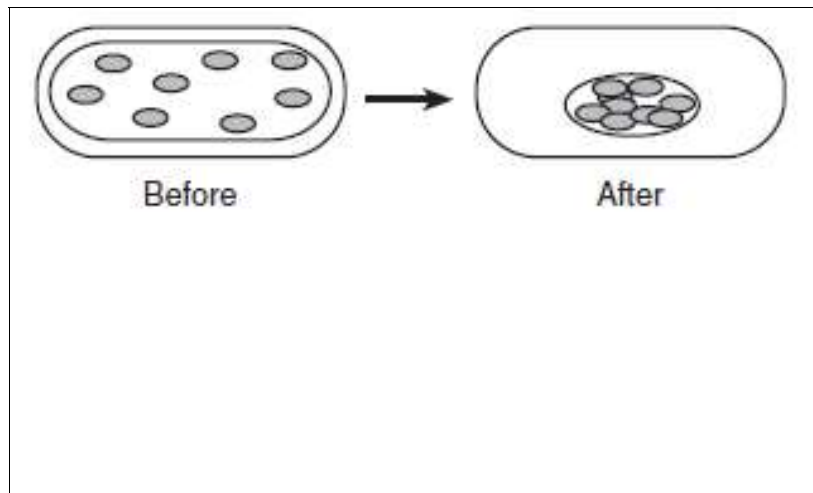
Data Base File Number: 1039

Regents Date June2015-77.bmp

June2015

77 6/16/2015 LAB5

Answer 1



## plasmolysis

431. Two skin cells from the same animal were each placed in a different solution. The diagrams as shown represent the changes that occurred in each cell after 5 minutes in each solution. Which cell was placed in a solution containing a higher concentration of salt than the concentration of salt normally found in these skin cells?

- (1) A  
(2) B  
(3) Both A and B  
(4) Neither A or B

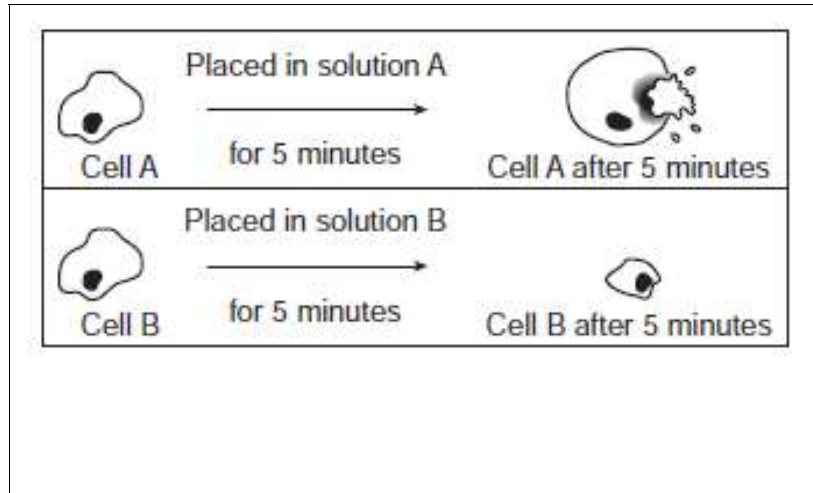
Data Base File Number: 1625

Regents Date Aug2023-84.bmp

Aug2023

84 8/17/2023 LAB5

Answer 2



## pollination / insect

432. The diagram below represents a species of bee that helps one type of orchid plant reproduce by carrying pollen on structure X from one orchid flower to another. Pollination by this species of bee is the only way the orchid can reproduce. If this bee species dies out, this orchid species would most likely

- (1) cease to exist  
(2) find another animal to carry the pollen  
(3) find another animal to carry the pollen  
(4) develop another way to reproduce

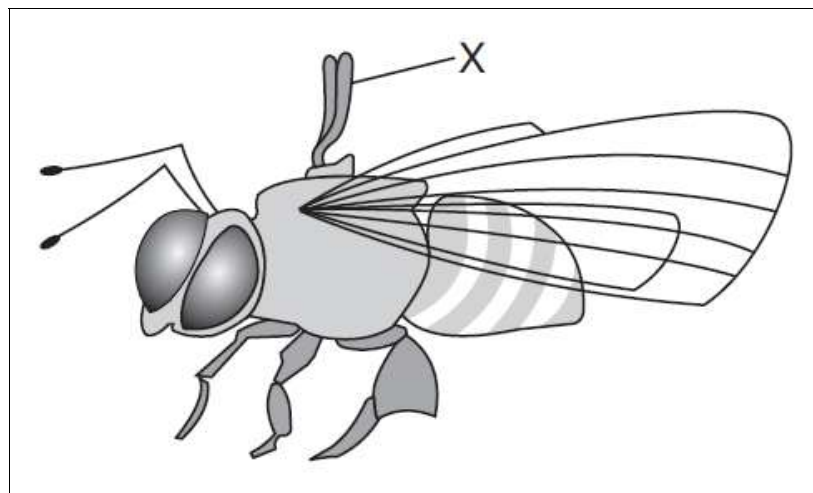
Data Base File Number: 215

Regents Date August2009-33.b

Aug2009

33 8/13/2009 S4K6

Answer 1



**pollution / air**

433. The diagram shown represents how air pollution may move across the eastern United States. In order to reduce the amount of air pollution in Pennsylvania, which change is necessary?

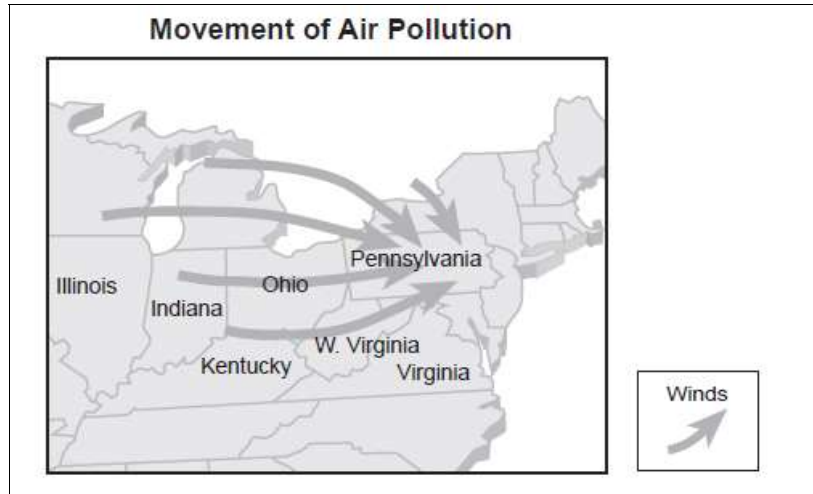
- (1) Laws must be passed to protect endangered species.
- (2) The use of natural resources must be increased.
- (3) More coal-burning power plants must be built.
- (4) The cooperation between the different states must be improved.

Data Base File Number: 1099

Regents Date June2016-30.bmp

June2016  
30 6/15/2016 S4K7

Answer 4



**pollution / air**

434. NOTE: ROTATE your paper to the LEFT to view the MAP. The map shows the movement of some air pollution across part of the United States. Which statement is a correct inference that can be drawn from this information?

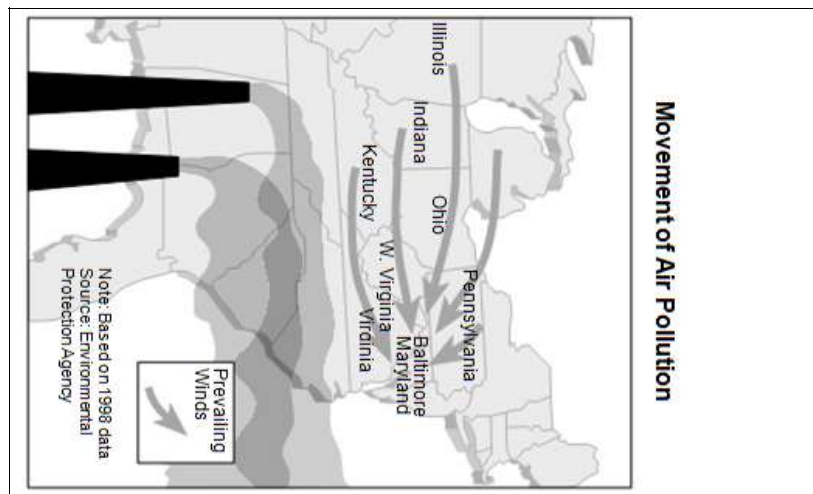
- (1) Illinois produces more air pollution than the other states shown.
- (2) The air pollution problem in Baltimore is increased by the addition of pollution from other areas.
- (3) There are no air pollution problems in southern states.
- (4) The air pollution problems in Virginia clear up quickly as the air moves toward the sea.

Data Base File Number: 739

Regents Date June2003-36.bmp

June2003  
36 6/19/2003 S1K3

Answer 2



## population

435. The graph shows the growth of a population of coyotes in a wilderness area. A possible cause for the population decrease at X is
- (1) disease
  - (2) harsh winter
  - (3) food supply decreased
  - (4) any of the above could be a possible cause for the coyote population to decrease

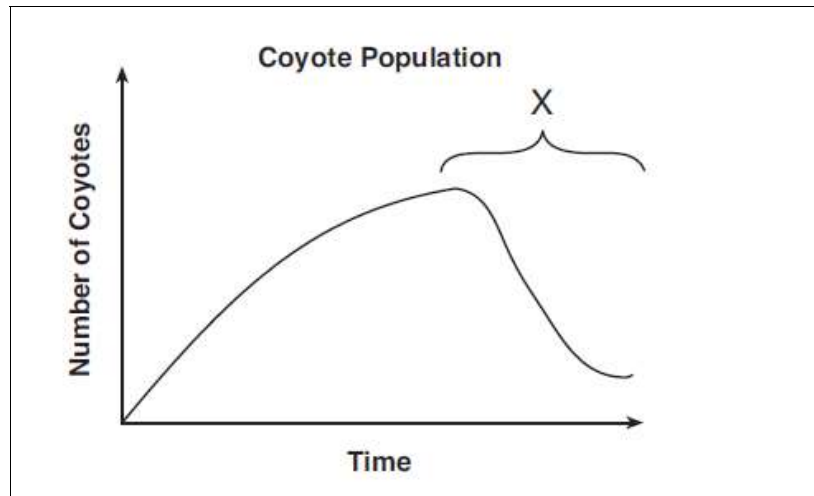
Data Base File Number: 270

Regents Date June2010-54.bmp

June2010

54 6/16/2010 S4K1

Answer 4



## population

436. The graph shows changes in the populations of two species that interact only with each other over a period of time. Which statement best describes these two species?
- (1) Species A is a producer and species B is its consumer
  - (2) Species A is a host and species B is its parasite.
  - (3) Species A is a predator and species B is its prey
  - (4) Species A is a scavenger and species B is its decomposer.

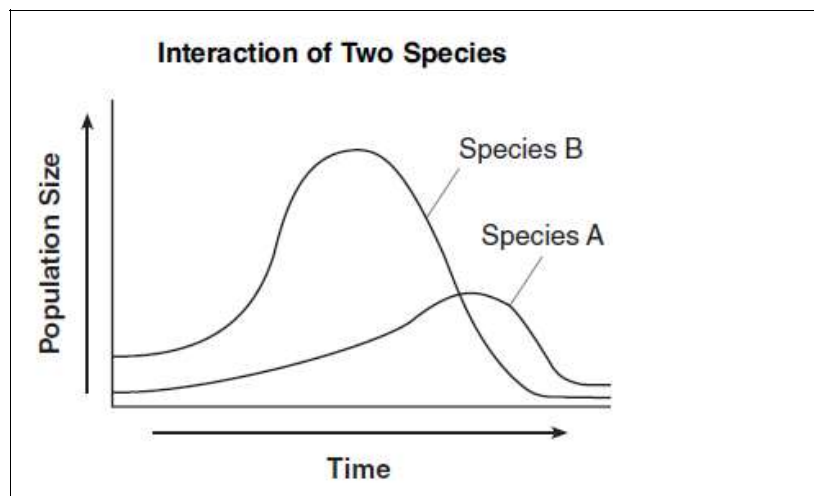
Data Base File Number: 241

Regents Date Jan2010-40.bmp

Jan2010

40 1/26/2010 S4K6

Answer 3



population

437. A biologist collected the data shown in the table. Which statement is supported by the data in the table?
- (1) Populations do not vary from month to month.
  - (2) The populations are highest in September.
  - (3) The grasshoppers increased in length in July.
  - (4) Seasonal variations may affect populations.

Data Base File Number: 76

Regents Date Jan08-37.bmp

Jan2008

38 1/25/2008 S4K1

Answer 4

Type of Organism	Number of Organisms in a Field		
	May	July	September
grasshoppers	100	500	150
birds	25	100	10
spiders	75	200	50

population

438. Base your answer to question 36 on the information given in the question and on your knowledge of biology. The information came from; Source: "USA Today, 12/28/05 ." " Alaska: Anchorage -- Birders noted a sharp increase in European starlings in the 2005 Anchorage Christmas Bird Count. The sometimes aggressive species is relatively new to Alaska. Only three starlings were spotted during the 1995 Christmas bird count. In 2004, there were 35 birds. In the year 2005, birders counted 156." Which graph best represents the change in the number of starlings seen in the Anchorage area?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

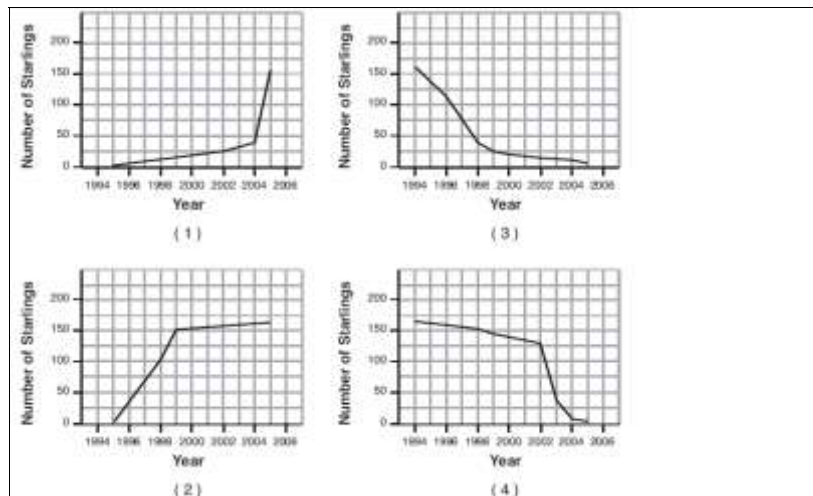
Data Base File Number: 218

Regents Date August2009-36.b

Aug2009

36 8/13/2009 S1K3

Answer 1



## population / carrying capacity

439. Changes in a deer population are shown in the graph. Which statement best explains section X?

- (1) The population has reached the carrying capacity of its environment
- (2) Energy is used for interbreeding between members of different species.
- (3) A predator recycles the remains of dead organisms.
- (4) Competition does not occur between members of different species in the same habitat.

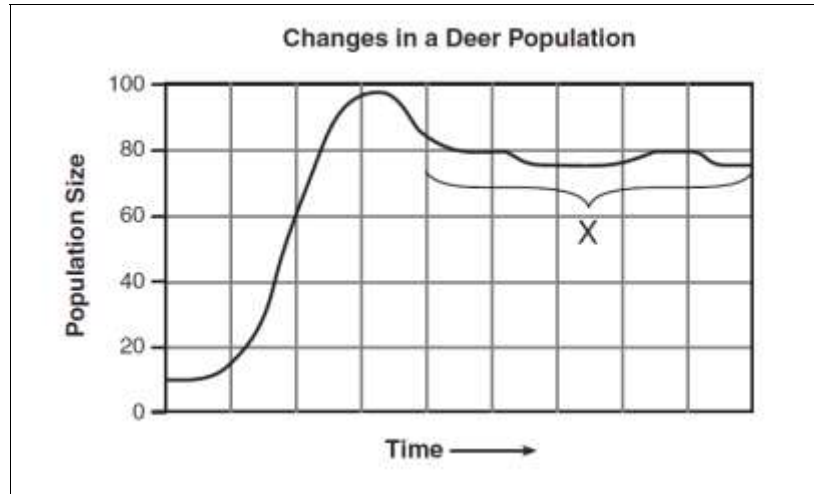
Data Base File Number: 319

Regents Date Jan2011-40.bmp

Jan2011

40 1/25/2011 S4K6

Answer 1



## population / environment

440. The graph below shows the changes in the size of a fish population over a period of time. The dashed line on the graph represents the

- (1) carrying capacity of the environment
- (2) life span of the species
- (3) level at which extinction is reached
- (4) level of maximum biodiversity of the species

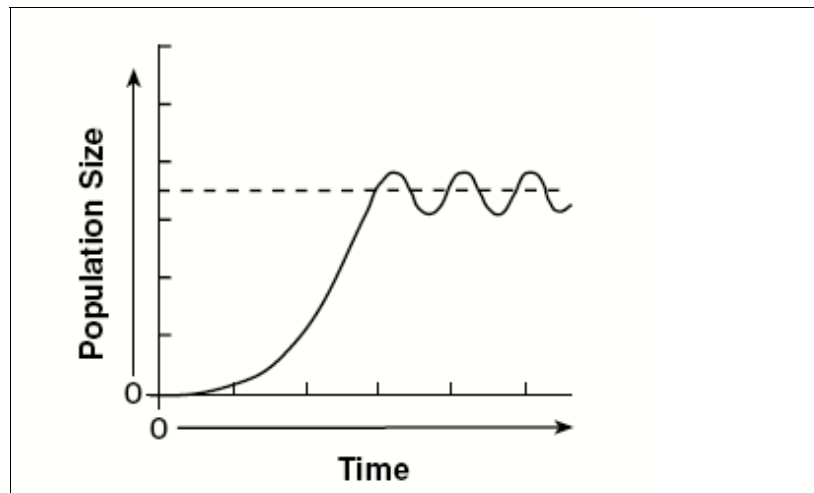
Data Base File Number: 162

Regents Date Jan09-42.bmp

Jan2009

42 1/27/2009 S4K6

Answer 1





## population equilibrium

441. The graph shown represents some changes in the number of individuals in a particular population in a stable ecosystem over a period of time. Which statement best describes the trend shown in this graph?

- (1) Ecosystem conditions will eventually cause a population to become extinct.
- (2) In a stable ecosystem, the number of individuals in a population is usually maintained within a certain range.
- (3) The interactions between a population and various factors in an environment are always predictable.
- (4) In order for any ecosystem to maintain a balance, populations must be reduced to half their original number.

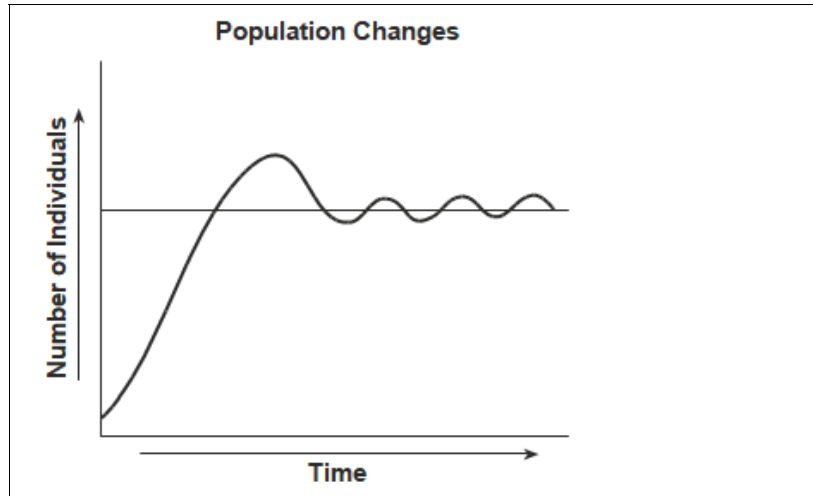
Data Base File Number: 1187

Regents Date June2017-43.bmp

June2017

43 6/14/2017 S4K1

Answer 2



## population equilibrium

442. The graph shown indicates the size of a fish population over a period of time. The section of the graph labeled A represents

- (1) biodiversity within the species
- (2) nutritional relationships of the species
- (3) a population becoming extinct
- (4) a population at equilibrium

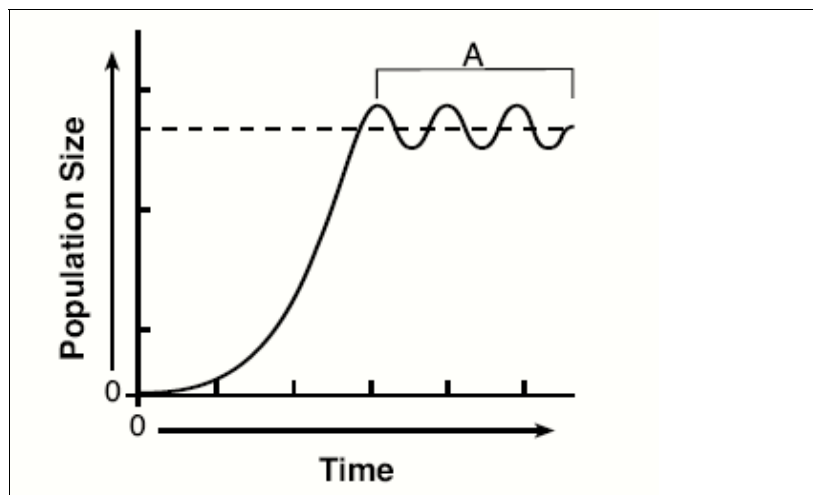
Data Base File Number: 129

Regents Date Aug08-34.bmp

Aug2008

34 8/13/2008 S4K1

Answer 4



## population growth

1443. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the current percentage of each population by age and gender (male/female) for two countries. At the present time, both populations have the same number of individuals. In which of these countries will the population growth over the next 20 years place the greatest strain on the environment?

- (1) Country A, since the larger percentage of young could result in rapid population growth
- (2) Country B, since the smaller percentage of young could result in rapid population growth
- (3) Country A, since the smaller percentage of people over 60 uses the most resources
- (4) Country B, since the larger percentage of people over 60 uses the fewest resources

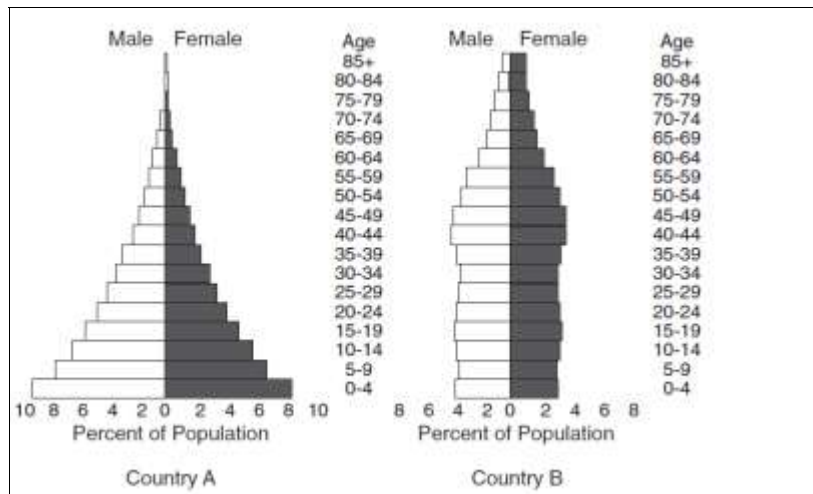
Data Base 1055  
File Number:

Regents Date August2015-42.b

Aug2015

42 8/12/2015 S4K7

Answer 1



## population growth

444. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the changes in a population over a period of 10 years. One factor that could result in an increase in the population size after year 10 would be

- (1) increased competition within the species
- (2) additional food became available
- (3) predators of the species became more numerous
- (4) a new parasite negatively affected reproduction in the species

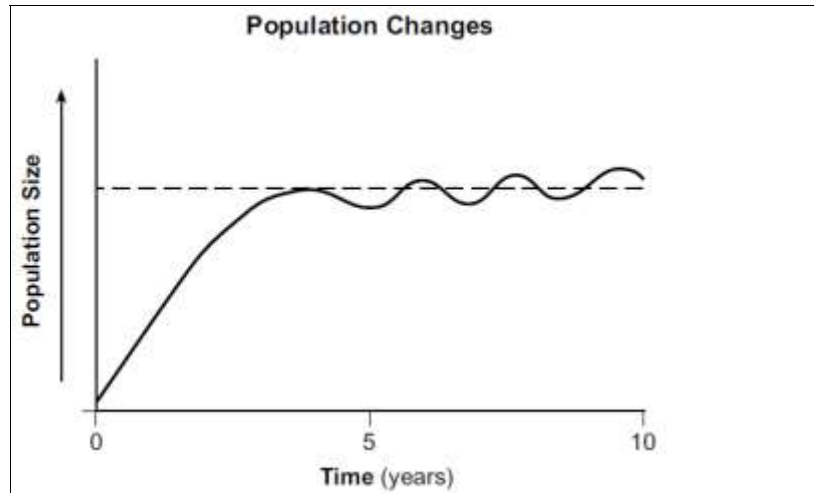
Data Base File Number: 1554

Regents Date Jan2023-48.bmp

Jan2023

49 1/24/2023 S4K6

Answer 2



## population growth

445. The graph shown represents the growth of a population of flies in a jar. Which letter indicates the part of the graph that represents the carrying capacity of the environment in the jar?

- (1) A
- (2) B
- (3) C
- (4) D

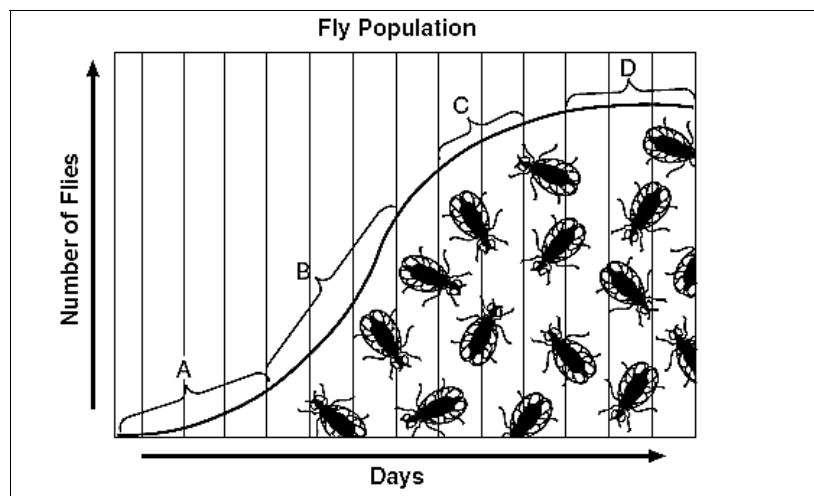
Data Base File Number: 11

Regents Date Aug07-28.bmp

Aug2007

28 8/16/2007 S4K6

Answer 4



## population growth

446. Which graph correctly represents the pattern of human population growth over the past 5000 years?

- (1) 1 (3) 3  
 (2) 2 (4) 4

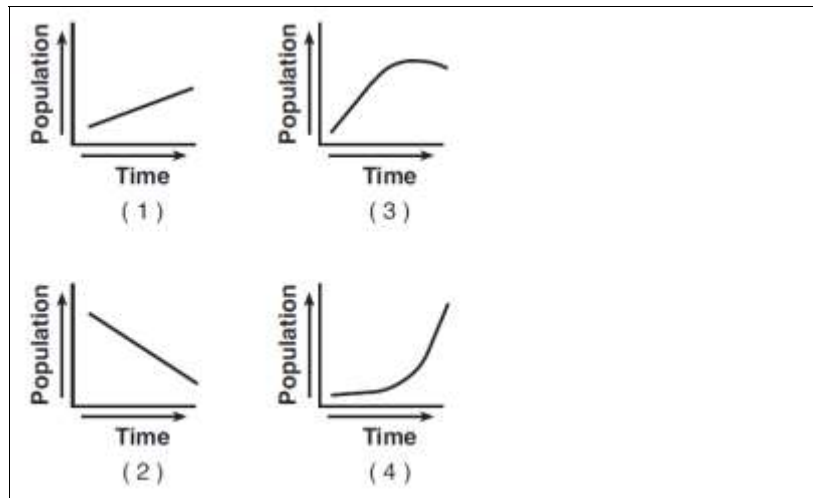
Data Base File Number: 874

Regents Date June2013-5.bmp

June2013

5 6/11/2013 S4K7

Answer 4



## population growth

447. The graph shows data on human population growth. The trend shown on the graph would most likely result in

- (1) a decreased demand for deforestation (3) a decrease in air pollution  
 (2) an increase in available freshwater (4) an increased demand for land use

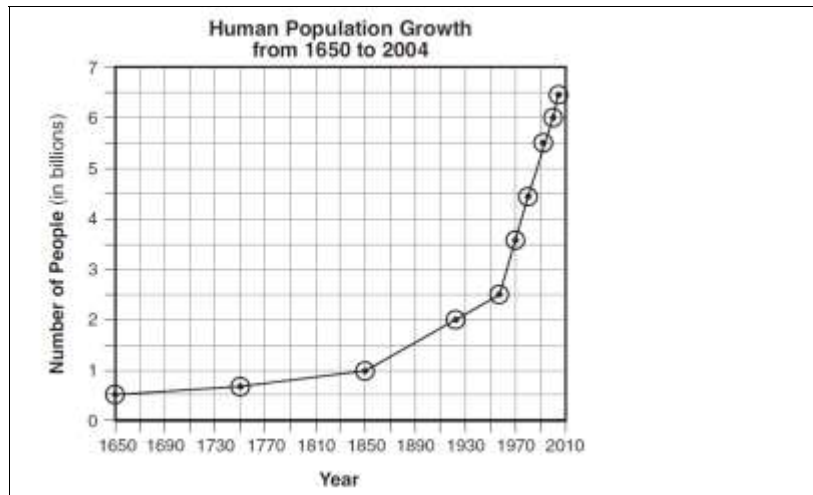
Data Base File Number: 291

Regents Date Aug2010-41.bmp

Aug2010

42 8/18/2010 S4K7

Answer 4



## population growth

448. Base your answer to this question on the information and graph below and on your knowledge of biology. A population of paramecia (single-celled aquatic organisms) was grown in a 200-mL beaker of water containing some smaller single-celled organisms. Population growth of the organisms for 28 hours is shown in the graph. One likely explanation for the change in the paramecium population from 26 hours to 28 hours is that the

- (1) carrying capacity of the beaker was exceeded
- (2) rate of reproduction increased
- (3) time allowed for growth was not sufficient
- (4) oxygen level was too high

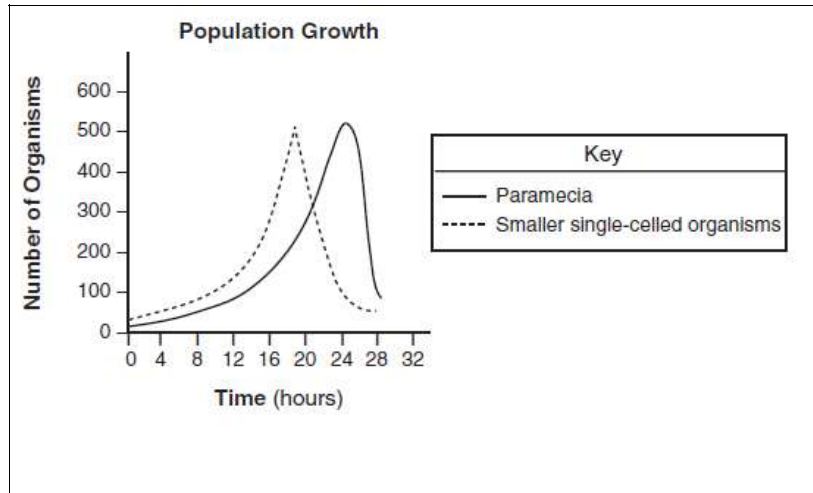
Data Base 523  
File Number:

Regents Date Aug2006-39.bmp

Aug2006

40 8/16/2006 S4K6

Answer 1



## population growth

1449. The graph shows how the human population has grown over the last several thousand years. Which statement is a valid inference that can be made if the human population continues to grow at a rate similar to the rate shown between 1000 A.D. and 2000 A.D.?

- (1) Future ecosystems will be stressed and many animal habitats may be destroyed.
- (2) Global warming will decrease as a result of a lower demand for fossil fuels.
- (3) One hundred years after all resources are used up, the human population will level off.
- (4) All environmental problems can be solved without a reduction in the growth rate of the human population.

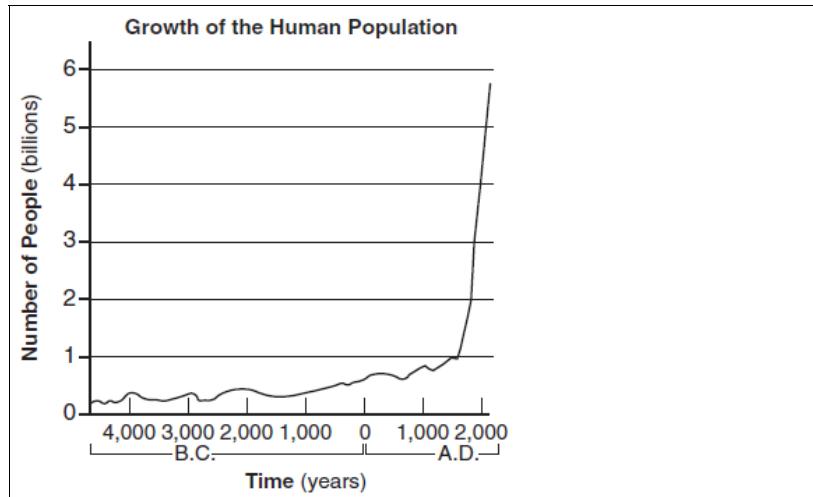
Data Base 488  
File Number:

Regents Date June2006-33.bmp

June2006

33 6/21/2006 S4K7

Answer 1



## population growth

450. Students conducting a study on an insect population placed 25 insects of the same size in a box. The amount of food, water, and shelter available to the insects was kept constant. Each month, students removed and counted the number of insects present, recorded the total, and returned the insects to the box. The graph shows the number of insects in the box over a 12 month period. What inference can be made regarding this insect population?

- (1) All the insects in the box are the same age.
- (2) The insects hibernated from January to April.
- (3) The population has carnivorous members.
- (4) The population reached carrying capacity by January.

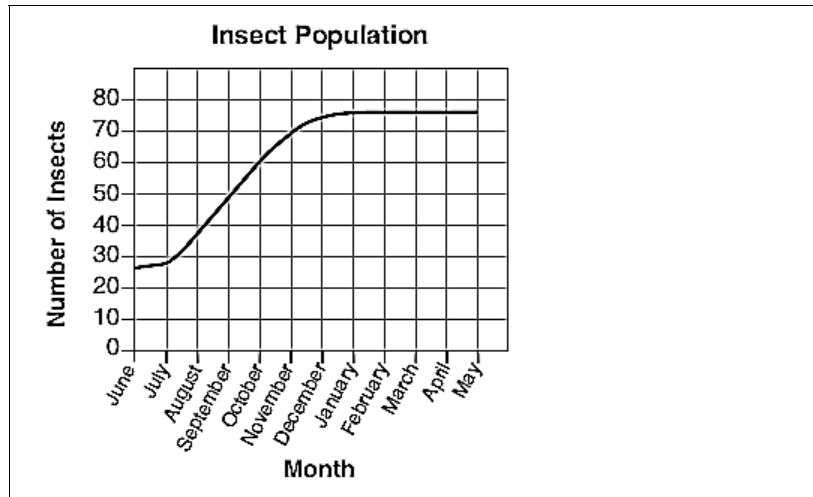
Data Base 74  
File Number:

Regents Date Jan08-36.bmp

Jan2008

36 1/25/2008 S4K6

Answer 4



## population growth

451. Base your answer to this question on the information and graph given and on your knowledge of biology. A population of paramecia (single-celled aquatic organisms) was grown in a 200-mL beaker of water containing some smaller single-celled organisms. Population growth of the organisms for 28 hours is shown in the graph. Which factor most likely accounts for the change in the paramecium population from 8 to 20 hours?

- (1) an increase in the nitrogen content of water  
 (2) an increase in wastes produced  
 (3) an increase in available food  
 (4) an increase in water pH

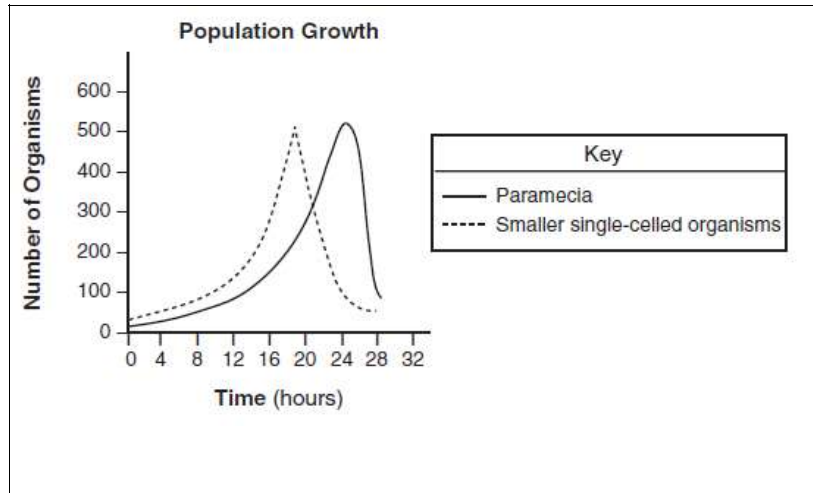
Data Base File Number: 522

Regents Date Aug2006-39.bmp

Aug2006

39 8/16/2006 S1K3

Answer 3



## population interaction

452. The graph shows changes in the populations of hares and lynx in a Canadian ecosystem. Which statement about the hares and lynx can be supported with information from the graph?

- (1) The hare is the predator of the lynx because it is a larger animal.  
 (2) The lynx population begins to drop after the hare population drops.  
 (3) Both populations go through cycles due to the succession of plant species.  
 (4) Both populations have a carrying capacity of 3000 per square kilometer

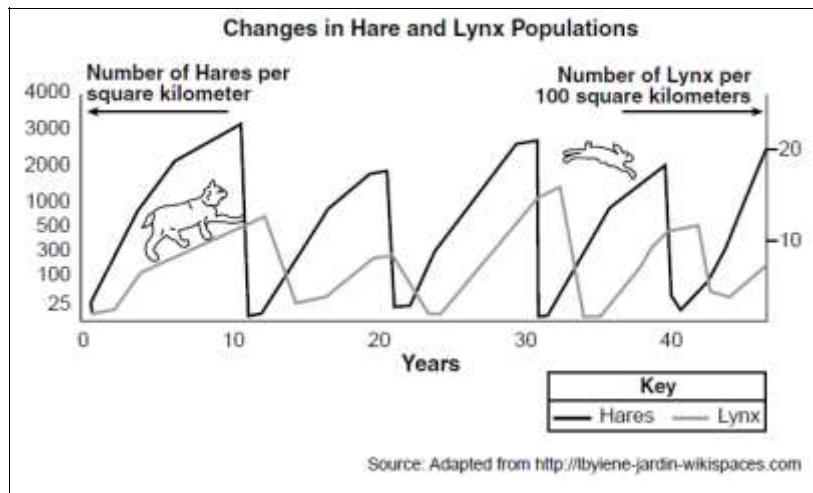
Data Base File Number: 1341

Regents Date June2019-32.bmp

June2019

32 6/18/2019 S1K3

Answer 2





## population size

453. In a particular ecosystem, squirrels make up a large portion of the diet of coyotes. A fatal disease in the squirrel population begins to reduce their population over a period of months. Which graph best represents the expected changes in population size of the coyotes and the squirrels?

(1) 1

(3) 3

(2) 2

(4) 4

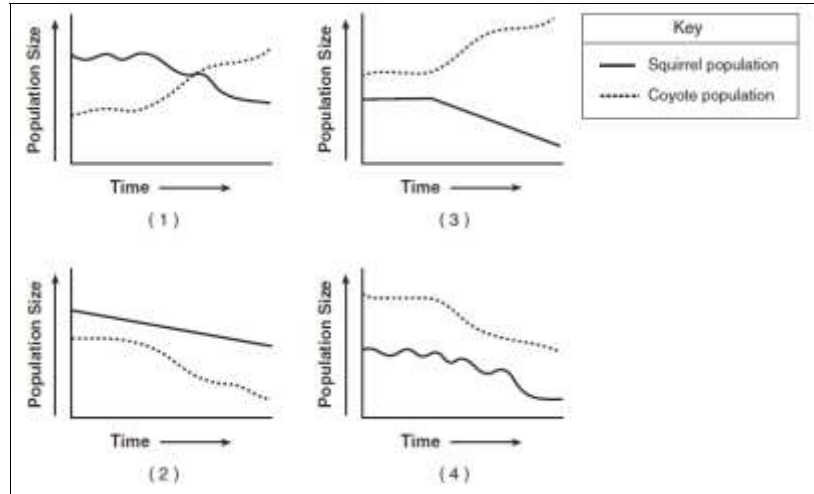
Data Base 313  
File Number:

Regents Date Jan2011-11.bmp

Jan2011

33 1/25/2011 S4K1

Answer 2



## predator / prey

1454. Base your answer to this question on the information given and the photograph shown. and on your knowledge of biology.

### Northern Quolls vs the Cane Toads

Poisonous South American cane toads were introduced into Australia in 1935 in an attempt to control a beetle that was eating sugar cane crops. However, the toads did not control the beetles and, instead, they caused an environmental disaster. Today, the toad population is estimated to be greater than 200 million.

As the invasive toads spread westward across northern Australia, many native species were negatively affected. For example, in the years since the toads' introduction, scientists have observed that the entire population of the northern quoll, a small squirrel-sized carnivore, has declined more than 75%. The decline is due to the fact that the quolls mistake the poisonous toads for something that they can safely eat. When they eat the toads, they die from the poison that the toads produce. The northern quolls may soon become extinct if something cannot be done to save them. Recently, some quolls were found to have a genetic trait that makes them uninterested in preying on the toads. Scientists have now discovered that these quolls with "toad-smart genes" can pass them on to their offspring. The scientists plan to release quolls that avoid eating the toads into native populations, hoping that they will breed and produce offspring that also avoid eating the toads, thus saving the species from extinction. How would the Northern Quoll extinction effect the other organisms in the ecosystem?

- (1) the predators would decrease in number
- (2) the predators would increase in number
- (3) the predator level would remain constant
- (4) the predators would mutate

Data Base 1650  
File Number:

Regents Date Jan2024-65.bmp

Jan2024

70 1/23/2024 S4K1

Answer 1



Source <http://theinvasionofcane.toads.inaustralia.blogspot.com>

predator / prey

455. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows interactions of moose and wolf populations on Isle Royale. What is the relationship between a wolf and a moose?

- (1) wolf-prey; moose-predator
- (2) wolf-parasite; moose-host
- (3) wolf-predator; moose-decomposer
- (4) wolf-predator; moose-prey

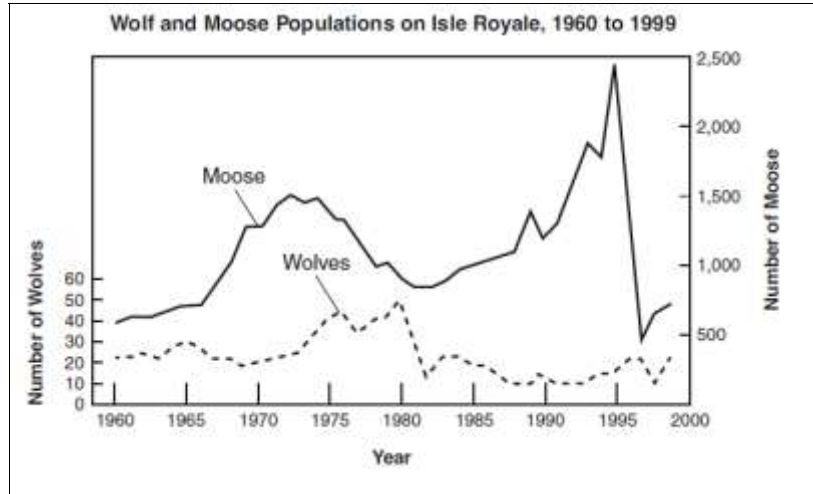
Data Base File Number: 625

Regents Date Jan2013-50.bmp

Jan2013

50 1/23/2013 S4K6

Answer 4



predator / prey

456. Fire ants have a powerful venom that is deadly to the small animals they eat. The deadly venom has reduced the populations of birds who build nests on the ground. The relationship between fire ants and ground-nesting birds is an example of

- (1) producer/consumer
- (2) predator/prey
- (3) scavenger/decomposer
- (4) parasite/host

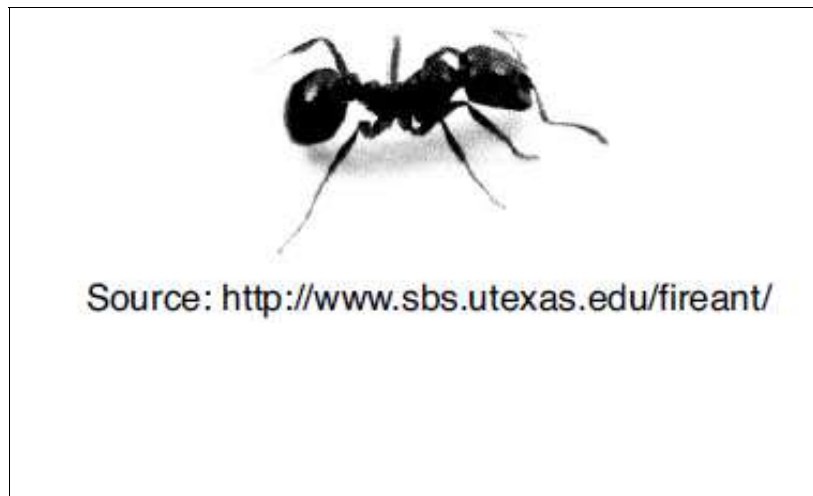
Data Base File Number: 1471

Regents Date June2022-22.bmp

June2022

22 6/15/2022 S4K6

Answer 2



predator / prey

457. The graph shown represents a predator-prey relationship. What is the most probable reason for the increasing predator population from day 5 to day 7?

- (1) an increasing food supply from day 5 to day 6
- (2) a predator population equal in size to the prey population from day 5 to day 6
- (3) the decreasing prey population from day 1 to day 2
- (4) the extinction of the yeast on day 3

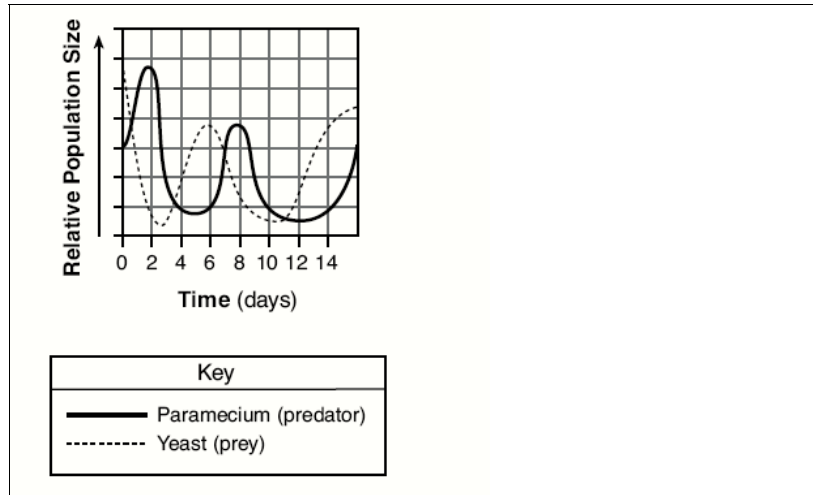
Data Base File Number: 127

Regents Date Aug08-32.bmp

Aug2008

32 8/13/2008 S4K6

Answer 1



predator / prey

458. The graph shown represents the white-tailed deer population in a certain area of New York State during two different years (A and B). ONE reason that the population of deer is greater during Year B than during Year A could be that, during Year B, there were fewer

- (1) resources available
- (2) decomposers adding nutrients to the soil
- (3) white-tail deer predators present
- (4) white-tail deer born

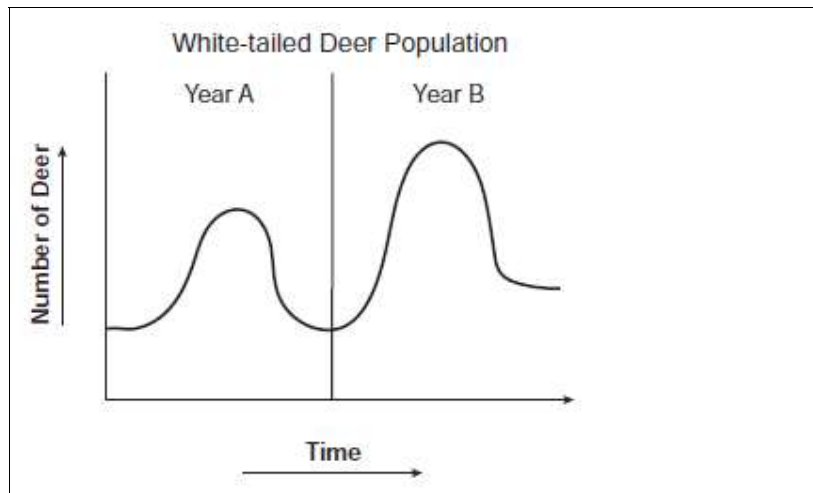
Data Base File Number: 1639

Regents Date Jan2024-43.bmp

Jan2024

43 1/23/2024 S4K6

Answer 3



predator / prey

459. A graph of population changes of two animal species over time is shown. Using the information on the graph, what is the most likely relationship between these two populations?

- (1) predator/prey
- (2) parasite/host
- (3) consumer/decomposer
- (4) pathogen/host

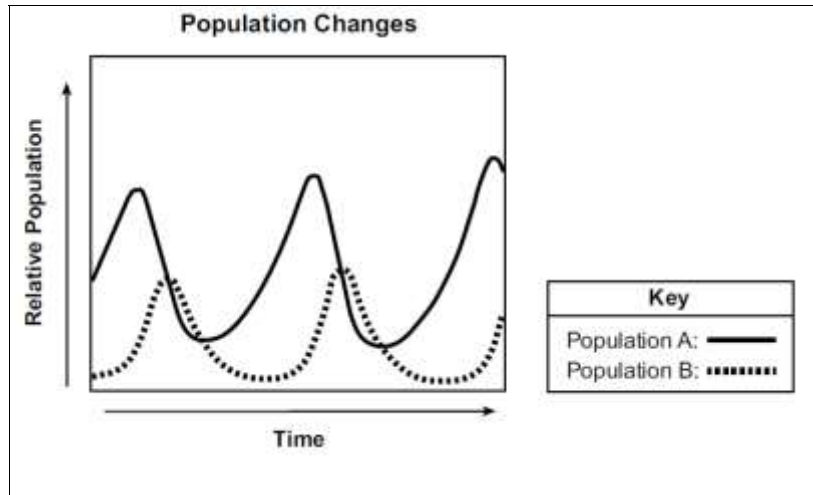
Data Base File Number: 1548

Regents Date Jan2023-34.bmp

Jan2023

34 1/24/2023 S4K6

Answer 1



predator / prey

460. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram is from Wikipedia(tm). Didinium and Paramecium are single-celled fresh water protozoa. The diagram at the LEFT is the Didinium. The diagram at the RIGHT is the Didinium eating a Paramecium. What is the relationship between Didinium and Paramecium?

- (1) prey - predator
- (2) parasite - host
- (3) predator - prey
- (4) host - parasite

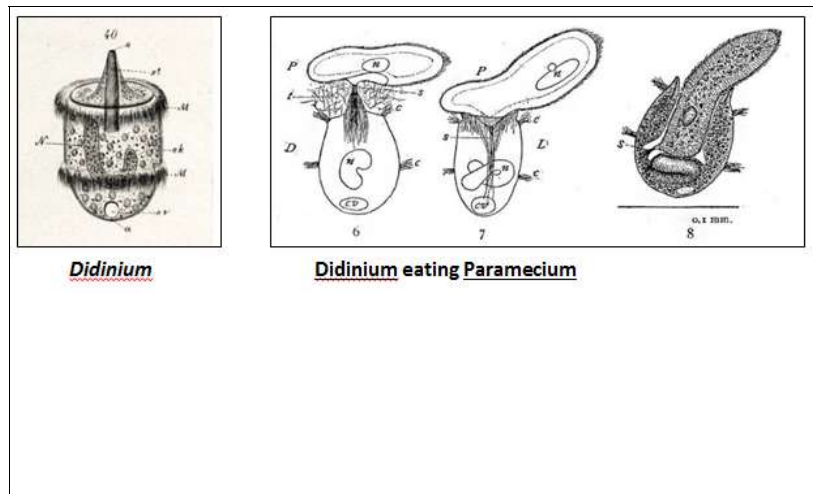
Data Base File Number: 703

Regents Date Aug2004-DID.bm

Aug2004

RBS 8/17/2004 RBS

Answer 3



## predators

1461. Base your answer to this question on the information and drawing given and on your knowledge of biology. The drawing represents a salamander. Salamanders are small amphibians that live in a variety of environments. Two species of salamander inhabit an island. The habitat on each side of the island is different. One side tends to be wet; the other side tends to be dry. Researchers want to know if the salamanders will survive equally well on either side of the island. Species A lives on the wet side of the island, while Species B lives on the dry side of the island. Researchers develop two artificial habitats, one that simulates conditions on the wet side and one that simulates conditions on the dry side. What is a possible reason why researchers would put the salamanders in an artificial environment, as opposed to conducting the experiment in their natural habitat?

- (1) To avoid interbreeding.
- (2) To avoid predators
- (3) To avoid migration
- (4) To avoid mutations.

Data Base File Number: 1144

Regents Date August2016-56.b

Aug2016

56 8/18/2016 S1K2

Answer 2



**predators**

462. Base your answer to this question on the information given and on your knowledge of biology. The photograph shows a Canada lynx, a mammal native to North America. Lynx are found in areas where there is deep, soft snow cover during the winter months. The body design of the Canada lynx helps keep the animal on top of the soft snow. Several unique characteristics, such as the design of its feet and its weight, enable the cat to successfully chase and catch snowshoe hares, its primary source of food. Snowshoe hares are also able to remain on top of the snow. Increased winter recreation has created packed snow trails in lynx habitat. This allows coyotes and cougars to compete with lynx. What is the niche that the lynx, coyote, and cougar are competing to fill?

- (1) parasite / host
- (2) saprophyte / parasite
- (3) predator / carnivore
- (4) pathogen / predator

Data Base File Number: 1118

Regents Date June2016-65.bmp

June2016

66 6/15/2016 S4K6

Answer 3



Source: <http://www.allposters.com>

**predators**

463. Base your answer to this question on the information given and on your knowledge of biology. The chart describes the beaks of various types of birds that live in a small island ecosystem containing flowering land plants, aquatic plants, many small mammals, amphibians, and several species of trees. Which beak type would be characteristic of predators of small mammals?

- (1) cracker
- (2) shredder
- (3) chisel
- (4) probe






Data Base File Number: 633

Regents Date Jan2013-77.bmp

Jan2013

77 1/23/2013 LAB3

Answer 2

Beak Shape	Beak Type	Adaptation and Use
	Cracker	Seed eaters like sparrows and cardinals have short, thick beaks for cracking seeds.
	Shredder	Birds of prey like hawks and owls have sharp, curved beaks for tearing meat.
	Chisel	Woodpeckers have beaks that are long and chisel-like for boring into wood to eat insects.
	Probe	Hummingbirds have beaks that are long and thin for probing flowers for nectar.
	Strainer	Some ducks have long, flat beaks that strain small plants and animals from the water.

predators

464. Base your answer to this question on the information and data table given and on your knowledge of biology. A student added two species of single-celled organisms, "Paramecium caudatum" and "Didinium nasutum", to the same culture medium. Each day, the number of individuals of each species was determined and recorded. The results are shown in the data table given. Which protozoan was most likely the PREDATOR?

- (1) "Paramecium"
- (2) "Didinium"
- (3) "Ameba"
- (4) "Euglena"

Data Base File Number: 695

Regents Date Aug2004-40.bmp

Aug2004  
40 8/17/2004 S1K3

Answer 2

Day	Number of Paramecium	Number of Didinium
0	25	2
1	60	5
2	150	10
3	50	30
4	25	20
5	0	2
6	0	0

producer

465. The diagram shown represents a marine food web. The organisms represented by X are

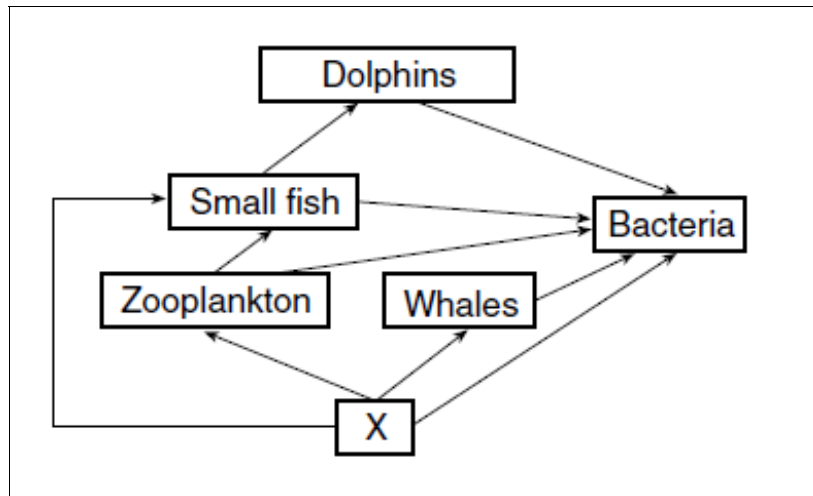
- (1) decomposers
- (2) producers
- (3) carnivores
- (4) scavengers

Data Base File Number: 1231

Regents Date Jan2018-18.bmp

Jan2018  
18 1/22/2018 S4K1

Answer 2





**producer**

466. Base your answer to this question on the diagram shown and on your knowledge of biology. The arrows in the diagram represent biological processes. Which type of organism carries out process 1?

- (1) predator
- (2) carnivore
- (3) producer
- (4) parasite

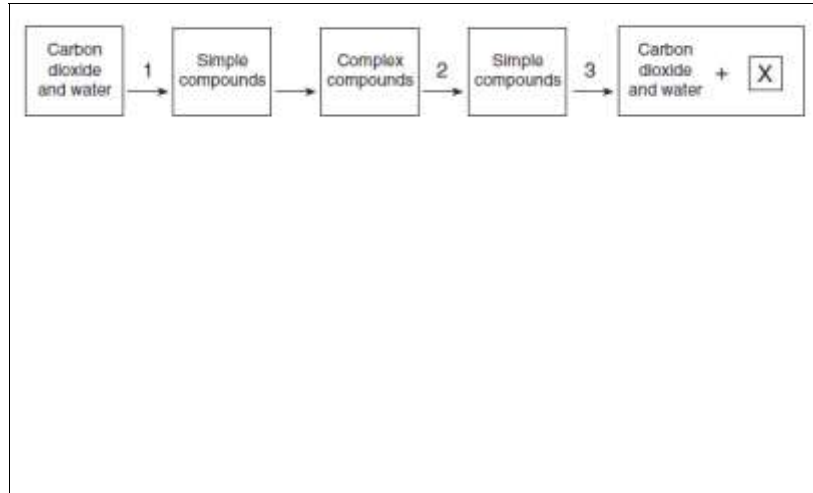
Data Base File Number: 497

Regents Date June2006-52.bmp

June2006

52 6/21/2006 S4K1

Answer 3



**producer**

467. Mice live in an ecosystem which also includes wheat plants. Which row in the chart shown best identifies the relationship between the mice and the wheat?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 881

Regents Date June2013-34.bmp

June2013

34 6/11/2013 S4K1

Answer 4

Row	Role of Mice	Role of Wheat
(1)	producer	consumer
(2)	predator	host
(3)	host	predator
(4)	consumer	producer

## producer

468. Base your answer to this question on the information given and on your knowledge of biology. The Venus flytrap is a plant that uses specialized leaves in order to capture and digest small insects. Although the Venus flytrap uses its prey to obtain certain molecules that it needs, it is still classified as a producer because it

- (1) uses its prey to produce food
- (2) consumes the prey to produce energy
- (3) synthesizes energy by using oxygen and releasing carbon dioxide
- (4) synthesizes glucose by using carbon dioxide and water

Data Base File Number: 1432

Regents Date June2021-36.bmp

June2021

36 6/22/2021 S4K1

Answer 4



Source: <https://www.britannica.com/plant/Venus-flytrap>

## producer / prey

469. Which row in the chart shows a direct relationship that can exist between two living organisms?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1199

Regents Date Aug2017-10.bmp

Aug2017

10 8/17/2017 S4K6

Answer 2

Row	Relationship
(1)	producer - carnivore
(2)	predator - prey
(3)	parasite - prey
(4)	carnivore - host

**protein**

470. Base your answer to this question on the diagram of the cell shown and your knowledge of biology. Which two structures interact in the process of protein synthesis?

- (1) 1 and 2
- (2) 2 and 3
- (3) 3 and 4
- (4) 4 and 1

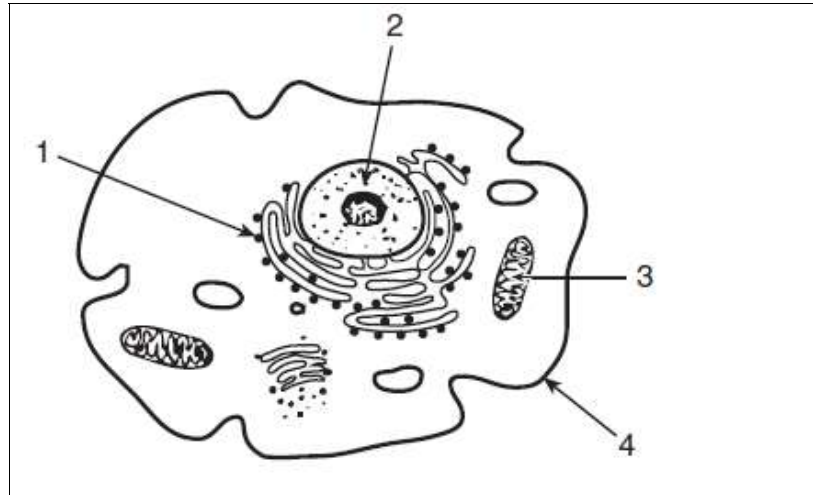
Data Base File Number: 651

Regents Date Jan2004-56.bmp

Jan2004

56 1/29/2004 S4K2

Answer 1



**protein**

471. Which row in the chart shown correctly pairs a food molecule with its building block?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1010

Regents Date June2015-2.bmp

June2015

2 6/16/2015 S4K1

Answer 3

Row	Food Molecule	Building Block
(1)	starch	amino acid
(2)	sugar	starch
(3)	protein	amino acid
(4)	amino acid	sugar

## protein function

472. The diagram shows two different structures, 1 and 2, that are present in many singlecelled organisms. Structure 1 contains protein A, but not protein B, and structure 2 contains protein B, but not protein A. Which statement is correct concerning protein A and protein B?

- (1) Proteins A and B have different functions and different amino acid chains.
- (2) Proteins A and B have different functions but the same amino acid chains.
- (3) Proteins A and B have the same function but a different sequence of bases (A, C, T, and G).
- (4) Proteins A and B have the same function and the same sequence of bases (A, C, T, and G).

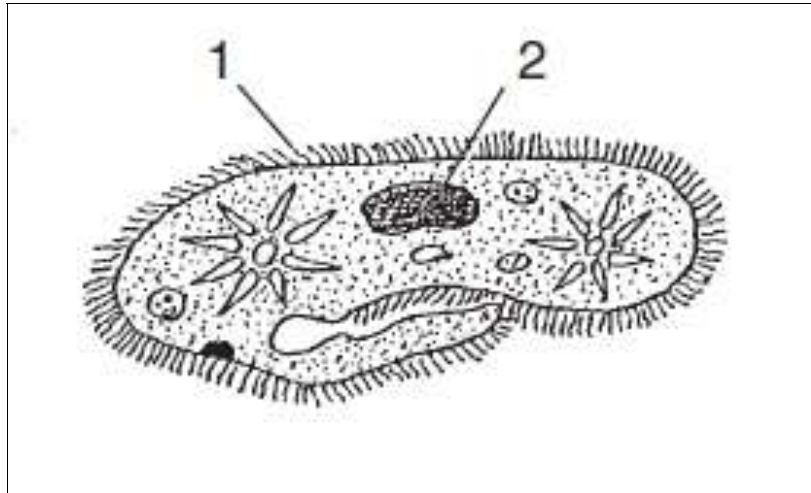
Data Base 804  
File Number:

Regents Date June2002-12.bmp

June2002

12 6/19/2002 S4K2

Answer 1



## protein shape

473. The diagram shown represents a protein molecule present in some living things. This type of molecule is composed of a sequence of
- (1) amino acids arranged in a specific order
  - (2) simple sugars alternating with starches arranged in a folded pattern
  - (3) large inorganic subunits that form chains that interlock with each other
  - (4) four bases that make up the folded structure

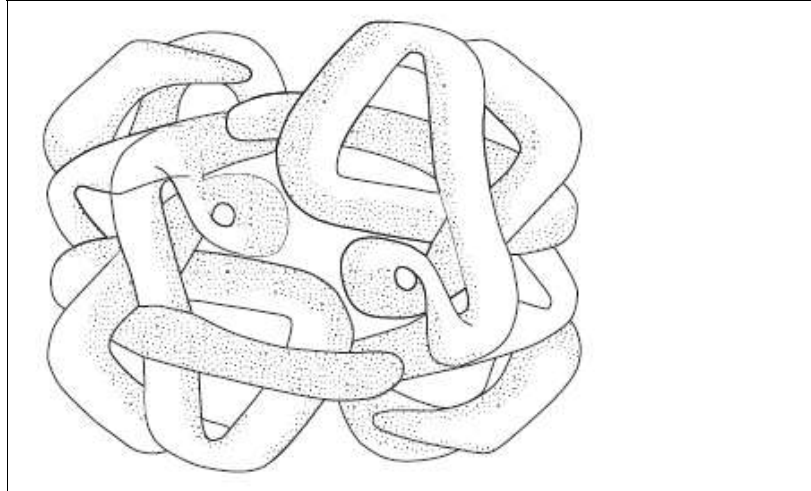
Data Base File Number: 1126

Regents Date August2016-11.b

Aug2016

11 8/18/2016 S4K2

Answer 1



## protein shape

474. In the diagram shown, X represents a process that causes a protein to unfold and stop functioning. Process X is most likely caused by
- (1) the digestion of the amino acids that make up the proteins
  - (2) the synthesis of a protein with different simple sugars
  - (3) removal of the gene that codes for the production of the protein
  - (4) an internal factor in the body, such as a temperature increase

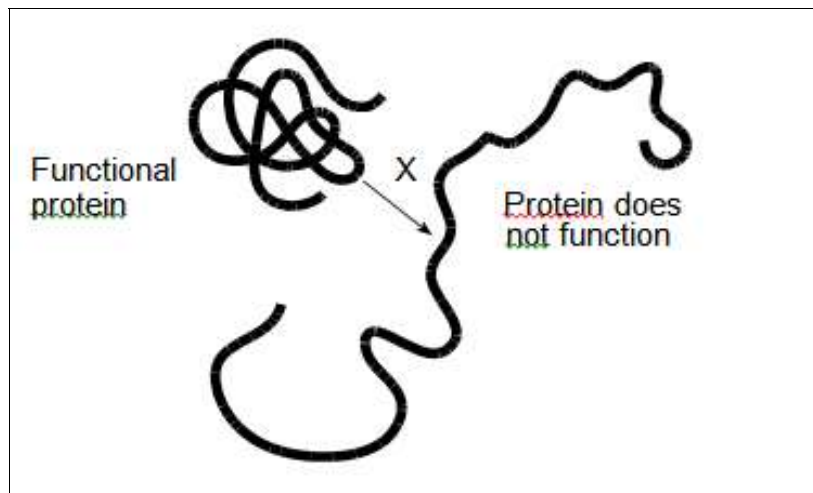
Data Base File Number: 1180

Regents Date June2017-33.bmp

June2017

33 6/14/2017 S4K5

Answer 4



## pulse rate

475. Base your answer to this question on the information given and on your knowledge of biology. A group of students designed an experiment to determine if an individual's age had any effect on pulse rate. The data collected are recorded in the table as shown. Based on these data, the students concluded that pulse rate increases with age. One reason this conclusion might be questioned is

- (1) The pulse rate did not increase each time the age increased.
- (2) The pulse rate increased each time the age increased.
- (3) There is insufficient data to support the conclusion.
- (4) The difference between the age groups is not the same.

Data Base File Number: 1596

Regents Date June2023-84.bmp

June2023

84 6/14/2023 LAB2

Answer 1

Age	8	17	18	22	28	31	37	43	51	60
Pulse rate/minute	76	61	67	58	68	69	62	48	84	54

## pulse rate

476. During a laboratory activity, a group of students obtained the data shown in the table. The group average for the resting pulse rate is

- (1) 107
- (2) 78
- (3) 73
- (4) 63

Data Base File Number: 207

Regents Date June09-65.bmp

June2009

65 6/18/2009 LABS

Answer 3

Student Tested	Pulse Rate at Rest (beats/min)	Pulse Rate After Exercise (beats/min)
A	70	97
B	74	106
C	83	120
D	60	91
E	78	122
Group Average		107

## pulse rate

477. Base your answers to this question on the information given and on your knowledge of biology. An experiment was conducted to measure the effect of exercise on pulse rate for a group of high school students. The table shows the results. Why was the resting pulse rates not the same for all students?

- (1) pulse rates at rest vary between students because of physical differences
- (2) pulse rates at rest vary because of room temperature
- (3) pulse rates at rest vary because of ATP deficiencies
- (4) pulse rates at rest vary because of blood sugar deficiencies

Data Base File Number: 1683

Regents Date June2024-79.bmp

June2024

79 6/14/2024 LAB2

Answer 1

Student Tested	Pulse Rate at Rest	Pulse Rate After Exercising
1	70	92
2	52	87
3	80	118
4	72	104
5	60	96
6	66	124

## pulse rate

478. A student went out to the school track and walked two laps, ran two laps, and then walked two more laps. On the grid shown, the line represents what most likely happened to the pulse rate of the student during these activities. Why does the pulse rate rise and then fall?

- (1) The body responds to changes in physical activity.
- (2) The muscles become fatigued.
- (3) More ATP is needed.
- (4) More glucose is needed.

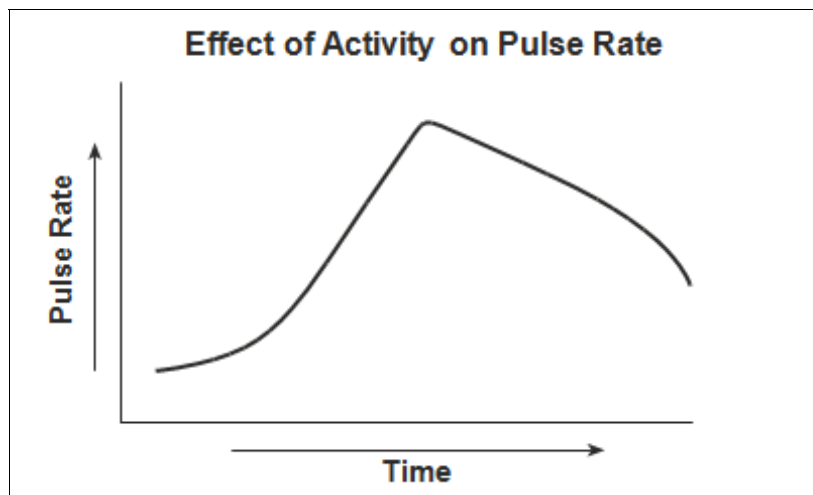
Data Base File Number: 1153

Regents Date August2016-85.b

Aug2016

85 8/18/2016 LAB2

Answer 1



## reaction time

479. The data in the table shown were collected during a reaction-time experiment conducted in five biology classes. Average reaction times for each class were determined first at room temperature and then after cooling each student's hand in cold water for two minutes. Which statement is best supported by the data?
- (1) Cooling the hand increases the reaction time.
  - (2) Cooling the hand does not affect the reaction time.
  - (3) Cooling the hand affects only some subjects.
  - (4) Two minutes of cooling is not enough to affect reaction time.

Data Base File Number: 21

Regents Date Aug07-63.bmp

Aug2007

63 8/16/2007 LABS

Answer 1

Average Reaction Times to Grab a Falling Ruler

Class	At Room Temperature (seconds)	After Cooling (seconds)
1	.42	.48
2	.36	.41
3	.35	.47
4	.43	.58
5	.44	.47
Averages	.40	.48



## receptor

480. Lobsters prey on sea hares, which are marine animals. The lobsters find their prey through a sense of smell. The sea hares defend themselves by squirting ink at the lobster, as shown in the photo. The ink sticks to the lobster, interfering with its sense of smell. The most likely reason the sea hare can escape is because the sea hare ink

- (1) pushes the sea hare away rapidly as the ink is expelled
- (2) blocks a receptor on certain cells in the lobster
- (3) causes the lobster to change its prey
- (4) prevents movement of the lobster

Data Base File Number: 1197

Regents Date Aug2017-6.bmp

Aug2017

6 8/17/2017 S4K1

Answer 2



## receptor / hormone

481. The diagram shows a biological process. Why do the hormones attach to the target cell and NOT to other cells in the diagram?

- (1) Target cells carry on natural selection.
- (2) Hormones act as enzymes to target cells.
- (3) Target cells have receptors that are specific for a hormone and non-target cells lack receptors for the hormone.
- (4) Endocrine cells are specific for target and non-target cells.

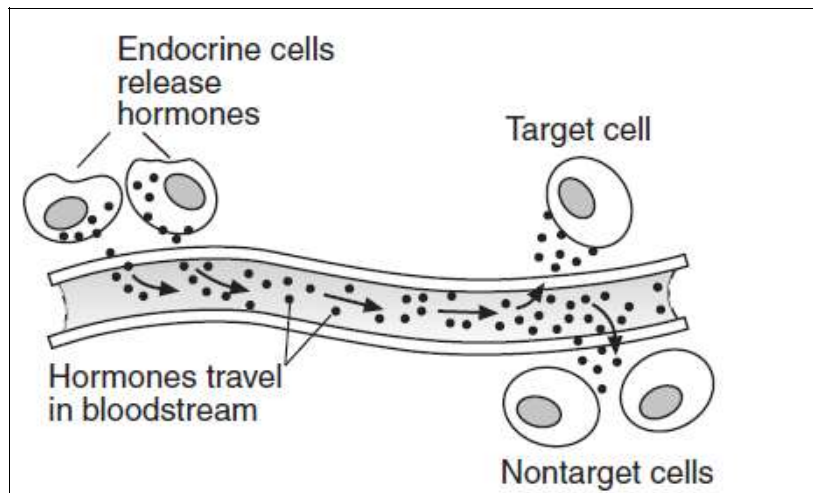
Data Base File Number: 792

Regents Date Aug2002-54.bmp

Aug2002

54 8/13/2002 S4K1

Answer 3



## receptor / hormone

1482. The diagram shown represents two molecules that can interact with each other to cause a biochemical process to occur in a cell. Molecules A and B most likely represent
- (1) a protein and a chromosome
  - (2) a receptor and a hormone
  - (3) a carbohydrate and an amino acid
  - (4) an antibody and a hormone

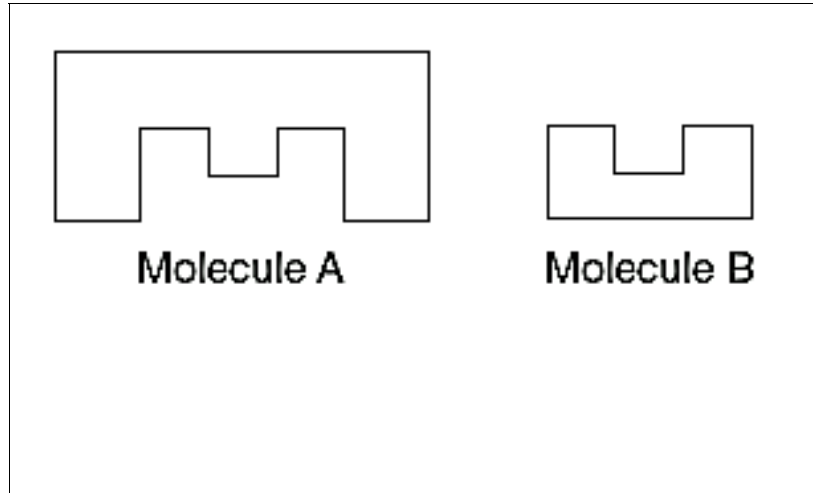
Data Base File Number: 29

Regents Date June07-26.bmp

June2007

26 6/20/2007 S4K5

Answer 2



## receptor / hormone

1483. The molecules represented in the diagram shown can interact to cause a biochemical process to occur. Molecule A and molecule B most likely represent
- (1) a nerve signal and a gene
  - (2) a receptor and a hormone
  - (3) a chromosome and an antigen
  - (4) a starch and an amino acid

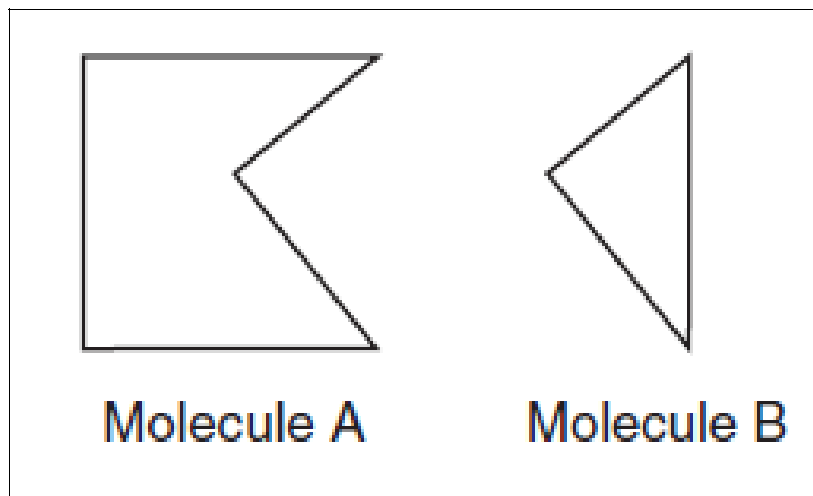
Data Base File Number: 985

Regents Date Jan2015-6.bmp

Jan2015

6 2/26/2015 S4K1

Answer 2



receptor molecules

484. Base your answer to this question on the diagram shown and on your knowledge of biology. Which statement best describes the diagram?

- (1) Nerve cell X is releasing receptor molecules.
- (2) Nerve cell Y is signaling nerve cell X.
- (3) Nerve cell X is attaching to nerve cell Y.
- (4) Nerve cell Y contains receptor molecules for substance A.

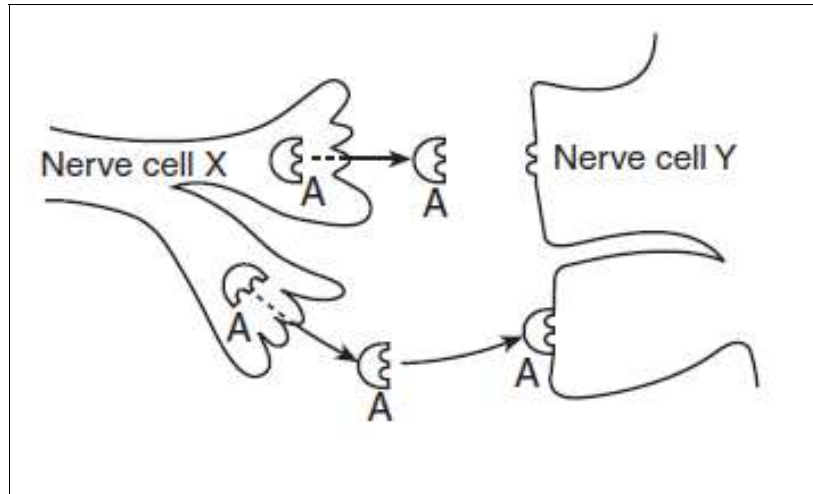
Data Base File Number: 670

Regents Date June2004-34.bmp

June2004

36 6/18/2004 S4K1

Answer 4



receptor molecules

485. Base your answer to this question on the diagram shown which illustrates a role of hormones. Letter B indicates

- (1) ribosomes
- (2) receptor molecules
- (3) tissues
- (4) inorganic substances

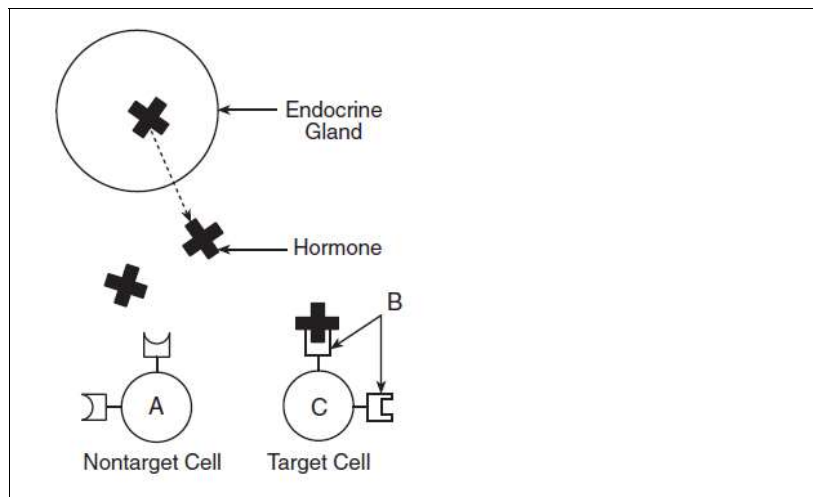
Data Base File Number: 652

Regents Date Jan2004-58.bmp

Jan2004

58 1/29/2004 S4K1

Answer 2



## receptor molecules

486. A process that occurs in the human body is represented in the diagram shown. Which statement is most closely associated with the diagram?

- (1) Small molecules are obtained from large molecules during digestion.
- (2) Certain molecules are replicated by means of a template.
- (3) Receptor molecules play an important role in communication between cells.
- (4) Energy from nutrients is utilized for waste disposal.

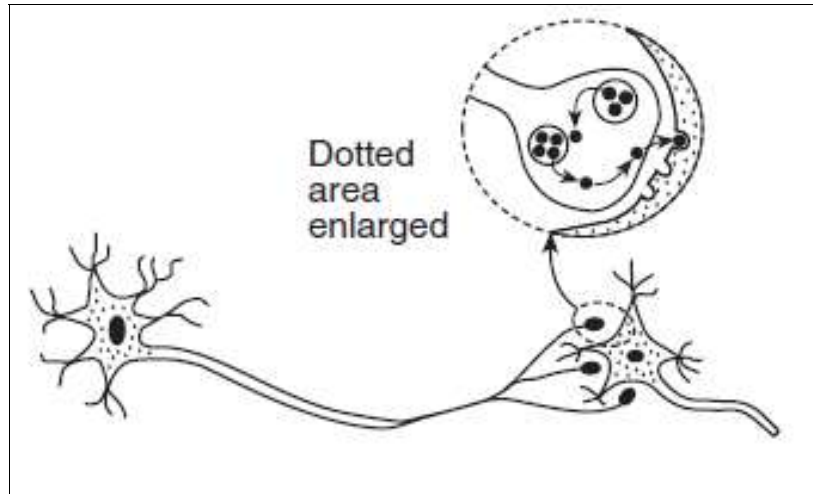
Data Base File Number: 566

Regents Date June2005-33.bmp

June2005

33 6/22/2005 S4K1

Answer 3



## receptor molecules

487. The diagram shown represents the region between two nerve cells. Cell A releases a chemical that travels to and binds with structure X on cell B. Structure X most likely represents

- (1) a receptor molecule
- (2) an inorganic substance
- (3) a ribosome
- (4) an antibody

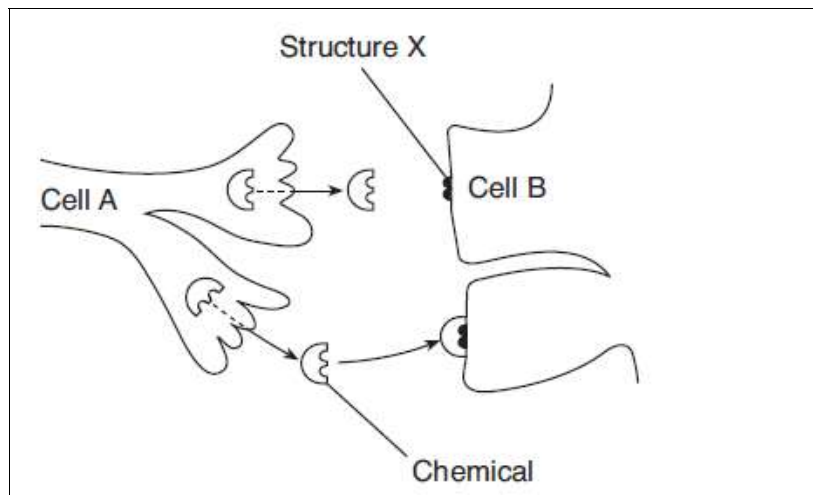
Data Base File Number: 899

Regents Date Aug2013-5.bmp

Aug2013

5 8/14/2013 S4K1

Answer 1



receptor sites

488. Base your answer to this question on the diagram shown and on your knowledge of biology. A drug is developed that, due to its molecular shape, blocks the action of substance A, in DIAGRAM A . Which shape in DIAGRAM B would the drug molecule most likely resemble?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

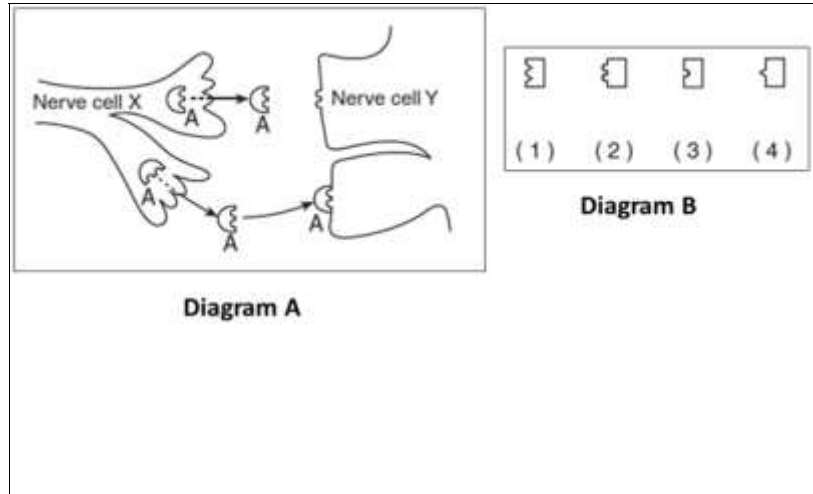
Data Base File Number: 671

Regents Date June2004-37B.b

June2004

37 6/18/2004 S4K1

Answer 2



receptor sites

489. Base your answer to this question on the information given and on your knowledge of biology. Botulinum toxin is a protein produced by the bacterium "Clostridium botulinum". It causes a serious form of food poisoning in humans. In a very dilute form, it is also commonly used to eliminate some signs of aging, such as wrinkles. It does this by preventing nerves from releasing a chemical messenger called acetylcholine into the synapse (space between a nerve cell and a muscle cell). The toxin affects the process that causes the muscle cell to contract and form wrinkles. The diagram shown represents a process that is involved in the formation of wrinkles. Which structure is MISSING on the muscle cell membrane in the diagram that would allow the nerve cell to communicate with the muscle cell?

- (1) reseptor sites
- (2) mitochondria
- (3) toxic sites
- (4) ATP producing sites

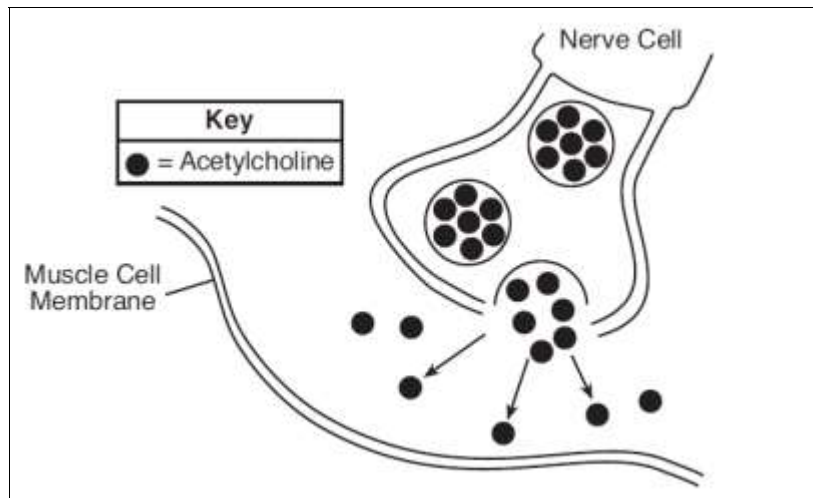
Data Base File Number: 889

Regents Date June2013-53.bmp

June2013

53 6/11/2013 S4K1

Answer 1



receptors

490. Base your answers to this question on the diagram shown and on your knowledge of biology. Each arrow in the diagram represents a different hormone released by the pituitary gland that stimulates the gland indicated in the diagram. All structures are present in the same organism. Why does hormone 1 influence the action of gland A but not gland B or C?

- (1) Every activity in gland A is different from the activities in glands B and C.
- (2) cells of glands B and C contain different receptors than the cells of gland A.
- (3) Each gland contains cells that have different base sequences in their DNA.
- (4) The distance a chemical can travel is influenced by both pH and temperature

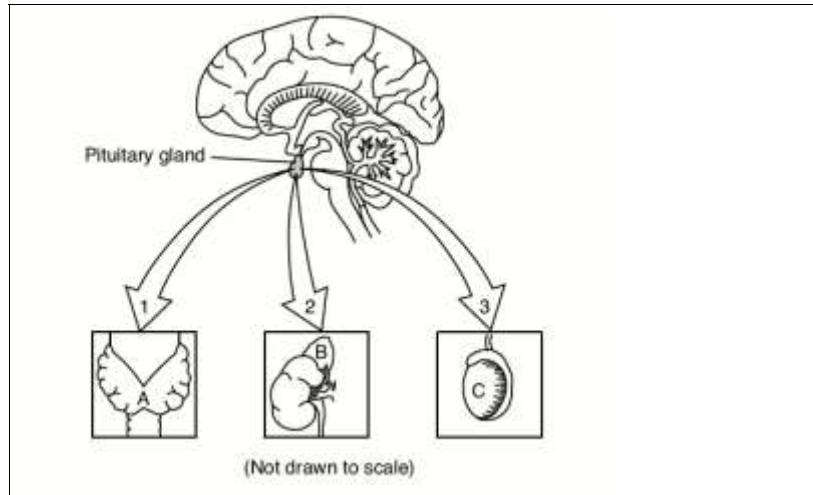
Data Base File Number: 135

Regents Date Aug08-38.bmp

Aug2008

40 8/13/2008 S4K1

Answer 2



receptors

491. A cell with receptors for two different hormones is represented in the diagram. Which chemical would most likely interfere with the activity of hormone A, but not hormone B?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

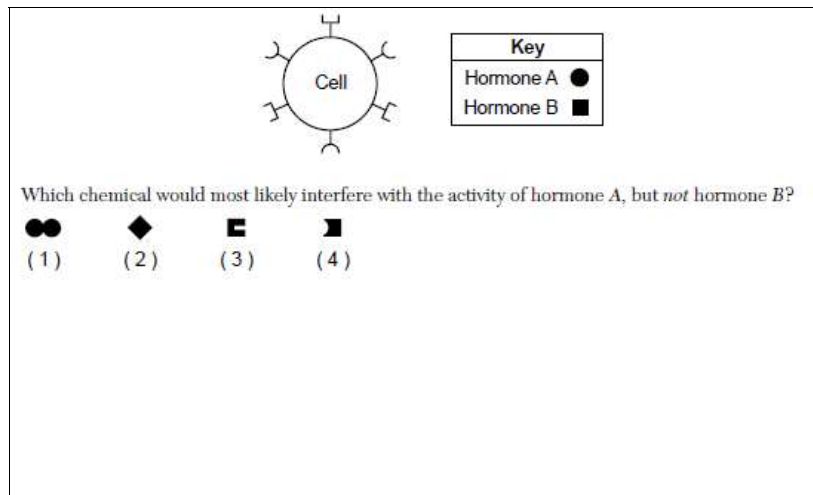
Data Base File Number: 1372

Regents Date Aug2019-35.bmp

Aug2019

35 8/14/2019 S4K1

Answer 1



## recombination

492. The puppies shown in the photograph below are all from the same litter. The differences seen within this group of puppies are most likely due to

- (1) overproduction and selective breeding
- (2) mutations and elimination of genes
- (3) evolution and asexual reproduction
- (4) sorting and recombination of genes

Data Base 181  
File Number:

Regents Date **June09-12.bmp**

June2009

12 6/18/2009 S4K3

Answer 4



## recombination

1493. Base your answer to this question on the information and chart shown and on your knowledge of biology. Scientists studied the distribution of a species of pocket mouse that lived in the sandy desert regions of the southwestern United States. They are eaten by a variety of predators. Pocket mice are active at night, and feed on seeds and grasses. A single female mouse can reproduce several times each year, producing a litter of 3 to 13 offspring each time. Each new litter is considered a generation. A volcanic eruption that resulted in lava flows changed the color of the area that the mice inhabit from light brown to black. Data from the scientist's research of the population are shown in the chart. What is the role of recombination in the appearance of the trait for black fur color in the pocket mouse population?

- (1) Recombination controls all pigments in the mouse.
- (2) Recombination is caused by the volcanic eruption.
- (3) Recombination provides genetic variability for fur color in the offspring.
- (4) Recombination is fatal for dark fur color.

Data Base File Number: 1116

Regents Date June2016-58.bmp

June2016

58 6/15/2016 S4K3

Answer 3

Changes in Pocket Mouse Fur Color after a Volcanic Eruption

Number of Generations	Percentage of Pocket Mice with Light Brown Fur	Percentage of Pocket Mice with Black Fur
10	95%	5%
25	90%	10%
50	75%	25%
100	5%	95%



## recombination

1494. Base your answer to this question on the information and diagram shown and on your knowledge of biology. If a Chihuahua with short hair has a hidden gene for long hair, it can produce both long-haired and short-haired puppies when bred to a Chihuahua with long hair. A Chihuahua is born having a trait that is different from either of its parents. A possible explanation for the difference is that the Chihuahua puppy

- (1) was produced as a result of the recombination of genes during sexual reproduction
- (2) was produced as a result of the process of asexual reproduction
- (3) inherited a gene from one of its grandparents and not its parents
- (4) had a mutation that occurred after it was born

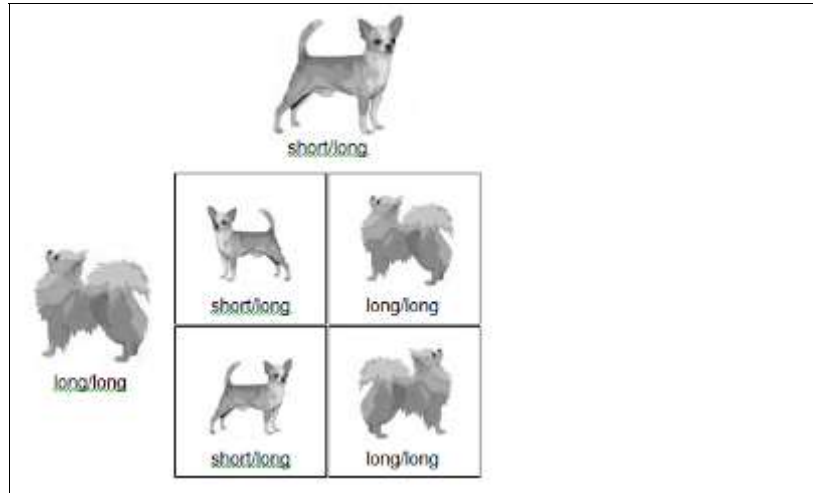
Data Base 1219  
File Number:

Regents Date Aug2017-48.bmp

Aug2017

49 8/17/2017 S4K3

Answer 1



## recycling

495. Which statement most accurately predicts what would happen in the aquarium shown if it were tightly covered and maintained in natural light for one month?

- (1) The water temperature would rapidly decrease.
- (2) The process of respiration in the snail would decrease
- (3) The rate of reproduction of the fish would be affected.
- (4) The organisms would probably survive because materials would cycle.

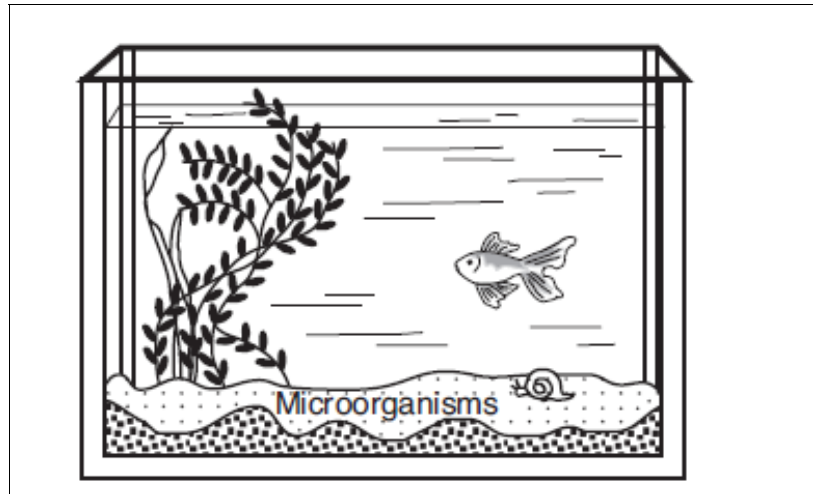
Data Base File Number: 266

Regents Date June2010-39.bmp

June2010

39 6/16/2010 S4K6

Answer 4



## recycling

496. The graph shows the percentage of solid wastes recycled in New York State between 1987 and 1997. What is one specific positive effect recycling has on the environment?

- (1) The increased percent of recycling involves the use of materials such as glass, plastic, and aluminum cans to produce other products.
- (2) Recycling did not increase effectively over the ten year period.
- (3) Recycling increased the costs to the consumer.
- (4) Dumps and landfills went out of business.

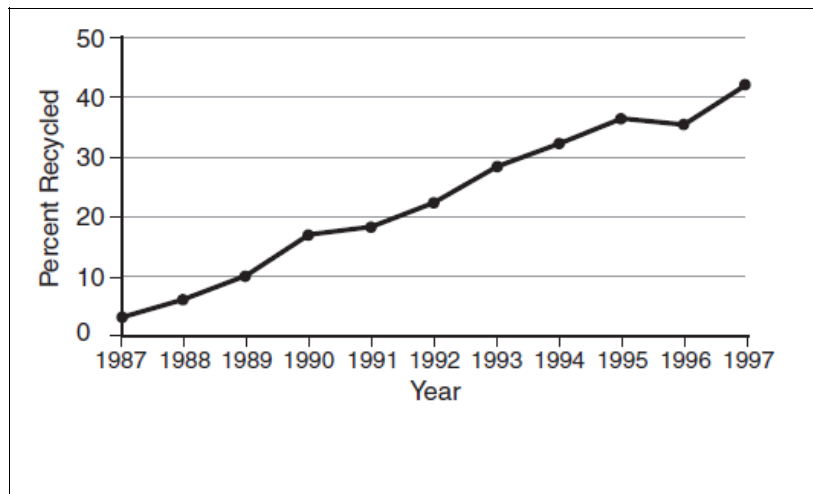
Data Base File Number: 699

Regents Date Aug2004-56.bmp

Aug2004

56 8/17/2004 S4K7

Answer 1



## recycling

1497. Which statement best explains the purpose of the microorganisms in this aquarium?

- (1) Microorganisms recycle nutrients that support the ecosystem.
- (2) Microorganisms recycle the energy in this ecosystem.
- (3) Microorganisms are a source of food for the plant.
- (4) Microorganisms are an abiotic factor important for decomposition.

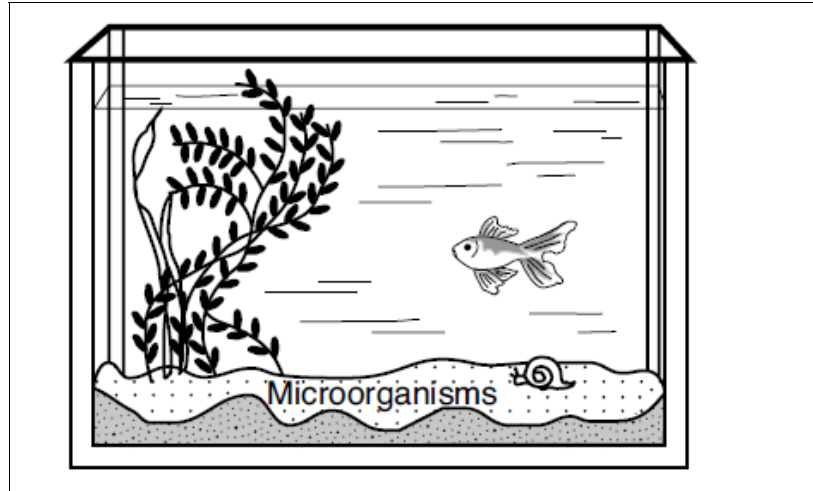
Data Base File Number: 1475

Regents Date June2022-29.bmp

June2022

29 6/15/2022 S4K6

Answer 1



## red cells / crenated

1498. Base your answer to this questions on the information given and on your knowledge of biology. A student prepared four different red blood cell suspensions, as shown in the chart. Which suspension would contain red blood cells that would appear wrinkled and reduced in volume?

- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 331

Regents Date Jan2011-76.bmp

Jan2011

76 1/25/2011 LABS

Answer 2

Suspension	Contents
A	red blood cells in normal blood serum (0.7% salt solution)
B	red blood cells in 10% salt solution
C	red blood cells in distilled water
D	red blood cells in tap water

## regeneration

499. A student read that liquid extracted from an "Aloe vera" plant promotes the healing of burned tissue. She decided to investigate the effect of different concentrations of "Aloe vera" extract on the regeneration (regrowth of lost or damaged tissue) rate in planaria. Planaria are small flatworms known for their ability to regenerate. The student used a sterile scalpel to cut each of 30 planaria in half. This gave her 10 heads and 10 tails for each of three experimental groups. The planaria were kept in separate Petri dishes in the same amount of water and at the same temperature. Group 1 received 0% "Aloe vera" extract, Group 2 received a 20% concentration of the extract, and Group 3 received a 40% concentration. On days 7, 10, and 14, she recorded the amount of tissue regeneration in all three groups. She observed that the group with 20% "Aloe vera" added regenerated more slowly than the group with 40% added. A reasonable inference based on these results would be that

- (1) "Aloe vera" affected the rate of cell division, resulting in an increased rate of regeneration
- (2) the control group, which received no "Aloe vera", did not regenerate
- (3) if she applied 30% "Aloe vera" to a group, it would regenerate tissue more rapidly than the 40% group
- (4) the application of "Aloe vera" to earthworms would have no effect on tissue regeneration

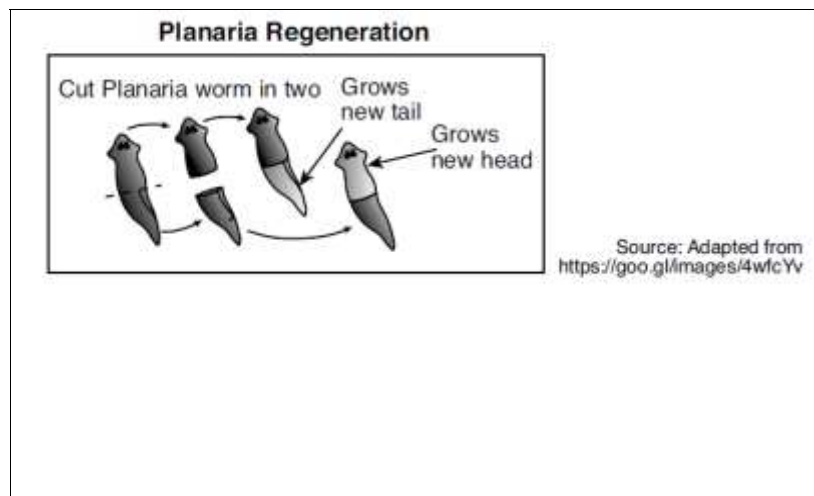
Data Base File Number: 1478

Regents Date June2022-32.bmp

June2022

32 6/15/2022 S4K4

Answer 1



## regeneration

500. The axolotl, also known as the Mexican walking fish, can regenerate parts of its body, such as a leg or a tail. The regeneration of these parts involves the process of

- (1) biotechnology
- (2) selective breeding
- (3) mitotic cell division
- (4) fertilization

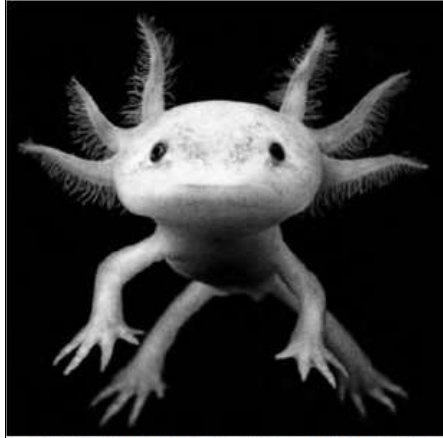
Data Base File Number: 1646

Regents Date Jan2024-17.bmp

Jan2024

17 1/23/2024 S4K4

Answer 3



Source: <https://futurism.com/meet-axolotl-mexican-walking-fish>

## renewable energy

501. Base your answer to this question on the information and photograph shown and on your knowledge of biology. The photograph shown is part of an advertisement used by a company selling solar panels. The company claims that their panels, like plants, provide clean, renewable energy. They also claim that using solar panels will have a positive effect on the biosphere by reducing global warming. The source of energy for both the green flower plant and the solar panels is

- (1) sun
- (2) water
- (3) nitrogen
- (4) oxygen

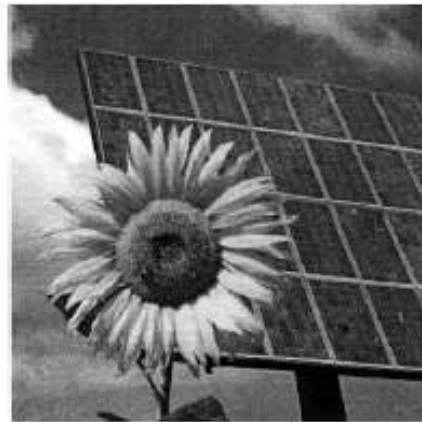
Data Base File Number: 1035

Regents Date June2015-56.bmp

June2015

56 6/16/2015 S4K7

Answer 1



Source: <http://www.stockwatch.in/files/Energy.jpg>

## renewable resource

502. Base your answer to this question on the information given and the photograph shown and on your knowledge of biology. The photograph shows a handful of croton nuts.

The Power of the Croton Nut ---

The croton nut tree grows in East Africa. It produces a nut that is inedible [to humans], and the tree itself was considered of little use except for firewood. The trees grow over vast areas, and many of these areas have been deforested to get rid of the trees and to make more land available for agriculture. Recently, scientists and engineers in Kenya have been able to crush the nuts and obtain oil, which can be used as a less expensive substitute for diesel fuel, a nonrenewable fossil fuel. The leftover nut pulp can be processed and sold for fertilizer, compressed into biofuel briquettes for use in cooking stoves, or converted into feed for chickens, making the commercial use of the croton nut a zero-waste process. Why does the use of croton nut oil represents an advantage over the use of conventional diesel fuel?

- (1) The croton nut oil is renewable.
- (2) Diesel fuel is renewable.
- (3) The croton nut oil is more expensive
- (4) Crushed croton nuts are expensive to process.

Data Base 1411  
File Number:

Regents Date Jan2020-59.bmp

Jan2020

59 1/21/2020 S4K2

Answer 1



Source: <http://www.ozy.com/fast-forward/please-dont-eat-the-diesel-substitute/60533>

## renewable resource

503. A ski resort installed a wind turbine similar to those represented in the diagram to supply some of its energy needs. This turbine was most likely installed because wind power is
- (1) renewable and does substantial damage to the atmosphere
  - (2) renewable and does minimal damage to the atmosphere
  - (3) nonrenewable and does substantial damage to the atmosphere
  - (4) nonrenewable and does minimal damage to the atmosphere

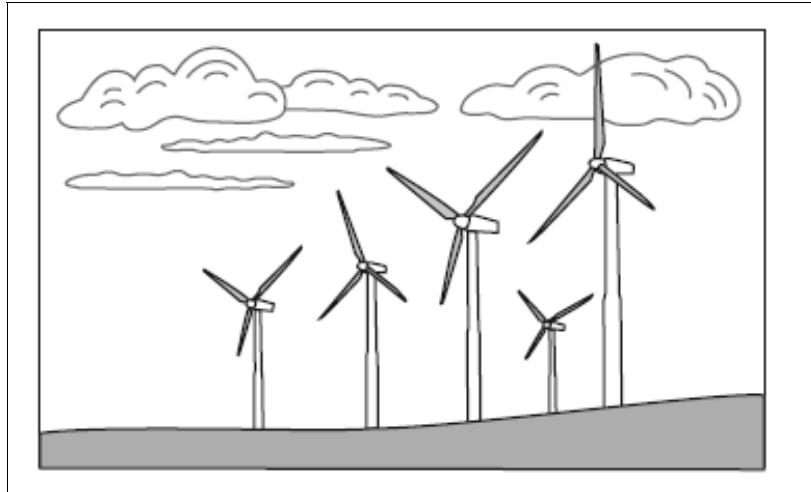
Data Base File Number: 410

Regents Date June2012-27.bmp

June2012

27 6/19/2012 S4K7

Answer 2



## replication

504. Base your answer to this question on the diagram shown and your knowledge of biology. The diagram represents a single-celled organism, such as an ameba, undergoing the changes shown. Process 1 is known as
- (1) replication
  - (2) meiosis
  - (3) differentiation
  - (4) digestion

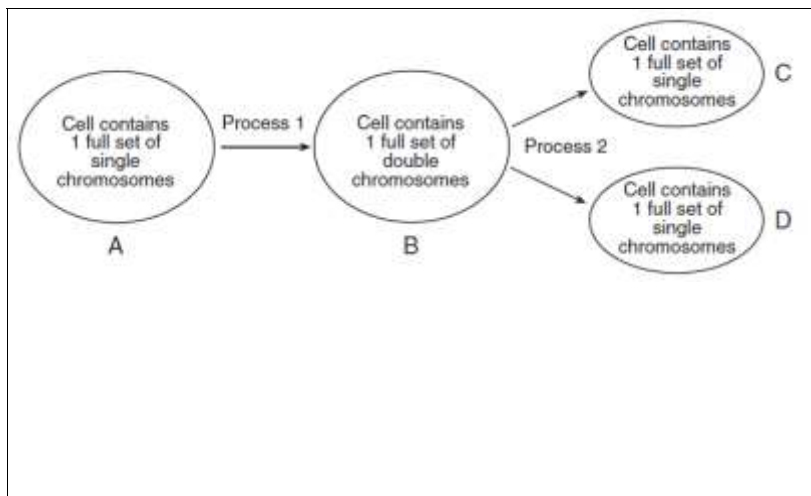
Data Base File Number: 515

Regents Date Aug2006-31.bmp

Aug2006

32 8/16/2006 S4K4

Answer 1



## replication

505. Which nuclear process is represented in the diagram shown?

- (1) recombination
- (2) fertilization
- (3) replication
- (4) mutation

Data Base File Number: 92

Regents Date June08-11.bmp

June2008

11 6/24/2008 S4K2

Answer 3

A DNA molecule → The two strands of → Molecular bases → Two identical DNA  
untwists. DNA separate. pair up. molecules are produced.

## reproduction

506. The diagram shown represents a developing bird egg. What is the primary function of this egg?

- (1) food supply for predators to preserve predator populations
- (2) adaptation to allow maximum freedom for parent birds
- (3) continuation of the species through reproduction
- (4) preservation of the exact genetic code of the parent birds

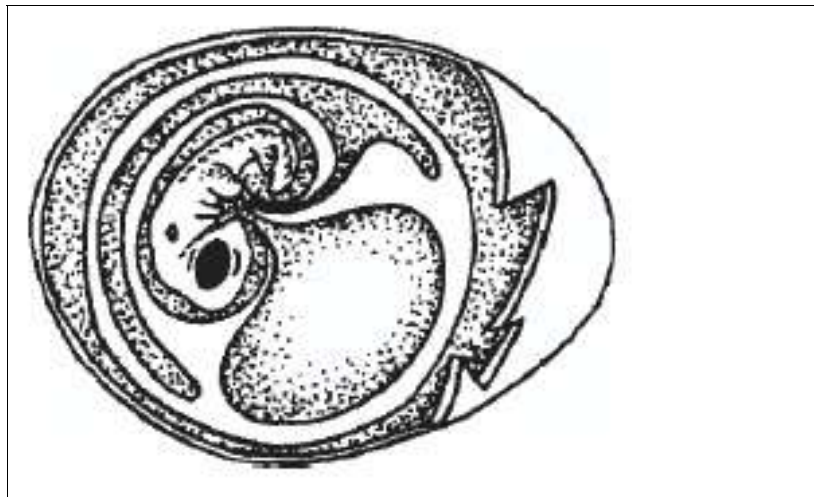
Data Base File Number: 713

Regents Date Jan2003-22.bmp

Jan2003

22 1/30/2003 S4K4

Answer 3





## reproduction

507. Base your answer to this question on the graph shown and on your knowledge of biology. The graph represents changes in the mass of a fetus from week 8 to its birth at week 43. During which five-week period did the fetal mass increase at the greatest rate?

(1) weeks 10-15

(3) weeks 25-30

(2) weeks 15-20

(4) weeks 30-35

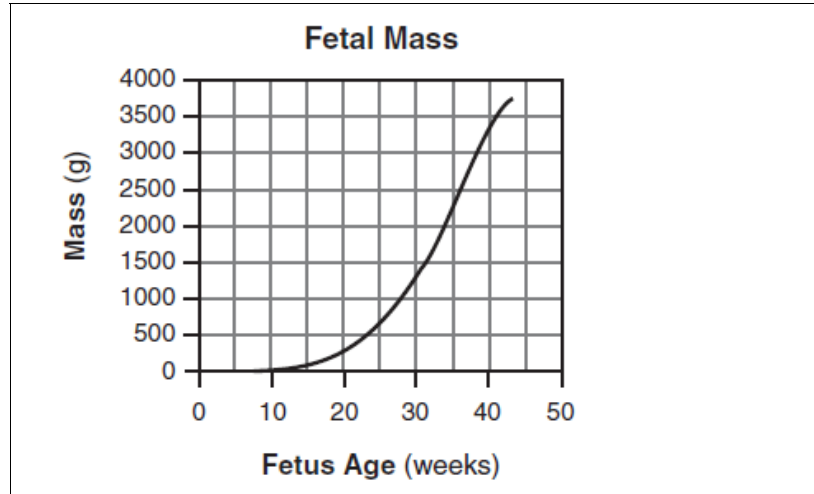
Data Base 245  
File Number:

Regents Date Jan2010-50.bmp

Jan2010

50 1/26/2010 S4K4

Answer 4



## reproduction

508. Models A and B as shown in the diagram illustrate two different methods of reproduction. Which statement best describes the offspring that result from these methods?
- (1) Both models A and B produce offspring that have fewer chromosomes than the parent cells.
  - (2) Both models A and B result in offspring that have more chromosomes than the parent cells.
  - (3) Model A produces offspring with genetic information different from the parent. Model B produces offspring that are genetically identical to the parents.
  - (4) Model A produces offspring with identical genetic information to the parent cells. Model B produces offspring that are genetically different from the parent cells.

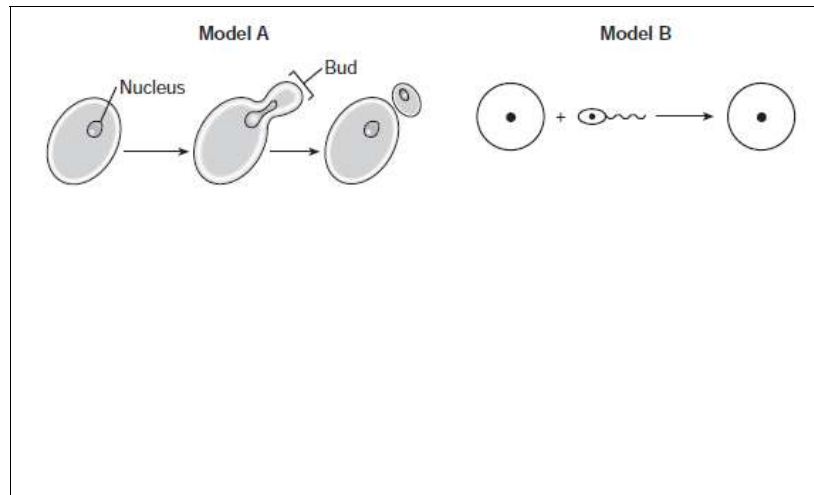
Data Base File Number: 1599

Regents Date Aug2023-12.bmp

Aug2023

12 8/17/2023 S4K4

Answer 4



## reproduction

509. Five different living organisms are represented below. Which statement about the organisms in the diagram is correct?

- (1) All of the organisms are autotrophs.
- (2) Only the flowering plant, green heron, and aquatic plant carry out photosynthesis.
- (3) Only the frog and green heron can maintain homeostasis.
- (4) All of the organisms pass on traits through reproduction.

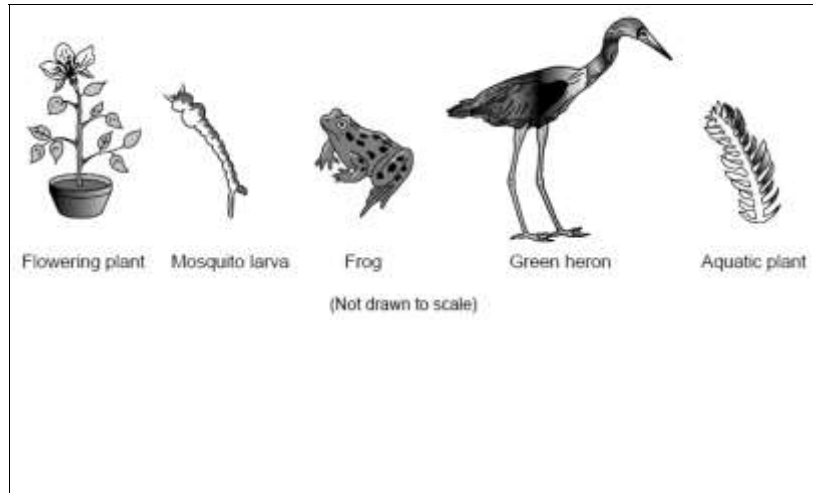
Data Base File Number: 1254

Regents Date June2018-24.bmp

June2018

24 6/13/2018 S4K1

Answer 4



## reproduction

510. Two cellular events that normally occur during two processes are represented in the diagram shown. Which row in the chart shown correctly identifies the processes in which these events occur?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

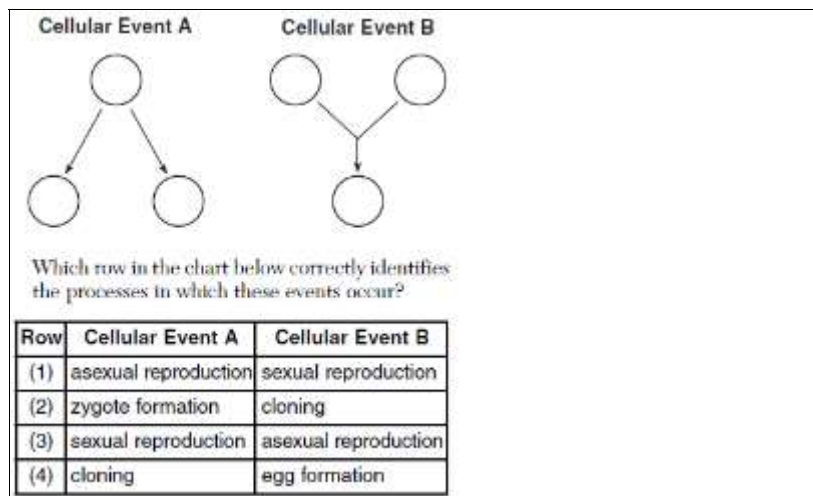
Data Base File Number: 989

Regents Date Jan2015-17.bmp

Jan2015

17 2/26/2015 S4K4

Answer 1



## reproduction

1511. Some chemical interactions in a human are shown in the graph. This graph represents hormones and events in the

- (1) process of fetal growth and development
- (2) process of meiotic cell division during sperm development
- (3) reproductive cycle of males
- (4) reproductive cycle of females

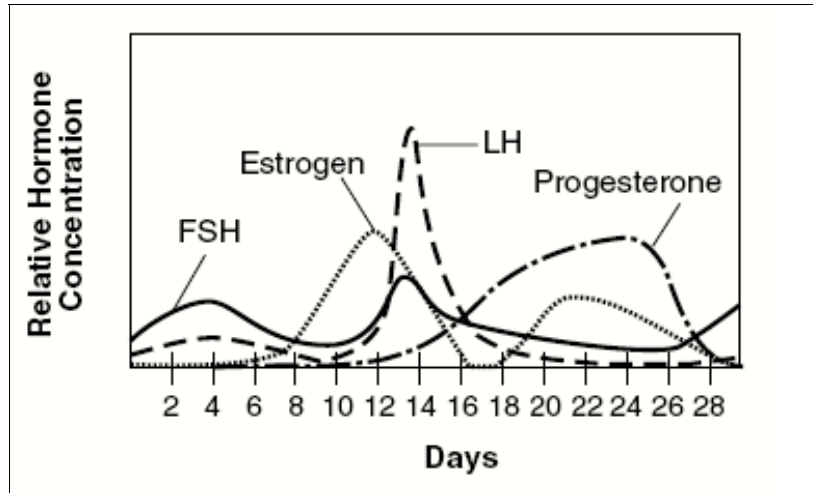
Data Base File Number: 151

Regents Date: Jan09-16.bmp

Jan2009

16 1/27/2009 S4K4

Answer: 4



## reproduction

1512. The diagrams shown represent organs of two individuals. Which individual contains organs that produce gametes?

- (1) Both A and B.
- (2) A, only
- (3) B, only
- (4) neither A nor B

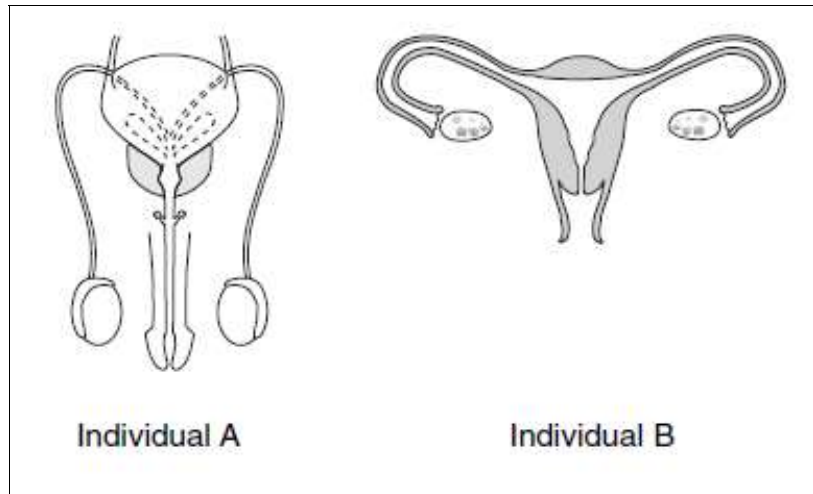
Data Base File Number: 746

Regents Date: June2003-47.bmp

June2003

47 6/19/2003 S4K4

Answer: 1



## reproduction

513. Base your to this question on the diagram shown and on your knowledge of biology. The diagram represents the reproductive systems of the human female and male. In which structure do gametes usually unite to produce a zygote?

- (1) A (3) C  
 (2) G (4) F

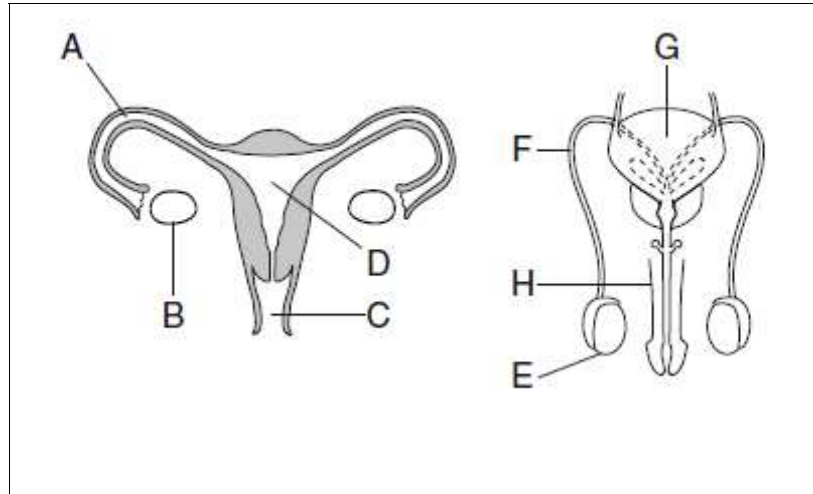
Data Base 441  
 File Number:

Regents Date Aug2012-38.bmp

Aug2012

39 8/17/2012 S4K4

Answer 1



## reproduction

514. Base your answers to this question on the diagram shown and on your knowledge of biology. Each arrow in the diagram represents a different hormone released by the pituitary gland that stimulates the gland indicated in the diagram. All structures are present in the same organism. What would most likely occur if the interaction is blocked between the pituitary and gland C, the site of meiosis in males?

- (1) The level of progesterone would start to increase. (3) Gland A would begin to interact with hormone 3 to maintain homeostasis  
 (2) The pituitary would produce another hormone to replace hormone 3. (4) The level of testosterone may start to decrease

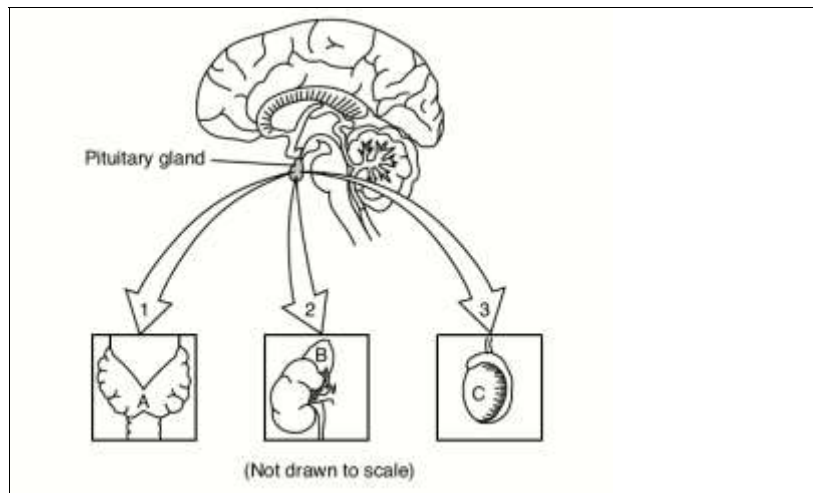
Data Base 134  
 File Number:

Regents Date Aug08-38.bmp

Aug2008

38 8/13/2008 S4K4

Answer 4



## reproduction

1515. Rabbits have evolved strategies that get them through periods of time when there is little food. The diagram shown represents essential life functions that rabbits need to perform. Which life function in the diagram could be eliminated without affecting an individual rabbit's ability to survive when food is scarce?

(1) digestion

(3) circulation

(2) excretion

(4) reproduction

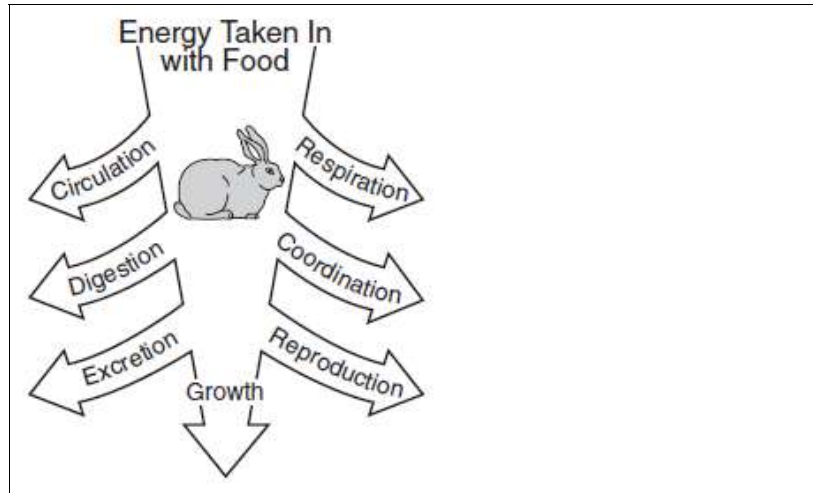
Data Base File Number: 993

Regents Date Jan2015-32.bmp

Jan2015

32 2/26/2015 S4K1

Answer 4



## reproduction

1516. How does the type of reproduction shown in method A in the diagram differ from the type of reproduction shown in method B?

- (1) Method A illustrates sexual reproduction, and method B illustrates asexual reproduction.
- (2) Offspring produced by method B will be genetically alike, but offspring produced by method A will be genetically different.
- (3) The two cells shown in the last step of method A are genetically alike, but the two cells shown in the last step of method B are genetically different.
- (4) Offspring produced by method A will be genetically like the parent, but offspring produced by method B will be genetically different from the parents.

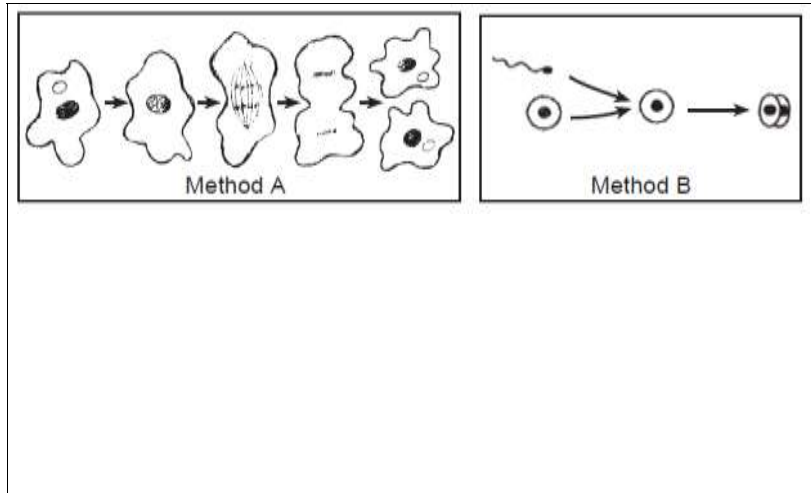
Data Base File Number: 828

Regents Date Jan2002-8.bmp

Jan2002

8 1/23/2002 S4K2

Answer 4



## reproduction

1517. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents the reproductive systems of the human female and male. In which structure would both mitosis and differentiation of an embryo occur?

- (1) G
- (2) B
- (3) E
- (4) D

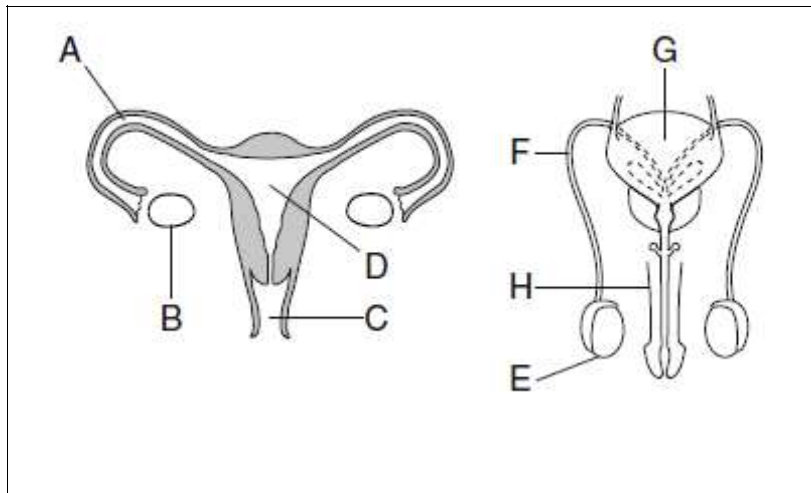
Data Base File Number: 440

Regents Date Aug2012-38.bmp

Aug2012

38 8/17/2012 S4K4

Answer 4



reproduction / female

518. The diagram shown represents part of the human female reproductive system. Fertilization and development normally occur in structures

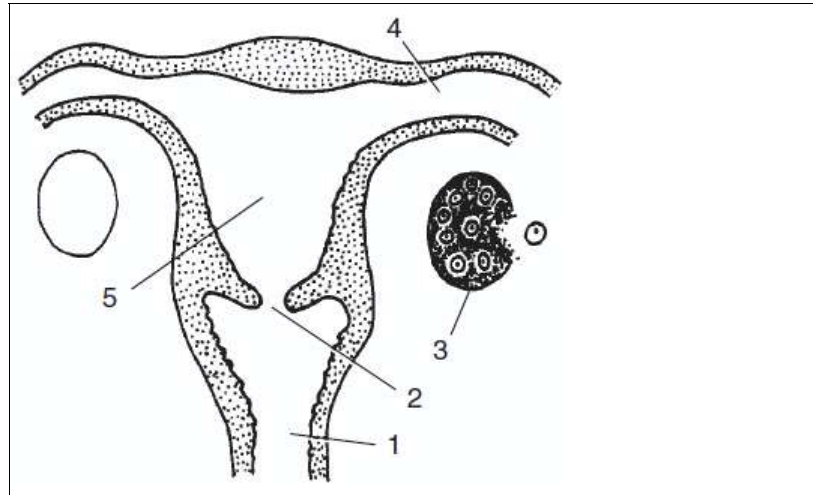
- (1) 1 and 5
- (2) 2 and 5
- (3) 3 and 1
- (4) 4 and 5

Data Base File Number: 714

Regents Date Jan2003-23.bmp

Jan2003  
23 1/30/2003 S4K4

Answer 4



reproduction / female

519. Base your answer to this question on the information given and on your knowledge of biology. The letters in the diagram indicate structures present in a human female. What would occur if both structures labeled B were damaged or blocked?

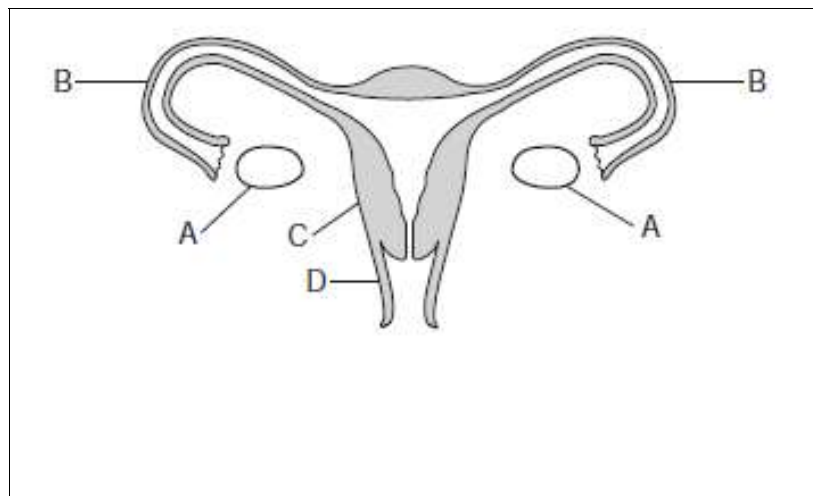
- (1) The egg would remain in the uterus and not travel to the ovary.
- (2) The egg would not be able to unite with the sperm.
- (3) The reproductive cycle in the female would stop.
- (4) The process of mitosis would stop in the ovary.

Data Base File Number: 1635

Regents Date Jan2024-39.bmp

Jan2024  
39 1/23/2024 S4K2

Answer 2





reproduction / female

520. The diagram shown represents human reproductive systems. Which statement best describes part of the human reproductive process?

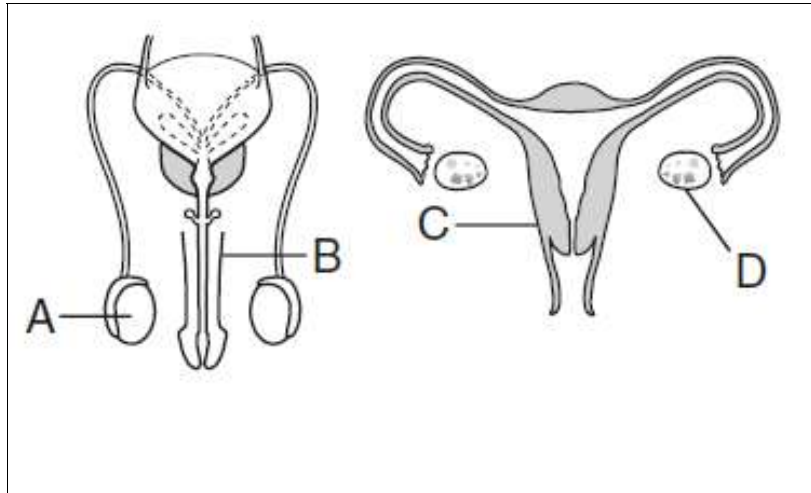
- (1) Testosterone produced in A is transferred to D, where it influences embryonic development.
- (2) Testosterone produced in D influences formation of sperm within B.
- (3) Estrogen and progesterone influence the activity of C.
- (4) Progesterone stimulates the division of the egg within C.

Data Base File Number: 481

Regents Date June2006-18.bmp

June2006  
18 6/21/2006 S4K4

Answer 3



reproduction / female

521. Base your answer to this question on the information given and on your knowledge of biology. The letters in the diagram indicate structures present in a human female. Identify the structure that supports the development of the fetus and is also influenced by hormones.

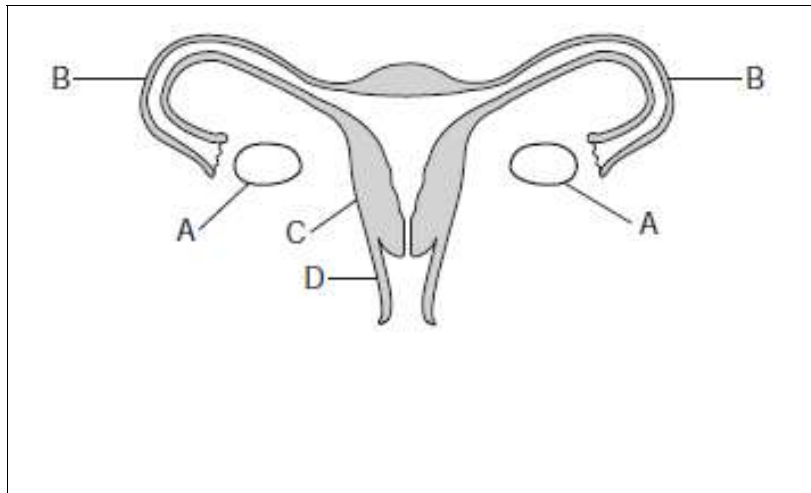
- (1) A
- (2) B
- (3) C
- (4) D

Data Base File Number: 1636

Regents Date Jan2024-39.bmp

Jan2024  
40 1/23/2024 S4K4

Answer 3



## reproduction / female

522. Which structure shown in the diagram produces egg cells?

- (1) A only
- (2) B only
- (3) A or B
- (4) A and B

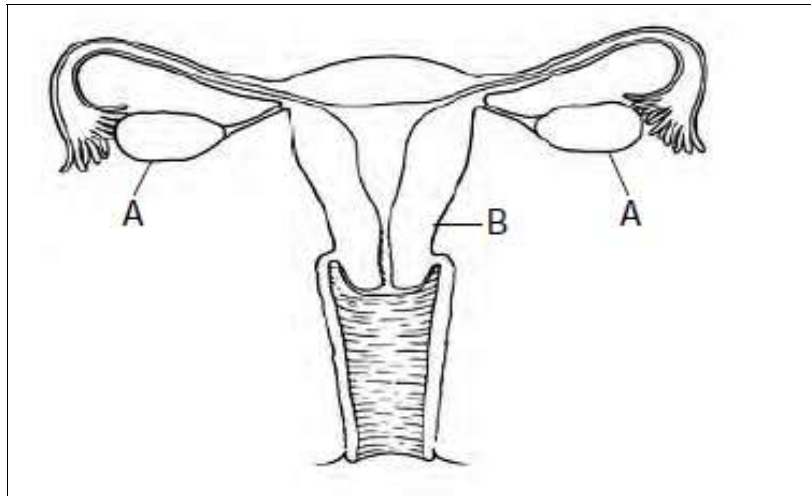
Data Base File Number: 1675

Regents Date June2024-53.bmp

June2024

53 6/14/2024 S4K4

Answer 1



## reproduction / female

523. The diagram shown represents structures found in the female reproductive system. If the areas labeled A were completely blocked on both sides, the most likely result would be that

- (1) egg and estrogen production would stop
- (2) sperm and insulin production would stop
- (3) fertilization would not occur
- (4) an embryo would develop

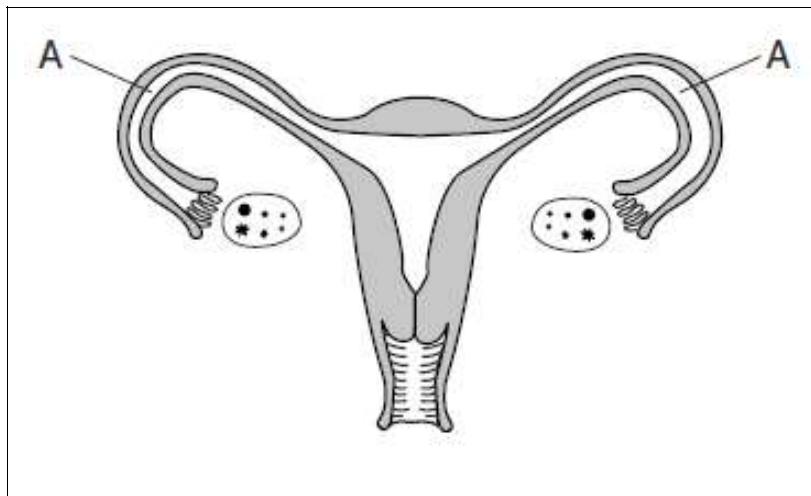
Data Base File Number: 1227

Regents Date Jan2018-3.bmp

Jan2018

3 1/22/2018 S4K4

Answer 3



## reproduction / female

524. A diagram of the female reproductive system is shown. Identify the structure within which the egg cell is normally fertilized.

(1) A

(3) C

(2) B

(4) D

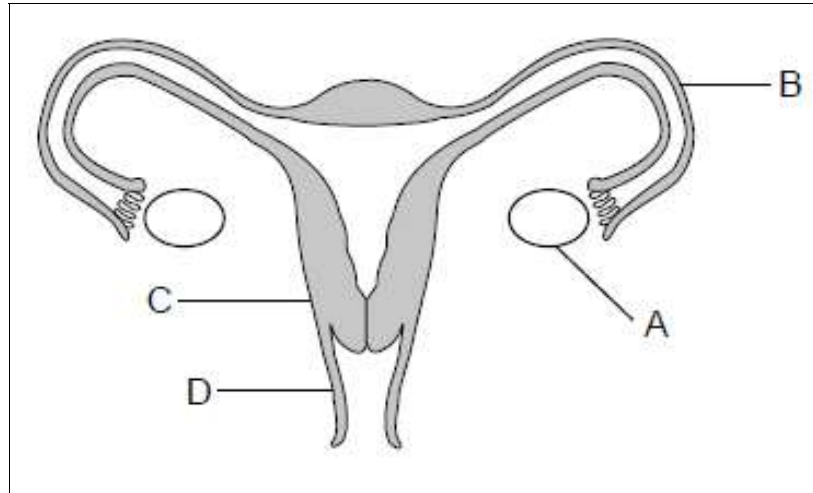
Data Base File Number: 1251

Regents Date June2018-16.bmp

June2018

16 6/13/2018 S4K4

Answer 2



## reproduction / female

525. Blockages caused by a condition known as Pelvic Inflammatory Disease (PID) are represented in the diagram shown of the female reproductive system. If blockages of this type occur, the most likely result would be that

(1) the egg would remain in the uterus and not travel upward

(3) hormones could not be produced by the ovaries

(2) the female gamete would not be able to unite with the male gamete

(4) the process of asexual reproduction would be prevented or interrupted

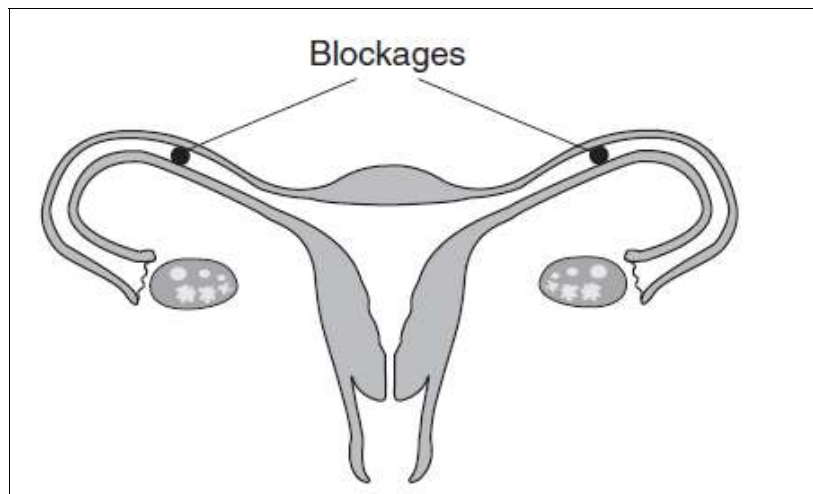
Data Base File Number: 1052

Regents Date August2015-38.b

Aug2015

38 8/12/2015 S4K4

Answer 2



## reproduction / female

526. Base your answer to this question on the information and diagram shown and on your knowledge of biology.

Endometriosis is a condition that occurs in some women, causing multiple cells or layers of cells to grow outside of the uterus. In some cases, these growths can actually cover the entire ovary or cause the tube leading from the ovary to the uterus to be blocked. The diagram shown represents the female reproductive system. Two structures, A and B, are labeled. Structures A and B are the

- (1) ovary and oviduct
- (2) uterus and cervix
- (3) uterus and oviduct
- (4) oviduct and uterus

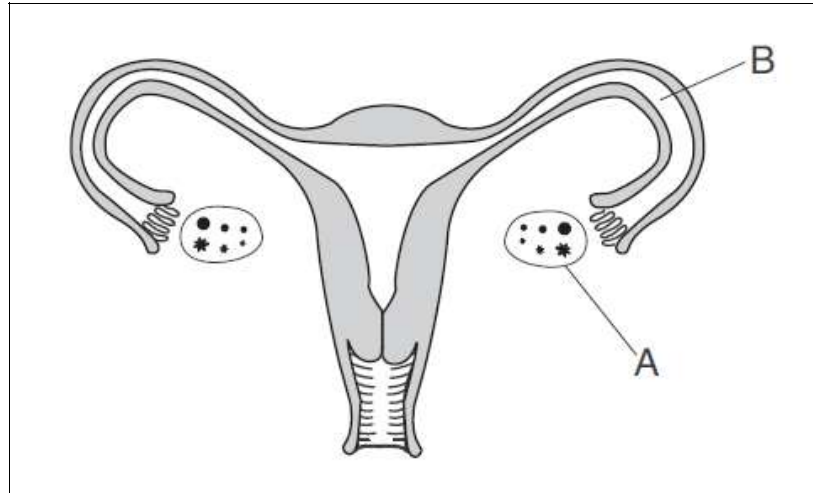
Data Base File Number: 892

Regents Date June2013-71.bmp

June2013

71 6/11/2013 S4K4

Answer 1



## reproduction / female

527. Base your answer to this question on the information given and on your knowledge of biology. The diagram shown represents the human female reproductive system. Which structure produces the eggs?

- (1) A
- (2) B
- (3) C
- (4) A, B, OR C

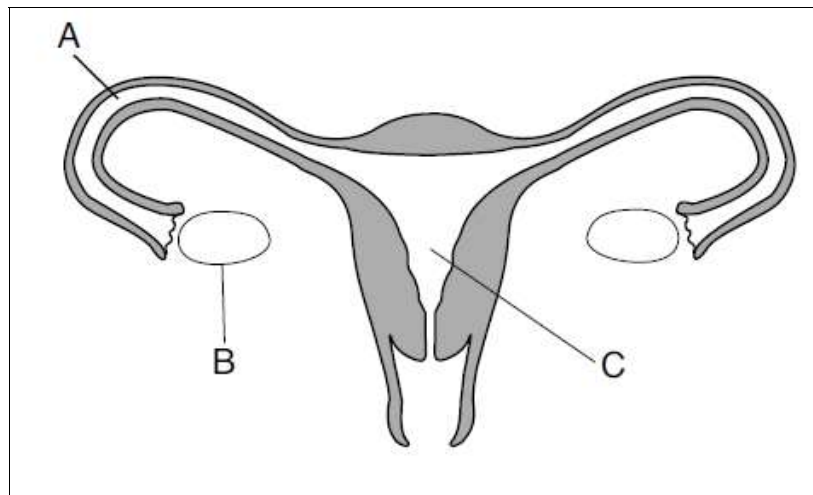
Data Base File Number: 1438

Regents Date June2021-52.bmp

June2021

52 6/22/2021 S4K4

Answer 2



reproduction / female

528. The diagram shown represents the human female reproductive system. Which row in the chart correctly describes the normal function of two of the labeled structures?

(1) 1

(3) 3

(2) 2

(4) 4

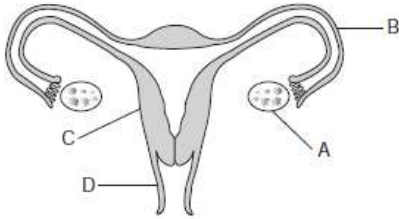
Data Base File Number: 1603

Regents Date Aug2023-28.bmp

Aug2023

28 8/17/2023 S4K4

Answer 3



Which row in the chart correctly describes the normal function of *two* of the labeled structures?

Row	Structures and Their Functions
(1)	eggs are produced in A, and the fetus develops in B
(2)	meiosis occurs in A, and development occurs in D
(3)	fertilization occurs in B, and the placenta forms in C
(4)	fertilization occurs in D, and the fetus develops in C

reproduction / female

529. The diagram shown represents some structures in the human female reproductive system. The processes of meiosis and fertilization are essential in human reproduction. Which row in the chart correctly identifies where in the female reproductive system these two processes occur?

(1) 1

(3) 3

(2) 2

(4) 4

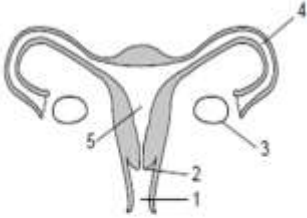
Data Base File Number: 1368

Regents Date Aug2019-26C.bm

Aug2019

26 8/14/2019 S4K4

Answer 3



Row	Meiosis	Fertilization
(1)	1	3
(2)	2	5
(3)	3	4
(4)	4	5

## reproduction / male

530. The diagram below represents the human male reproductive system. Which activity would be prevented by blockages at X and Y?

- (1) transport of urine out of the body
- (2) passage of testosterone to the female to stimulate egg production
- (3) movement of sperm out of the body
- (4) movement of testosterone to the testes to stimulate sperm production

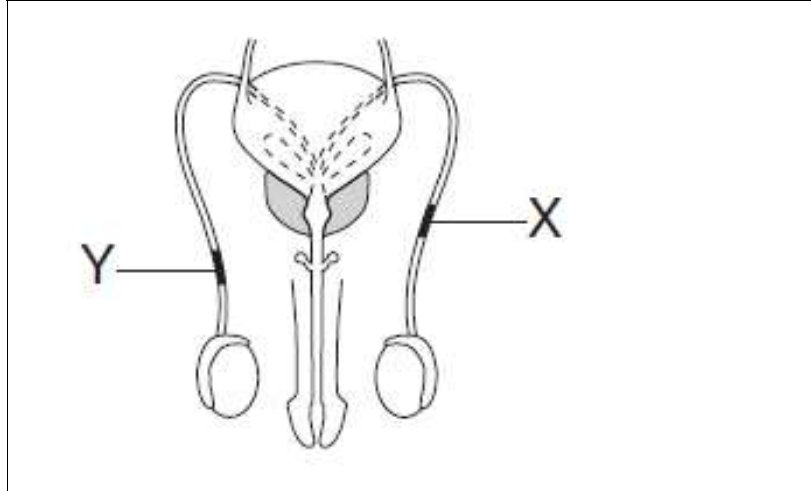
Data Base File Number: 309

Regents Date Jan2011-22.bmp

Jan2011

22 1/25/2011 S4K4

Answer 3



## reproductive cells

531. Which statement concerning the reproductive cells in the diagram shown is correct?

- (1) The cells are produced by mitosis and contain all the genetic information of the father.
- (2) If one of these cells fertilizes an egg, the offspring will be identical to the father.
- (3) Each of these cells contains only half the genetic information necessary for the formation of an offspring.
- (4) An egg fertilized by one of these cells will develop into a female with the same characteristics as the mother.

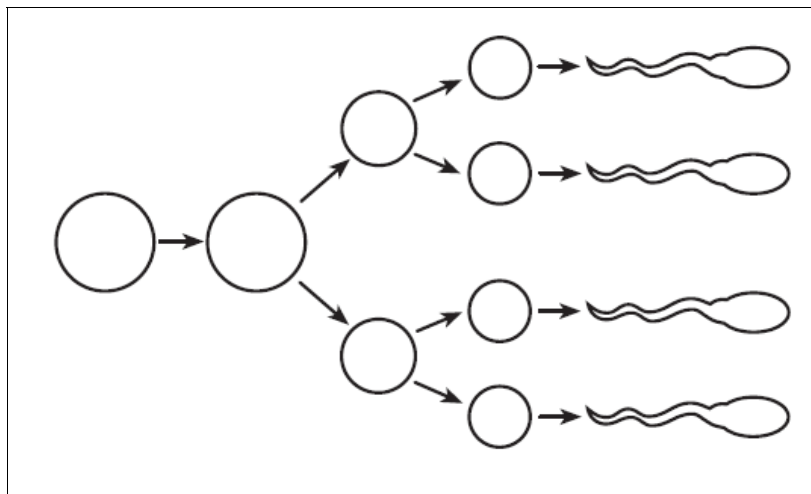
Data Base File Number: 275

Regents Date Aug2010-3.bmp

Aug2010

3 8/18/2010 S4K2

Answer 3



## reproductive success

532. The diagrams shown represent a human organ system. The major function of the system is to

- (1) provide immunity essential for the survival of each individual in a population
- (2) provide cells that are necessary for the survival of the species
- (3) produce chemical messages that are necessary for nerve cell development
- (4) control the passage of nutrients into and out of a developing fetus

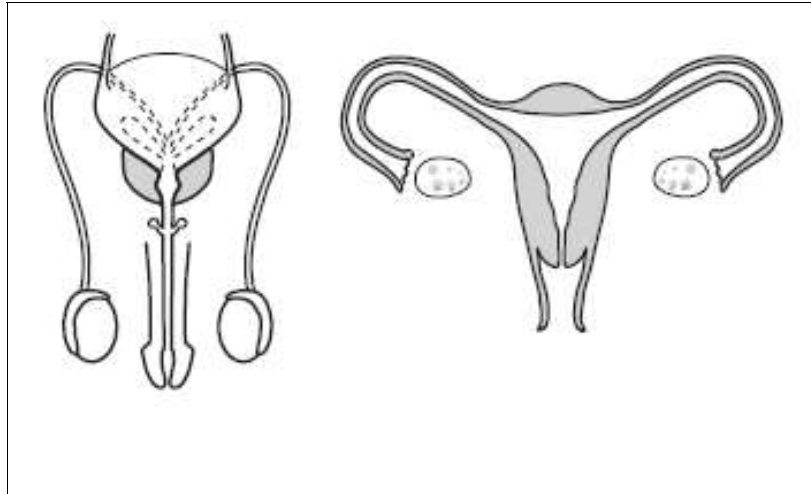
Data Base 961  
File Number:

Regents Date Aug2014-17.bmp

Aug2014

17 8/14/2014 S4K4

Answer 2



## reproductive success

1533. Base your answer to this question on the information given and on your knowledge of biology.

----- Fitness of Male Juncos -----

Animals communicate with each other in many ways. For example, many male birds have bright colors to signal their fitness to females. Scientists hypothesized that female birds also use their sense of smell to gather information about the fitness of their potential mates. To test this, scientists gathered male juncos and determined the amount of a chemical produced by the male birds that is sensed by the female birds. Scientists then collected data on the number of offspring produced by each male during one breeding season. The results are shown in the chart. ----- Which conclusion is most valid, based on the data?

- (1) Male juncos with a higher percentage of the male chemical have greater reproductive success.
- (2) Male juncos with a lower percentage of the male chemical have greater reproductive success.
- (3) The percentage of the male chemical has no effect on the reproductive success of the male juncos.
- (4) There is a negative relationship between the percentage of male chemical produced and the reproductive success of the male juncos.

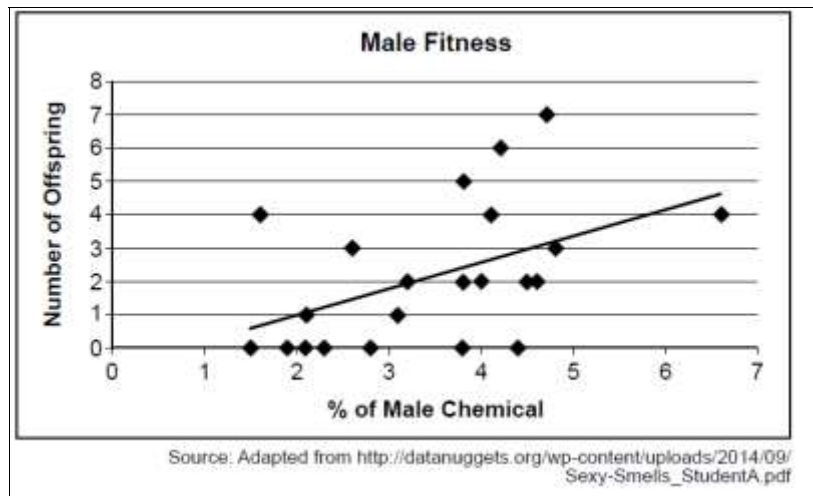
Data Base File Number: 1574

Regents Date June2023-34.bmp

June2023

34 6/14/2023 LABA

Answer 1





## reproductive success

534. Base your answer to this question on the information in the chart shown and on your knowledge of biology. How does the ability to produce 3000 to 6500 eggs benefit the species?

- (1) It decreases the opportunity for more frogs to compete for limited resources.
- (2) More offspring are likely to survive and reproduce.
- (3) The offspring will be more widely distributed by fast-moving water.
- (4) The chances for asexual reproduction in the frogs will increase.

Data Base File Number: 1400

Regents Date Jan2020-35.bmp

Jan2020

35 1/21/2020 S4K3

Answer 2

Where in New York State do leopard frogs live?	Marshes, ponds, swamps, and slow-moving water
How often do they breed?	Once each year
When is their breeding season?	March until June
How many eggs does one frog produce?	3000 to 6500
How long until the fertilized eggs hatch?	2 to 3 weeks
When do they reach sexual maturity?	Males: 365 days      Females: 730 days

**reproductive success**

1535. Base your answers to this question on the information given and on your knowledge of biology.  
**Glow-Worms ----**  
The European glow-worm ("*Lampyrus noctiluca*") is an insect and a member of the firefly family. Males are ordinary-looking beetles with brown wings. Females are much larger, don't have wings, glow, and look like a large larva. Adult glow-worms usually live for less than two weeks. They don't eat, focusing all their energy on finding a mate. The glow-worm has few enemies. Its body contains a poison that protects it from predators and its light warns would-be attackers that it is not safe to eat. Greenish light glows from the end of a female's abdomen, an organ called the lantern, for up to several hours each night. There are great differences in the size of the female lanterns. In an experiment, scientists found that females with larger lanterns glowed brighter, and the brightest females laid the most eggs. The diagram shows three different glow-worms. One way that a glowing abdomen helps the glow-worm increase its reproductive success is

- (1) It attracts females to the males.
- (2) It attracts males to the females
- (3) It lights the path of flight.
- (4) It has no effect on reproduction.

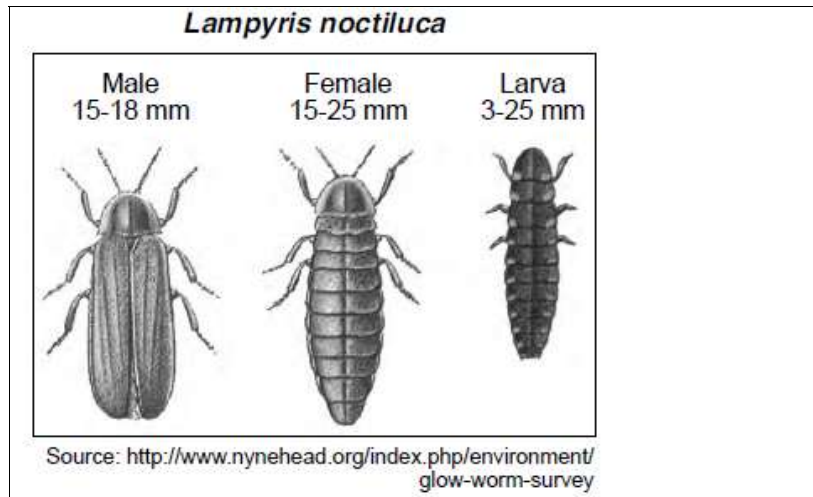
Data Base 1410  
File Number:

Regents Date Jan2020-53.bmp

Jan2020

53 1/21/2020 S4K4

Answer 2



## reproductive success

536. The photograph shows a recently discovered all-black penguin chick and several typical black-and-white chicks. The appearance of this penguin chick with all black feathers might
- (1) increase the types of foods penguins can eat
  - (2) decrease the diversity of the penguin population
  - (3) decrease the number of variations present in the black penguin population
  - (4) result in an increase in black penguins over time if the trait provides a reproductive advantage

Data Base 987  
File Number:

Regents Date Jan2015-14.bmp

Jan2015

14 2/26/2015 S4K3

Answer 4



## respiration

537. Base your answer to this question on the information and graph as shown and on your knowledge of biology. The graph shows changes in dissolved oxygen in a pond in the summertime over a 24-hour period. A large population of fish was introduced into the pond. During which part of the day would these fish affect the dissolved oxygen level in the pond?

- (1) both day and night, because respiration is occurring all the time in plants and animals
- (2) nighttime, because no respiration is occurring
- (3) daytime, because that is when plants are most active
- (4) neither day nor night, because only plants produce oxygen

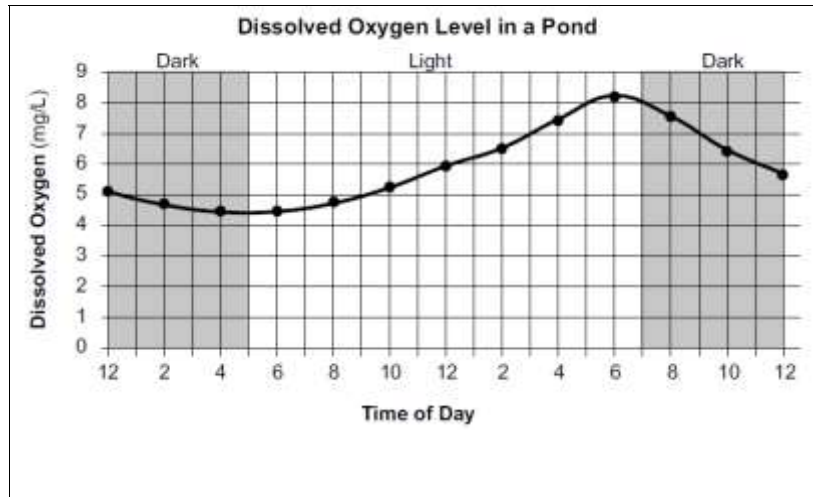
Data Base File Number: 1547

Regents Date Jan2023-31.bmp

Jan2023

32 1/24/2023 S4K5

Answer 1



## respiration

538. Base your answer to this question on the word equation shown and on your knowledge of biology. What process represented by the equation?

- (1) photosynthesis
- (2) respiration
- (3) digestion
- (4) homeostasis

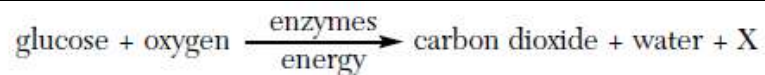
Data Base File Number: 839

Regents Date Jan2002-53.bmp

Jan2002

53 1/23/2002 S4K5

Answer 2



## respiration

1539. Base your answer to this question on the diagram shown, which illustrates a transport pathway of CO<sub>2</sub> in the human body, and on your knowledge of biology. Which cellular process most likely produced the carbon dioxide in the body cell?

- (1) cellular respiration
- (2) fermentation
- (3) diffusion
- (4) osmosis

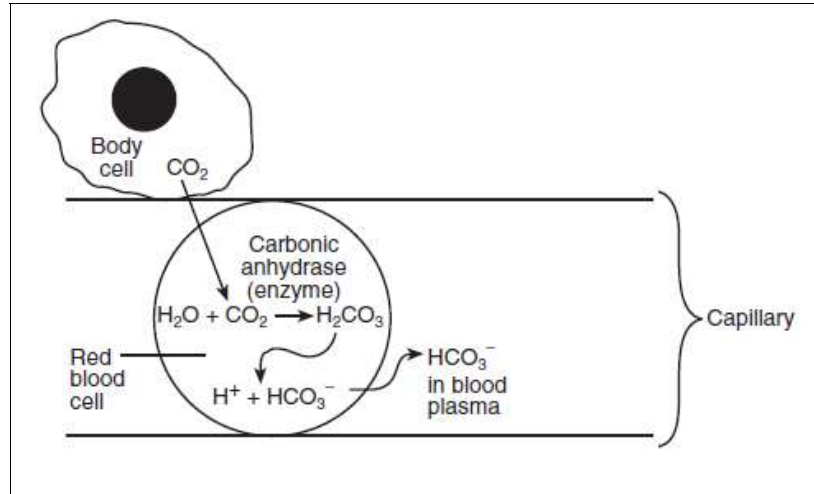
Data Base File Number: 468

Regents Date Jan2006-52.bmp

Jan2006

52 1/27/2006 S4K5

Answer 1



## respiration

1540. The graphs show the changes in the relative concentrations of two gases in the air surrounding a group of mice. Which process in the mice most likely accounts for the changes shown?

- (1) active transport
- (2) evaporation
- (3) respiration
- (4) photosynthesis

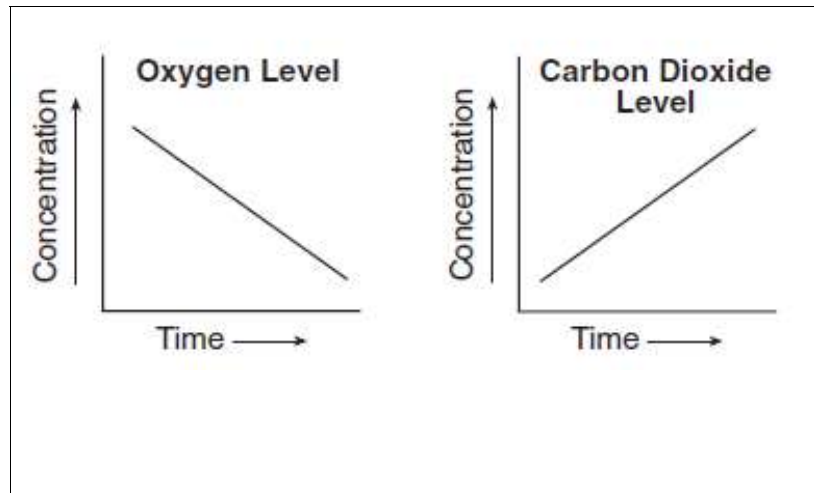
Data Base File Number: 535

Regents Date Jan2005-17.bmp

Jan2005

17 1/28/2005 S4K5

Answer 3



## respiration

541. Students did a jumping exercise but each consumed one candy bar before collecting data. After ten minutes, the students counted the jumps for one minute. Which row in the table as shown contains a correct explanation of how the body would use the candy bar?

(1) 1

(3) 3

(2) 2

(4) 4

Data Base File Number: 1716

Regents Date Aug2024-81.bmp

Aug2024

81 8/20/2024 LAB2

Answer 2

Row	Student	Explanation
(1)	A	The candy bar would provide protein for increasing the muscle mass to do the jumping jacks.
(2)	B	The candy bar would provide the raw materials required for cellular respiration in the muscles to do the jumping jacks.
(3)	C	The candy bar would increase the red blood cells' ability to carry more oxygen during the exercise.
(4)	D	The candy bar would help the digestive system to digest sugar faster during the exercise.

## respiration

542. Base your answer to this question on the information and diagram below and on your knowledge of biology. Two test tubes, A and B, were set up as shown in the diagram. Bromthymol blue, which turns from blue to yellow in the presence of carbon dioxide, was added to the water at the bottom of each tube before the tubes were sealed. The tubes were maintained at the temperatures shown for six days. (Average room temperature is 20°C.). Which life process is responsible for the change in tube A?

(1) photosynthesis

(3) homeostasis

(2) respiration

(4) active transport

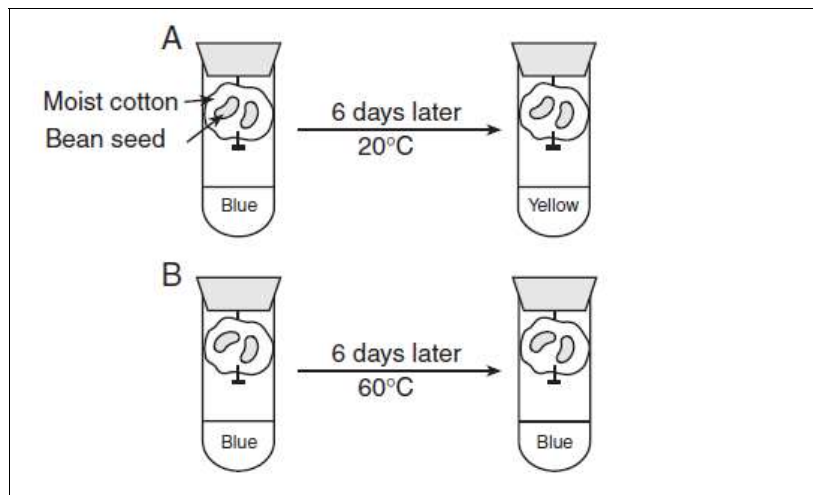
Data Base File Number: 548

Regents Date Jan2005-46.bmp

Jan2005

46 1/28/2005 S4K5

Answer 2



## respiration

1543. Base your answer to this question on the information and diagram shown and on your knowledge of biology. The setup in the diagram shows four test tubes. Tube 1 contains water only. Tube 2 contains a live snail. Tube 3 contains a live green water plant. Tube 4 contains both a live green water plant and a live snail. In this setup, which tubes contain at least one organism carrying on cellular respiration?

(1) tubes 1 and 2, only

(3) tubes 3 and 4, only

(2) tubes 2 and 4, only

(4) tubes 2, 3, and 4, only

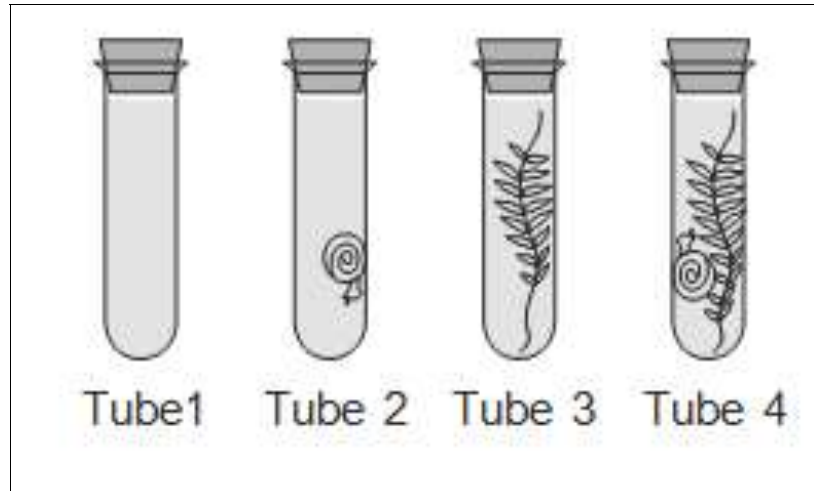
Data Base File Number: 1216

Regents Date Aug2017-42.bmp

Aug2017

42 8/17/2017 S4K5

Answer 4



## respiration

1544. Which biological process is represented in the diagram shown?

(1) photosynthesis

(3) digestion

(2) respiration

(4) replication

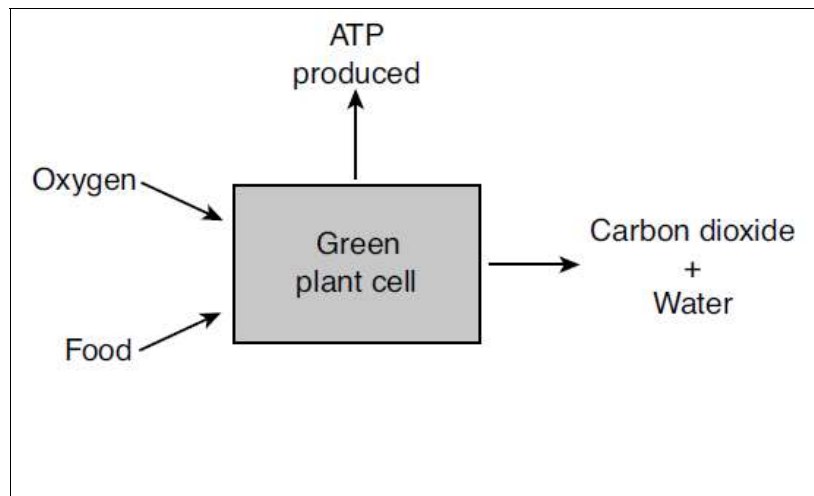
Data Base File Number: 1424

Regents Date June2021-28.bmp

June2021

28 6/22/2021 S4K5

Answer 2



## respiration

1545. Yeast cells carry out the process of cellular respiration as shown in this equation.  $\text{GLUCOSE} + \text{YEAST} \rightarrow \text{ETHYL ALCOHOL} + \text{CARBON DIOXIDE}$ . An investigation was carried out to determine the effect of temperature on the rate of cellular respiration in yeast. Five identical experiments were set up as shown on the LEFT side of the diagram. The only variation was the incubating temperature of the water bath which varied from 5-80 degrees C as shown in the data table. Gas was collected (D) after thirty minutes of incubation at each temperature, The maximum rate of cellular respiration in yeast occurred at which temperature?

- (1) 5 degrees C  
 (2) 20 degrees C  
 (3) 40 degrees C  
 (4) 60 degrees C

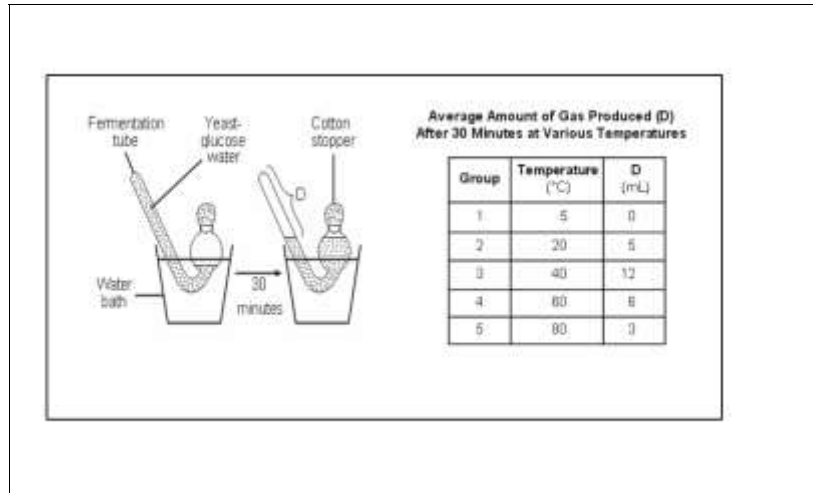
Data Base File Number: 198

Regents Date June09-45AB.bm

June2009

45 6/18/2009 S1K3

Answer 3



## respiration

1546. A biological process that occurs in both plants and animals is shown in the UPPER part of the diagram shown. Which row in the chart shown identifies the lettered substances in this process?

- (1) 1  
 (2) 2  
 (3) 3  
 (4) 4

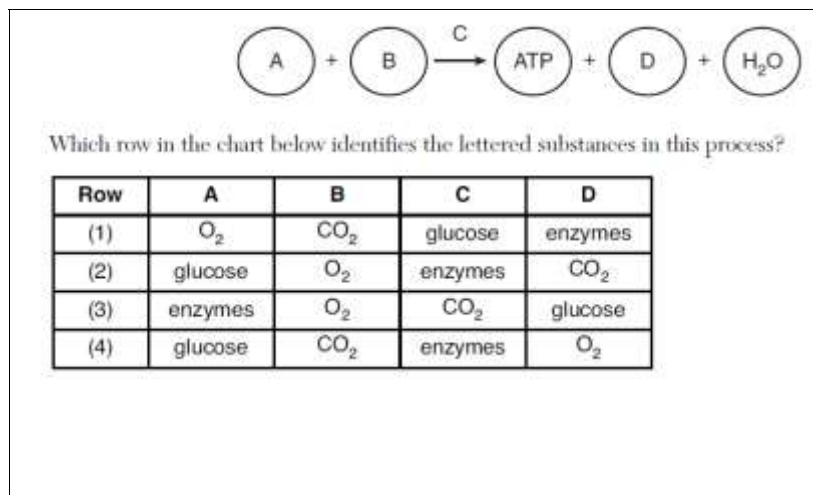
Data Base File Number: 290

Regents Date Aug2010-41.bmp

Aug2010

41 8/18/2010 S4K5

Answer 2





## respiration

547. Which life process carried out by a green plant is represented in the diagram shown?

- (1) respiration
- (2) photosynthesis
- (3) digestion
- (4) replication

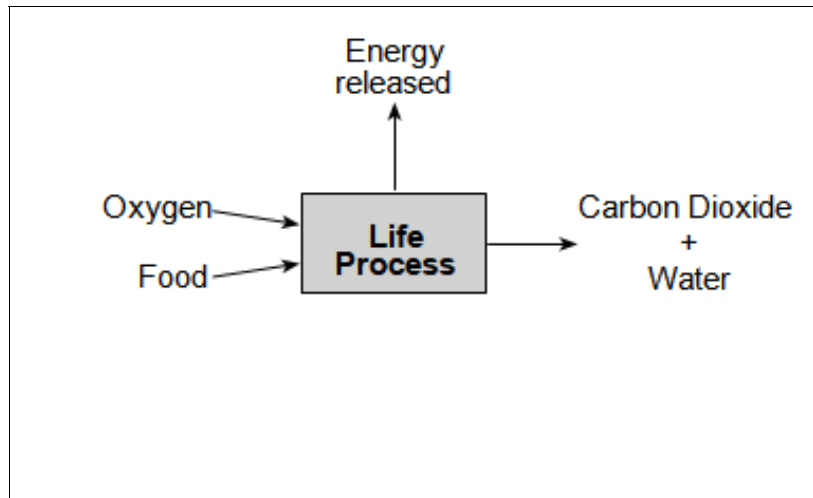
Data Base File Number: 1173

Regents Date June2017-15.bmp

June2017

15 6/14/2017 S4K5

Answer 1



## ribosome

548. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram shows how ATP is used by some cell structures to perform various functions. Which cell structure is represented by B?

- (1) vacuole
- (2) ribosome
- (3) cytoplasm
- (4) chloroplast

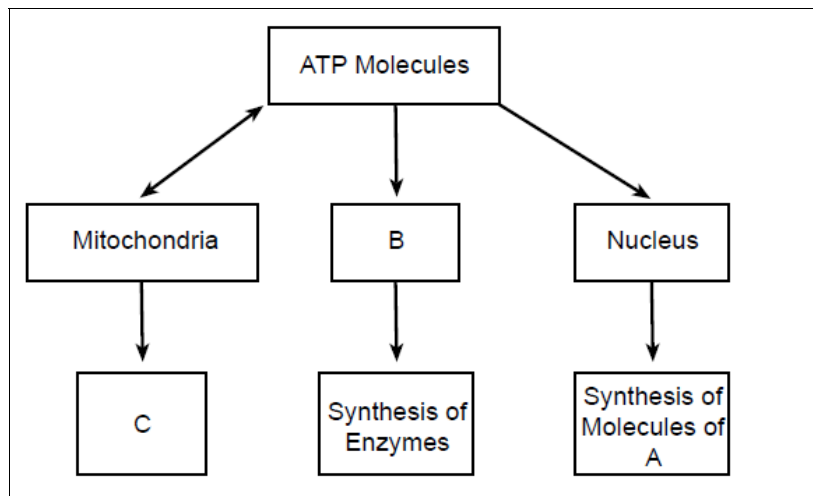
Data Base File Number: 1261

Regents Date June2018-42.bmp

June2018

42 6/13/2018 S4K1

Answer 2



**ribosome**

549. The diagram shown represents a cell that produces digestive enzymes. Which cellular structure would be the most likely location for the synthesis of these enzymes?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

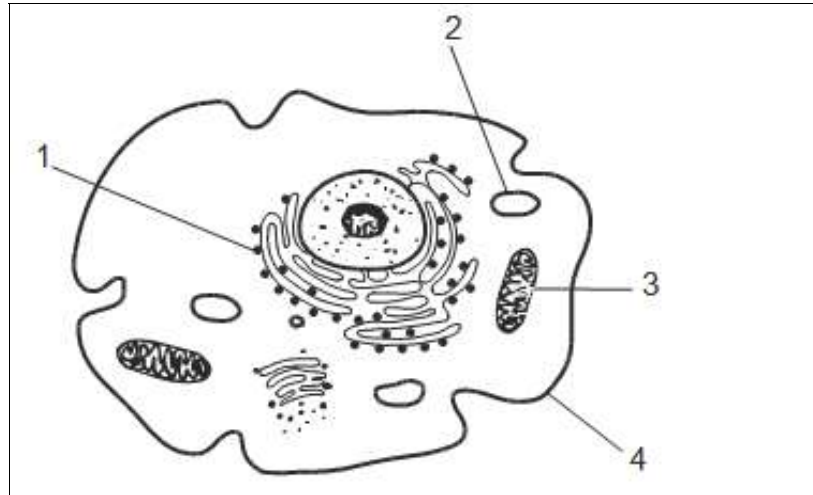
Data Base File Number: 1177

Regents Date June2017-27.bmp

June2017

27 6/14/2017 S4K1

Answer 1



**ribosome**

550. Base your answer to this question on the diagram shown, which represents a process that occurs in living cells, and on your knowledge of biology. Structure X is a

- (1) mitochondrion
- (2) vacuole
- (3) nucleus
- (4) ribosome

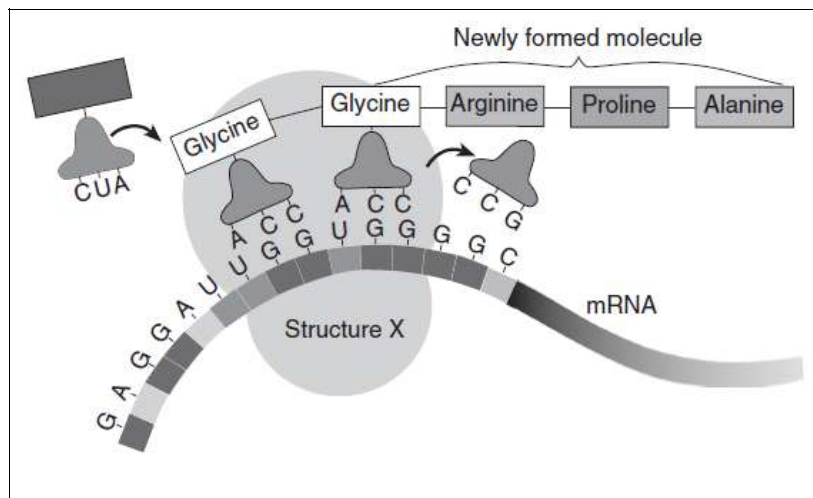
Data Base File Number: 1148

Regents Date August2016-73.b

Aug2016

73 8/18/2016 LAB1

Answer 4



## ribosome

551. Base your answer to this question on the diagram below, which represents a sequence of events in a biological process that occurs within human cells and on your knowledge of biology. Molecule A contains the

- (1) starch necessary for ribosome synthesis in the cytoplasm
- (2) organic substance that is broken down into molecules B, C, and D
- (3) proteins that form the ribosome in the cytoplasm
- (4) directions for the synthesis of molecules B, C, and D

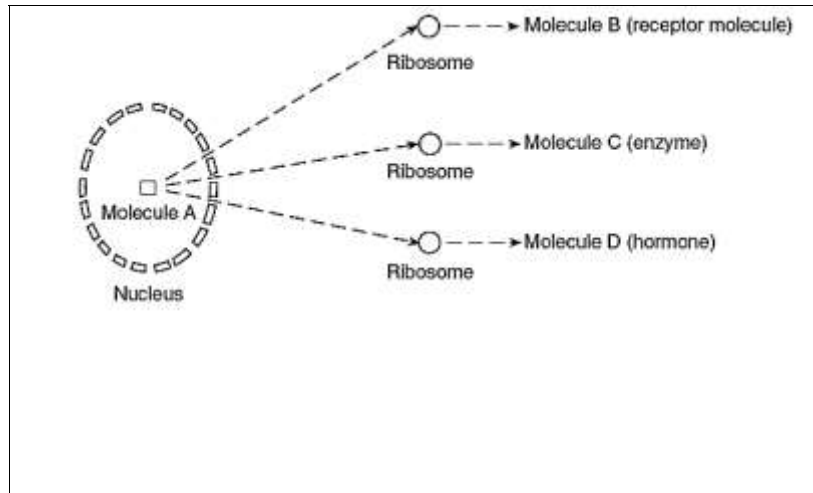
Data Base File Number: 16

Regents Date Aug07-38.bmp

Aug2007

37 8/16/2007 S4K2

Answer 4



## ribosome

552. The diagram shown represents a process taking place in a cell. The type of organic molecule that is being synthesized is

- (1) DNA
- (2) starch
- (3) protein
- (4) fat

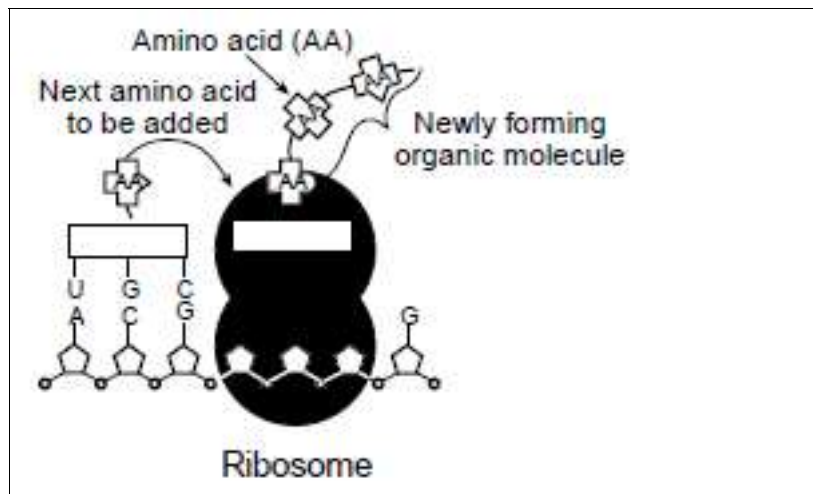
Data Base File Number: 1367

Regents Date Aug2019-23.bmp

Aug2019

23 8/14/2019 S4K1

Answer 2



## ribosome

1553. Base your answer to this question on the diagram shown and information given and on your knowledge of biology. The diagram represents a germinating bean seed that has been split open. When water is available and growth begins, the plant embryo inside the seed secretes enzymes to digest the starch stored in the seed. The enzymes in cells of the plant embryo are produced directly by the

- (1) ribosomes
- (2) nuclei
- (3) mitochondria
- (4) vacuoles

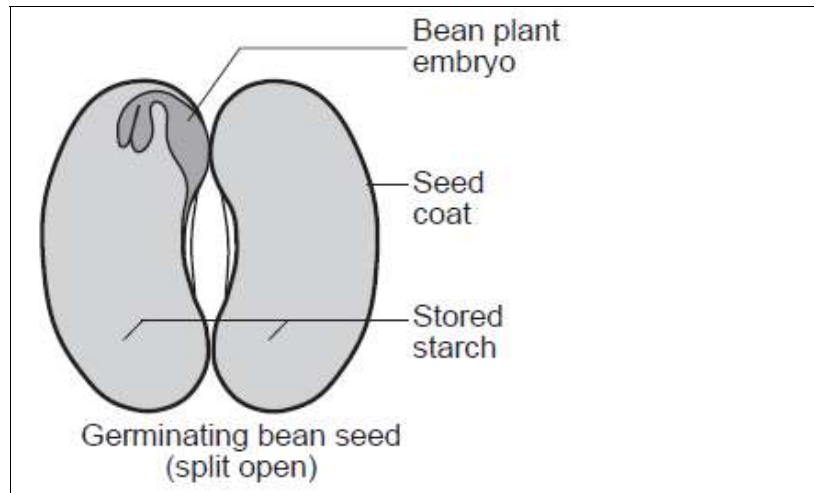
Data Base File Number: 1077

Regents Date Jan2016-37.bmp

Jan2016

37 1/27/2016 S4K1

Answer 1



## ribosome

1554. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram represents a series of events that occur within living organisms. Cell structure "X" is a

- (1) ribosome
- (2) vacuole
- (3) cell membrane
- (4) mitochondrion

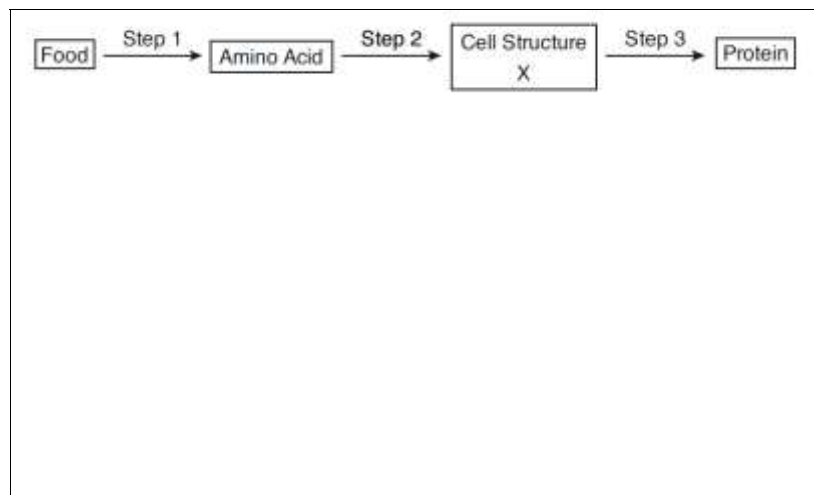
Data Base File Number: 1484

Regents Date June2022-38.bmp

June2022

39 6/15/2022 S4K1

Answer 1



## ruler measurement

1555. A clear plastic ruler is placed across the middle of the field of view of a compound light microscope. A row of cells can be seen under low-power magnification (100×). What is the average length of a single cell in micrometers ( $\mu\text{m}$ )?

- (1) 10 $\mu\text{m}$  (3) 200 $\mu\text{m}$   
(2) 100 $\mu\text{m}$  (4) 2000 $\mu\text{m}$

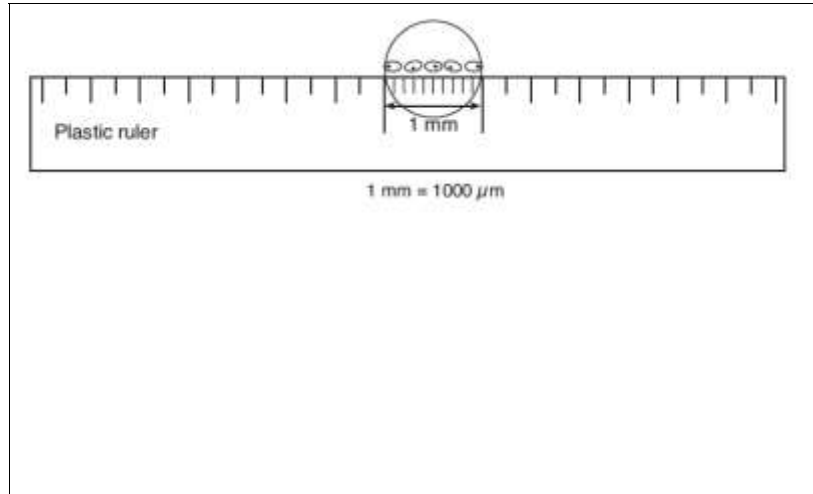
Data Base File Number: 260

Regents Date June2010-31.bmp

June2010

31 6/16/2010 S4K1

Answer 3



## scientific data

1556. Base your answer to this question on the information and data table below and on your knowledge of biology. Based on the data, students noticed that there was a large increase in the number of measles cases in 2014. Which statement best explains the research the students might do to state a claim about the cause of this increase?

- (1) Determine if the outbreak that occurred in 2014 occurred in unvaccinated people. (3) Investigate the vaccine that children received in 2014 to see if it mutated.  
(2) Check if the virus mutated, resulting in a decrease in the number of people infected with measles. (4) Test the measles virus to determine if it developed resistance to antibiotics.

Data Base File Number: 1640

Regents Date Jan2024-47.bmp

Jan2024

47 1/23/2024 S4K1

Answer 1

Year	Number of Measles Cases
2010	63
2011	220
2012	55
2013	187
2014	667
2015	188
2016	86
2017	120
2018	372
2019*	839

\* As of 5/10/19  
Source: <https://www.cdc.gov/measles/cases>

## scientific method

1557. Base your answer to this question on the information and illustrations as shown and on your knowledge of biology. The illustrations represent cross sections of two different plant stems. A student compared two stem cross sections. Stem cross section A is from a plant that can be used to produce products with valuable medicinal properties. Stem cross section B is from a plant growing in the same area of the forest and its usefulness for producing medicines is unknown. The student concluded that the stem cross sections had many structural similarities and that the plant that produced cross section B would produce the same valuable medicinal products. Is the student's conclusion valid?

- (1) Yes, because the structural similarities indicate a close relationship between the organisms.
- (2) Yes, because these plants grow in the same regions of the forest ecosystem and look similar.
- (3) No, because he did not evaluate soil conditions, such as pH, with chemical indicators.
- (4) No, because this structural evidence alone is insufficient and molecular evidence should be obtained.

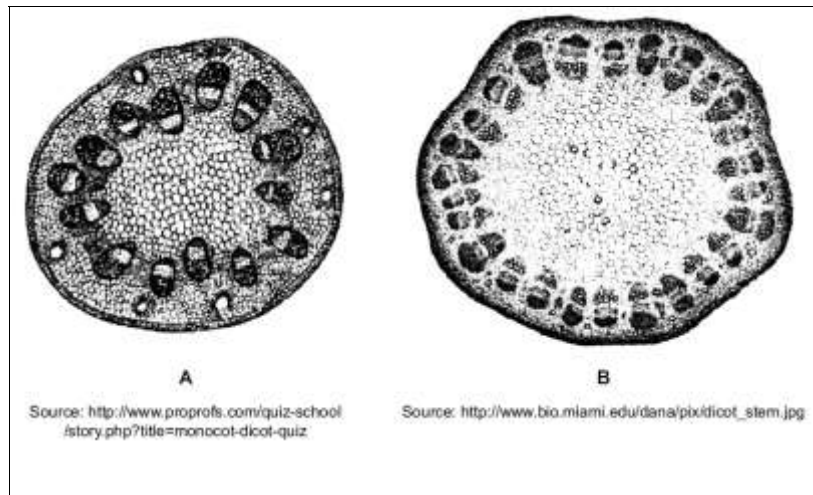
Data Base File Number: 1558

Regents Date Jan2023-73.bmp

Jan2023

73 1/24/2023 LAB1

Answer 4



## scientific method

558. Base your answer to this question on the data table shown and on your knowledge of biology. The table contains information about glucose production in a species of plant that lives in the water of a salt marsh. Which terms describe temperature in this investigation?

- (1) abiotic factor and independent variable                      (3) biotic factor and independent variable  
(2) abiotic factor and dependent variable                      (4) biotic factor and dependent variable

Data Base                      525  
File Number:

Regents Date                      **Aug2006-50.bmp**

Aug2006

50                      8/16/2006                      S4K1

Answer                      **1**

Temperature (°C)	Glucose Production (mg/hr)
10	5
20	10
30	15
40	5

## scientific method

559. The kakapo is a small, flightless parrot. Currently there is a small population of kakapos living on four islands off the coast of New Zealand. Scientists are concerned that the kakapo may become extinct due to the introduction of predators and recent infections that have drastically reduced the already small population. During their conservation attempts, scientists made an interesting observation: When food is plentiful, more male offspring survive. Scientists provided the illustration as shown to explain this observation. If scientists were going to test this hypothesis, the best way would be to select a test group and develop a research plan that includes collecting data when

- (1) all of the kakapos are fed a reduced amount of food
- (2) all of the kakapos are fed an unlimited amount of food
- (3) the kakapo test group is divided in half, and one-half is fed unlimited food and the other a reduced amount of food
- (4) the entire test group of kakapos is fed one type of food for one month and a different type of food for the second month

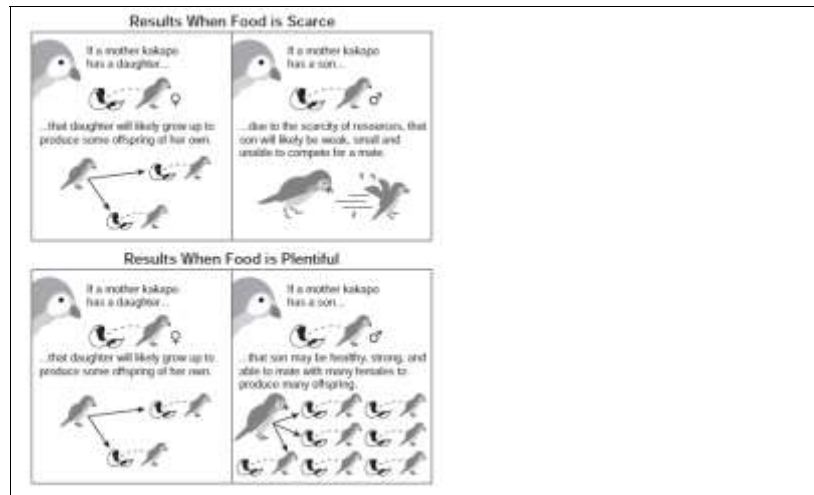
Data Base File Number: 1702

Regents Date Aug2024-43.bmp

Aug2024

43 8/20/2024 S1K3

Answer 3





**scientific method**

1560. A student performed an experiment to determine if treating 500 tomato plants with an auxin (a plant growth hormone) will make them grow faster. The results are shown in the table. The student can NOT draw a valid conclusion from these results because

- (1) there is no hypothesis
- (2) there is no theory
- (3) there is no control
- (4) there is insufficient data

Data Base File Number: 543

Regents Date Jan2005-36.bmp

Jan2005

36 1/28/2005 S1K3

Answer 3

Days	Average Stem Height (cm)
1	10
5	13
10	19
15	26
20	32
25	40

**scientific method**

1561. The chart shown provides information about two scientific iscoveries in the field of biology. Which statement is the best interpretation of the material presented in the chart?

- (1) Scientific explanations are built by combining evidence that can be observed with what people already know.
- (2) Inquiry involves making judgments about the reliability of the source and relevance of the information.
- (3) Science provides information, but values are also essential to making ethical decisions.
- (4) Hypotheses are valuable even if they turn out not to be true, because they may lead to further investigation.

Data Base File Number: 1135

Regents Date August2016-39.b

Aug2016

39 8/18/2016 S1K1

Answer 1

Early Discovery	Later Discovery
People living near swamps are more likely to get malaria than people who do not live near swamps. Burning swamps early in the summer reduces the amount of malaria.	Mosquitoes breed and lay their eggs in swamps and other pools of still water. Mosquitoes are the carriers of the organisms that cause malaria.
Dark-staining bodies called chromosomes can be seen only in dividing cells. The number of chromosomes doubles during cell division.	Chromosomes contain DNA, which is able to copy itself. DNA carries the genetic code, which is passed from a parent cell to two or more daughter cells.

## scientific method

1562. Base your answer to this question on the information given, the data table shown and on your knowledge of biology. Five students design an experiment to answer the question: "How is heart rate affected by running?" Two chairs were set up at different ends of a large room. The pulse rate of each student was taken at rest just before running. Each of the five students ran between the chairs a different number of times. Their pulse rates were taken after running and the results are shown in the table. If a control group is NOT included in an experiment, it would be difficult to

- (1) formulate a hypothesis for the experiment
- (2) make observations about the experimental group
- (3) record data in a data table
- (4) draw a valid conclusion

Data Base File Number: 395

Regents Date Jan2012-76.bmp

Jan2012

76 1/25/2012 LAB2

Answer 4

Student	Number of Times the Student Ran Between the Chairs	Pulse Rate After Running (beats/min)
A	2	88
B	4	96
C	6	104
D	8	112
E	10	120

## scientific method

563. The diagram shows two setups that were used to study bacterial growth. Each setup initially contained an equal number of the bacterium "E. coli" in different carbohydrate solutions. After one hour, a 1-milliliter sample was drawn from each tube and analyzed. The number of bacteria found in the sample from test tube 1 was higher than the number in test tube 2. Which conclusion regarding this investigation is NOT valid?

- (1) All bacteria grow best in a solution of glucose.
- (2) "E. coli" grows better in a 10% solution of glucose than in a 10% solution of sucrose.
- (3) The type of sugar solution will make a difference in the rate of growth of "E. coli".
- (4) The rate of growth of "E. coli" depends on the type of carbohydrate present.

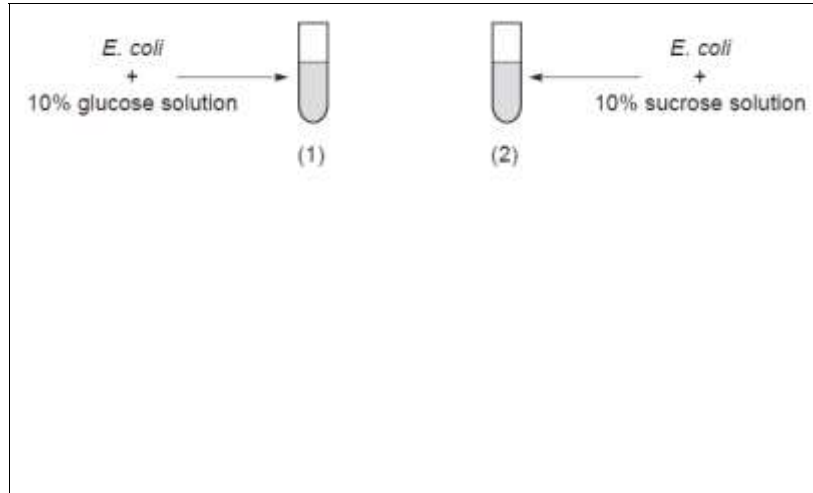
Data Base File Number: 857

Regents Date June2001-60.bmp

June2001

60 6/15/2001 S1K3

Answer 1



## scientific method

1564. Venus flytraps are plants that have specialized leaves that can capture insects. Researchers have discovered evidence that supports the claim that Venus flytraps do not capture the insects that usually pollinate them. The researchers studied the remains of captured insects in more than 200 plants. The remains did not contain any of the three most common pollinators of the plants. Additional research showed that 87% of Venus flytrap pollinators can fly, and only 20% of the insects captured can fly. The flowers of the Venus flytrap are elevated above the leaves of the plant. In order to support the claim that the pollinators of the Venus flytrap are mostly flying insects, the researchers would

- (1) publish the study immediately and ask other researchers to support their claim
- (2) expand the study to other Venus flytrap habitats and determine the number of flying and nonflying insect remains found in the plants there
- (3) continue to study the insects found in the Venus flytraps in the research area, but only record the number of insects without wings
- (4) compare the kinds of insect bodies with and without wings found in pitcher plants, a plant similar to the Venus flytrap, with the kinds of insects found in the original study

Data Base File Number: 1630

Regents Date Jan2024-31.bmp

Jan2024

31 1/23/2024 S1K2

Answer 2



## scientific study

565. A mineral supplement designed to prevent the flu was given to two groups of people during a scientific study. Dosages of the supplement were measured in milligrams per day, as shown in the table. After 10 weeks, neither group reported a case of the flu. Which procedure would have made the outcome of this study more valid?

- (1) test only one group with 200 mg of the supplement
- (2) test the supplement on both groups for 5 weeks instead of 10 weeks
- (3) test a third group that receives 150 mg of the supplement
- (4) test a third group that does not receive the supplement

Data Base 262  
File Number:

Regents Date June2010-33.bmp

June2010

33 6/16/2010 S1K3

Answer 4

Supplement Dosages

Group	Dosage (mg/day)
A	100
B	200

## scientific study

566. Base your answer to this question on the information and diagram shown and on your knowledge of biology. In the early 1600s, a scientist planted a willow tree that weighed 5 pounds in 200 pounds of dry soil. He placed it outside and watered it for 5 years. At the end of that time, he observed that the tree had gained 164 pounds 3 ounces, while the soil had lost just 2 ounces. ---- From this, he concluded that plants gain weight from the water they take in. His conclusion was based on

- (1) the input of scientists from many countries doing similar studies
- (2) the application of advanced technologies to the study of a problem
- (3) careful observation, measurements, and inferences from his data
- (4) an extensive knowledge of the process of photosynthesis

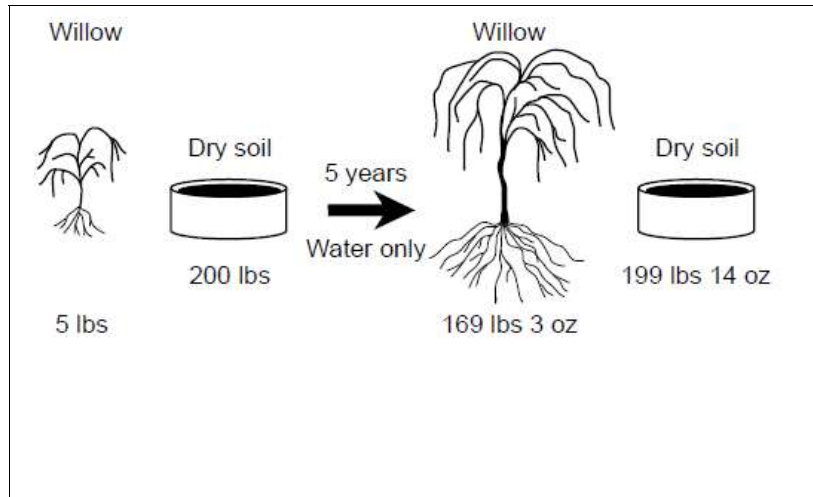
Data Base File Number: 1257

Regents Date June2018-32.bmp

June2018

32 6/13/2018 S1K1

Answer 3



## secondary succession

567. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram indicates a change in an ecosystem. What natural event could cause the disruption indicated in the diagram?

- (1) fire
- (2) plowing up the field to plant corn
- (3) overhunting of rabbits
- (4) human introduction of an invasive insect

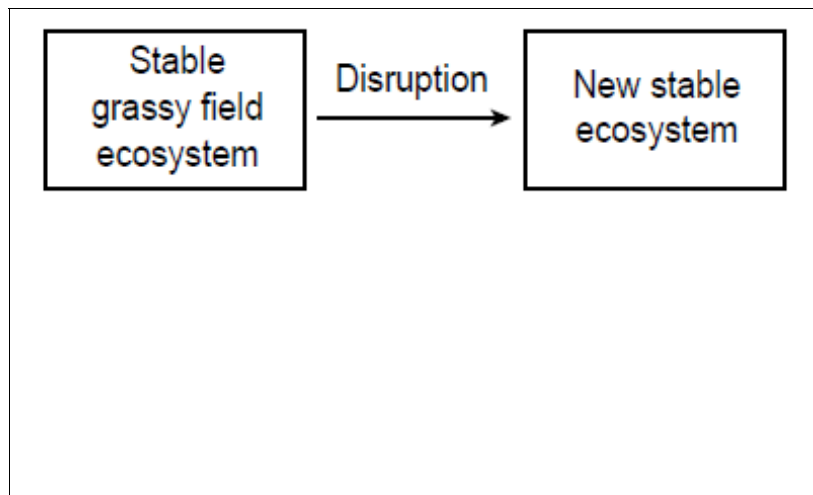
Data Base File Number: 1267

Regents Date June2018-53.bmp

June2018

53 6/13/2018 S4K3

Answer 1



## secondhand smoke

568. The data table shows an effect of secondhand smoke on the birth weight of babies born to husbands and wives living together during pregnancy. Based on these data, a reasonable conclusion that can be drawn about secondhand smoke during pregnancy is that secondhand smoke

- (1) is unable to pass from the mother to the fetus
- (2) slows the growth of the fetus
- (3) causes mutations in cells of the ovaries
- (4) blocks the receptors on antibody cells

Data Base File Number: 267

Regents Date June2010-40.bmp

June2010

40 6/16/2010 S4K4

Answer 2

	Wife: Nonsmoker Husband: Nonsmoker	Wife: Nonsmoker Husband: Smoker
Number of Couples	837	529
Average Weight of Baby at Birth	3.2 kg	2.9 kg

## selective breeding

569. Which statement provides accurate information about the technique illustrated in the diagram shown?

- (1) This technique results in offspring that are genetically identical to the parents.
- (2) New varieties of organisms can be developed by this technique known as selective breeding.
- (3) This technique is used by farmers to eliminate mutations in future members of the species.
- (4) Since the development of cloning, this technique is no longer used in agriculture.

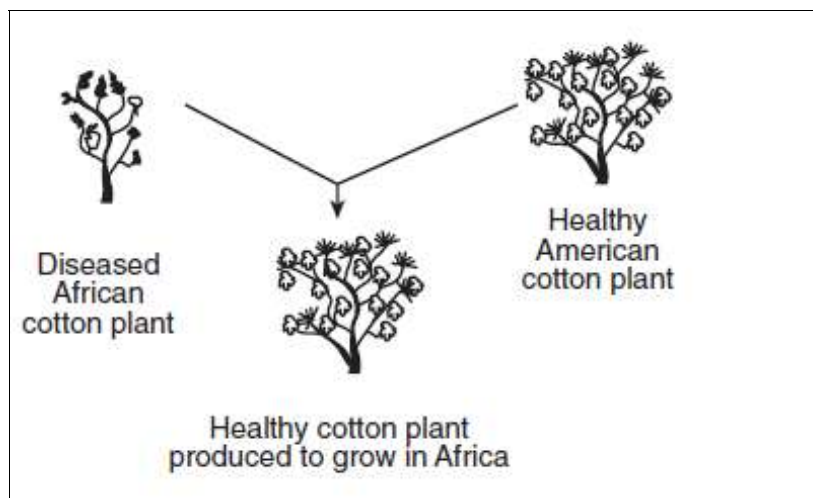
Data Base File Number: 456

Regents Date Jan2006-9.bmp

Jan2006

9 1/27/2006 S4K2

Answer 2



## selective breeding

570. Modern dogs are direct descendants of the gray wolf. They first appeared about 130,000 years ago. Today, there are about 150 different breeds of domestic dog, a few of which are shown in the diagram. The great variety of modern dogs can best be explained by

- (1) selective breeding of dogs over many years
- (2) the cloning of domestic dogs
- (3) genetic alterations in gray wolves alive today
- (4) natural selection favoring wolves over dogs

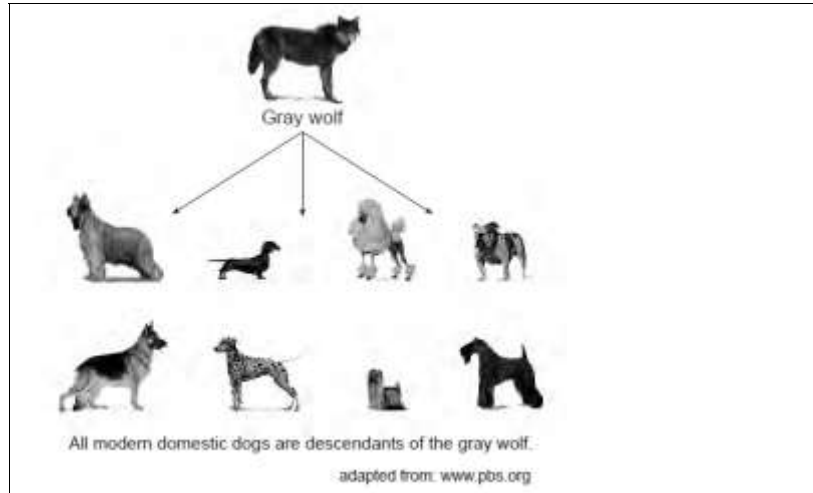
Data Base File Number: 939

Regents Date June2014-29.bmp

June2014

29 6/17/2014 S4K2

Answer 1





## selective breeding

571. The photographs show different varieties of cattle and the characteristics of each variety. Which statement best explains the development of variety C?

- (1) Nuclei from body cells taken from variety A were inserted into egg cells lacking nuclei taken from variety B.
- (2) Selective breeding was used to combine desirable traits from both varieties A and B.
- (3) The need to adapt to changes in the environment led to the selection of advantageous characteristics in the offspring of variety B.
- (4) Mutations that occurred in the body cells of variety A were passed on to the offspring generation after generation.

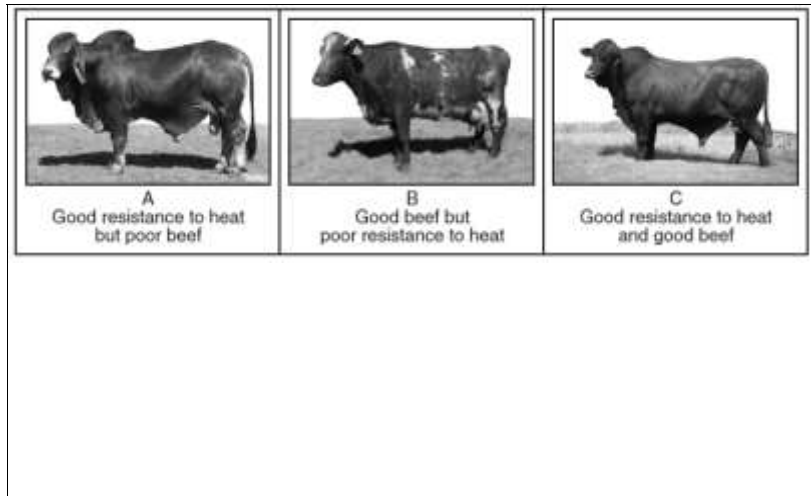
Data Base File Number: 1022

Regents Date June2015-34.bmp

June2015

34 6/16/2015 S4K2

Answer 2



## selective breeding

572. The diagram shown indicates a few of the many varieties of domestic dogs thought to have originated from wolves that were domesticated thousands of years ago. The many varieties of domesticated dogs were most likely produced as a result of

- (1) mutating the body cells of the dogs
- (2) selective breeding over many generations
- (3) genetic engineering with specific enzymes
- (4) cloning dogs with desirable traits

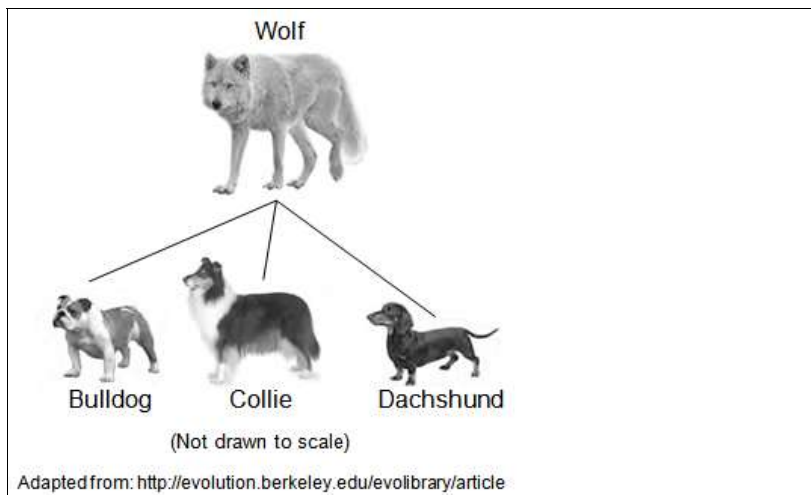
Data Base File Number: 1186

Regents Date June2017-42.bmp

June2017

42 6/14/2017 S4K2

Answer 2



## selective breeding

1573. Base your answer to this question on the information given and on your knowledge of biology.

### HOW ONE BULL COST THE DAIRY INDUSTRY \$420 MILLION -----

It all started with a bull named Chief. He had 16,000 daughters, 500,000 granddaughters, and 2 million great-granddaughters. Today, 14% of the genes present in Holstein dairy cows came from Chief.

Chief was popular because his daughters were fantastic milk producers. The problem is, he also had a single copy of a deadly mutation. The mutation spread undetected through the Holstein cow population and was responsible for the spontaneous death of 500,000 fetal calves. The loss of these calves cost the dairy industry \$420 million.

Over the past 35 years, using Chief's sperm, instead of sperm from an average bull, resulted in \$30 billion in increased milk production. Due to Chief's genetic contribution, the average dairy cow today produces four times more milk than a dairy cow in the 1960s.

Chief embodies the trade-offs associated with selective breeding. Why is using Chief to produce so many offspring an example of selective breeding?

- (1) Chief had valuable genetic traits resulting in high milk production.
- (2) Chief had a defective letal gene.
- (3) Chief had superior body size.
- (4) Chief was mostly white in hair color.

Data Base 1490  
File Number:

Regents Date June2022-66.bmp

June2022

66 6/15/2022 S4K2

Answer 1



Chief

Source: <https://www.progressivedairy.com>

## selective breeding

574. The arrows in the diagram indicate the development of four different varieties of vegetable plants from wild mustard. Each of these varieties was most likely produced as a result of

- (1) asexual reproduction in the wild for many years
- (2) changes in light availability
- (3) competition between plants
- (4) selective breeding over many generations

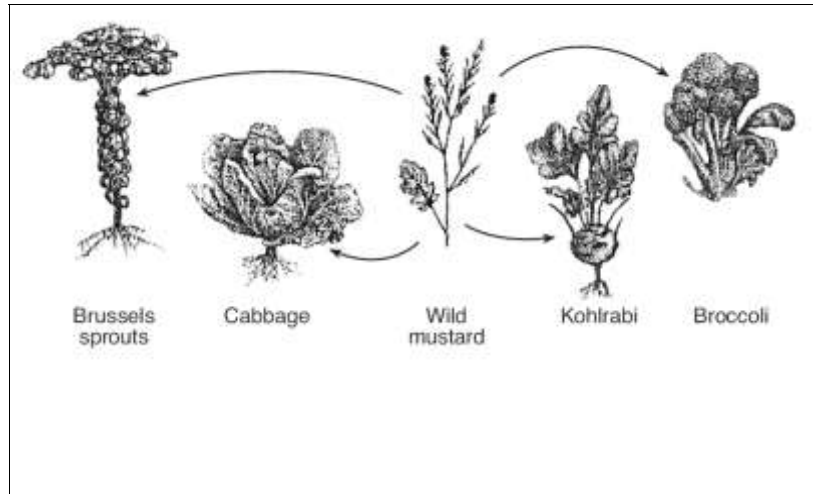
Data Base File Number: 306

Regents Date Jan2011-14.bmp

Jan2011

14 1/25/2011 S4K2

Answer 4



## sequencing

575. Part of a molecule found in cells is represented in the diagram shown. Which process is most directly affected by the arrangement of components 1 through 4?

- (1) diffusion through cell membranes
- (2) fertilization of a sex cell
- (3) sequencing of amino acids in cells
- (4) increasing the number of cells in an organism

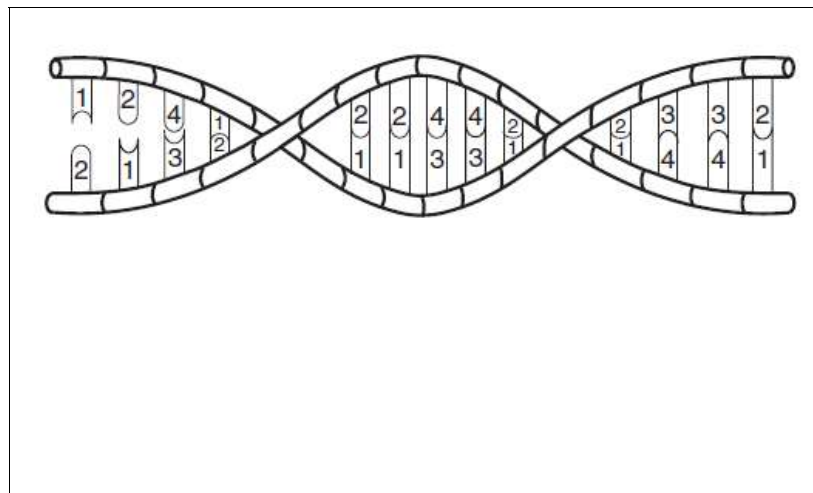
Data Base File Number: 315

Regents Date Jan2011-35.bmp

Jan2011

35 1/25/2011 S4K5

Answer 3



sex organs

576. Some human body structures are represented in the diagrams shown. In which structures would the occurrence of mutations have the greatest effect on human evolution?

- (1) 1 and 3
- (2) 2 and 5
- (3) 3 and 6
- (4) 4 and 6

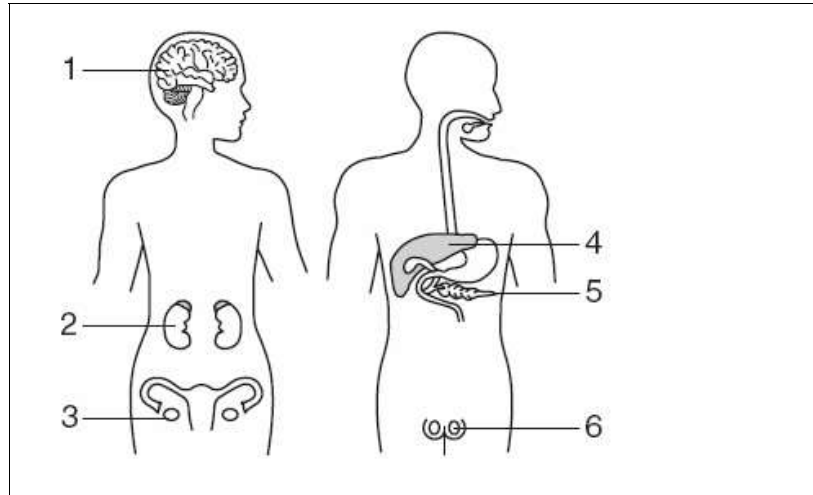
Data Base File Number: 23

Regents Date June07-12

June2007

12 6/20/2007 S4K3

Answer 3



sexual reproduction

577. The events shown occur during sexual reproduction. Which sequence represents the correct order of these events during sexual reproduction?

- (1) A → C → B → D
- (2) B → C → A → D
- (3) C → B → A → D
- (4) B → A → C → D

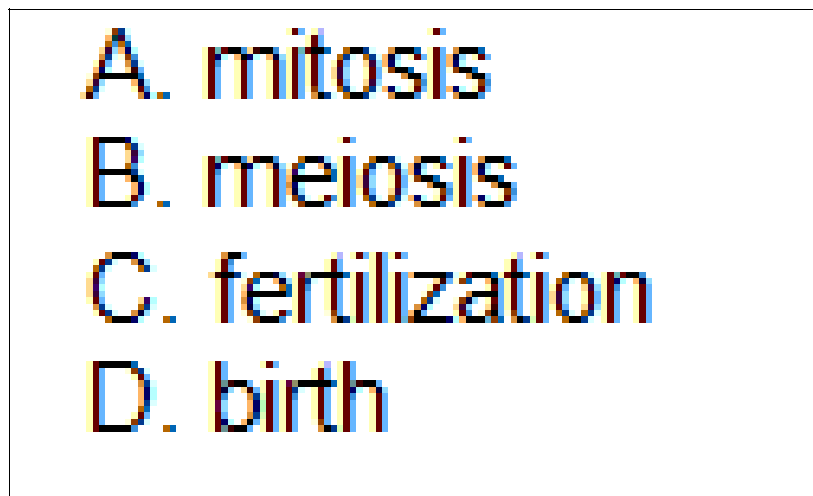
Data Base File Number: 1207

Regents Date Aug2017-32.bmp

Aug2017

32 8/17/2017 S4K4

Answer 2



## sexual reproduction

1578. The diagram shown represents cells that transport chromosomes. These cells are specialized for

- (1) oxygen transport
- (2) transmitting chemical signals over long distances
- (3) sexual reproduction
- (4) injecting antibodies into harmful bacteria

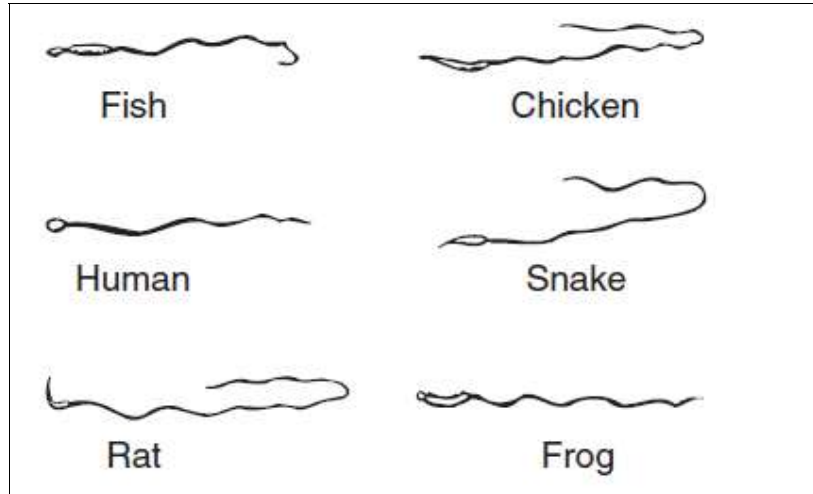
Data Base File Number: 760

Regents Date Aug2003-23.bmp

Aug2003

23 8/13/2003 S4K4

Answer 3



## sexual reproduction

1579. Sexual reproduction involves the processes as shown. Which sequence represents the order in which these processes occur?

- (1) A -> B -> C -> D
- (2) B -> A -> C -> D
- (3) C -> B -> D -> A
- (4) D -> B -> C -> A

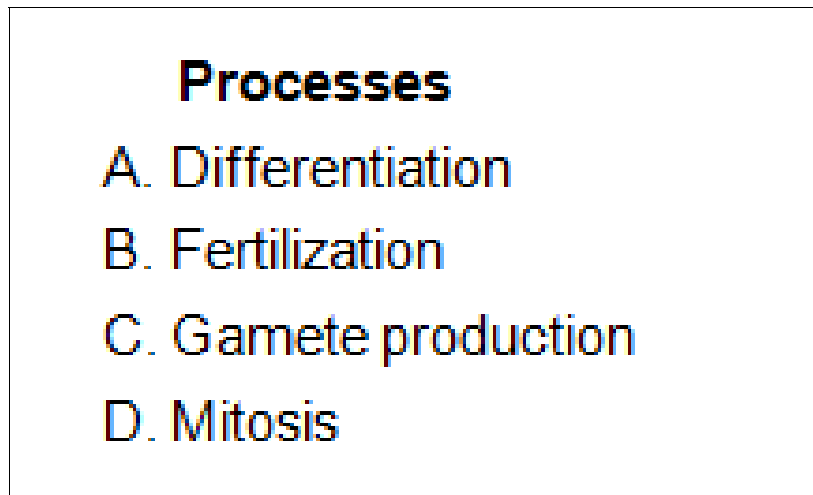
Data Base File Number: 233

Regents Date Jan2010-17.bmp

Jan2010

18 1/26/2010 S4K4

Answer 3



## simple sugar

580. Base your answer to this question on the diagram given and on your knowledge of biology. The diagram represents a portion of a starch molecule. The building blocks for this molecule are

- (1) amino acids
- (2) simple sugars
- (3) fats
- (4) molecular bases

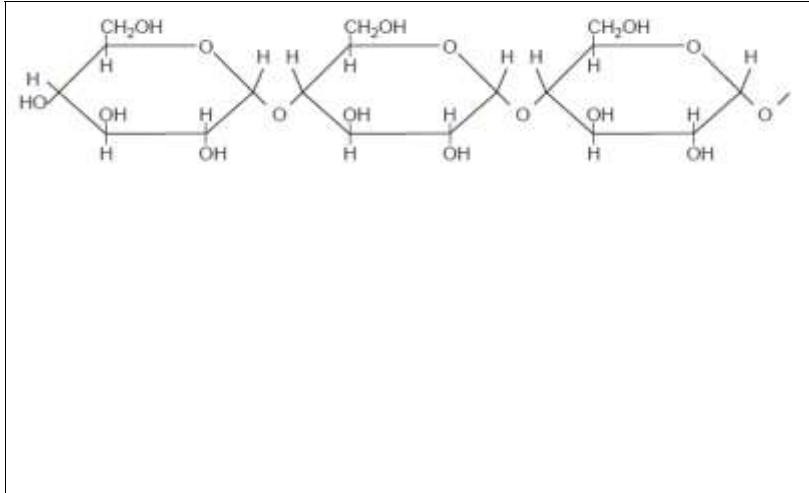
Data Base File Number: 1105

Regents Date June2016-37.bmp

June2016

37 6/15/2016 S4K5

Answer 2



## species relationships

581. Base your answer to this question on the information given and on your knowledge of biology. A valuable medicine is obtained from a certain rare species of plant. Scientists are anxious to find another more abundant species of plant that is closely related to the rare one, and also produces the medicine. Two newly discovered plant species, A and B, were studied and compared to the rare one. The results of the study are shown in the table. Which newly discovered species is more closely related to the rare species?

- (1) Species A
- (2) Species B
- (3) Species A and B
- (4) There is NO relationship between the RARE SPECIES and Species A or Species B.

Data Base File Number: 329

Regents Date Jan2011-72.bmp

Jan2011

72 1/25/2011 LABS

Answer 2

Species of Plant	Characteristics of Flowers	Shape of Leaves	Species Number of Chromosomes	Enzyme A Present	Enzyme B Present	Enzyme C Present
rare species	pink 5 petals	round	36	yes	yes	yes
species A	pink 5 petals	oval	34	no	no	yes
species B	white 5 petals	round	36	yes	yes	yes

## species relationships

582. The table given shows the results of a study on the lifespan of 115 individual song sparrows. The two most likely factors contributing to the decline in the number of these 115 sparrows during year 1 were

- (1) favorable climate and a rapid reproduction rate
- (2) lack of predators and an expanding habitat
- (3) lack of mating and loss of nesting sites
- (4) disease and predation

Data Base File Number: 1311

Regents Date Jan2019-37.bmp

Jan2019

37 1/22/2019 S4K6

Answer 4

Year	Number at Start of Year	Number at End of Year
1	115	25
2	25	19
3	19	12
4	12	2
5	2	1
6	1	0

## species relationships

583. Male birds of two different species living on the same island have developed different mating behaviors, as shown in the table. Which statement is best supported by information in the table?

- (1) It is likely that male birds in species A will mate with female birds in species B.
- (2) It is likely that birds from species A will only mate with birds from species A.
- (3) Male birds from one species will change their mating behavior if the only female birds available are from the other species.
- (4) Mating behaviors are important only when these two species live together in the same area.

Data Base File Number: 1403

Regents Date Jan2020-38.bmp

Jan2020

38 1/21/2020 S4K3

Answer 2

Species	Mating Behavior of Male Birds
A	rapid chirps while spreading their tail feathers
B	movement in circles while spreading their tail feathers

## species relationships

584. Base your answer to this question on the data table shown and on your knowledge of biology. The data table shows the estimated number of species extinctions from 1960 to 2010. What is one possible cause for the increase in the number of species extinctions from 1960-2010.

- (1) not enough mutations
- (2) not enough food
- (3) not enough oxygen
- (4) not enough carbon dioxide

Data Base File Number: 1293

Regents Date Aug2018-44.bmp

Aug2018

46 8/17/2018 S1K3

Answer 2

Year	Estimated Number of Species Extinctions
1960	5000
1970	10,000
1980	15,000
1990	25,000
2000	35,000
2010	50,000



## species relationships

585. Sailors in the past may have heard the greeting from a passing ship, "Avast ye scurvy dogs". This greeting would be a reference to a disease known as scurvy, which is due to inadequate intake of vitamin C. Which row in the chart shown correctly identifies the cause of this disease and a possible treatment for it?

(1) Row 1

(3) Row 3

(2) Row 2

(4) Row 4

Data Base File Number: 1402

Regents Date Jan2020-38.bmp

Jan2020

38 1/21/2020 S4K5

Answer 3

Row	Cause	Treatment
(1)	inherited trait	gene manipulation
(2)	organ malfunction	antibiotic injections
(3)	poor nutrition	fresh fruit
(4)	virus	vaccination

**species relationships**

586. Base your answer to this question on the information and diagram shown and on your knowledge of biology. When fish of certain species are injured, a chemical substance stored in skin cells of the fish is released into the water. This chemical causes an alarm response among other fish of the same species in the area. Nearby fish of this species become more alert and group together near the bottom. The chemical released from the injured fish MAY NOT cause an alarm response in other fish species because

- (1) Other species have antigens on their surface.
- (2) Other species have antibodies on their surface.
- (3) The alarm chemicals are specific to the species.
- (4) The alarm chemicals are destroyed by the species.

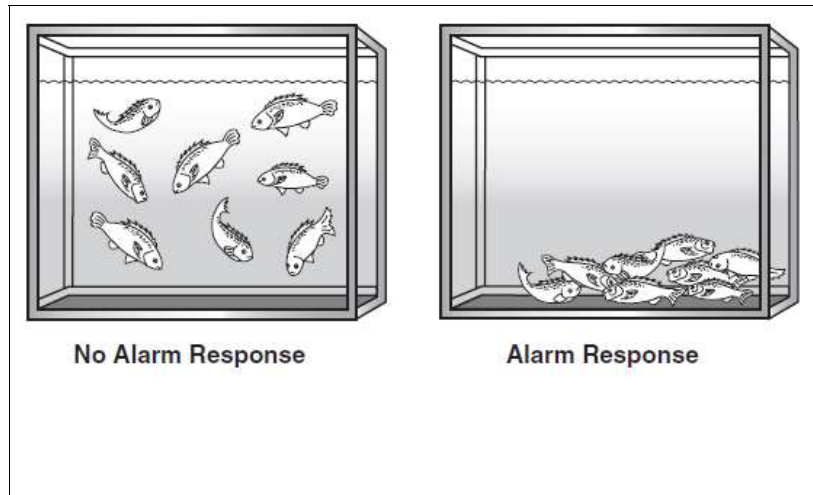
Data Base File Number: 1141

Regents Date August2016-48.b

Aug2016

48 8/18/2016 S4K1

Answer 3



**species relationships**

587. Which diagram below indicates that species D is more closely related to C than it is to either 1A or B?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

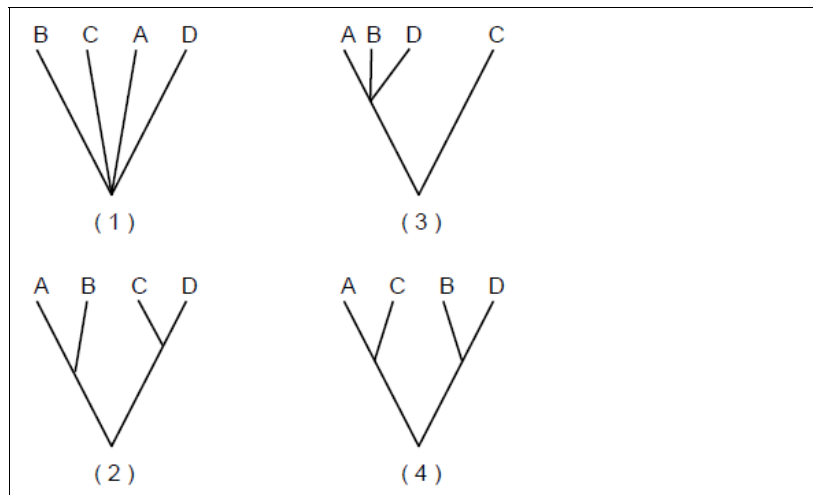
Data Base File Number: 1337

Regents Date June2019-25.bmp

June2019

25 6/18/2019 S4K3

Answer 2



## species relationships

588. The diagrams shown represent seeds taken from a carrot plant and seeds taken from plant species 1, 2, and 3. Which species would be expected to be most similar to the carrot?

- (1) Species 1
- (2) Species 2
- (3) Species 3
- (4) none of the species is similar to the carrot

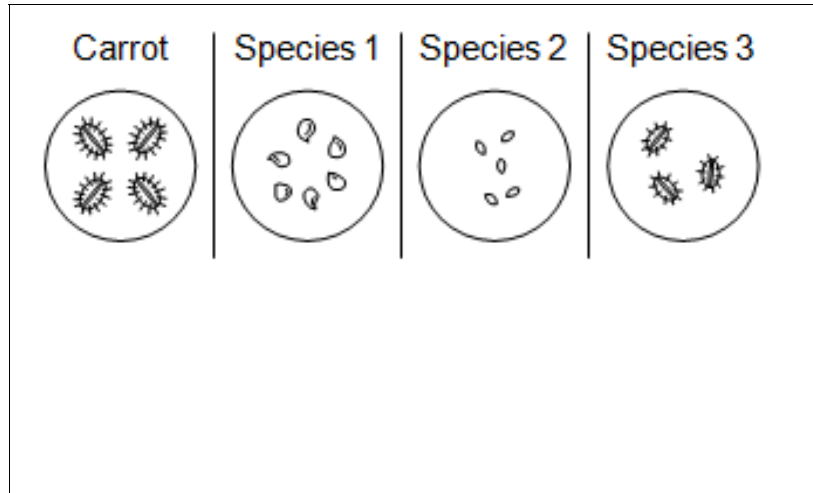
Data Base File Number: 957

Regents Date June2014-83.bmp

June2014

83 6/17/2014 LAB2

Answer 3



## sperm

589. A reproductive system is represented in the diagram below. If an injury occurred to the structure labeled A, the most likely result would be a problem with

- (1) delivery of sperm
- (2) production of gametes
- (3) production of hormones
- (4) excretion of urine

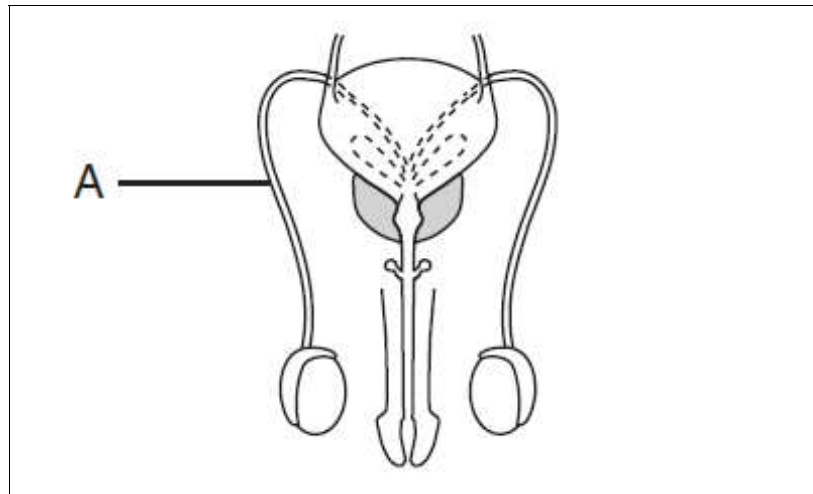
Data Base File Number: 280

Regents Date Aug2010-20.bmp

Aug2010

20 8/18/2010 S4K4

Answer 1



sperm

590. Which statement about the gametes represented in the diagram below is correct?

- (1) They are produced by females.
- (2) They are fertilized in an ovary.
- (3) They transport genetic material.
- (4) They are produced by mitosis

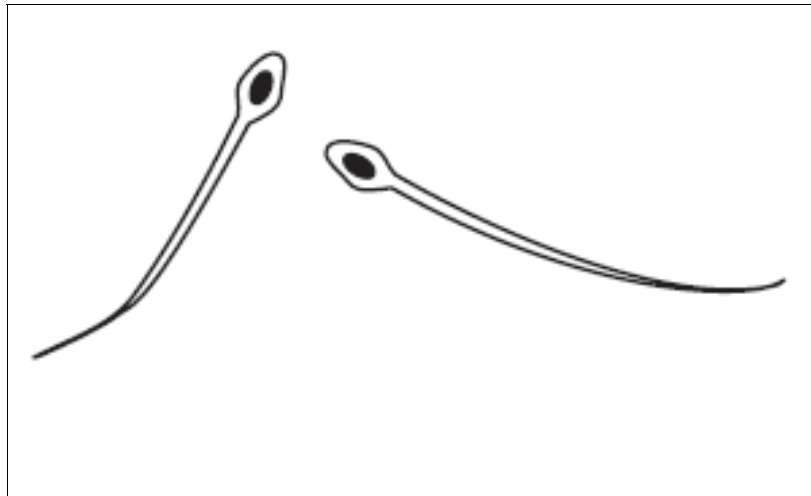
Data Base File Number: 458

Regents Date Jan2006-19.bmp

Jan2006

19 1/27/2006 S4K2

Answer 3



sperm

591. A sperm cell from an organism is represented in the diagram as shown. Which statement regarding this sperm cell is NOT correct?

- (1) The acrosome contains half the normal number of chromosomes.
- (2) Energy to move the flagellum originates in the middle piece.
- (3) The head may contain a mutation.
- (4) This cell can unite with another cell resulting in the production of a new organism.

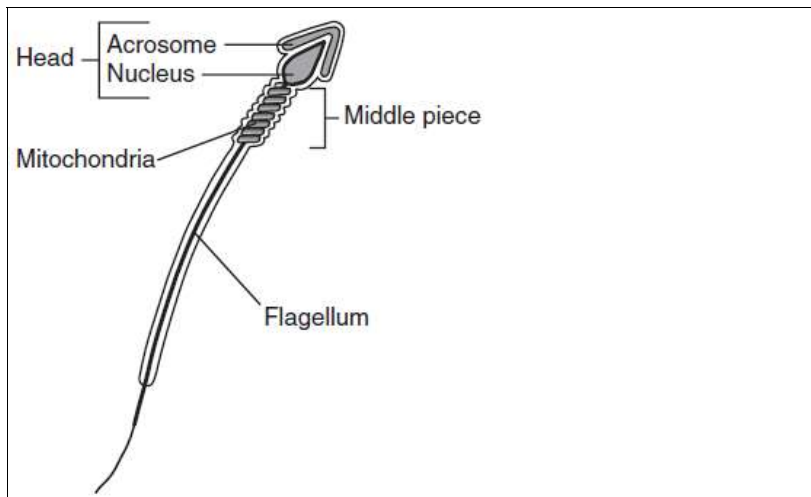
Data Base File Number: 567

Regents Date June2005-35.bmp

June2005

35 6/22/2005 S1K1

Answer 1



## sperm duct

592. The letters in the diagram indicate structures present in a human male. What change would occur immediately if both structures labeled B were damaged or blocked?

- (1) Structure A would decrease in size.
- (2) The blood supply to structure E would decrease.
- (3) Gametes would no longer be transported to structure C.
- (4) Structure D would be able to deliver more gametes.

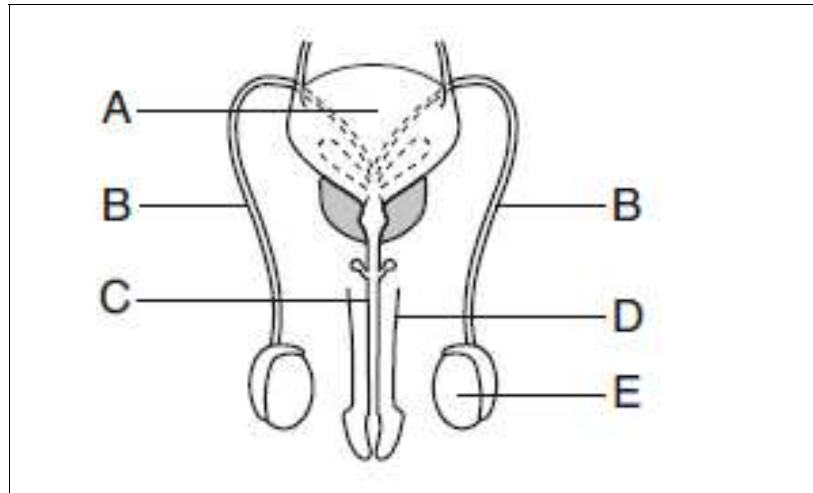
Data Base File Number: 413

Regents Date June2012-34.bmp

June2012

35 6/19/2012 S4K4

Answer 3



## stain

593. A student observes some cells with a compound light microscope as shown in view A. What did the student most likely do to obtain view B?

- (1) applied a biological stain to the slide
- (2) applied distilled water to the slide
- (3) used electrophoresis
- (4) used a higher magnification

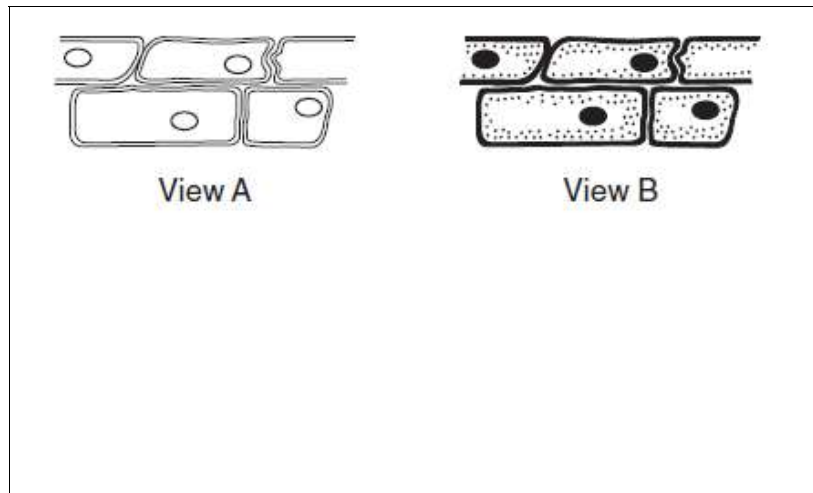
Data Base File Number: 248

Regents Date Jan2010-71.bmp

Jan2010

71 1/26/2010 LABS

Answer 1



## starch

594. Base your answer to this question on the diagram shown, which represents a metabolic process, and on your knowledge of biology. This process best represents

- (1) the bonding of amino acids to form a starch molecule
- (2) the digestion of amino acids to form a starch molecule
- (3) the bonding of simple sugars to form a starch molecule
- (4) the digestion of simple sugars to form a starch molecule

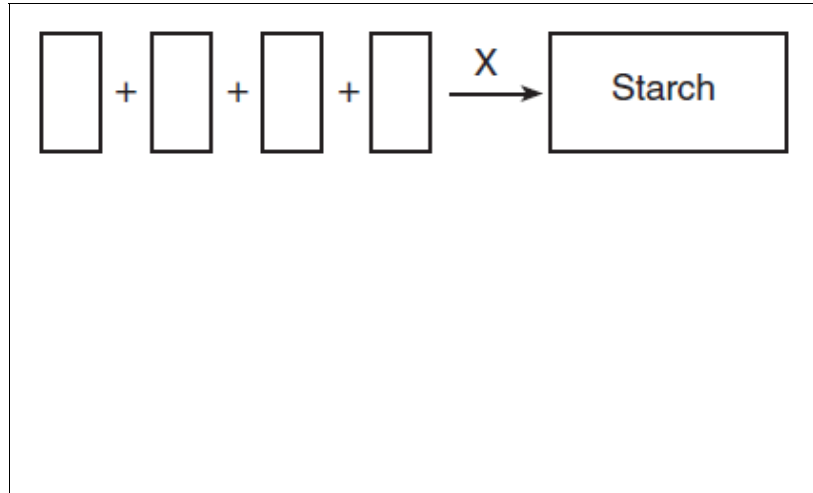
Data Base File Number: 1050

Regents Date August2015-35.b

Aug2015

35 8/12/2015 S4K1

Answer 3



## starch test / lab

595. The student placed a thin slice of potato in a drop of water on a glass slide. She added a coverslip and a drop of indicator. Using a compound light microscope, she examined the slide of potato and made the drawing as shown. The blue-black-stained structures labeled in her drawing are most likely

- (1) chloroplasts
- (2) starch grains
- (3) ribosomes
- (4) sugar molecules

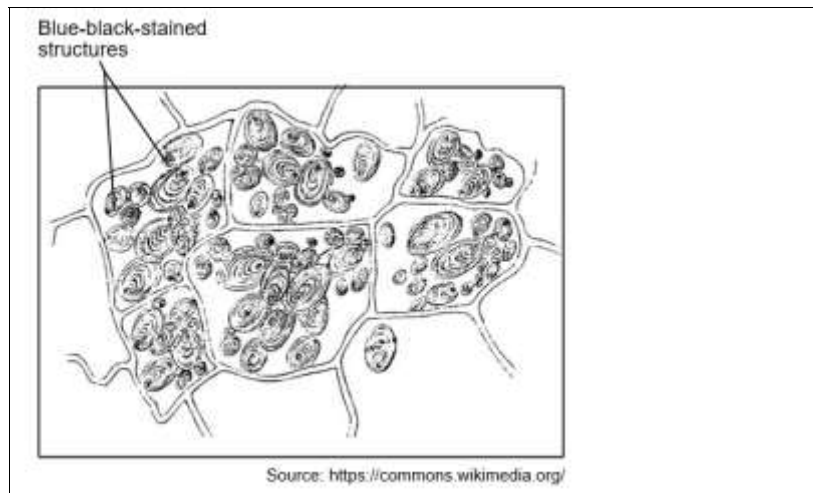
Data Base File Number: 1532

Regents Date Aug2022-82.bmp

Aug2022

82 8/17/2022 LAB5

Answer 2



starch test / lab

596. A laboratory setup for a demonstration is represented in the diagram shown. What indicator could be used in the beaker of water to indicate if starch moves through the membrane, from the test tube, into the beaker of water?

- (1) Brom Thymol blue solution
- (2) Benedict's solution
- (3) iodine solution
- (4) Fehling's solution

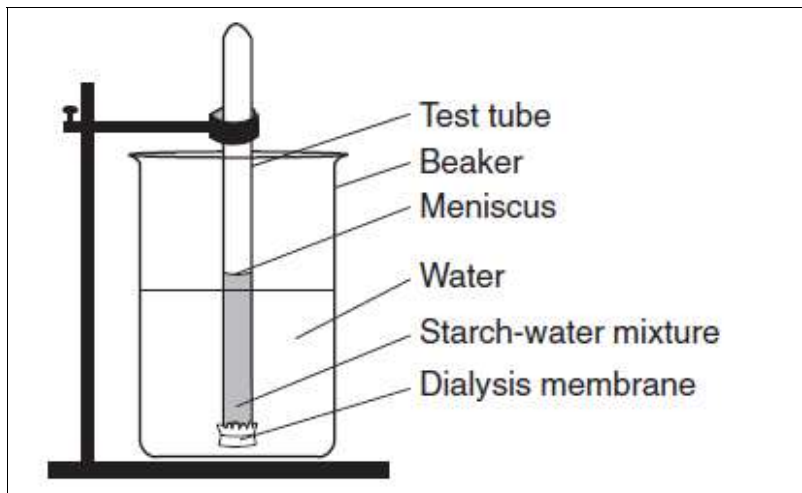
Data Base File Number: 503

Regents Date June2006-74.bmp

June2006

74 6/21/2006 LAB5

Answer 3



starch test / lab

597. Glucose indicator was added to a beaker of an unknown liquid. Starch indicator was added to a different beaker containing the same unknown liquid. The color of the indicator solutions before they were added to the beakers and the color of the contents of the beakers after adding the indicator solution are recorded in the chart shown. Which carbohydrate is present in the unknown liquid?

- (1) cellulose
- (2) starch
- (3) sucrose
- (4) glucose

Data Base File Number: 170

Regents Date Jan09-76.bmp

Jan2009

76 1/27/2009 LABS

Answer 2

Beaker	Solution	Color of Indicator Solution Before Adding to Beaker	Color of Contents of Beaker After Adding Indicator Solution
1	unknown liquid + glucose indicator	blue	blue (after heating)
2	unknown liquid + starch indicator	amber	blue black

## starch test / lab

598. A student filled two Petri dishes with a clear gel made with corn starch. He was given two unknown solutions, (A and B), and was asked to determine which solution contained a chemical that digests starch. Using a clean cotton swab, he dipped it into solution A and wrote a "?" invisibly onto the gel in one of the Petri dishes. He repeated the same procedure on the second Petri dish with a clean cotton swab he dipped in solution B. Twenty minutes later, he added starch-indicator solution to the surface of both Petri dishes. The surface of the Petri dish with solution A added turned completely blue. Most of the surface of the Petri dish to which solution B was added was blue, except the "?" was clear. The results are illustrated as shown in the diagram. An observation that supports the student's conclusion that solution B contained a chemical that digests starch is that the

- (1) damp cotton swab absorbed some of the starch where it touched the gel
- (2) starch indicator changed the color of the gel to blue
- (3) area swabbed with solution B remained clear
- (4) chemical in the starch indicator reacted with the chemical in B

Data Base 1492  
File Number:

Regents Date June2022-75.bmp

June2022

75 6/15/2022 LAB5

Answer 3





## statistical analysis

599. Honeybees have a very cooperative way of living. Scout bees find food, return to the hive, and do the "waggle dance" to communicate the location of the food source to other bees in the hive. The waggle, represented by the wavy line in the diagram below, indicates the direction of the food source, while the speed of the dance indicates the distance to the food. Different species of honeybees use the same basic dance pattern in slightly different ways as shown in the table. What is the relationship between the distance to the food source and the number of waggle runs in 15 seconds?

- (1) Fewer waggles means that the food source is farther away.
- (2) Fewer waggles means that the food source is closer.
- (3) More waggles means that the food source is farther away.
- (4) More waggles means that the food source is closer.

Data Base 138  
File Number:

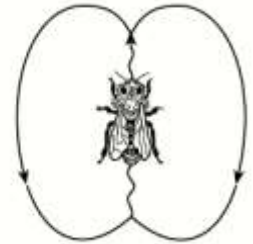
Regents Date Aug08-46.bmp

Aug2008

47 8/13/2008 S1K3

Answer 1

Number of Waggle Runs in 15 Seconds		Distance to Food (feet)
Giant Honeybee	Indian Honeybee	
10.6	10.5	50
9.6	8.3	200
6.7	4.4	1000
4.8	2.8	2000



stomate

600. The diagram shown represents a cross section of a leaf. how does the structure labeled X primarily function to maintain homeostasis in a plant?

- (1) it controls nitrogen loss
- (2) it controls respiration
- (3) it controls water loss
- (4) it controls starch digestion

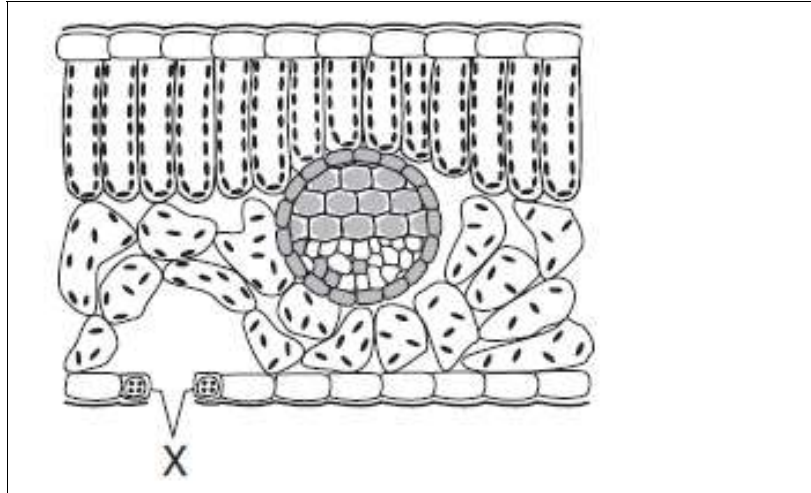
Data Base File Number: 770

Regents Date Aug2003-46.bmp

Aug2003

46 8/13/2003 S4K5

Answer 3



stomate

601. The diagram shown represents a cross section of a leaf of a green plant, showing an opening (stomate) in the lower surface. A stomate in the lower surface of the leaf has a function most similar to the function of which cell structure?

- (1) cell membrane
- (2) vacuole
- (3) ribosome
- (4) nucleus

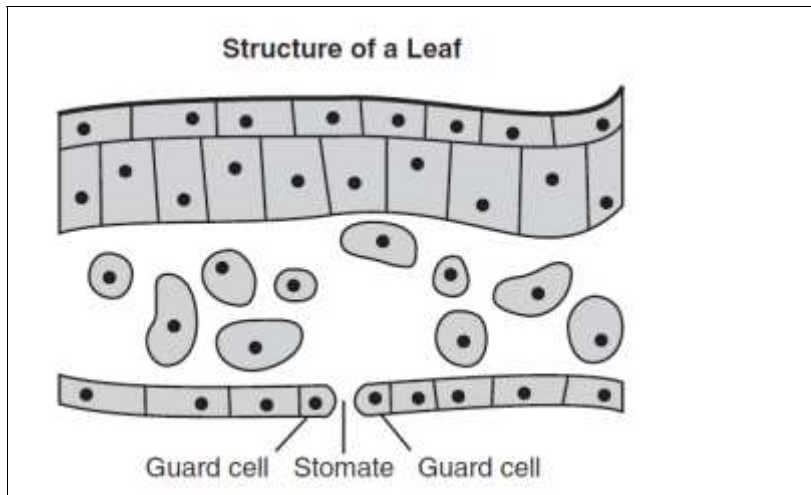
Data Base File Number: 303

Regents Date Jan2011-6.bmp

Jan2011

6 1/25/2011 S4K2

Answer 1



stomate

602. The diagram shown represents a cross section of part of a leaf. Which life functions are directly regulated through feedback mechanisms associated with the actions of the structures labeled X?

- (1) excretion and immunity
- (2) digestion and coordination
- (3) circulation and reproduction
- (4) respiration and photosynthesis

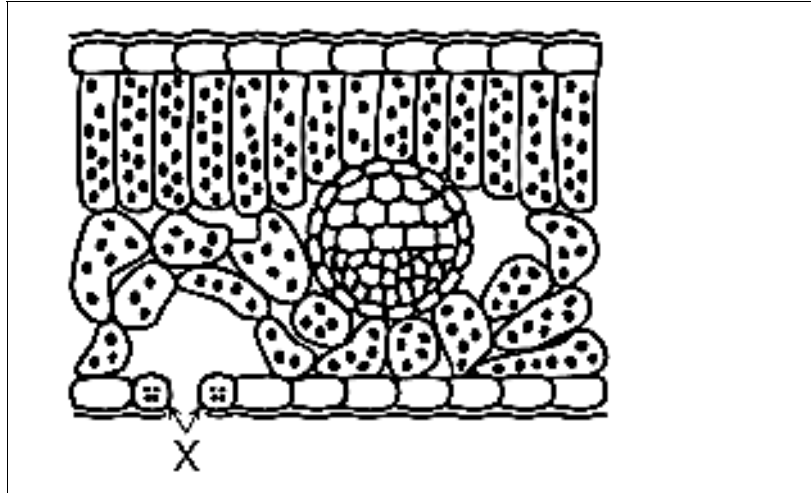
Data Base File Number: 9

Regents Date Aug07-22.bmp

Aug2007

22 8/16/2007 S4K5

Answer 4



stomate

603. The diagram shows specialized plant cells that control openings called stomates. The proper function of these cells is vital to the survival of the plant because they regulate the

- (1) rate of glucose use by root cells
- (2) absorption of sunlight by leaf cells
- (3) products of photosynthesis in the stem
- (4) exchange of gases in leaves

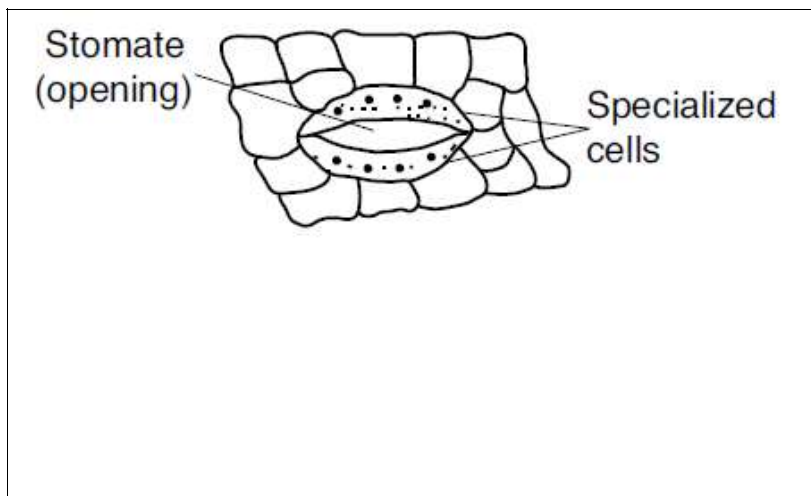
Data Base File Number: 1425

Regents Date June2021-29.bmp

June2021

29 6/22/2021 S4K5

Answer 4



## stomate

604. The photograph below shows a microscopic view of the lower surface of a leaf. What is the main function of the cells indicated by the black pointer?

- (1) regulate the rate of gas exchange
- (2) store food for winter dormancy
- (3) undergo mitotic cell division
- (4) give support to the veins in the leaf

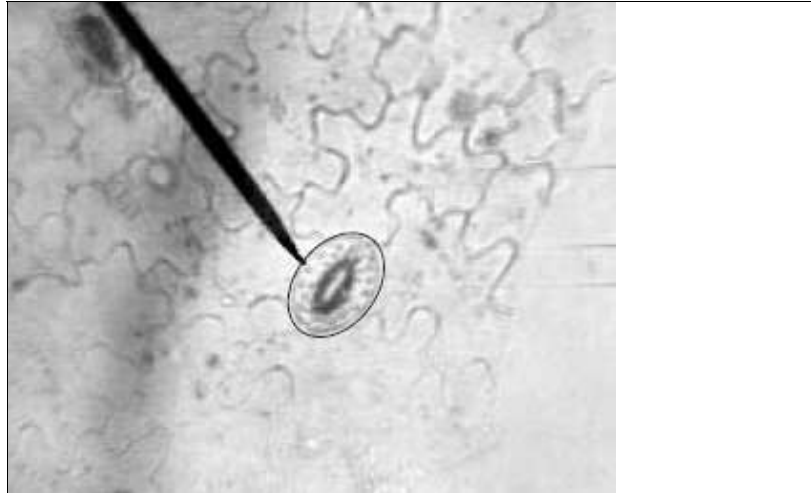
Data Base File Number: 786

Regents Date Aug2002-39.bmp

Aug2002

39 8/13/2002 S4K5

Answer 1



## stomate

605. The diagram shown represents changes in the sizes of openings present in leaves as a result of the actions of cells X and Y. The actions of cells X and Y help the plant to

- (1) maintain homeostasis by controlling water loss
- (2) store excess heat during the day and remove the heat at night
- (3) absorb light energy necessary for cellular respiration
- (4) detect changes in the biotic factors present in the environment

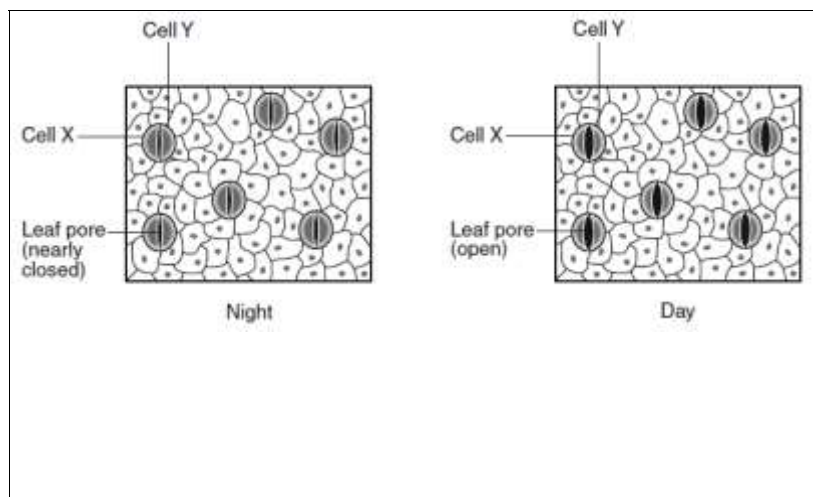
Data Base File Number: 611

Regents Date Jan2013-29.bmp

Jan2013

29 1/23/2013 S4K5

Answer 1



## stomate

606. The diagram shown represents specialized cells in the surface of the leaf of a green plant. The main function of these cells is to
- (1) change the size of the stomate to regulate water loss
  - (2) close the stomate to keep dust and dirt out of the leaf
  - (3) directly provide leaf cells with the water involved in photosynthesis
  - (4) allow newly formed glucose to be released from the leaf

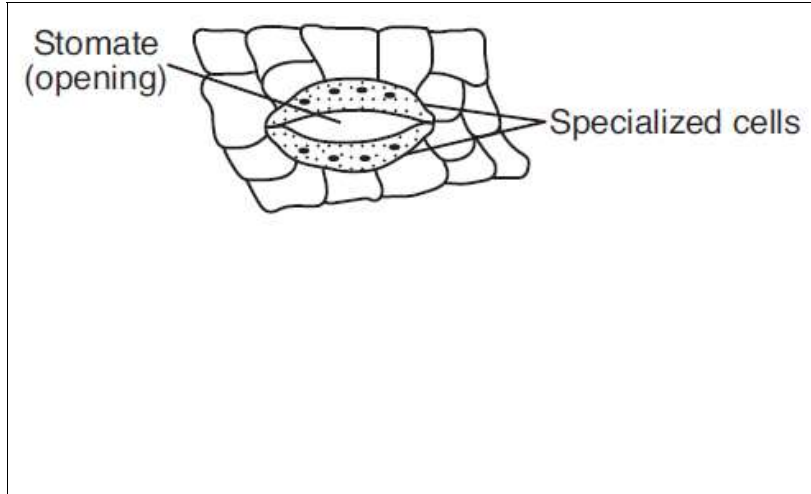
Data Base File Number: 883

Regents Date June2013-42.bmp

June2013

42 6/11/2013 S4K5

Answer 1



## stomate

607. Base your answer to this question on the information given and on your knowledge of biology. "Arabidopsis" (shown in the photo) plants respond to drought conditions by producing a stress hormone called ABA. This hormone slows down plant growth and leads to a decrease in the plant's use of water. ABA binds to specific receptors in the plant that cause the guard cells on the leaf surfaces to close the stomatal openings through which water vapor can normally pass. This reduces water loss during the drought conditions. Although it has been suggested that spraying plants with ABA during a drought could be beneficial, it is not practical. The chemical is expensive to produce and quickly loses its ability to bind to cell receptors in the plant cells. Recently, however, scientists have found a way to modify the ABA receptors in "Arabidopsis" plants so they can be activated by another chemical that is both stable and inexpensive. How is the response of the guard cells to a drought a feedback mechanism?

- (1) The guard cells close the stomates when there is less available water.
- (2) The guard cells close the stomates when there is more available water.
- (3) The guard cells close the stomates when there is less oxygen available.
- (4) The guard cells close the stomates when there is more oxygen available.

Data Base 1358  
File Number:

Regents Date June2019-69.bmp

June2019

70 6/18/2019 S4K5

Answer 1

### Scientists Reprogram Plants for Drought Tolerance



Source: Lancaster Farming 2/21/15/AAAS

## stomate

608. The diagram shown represents a change in guard cells that open and close pores in a plant. This change directly helps to

- (1) increase heterotrophic nutrition
- (2) absorb minerals
- (3) regulate water loss
- (4) reduce seed production

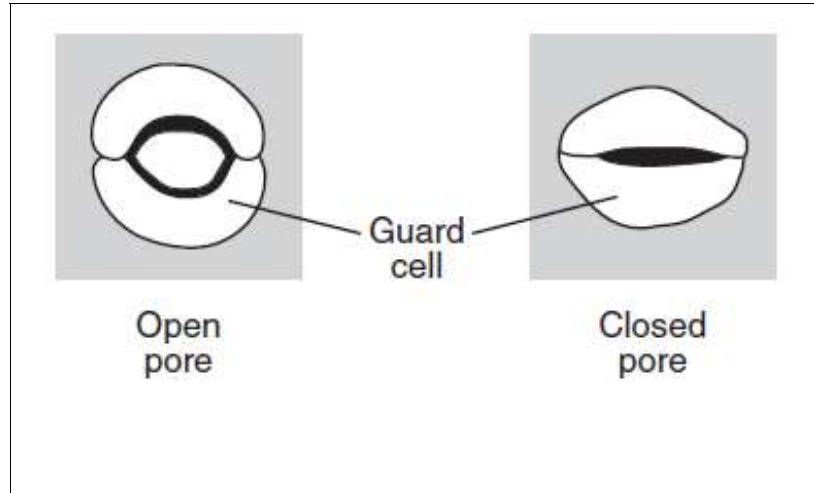
Data Base File Number: 382

Regents Date Jan2012-22.bmp

Jan2012

22 1/25/2012 S4K5

Answer 3



## structural similarities

609. The remains of three organisms are shown in the diagram. A study of these remains would indicate that these organisms have

- (1) identical food preferences
- (2) identical body sizes
- (3) structural similarities
- (4) habitat similarities

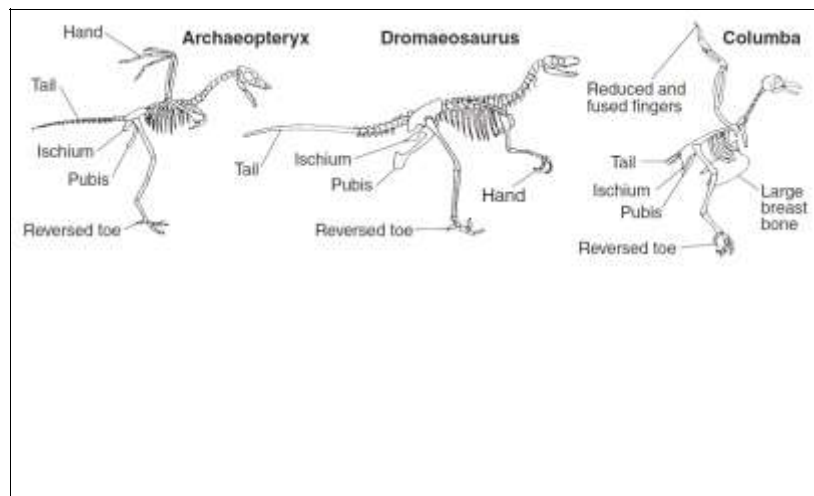
Data Base File Number: 238

Regents Date Jan2010-35.bmp

Jan2010

35 1/26/2010 S4K3

Answer 3



**structural similarities**

610. The information in the diagram was printed on a calendar of important events in the field of biology. This information is most closely associated with

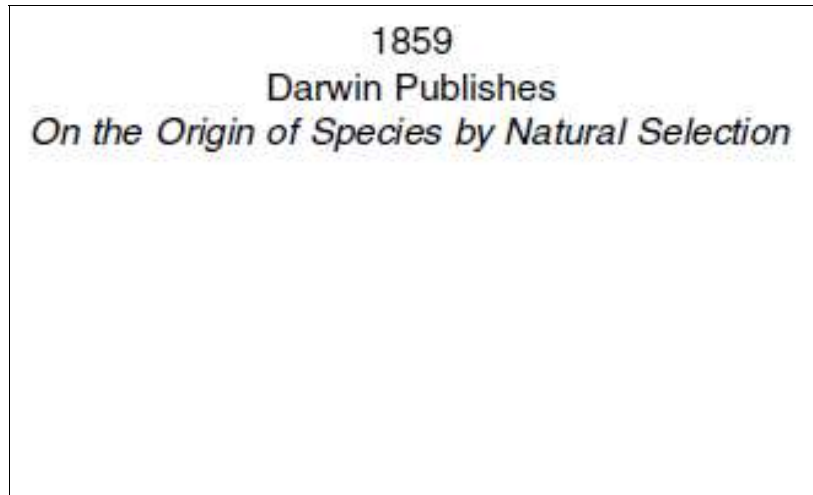
- (1) an explanation for the change in types of minerals in an area through ecological succession
- (2) the reasons for the loss of biodiversity in all habitats on Earth
- (3) an attempt to explain the structural similarities observed among diverse living organisms
- (4) the effect of carrying capacity on the size of populations

Data Base File Number: 759

Regents Date Aug2003-18.bmp

Aug2003  
18 8/13/2003 S4K3

Answer 3



**succession**

611. Base your answer to this question on the diagrams of the stages of succession as shown and on your knowledge of biology. What is the correct sequence of these stages?

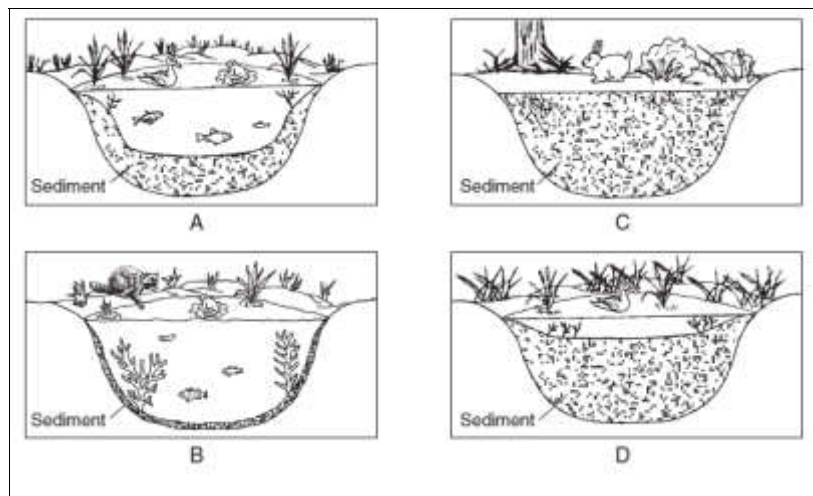
- (1) B → A → D → C
- (2) A → D → C → B
- (3) C → B → A → D
- (4) D → A → C → B

Data Base File Number: 823

Regents Date June2002-59.bmp

June2002  
59 6/19/2002 S4K6

Answer 1





**succession**

612. The diagram shown represents a biological process taking place in an area of New York State unaffected by natural disasters, Which statement correctly describes a stage in this process?

- (1) The grass stage is the most stable stage and exists for thousands of years.
- (2) The shrub stage modifies the ecosystem, making it more suitable for the pine forest
- (3) The pine forest stage has no biodiversity and the least competition.
- (4) The hardwood forest stage will be replaced by a pine forest

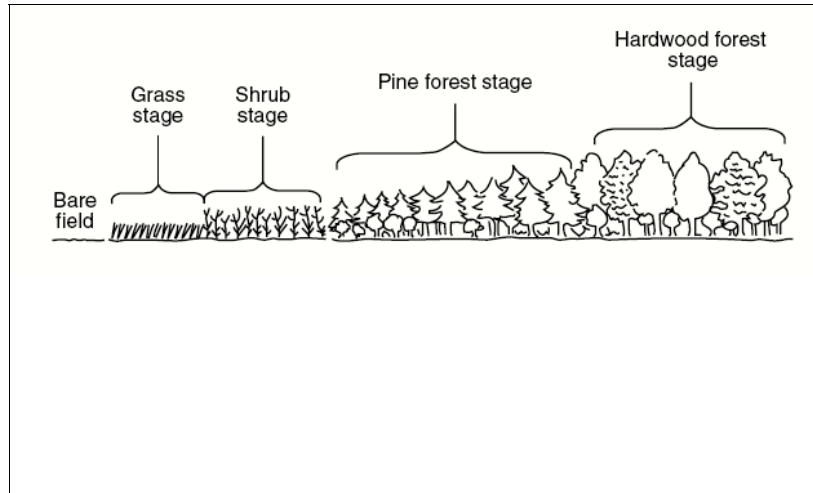
Data Base File Number: 154

Regents Date Jan09-26.bmp

Jan2009

26 1/27/2009 S4K6

Answer 2



**succession**

613. Over a long period of time, the stages represented in the diagram shown were each present in a particular ecosystem. After a forest fire, what is the most likely order in which these stages appeared?

- (1) D -> C -> A -> B
- (2) B -> D -> C -> A
- (3) A -> B -> C -> D
- (4) B -> C -> D -> A

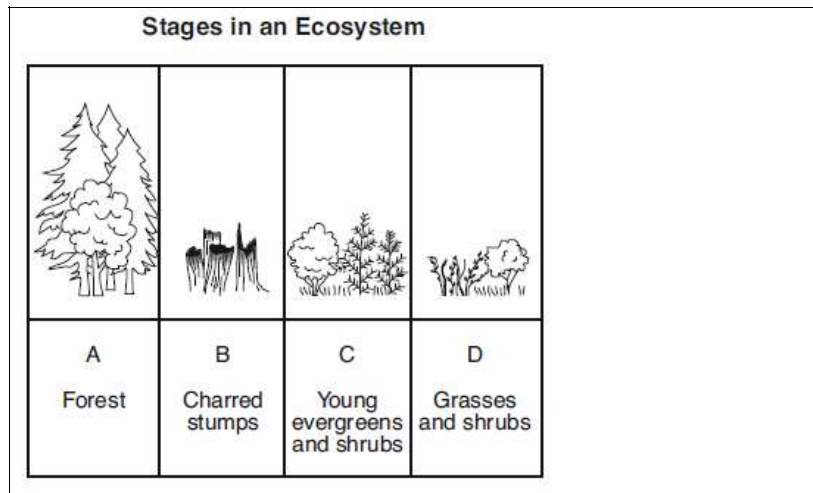
Data Base File Number: 409

Regents Date June2012-26.bmp

June2012

26 6/19/2012 S4K6

Answer 2



**succession**

614. Which of the stages in the diagram shown consists of plant species that modify the environment, eventually making it more suitable for another community?

- (1) grass stage, only
- (2) grass, shrub, and pine forest stages
- (3) shrub, pine forest, and hardwood forest stages
- (4) hardwood forest stage, only

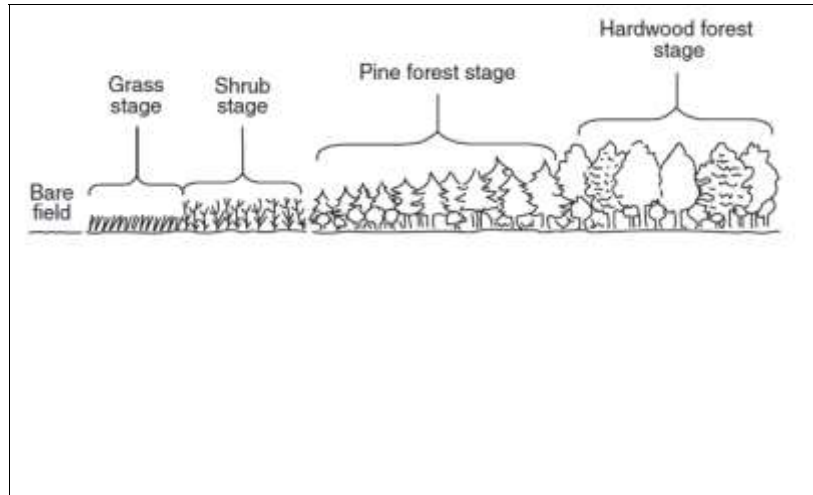
Data Base File Number: 540

Regents Date Jan2005-28.bmp

Jan2005

28 1/28/2005 S4K6

Answer 2



**succession**

615. Which statement best explains why different plant species are found at different water depths as represented in the diagram shown?

- (1) Energy flows through ecosystems in one direction, typically beginning with photosynthetic organisms.
- (2) In any particular environment, the growth and survival of organisms is affected by physical conditions.
- (3) Plants on land are higher up the food chain than plants under water.
- (4) Plant cells and some one-celled organisms contain chloroplasts.

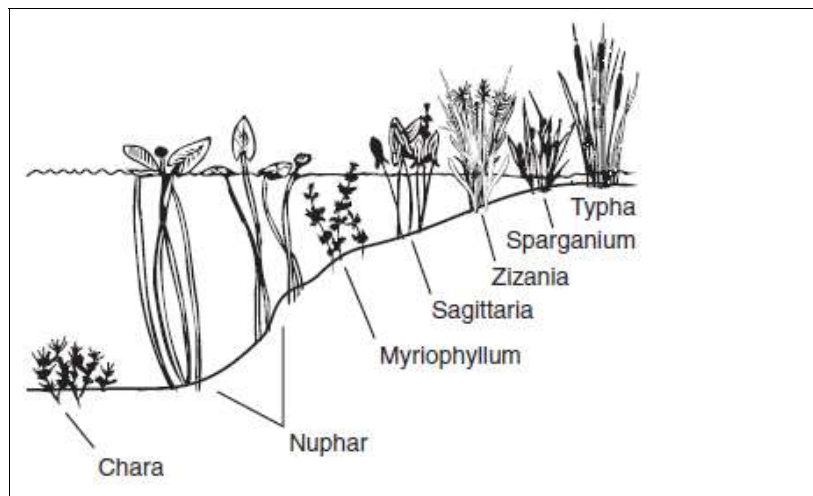
Data Base File Number: 383

Regents Date Jan2012-24.bmp

Jan2012

24 1/25/2012 S4K6

Answer 2



**succession**

616. The diagram shown represents a process that occurs in nature. This diagram can be used to illustrate the

- (1) effects of reduced competition between different types of plant life
- (2) effect of human intervention on a stable ecosystem
- (3) ecological succession from bare rock to stable ecosystem
- (4) evolution of mosses to trees over 200 years

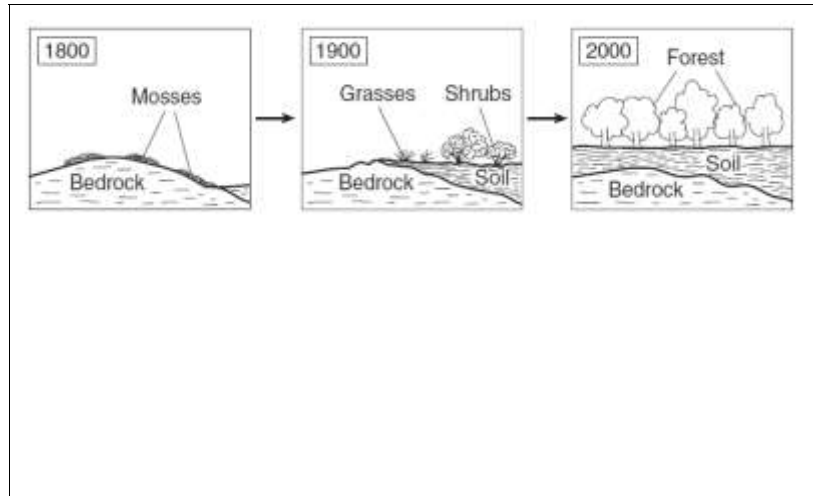
Data Base File Number: 234

Regents Date Jan2010-26.bmp

Jan2010

26 1/26/2010 S4K6

Answer 3



**succession**

617. Stage D in the diagram shown is located on land that was once a bare field. The sequence of stages leading from bare field to stage D best illustrates the process known as

- (1) replication
- (2) recycling
- (3) feedback
- (4) succession

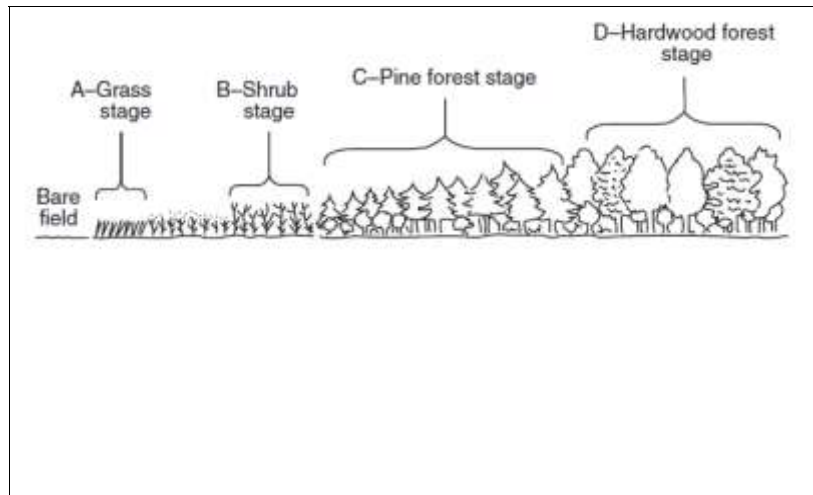
Data Base File Number: 668

Regents Date June2004-30.bmp

June2004

30 6/18/2004 S4K6

Answer 4



**succession**

1618. Which concept is represented by the graph shown?

- (1) ecological succession in a community
- (2) cycling of carbon and nitrogen in a forest
- (3) energy flow in a food chain over time
- (4) negative human impact on the environment

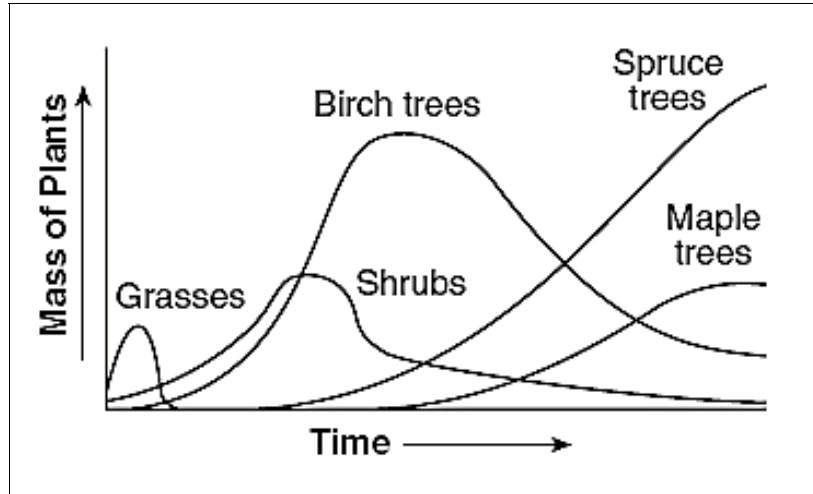
Data Base File Number: 13

Regents Date Aug07-32.bmp

Aug2007

32 8/16/2007 S4K6

Answer 1



**succession**

1619. The diagrams show some changes in an environment over time. Which phrase best describes this sequence of diagrams?

- (1) the path of energy through a food web in a natural community
- (2) the altering of an ecosystem by a natural disaster
- (3) natural communities replacing each other in an orderly sequence
- (4) similarities between an aquatic ecosystem and a terrestrial ecosystem

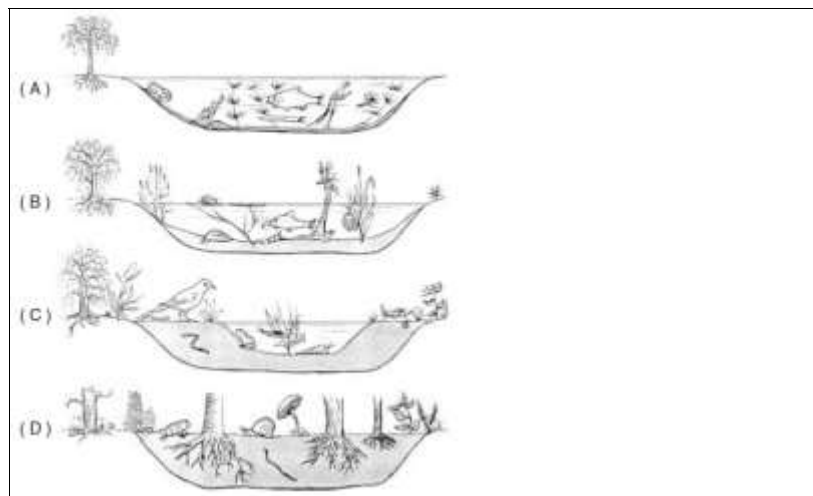
Data Base File Number: 783

Regents Date Aug2002-30.bmp

Aug2002

30 8/13/2002 S4K6

Answer 3



**succession**

620. Which statement best describes one of the stages represented in the diagram shown?

- (1) The mature forest will most likely be stable over a long period of time.
- (2) If all the weeds and grasses are destroyed, the number of carnivores will increase.
- (3) As the population of the shrubs increases, it will be held in check by the mature forest community.
- (4) The young forest community will invade and take over the mature forest community.

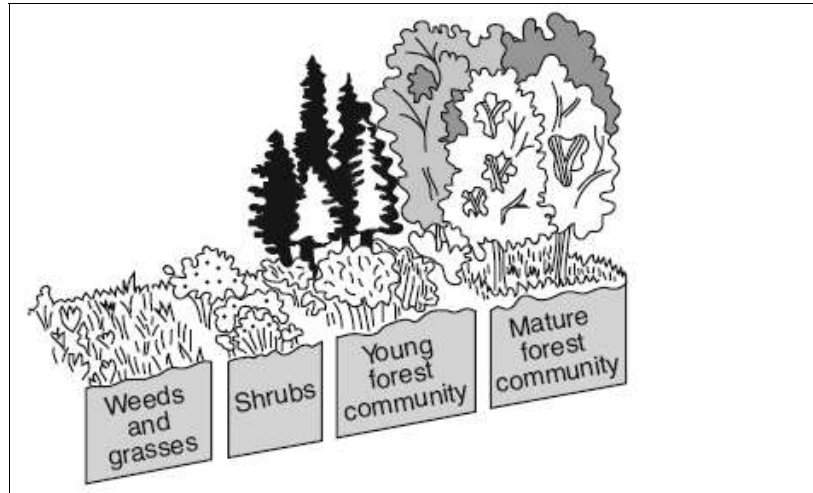
Data Base File Number: 177

Regents Date June09-1.bmp

June2009

1 6/18/2009 S4K1

Answer 1



**succession**

621. The diagram shown represents a process that occurs in nature. If the oak and hickory trees were burned in a forest fire, leaving bare soil, which group of plants would most likely be the first to grow back?

- (1) crabgrass and horseweed
- (2) oak and hickory trees
- (3) broomsedge and pine seedlings
- (4) mature pine and young deciduous trees

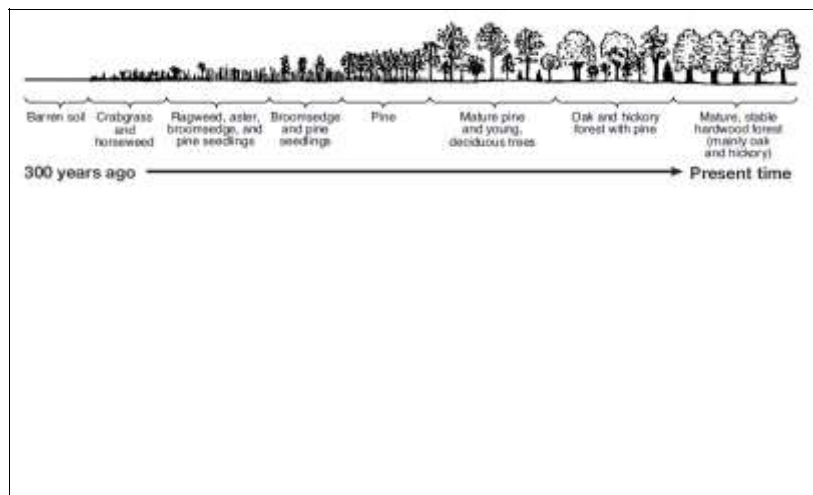
Data Base File Number: 963

Regents Date Aug2014-29.bmp

Aug2014

29 8/14/2014 S4K6

Answer 1



succession / secondary

622. Base your answer to this question on the graph shown and on your knowledge of biology. The graph shows the masses of different types of plants found in an area of the Adirondack Mountains after a forest fire occurred. Based on the information provided in the graph, the process that is occurring is

- (1) ecological succession
- (2) biological evolution
- (3) selective breeding
- (4) genetic engineering

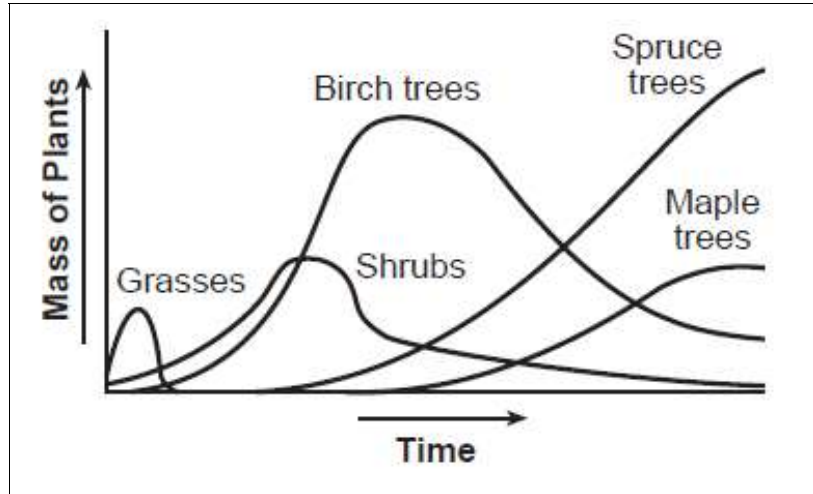
Data Base File Number: 1102

Regents Date June2016-34.bmp

June2016

34 6/15/2016 S4K6

Answer 1



succession / secondary

623. The diagram shows changes that might occur over time after a fire in a forest area. Which statement is most closely related to the events shown in the diagram?

- (1) The lack of animals in an altered ecosystem speeds natural succession.
- (2) Abrupt changes in an ecosystem only result from human activities.
- (3) Stable ecosystems never become established after a natural disaster.
- (4) An abrupt environmental change can cause a long-term gradual change in an ecosystem.

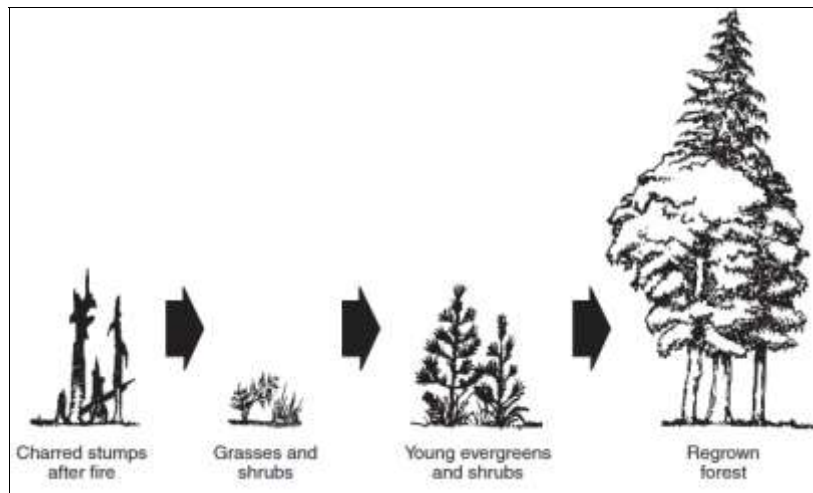
Data Base File Number: 725

Regents Date Jan2003-64.bmp

Jan2003

64 1/30/2003 S4K6

Answer 4



succession / secondary

624. Farmland abandoned in 1899 was observed to have significant changes in plant species over a 50-year period. The changes are shown in the chart. A forest fire burned all the trees on the land in 1955. Assuming no human interference, climate changes, or natural disasters, the plant species you would expect to see on this land in 2010 would most likely be

- (1) grasses
- (2) shrubs and briars
- (3) birch and cherry trees
- (4) beech and maple trees

Data Base File Number: 996

Regents Date Jan2015-39.bmp

Jan2015  
39 2/26/2015 S4K6

Answer 4

Year Observed	Plant Species
1900	grasses
1910	shrubs and briars
1920	birch and cherry trees
1950	beech and maple trees

survival

625. The activity of a single-celled organism is represented in the diagram shown. Which concept is best illustrated by this diagram?

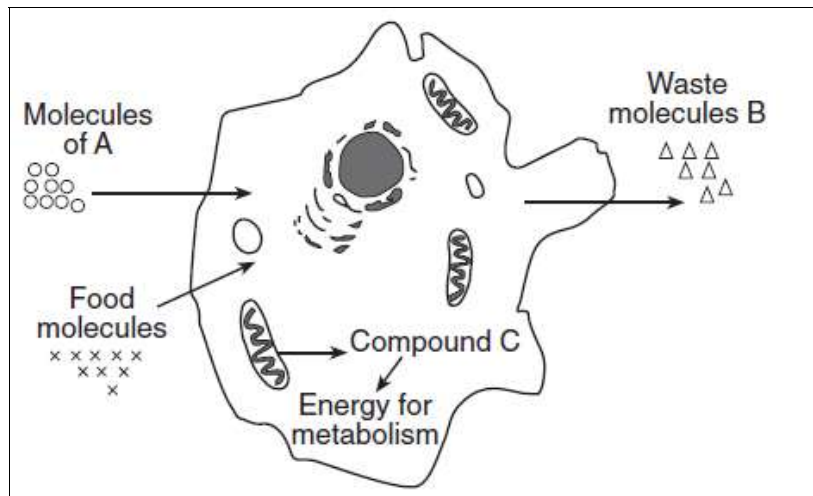
- (1) The life functions performed by single-celled organisms are different from the life functions performed by complex organisms.
- (2) Single-celled organisms carry out life functions that are essential for survival.
- (3) Since single-celled organisms lack organs, they can survive only in moist environments.
- (4) Single-celled organisms contain one organelle that performs all the life functions.

Data Base File Number: 1134

Regents Date August2016-38.b

Aug2016  
38 8/18/2016 S1K3

Answer 2





survival

626. The graph shows the percent of variation for a given trait in four different populations of the same species. The populations inhabit similar environments. In which population will the greatest number of individuals most likely survive if a significant environmental change related to this trait occurs?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

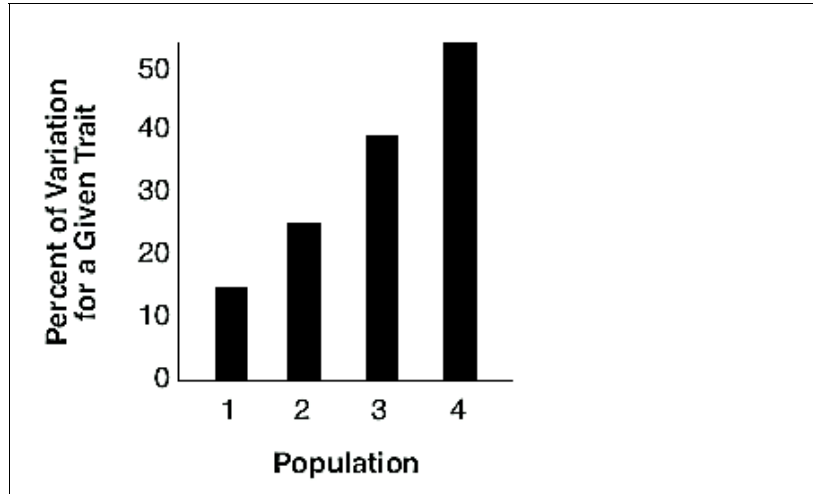
Data Base File Number: 65

Regents Date Jan08-15.bmp

Jan2008

15 1/25/2008 S4K3

Answer 4



survival of the fittest

627. The diagram shows the effect of spraying a pesticide on a population of insects over three generations. Which concept is represented in the diagram?

- (1) survival of the fittest
- (2) dynamic equilibrium
- (3) succession
- (4) extinction

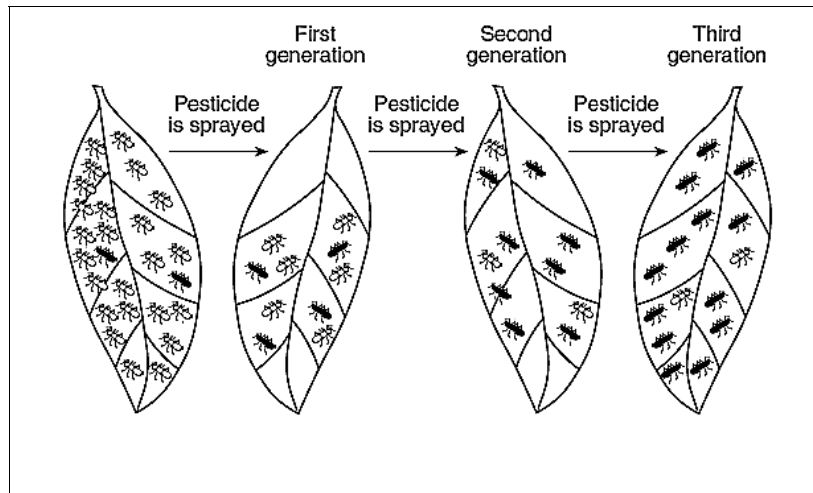
Data Base File Number: 40

Regents Date June07-37.bmp

June2007

37 6/20/2007 S4K3

Answer 1





## survival success

628. A species of octopus lives in the depths of the ocean where oxygen levels are low. These octopuses have specific proteins in their blood that allow for more efficient oxygen transport than in those that live in surface waters. Which statement best explains the presence of these proteins in the octopuses living deep in the ocean?

- (1) Migration to warmer and shallower ocean water favored the formation of the specific proteins.
- (2) Octopuses that had the specific proteins were able to survive and reproduce in the deep water environment and passed the trait on to future generations.
- (3) When some octopuses migrated to a deeper environment, they needed to produce new proteins so that their blood could carry more oxygen.
- (4) Mutations occurred in the body cells of the octopuses, which resulted in the specific proteins being produced and passed on to their offspring.

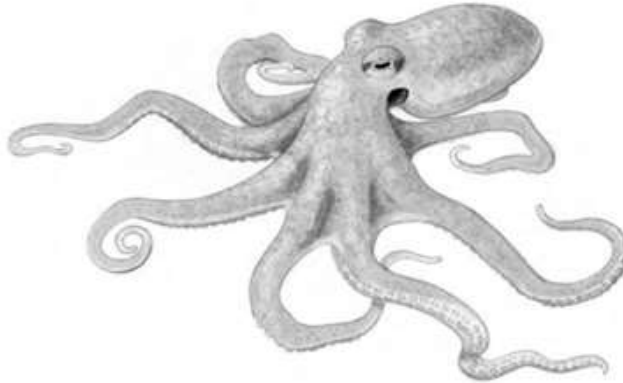
Data Base 1659  
File Number:

Regents Date June2024-14.bmp

June2024

14 6/14/2024 S4K3

Answer 2



Source: <http://www.fisheat.it/octopus-octopus-vulgaris/>

## survival success

629. Base your answer to this question on the photograph and information given, and on your knowledge of biology. New Caledonian crows consume a wide range of foods. These crows require tools to extract the larvae of wood boring beetles from their burrows. A bird pokes a larva with a stick until the larva is disturbed enough to bite the stick and hang on to it. The bird is then able to pull the larva out of its burrow. These larvae, with their unusual diet, have a distinct chemical that can be found in the feathers and blood of crows allowing scientists to determine the percentage of the crows' diet that is made up of beetle larvae. Scientists found that the beetle larvae are so energy-rich that just a few could satisfy the daily energy requirement for a crow. The crows with the greatest skill in using a twig as a tool benefit most in terms of nutrition. Why would the offspring of crows skilled at using twigs as tools have the greatest chance of survival?

- (1) They will be mutations. (3) They will have less food.  
(2) They will have more food. (4) They will be more intelligent.

Data Base 1115  
File Number:

Regents Date June2016-54.bmp

June2016

54 6/15/2016 S4K3

Answer 2



A captive New Caledonian crow forages for food using a stick tool. (Credit: Dr. Simon Walker)

survival success

630. Variations in the flying speed of a finch population are represented in the graph as shown. The top flying speed of a predator of these finches is also indicated on the graph. When describing finches with flying speeds in the region indicated by the "X" on the graph, it would be accurate to say that these individuals are more likely to

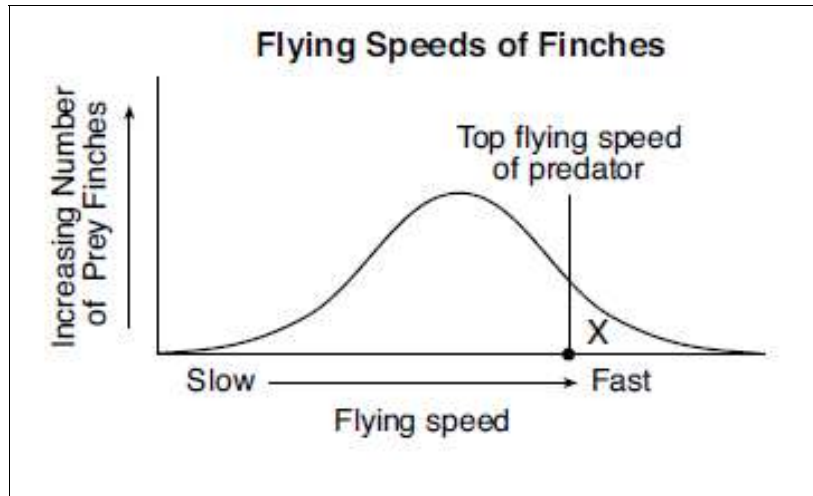
- (1) reproduce and increase the frequency of fast finches in the population
- (2) survive and undergo mutations that increase their flying speeds
- (3) require less food than the slower finches in the population
- (4) produce offspring that fly at average speeds

Data Base File Number: 1496

Regents Date June2022-82.bmp

June2022  
82 6/15/2022 LAB3

Answer 1



survival success

631. Base your answer to this question on the information and data table given and on your knowledge of biology. Examine the generation times for the animals in the chart as shown. Based on the data in the table, identify the species that would most likely have the greatest chance of surviving if their environment changed slowly over the course of 10,000 years.

- (1) raccoon
- (2) wolf
- (3) elephant
- (4) walrus

Data Base File Number: 1704

Regents Date Aug2024-52.bmp

Aug2024  
52 8/20/2024 S4K3

Answer 1

Generation Time (years)	Raccoon	Wolf	Bison	Lion	Polar Bear	Baboon	Fin Whale	Elephant	Walrus
Generations in 6,000 years	3,587	2,765	1,829	1,614	1,170	923	670	507	488

\*Generation time - Average span of years between birth of parents and the birth of offspring

## survival success

632. The offspring of a species of bird known as the European roller possess an effective defense mechanism. When they sense a threat by predators, the young birds vomit and cover themselves with a foul-smelling liquid. Which two systems work together to alert the young birds of danger and help produce the vomit?

- (1) respiratory and excretory
- (2) circulatory and immune
- (3) nervous and digestive
- (4) reproductive and muscular

Data Base File Number: 1420

Regents Date June2021-3.bmp

June2021

3 6/22/2021 S4K1

Answer 3



## survival success

633. A land-dwelling organism, A, and an aquatic single-celled organism, B, are represented in the diagram shown. Which statement best explains how A and B are able to survive in their environments?

- (1) The organelles in B perform similar functions to the organ systems in A.
- (2) The transport system in B is more complex than the transport system in A.
- (3) Both A and B take in oxygen from the water.
- (4) Only A can pass on traits to offspring.

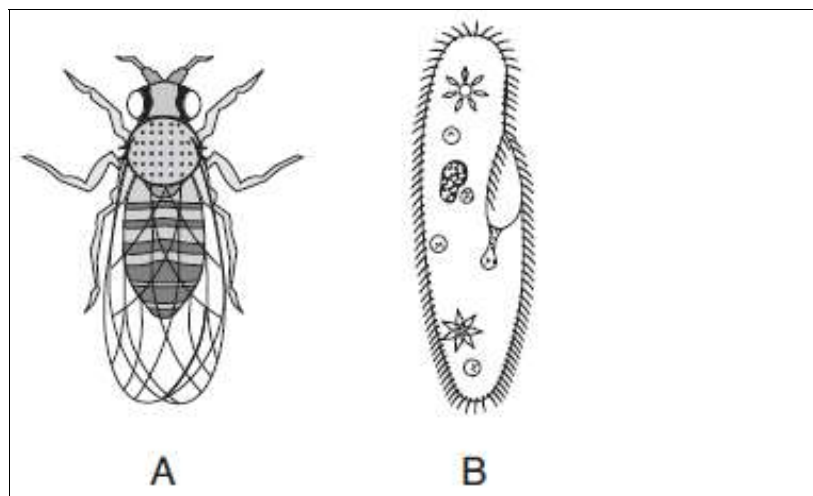
Data Base File Number: 1012

Regents Date June2015-7.bmp

June2015

7 6/16/2015 S4K7

Answer 1



## survival success

634. Base your answer to this question on the information given and on your knowledge of biology. Anoles are a diverse group of lizards that live on several islands including Cuba, Hispaniola, Jamaica, and Puerto Rico. Large populations of several species exist on these islands. The preferred region of the tree inhabited by the six species of anole lizards is represented in the diagram as shown. Would you expect the crown-giant and trunk-ground anoles to compete for resources if they lived on the same tree?

- (1) No
- (2) Yes
- (3) Cannot be determined.
- (4) Insufficient data to draw a conclusion.

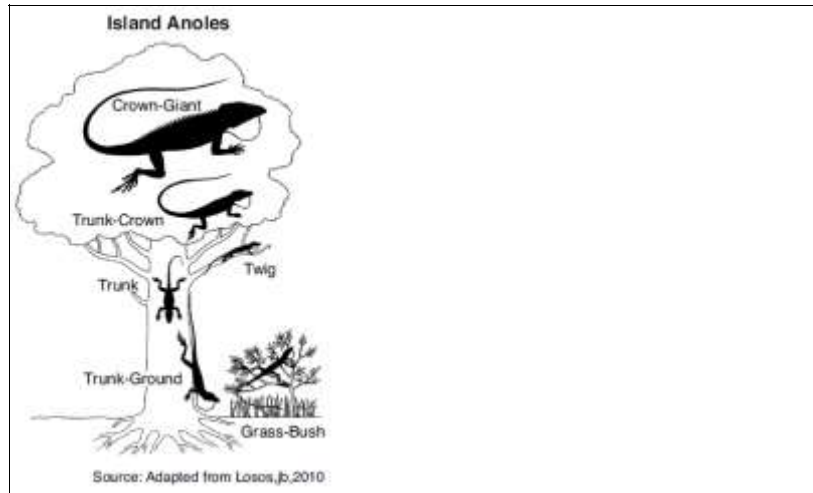
Data Base File Number: 1329

Regents Date Jan2019-84.bmp

Jan2019

84 1/22/2019 LAB3

Answer 1



## survival success

635. In the photograph shown, two fish are displaying a behavior commonly observed among pairs of rabbitfish. While one has its head down feeding on coral, the other remains upright, alert for predators. This behavior continues to be present in the rabbitfish population because

- (1) this behavior was learned by observing other fish species
- (2) both fish could not fit into the small spaces in the coral
- (3) this behavior increases their chance of survival
- (4) the fish species needed to become alert to survive

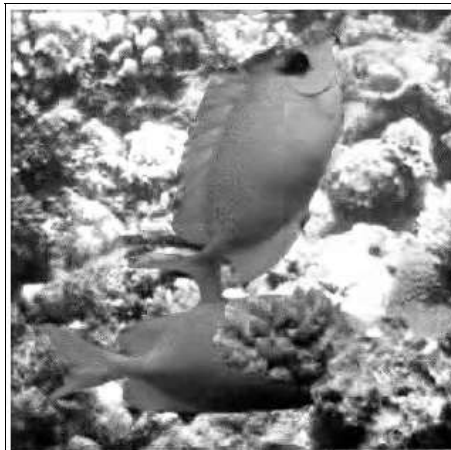
Data Base File Number: 1305

Regents Date Jan2019-24.bmp

Jan2019

24 1/22/2019 S4K3

Answer 3



## survival success

636. The tube-lipped nectar bat, found in Madidi National Park in Ecuador, has the longest tongue in relation to its size of any mammal. Its 8.5 cm tongue can reach into the deepest flowers. It is likely that the population of these bats with exceptionally long tongues will increase in the Madidi National Park ecosystem if

- (1) the population of plants with very deep flowers suffers a sharp decrease in number
- (2) the gene for the long tongue trait cannot get passed on to future generations of nectar bats
- (3) other mammal species with long tongues move into the area and increase competition
- (4) the tongue variation provides the species with an advantage in surviving and reproducing

Data Base 1536  
File Number:

Regents Date Jan2023-10.bmp

Jan2023

10 1/24/2023 S4K3

Answer 4



survival success

637. Base your answer to this question on the information given and on your knowledge of biology. The chart shows the reproductive characteristics of three species living in an area that has recently undergone a MAJOR environmental change. Which species could be the most successful in surviving an environmental change?

- (1) A
- (2) B
- (3) C
- (4) No species as shown could survive an environmental change.

Data Base File Number: 1527

Regents Date Aug2022-58.bmp

Aug2022

58 8/17/2022 S4K3

Answer 1

Species	Method of Reproduction	Frequency of Reproduction	Average Number of Offspring Produced Each Time
A	Asexual	Every two days	2
B	Sexual	Every two years	4
C	Sexual	Every year	20

survival success

638. Each row in the chart shown represents a different population of the same species of insect. Which row shows the population with the greatest chance of survival in a changing environment?

- (1) 1
- (2) 2
- (3) 3
- (4) 4





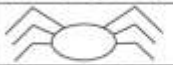

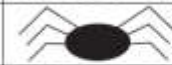









Data Base File Number: 1024

Regents Date June2015-36.bmp

June2015

36 6/16/2015 S4K3

Answer 1

(1)				
(2)				
(3)				
(4)				



**survival success**

639. The back of the Namib Desert darkling beetle, shown in the photograph, is covered in little bumps that collect water from the air. When it tilts forward, the water runs off its back into its mouth. These specialized structures on the beetle's back allow it to

- (1) locate food within the harsh desert environment
- (2) obtain a substance that is required for survival
- (3) reproduce asexually if mates are not available in the area
- (4) increase the chances of survival by producing organic raw materials

Data Base File Number: 1335

Regents Date June2019-15.bmp

June2019

15 6/18/2019 S4K6

Answer 2



Source: <http://myinformatics.com>

**survival success**

640. Which population in the chart shown has the best chance for survival in a rapidly changing environment?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 1213

Regents Date Aug2017-40.bmp

Aug2017

40 8/17/2017 S4K3

Answer 1

Population	Type of Reproduction	Average Life Span of Individuals	Total Number of Offspring Produced
(1)	sexual	13 days	100
(2)	asexual	13 days	100
(3)	sexual	12 weeks	25
(4)	asexual	12 weeks	25



## synthesis

641. Base your answer to this question on the diagram shown, which represents a process that occurs in living cells, and on your knowledge of biology. The process shown in the diagram is

- (1) cellular respiration
- (2) cellular reorganization
- (3) gene recombination
- (4) protein synthesis

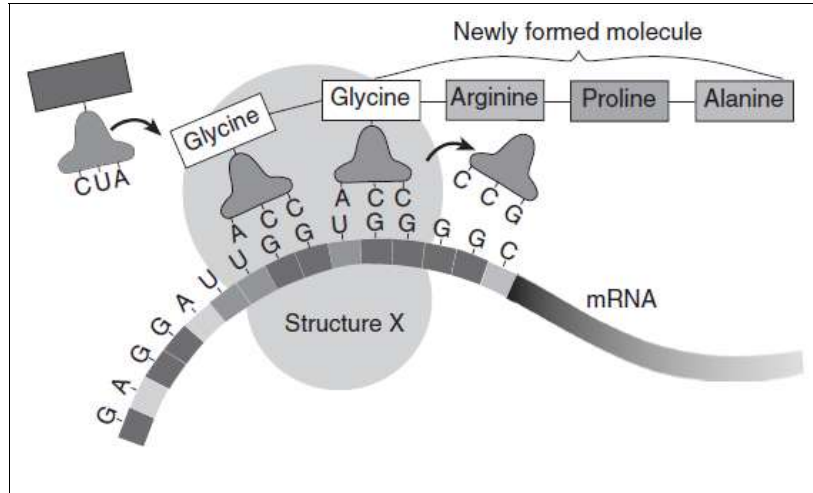
Data Base File Number: 1147

Regents Date August2016-73.b

Aug2016

73 8/18/2016 LAB1

Answer 4



## synthesis

642. What substance could be represented by the letter X in the diagram shown?

- (1) carbohydrates
- (2) ozone
- (3) carbon dioxide
- (4) water

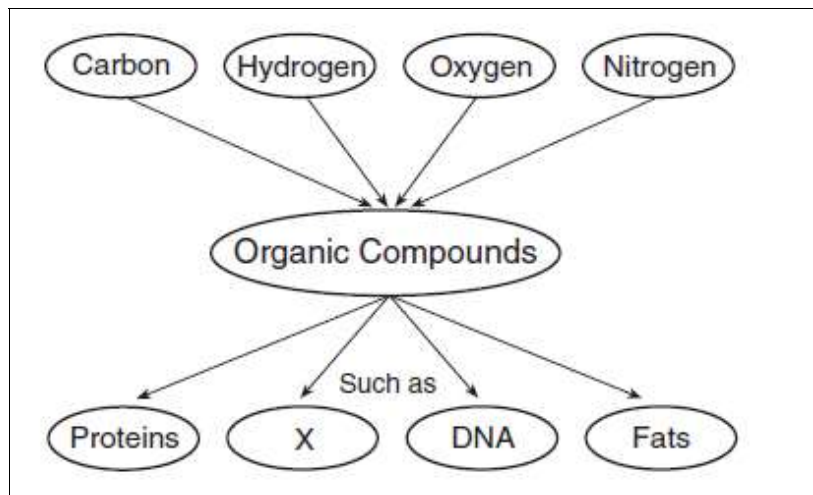
Data Base File Number: 643

Regents Date Jan2004-26.bmp

Jan2004

26 1/29/2004 S4K5

Answer 1



## synthesis

643. The diagram shown represents a sequence of events that occurs in living things. Letter X represents

- (1) inorganic molecules
- (2) organic molecules
- (3) biological catalysts
- (4) simple sugars

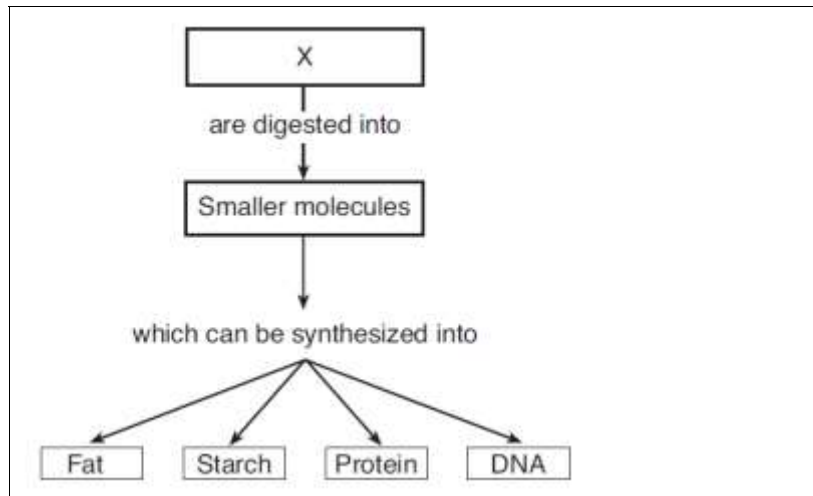
Data Base File Number: 882

Regents Date June2013-35.bmp

June2013

35 6/11/2013 S4K5

Answer 2



## synthesis

644. Which order of metabolic processes, shown in the diagram, converts nutrients consumed by an organism into cell parts?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 482

Regents Date June2006-19.bmp

June2006

19 6/21/2006 S4K5

Answer 1

- (1) digestion → absorption → circulation → diffusion → synthesis
- (2) absorption → circulation → digestion → diffusion → synthesis
- (3) digestion → synthesis → diffusion → circulation → absorption
- (4) synthesis → absorption → digestion → diffusion → circulation

**synthesis**

645. Which row in the chart shown contains correct information concerning synthesis?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

Data Base File Number: 505

Regents Date Aug2006-4.bmp

Aug2006

4 8/16/2006 S4K1

Answer 3

Row	Building Blocks	Substance Synthesized Using the Building Blocks
(1)	glucose molecules	DNA
(2)	simple sugars	protein
(3)	amino acids	enzyme
(4)	molecular bases	starch

**synthesis**

646. The diagram shown represents a process that occurs within a cell in the human pancreas. This process is known as

- (1) digestion by enzymes
- (2) protein synthesis
- (3) energy production
- (4) replication of DNA

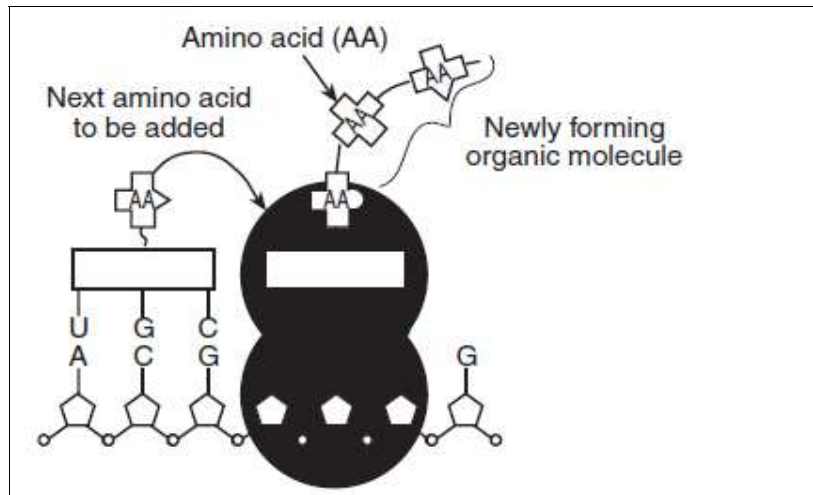
Data Base File Number: 860

Regents Date Aug2001-6.bmp

Aug2001

6 8/16/2001 S4K1

Answer 2



## synthesis

647. The diagram shown represents the synthesis of a portion of a complex molecule in an organism. Which of the following could be used to identify the building blocks and product?

- (1) starch molecules producing glucose
- (2) amino acid molecules producing part of a protein
- (3) sugar molecules producing ATP
- (4) DNA molecules producing part of starch

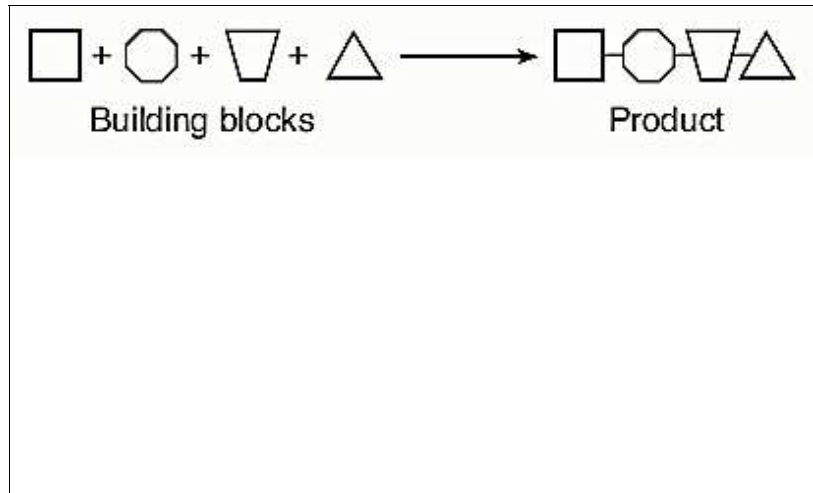
Data Base File Number: 90

Regents Date June08-9.bmp

June2008

9 6/24/2008 S4K1

Answer 2



## synthesis

648. The diagram shown represents a series of reactions that can occur in an organism. This diagram best illustrates the relationship between

- (1) enzymes and synthesis
- (2) amino acids and glucose
- (3) antigens and immunity
- (4) ribosomes and sugars

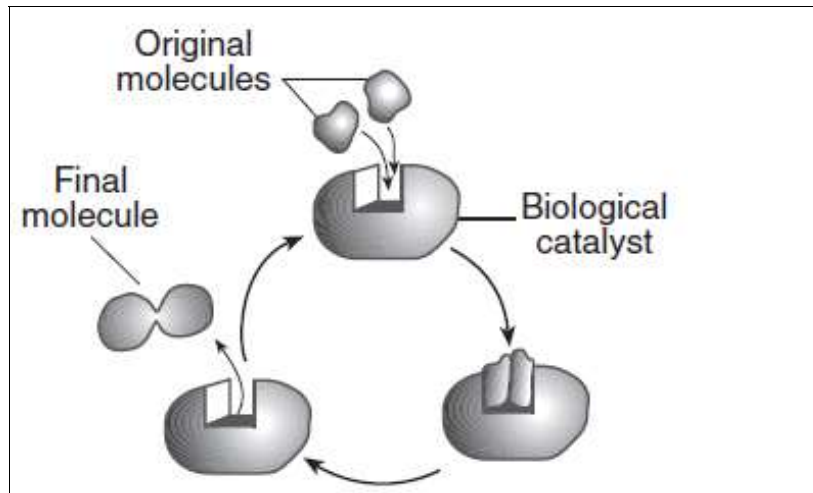
Data Base File Number: 558

Regents Date June2005-20.bmp

June2005

20 6/22/2005 S4K5

Answer 1



## technological advancement

649. It may be possible to bring back some extinct species using recent advances in genetic technology. Opinions regarding this issue are split within the scientific community. The table as shown summarizes some of the arguments on both sides. The arguments made by both sides provide evidence that

- (1) genetic technology is the best way to correct the damage humans have done to the environment
- (2) the introduction of genetic technology will benefit all organisms equally
- (3) any new technology that increases the biodiversity of the area should be used
- (4) the use of new technology requires decisions based on an assessment of costs, benefits, and risks

Data Base File Number: 1474

Regents Date June2022-28.bmp

June2022

28 6/15/2022 S4K7

Answer 4

Pro	Con
<ul style="list-style-type: none"><li>• It would increase the biodiversity of an ecosystem.</li><li>• It would bring back organisms that are extinct.</li></ul>	<ul style="list-style-type: none"><li>• The organisms that are brought back will compete with existing species.</li><li>• The process is very expensive.</li></ul>

## testes

650. Base your answer to this question on the diagram shown and on your knowledge of biology. The letters in the diagram indicate structures present in a human male. Which structure produces the male hormone responsible for characteristics such as muscle development, deep voice, and gamete production?

(1) A

(3) E

(2) B

(4) D

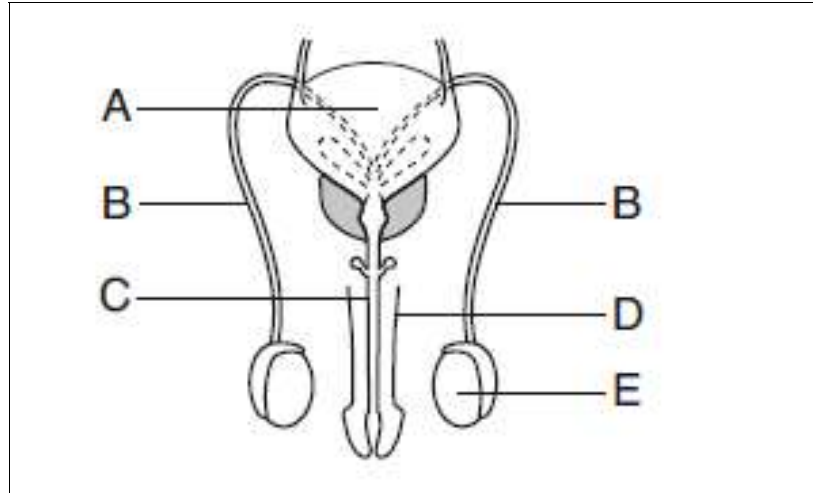
Data Base File Number: 412

Regents Date June2012-34.bmp

June2012

34 6/19/2012 S4K4

Answer 3



## testes

651. The diagram shown represents the reproductive system of a mammal. The hormone produced in structure A most directly brings about a change in

(1) blood sugar concentration

(3) the rate of digestion

(2) physical characteristics

(4) the ability to carry out respiration

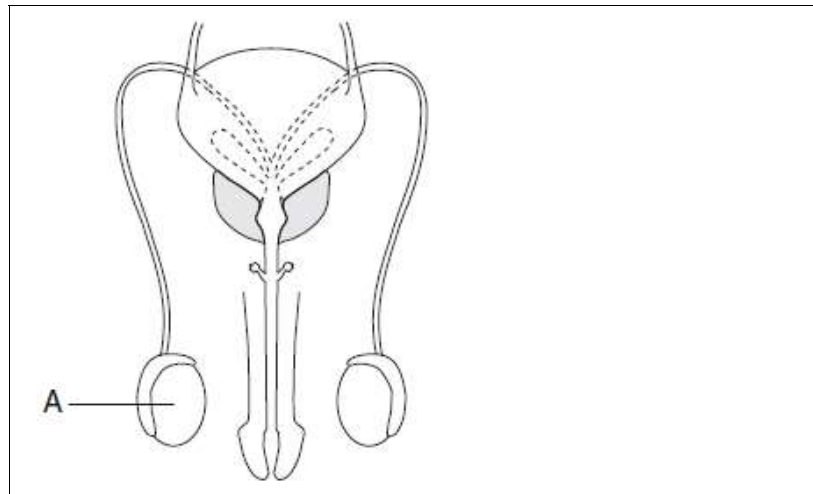
Data Base File Number: 641

Regents Date Jan2004-23.bmp

Jan2004

23 1/29/2004 S4K4

Answer 2



tissue

652. Which choice as shown in the diagram best completes the diagram with a correct label and definition for the box labeled X?

- (1) cell: the basic structural, functional, and biological unit
- (2) organ: a group of tissues with a common function
- (3) tissue: a group of cells with a similar structure and function
- (4) organ system: a collection of organs with a common function

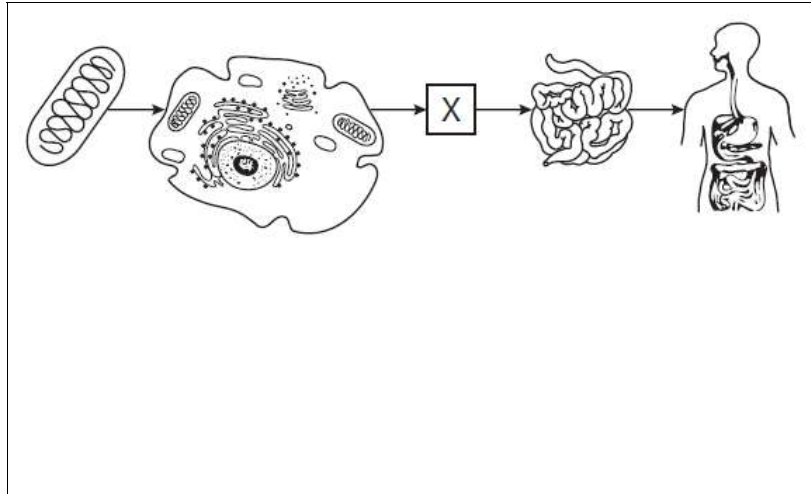
Data Base File Number: 1688

Regents Date Aug2024-17.bmp

Aug2024

17 8/20/2024 S4K1

Answer 3



tissue

653. The diagram shown represents the organization of structures within an organism. Which term best indicates the structures represented by the circle labeled X?

- (1) organelles
- (2) chromosomes
- (3) organ systems
- (4) tissues

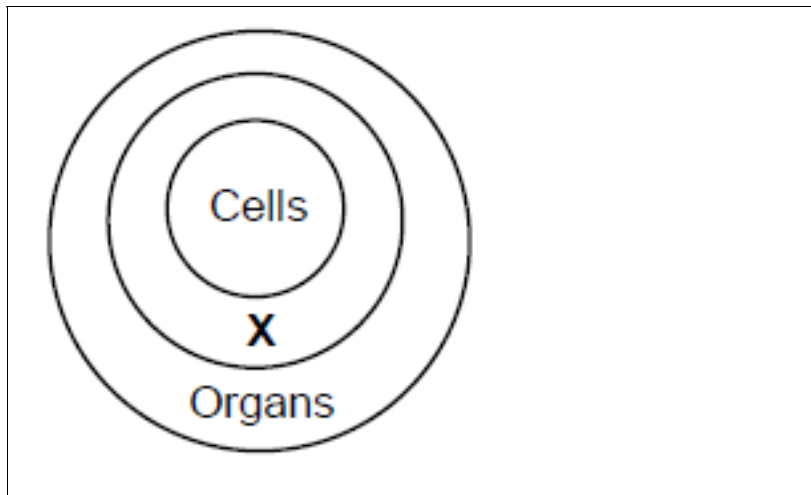
Data Base File Number: 1331

Regents Date June2019-11.bmp

June2019

11 6/18/2019 S4K1

Answer 4



## tissue

654. Levels of organization in humans are represented in the diagram as shown. Level "X" in the diagram most likely represents

- (1) molecules
- (2) organelles
- (3) tissues
- (4) ribosomes

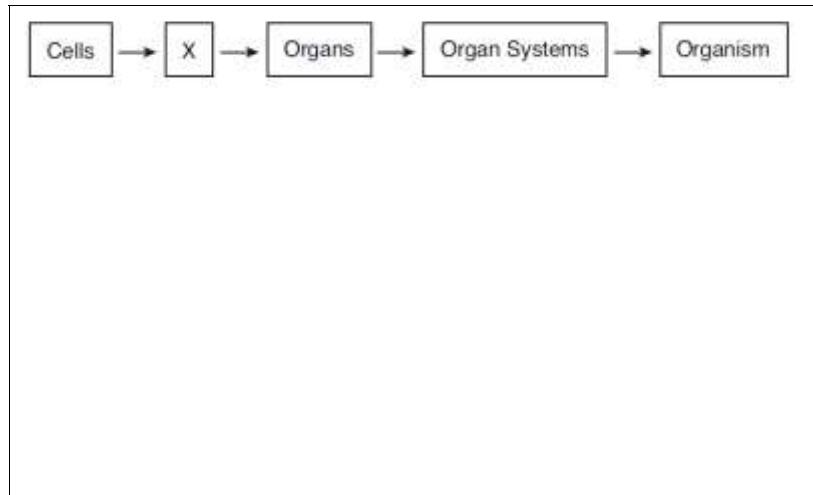
Data Base File Number: 1466

Regents Date June2022-10.bmp

June2022

10 6/15/2022 S4K1

Answer 3



## tissue

655. Some human body cells are shown in the diagram. These groups of cells represent different

- (1) tissues in which similar cells function together
- (2) organs that help to carry out a specific life activity
- (3) systems that are responsible for a specific life activity
- (4) organelles that carry out different functions

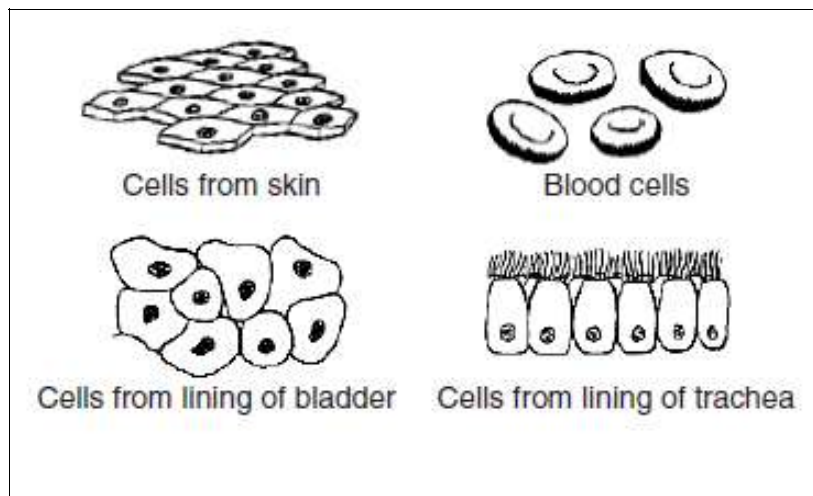
Data Base File Number: 534

Regents Date Jan2005-7.bmp

Jan2005

7 1/28/2005 S4K1

Answer 1





## tissue

656. The diagram shown represents levels of organization in living things. Which term would best represent X?

- (1) human
- (2) tissue
- (3) stomach
- (4) organelle

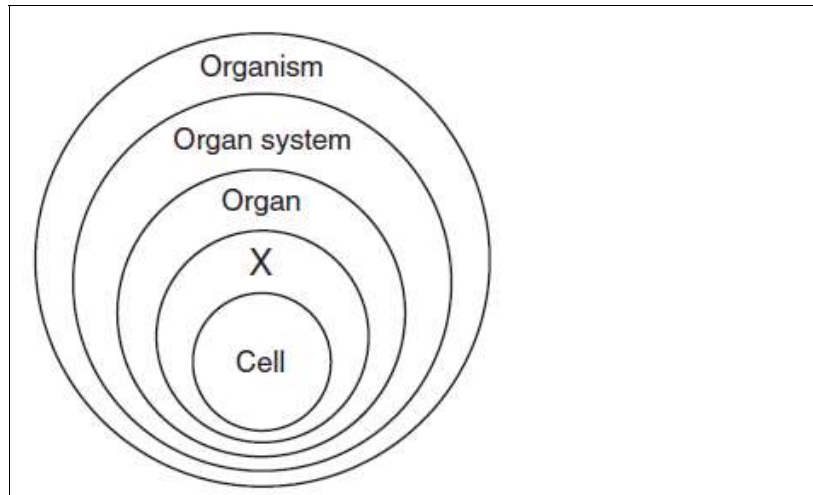
Data Base 473  
File Number:

Regents Date June2006-1.bmp

June2006

1 6/21/2006 S4K1

Answer 2



## transport

657. Which statement is a valid inference concerning structure X represented in the diagram below?

- (1) Structure X contains guard cells that regulate glucose intake.
- (2) Structure X carries out heterotrophic nutrition.
- (3) Structure X produces gametes for asexual reproduction.
- (4) Structure X transports materials for metabolic activities.

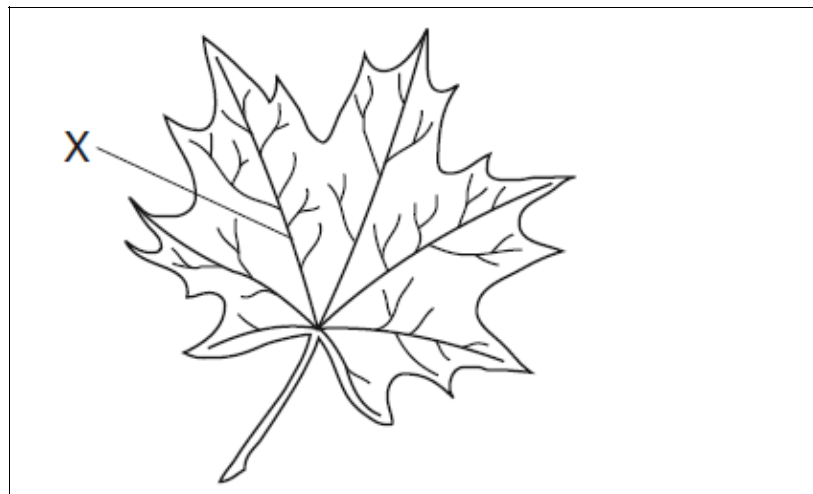
Data Base 435  
File Number:

Regents Date Aug2012-33.bmp

Aug2012

33 8/17/2012 S1K3

Answer 4



uterus

658. The letters in the diagram shown represent structures in a human female. Estrogen and progesterone increase the chance for successful fetal development by regulating activities within structure

- (1) A
- (2) B

- (3) C
- (4) D

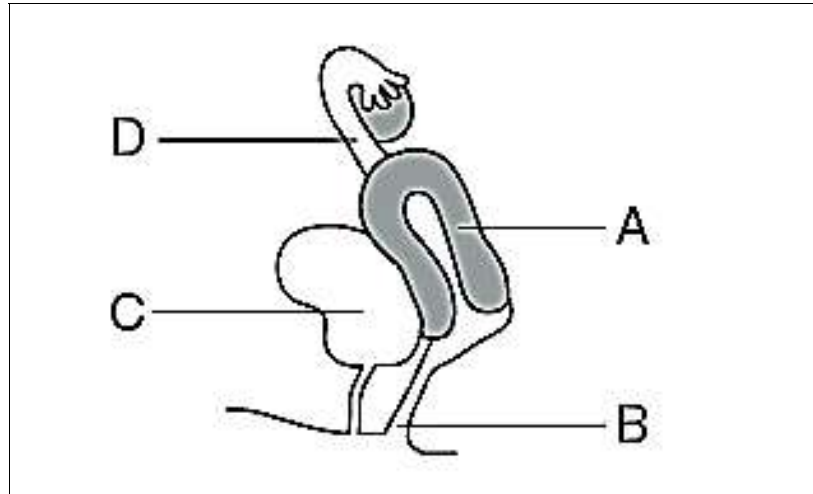
Data Base File Number: 26

Regents Date June07-18.bmp

June2007

18 6/20/2007 S4K4

Answer 1



uterus

659. Base your answer to this question on the diagram shown, which represents the human female reproductive system. In which part of this system does a fetus usually develop?

- (1) A
- (2) B

- (3) C
- (4) D

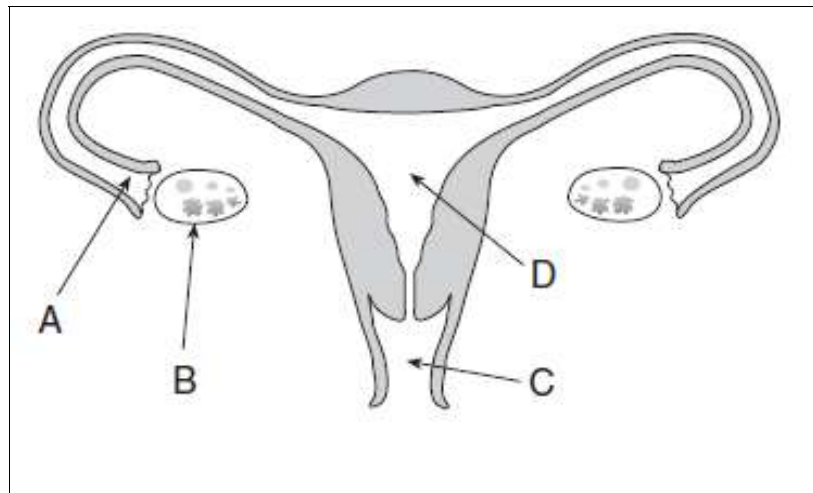
Data Base File Number: 639

Regents Date Jan2004-15.bmp

Jan2004

16 1/29/2004 S4K4

Answer 4



uterus

660. A diagram of the human female reproductive system is shown. Identify the structure labeled X.

- (1) ovary
- (2) oviduct
- (3) cervix
- (4) uterus

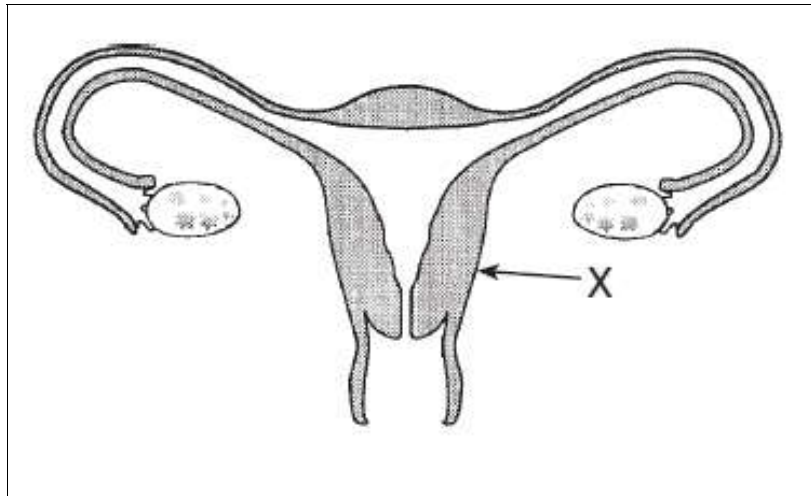
Data Base File Number: 797

Regents Date Aug2002-69.bmp

Aug2002

69 8/13/2002 S4K4

Answer 4



uterus

661. The diagram shows the human female reproductive system. The fetus normally develops within structure

- (1) A
- (2) B
- (3) C
- (4) D

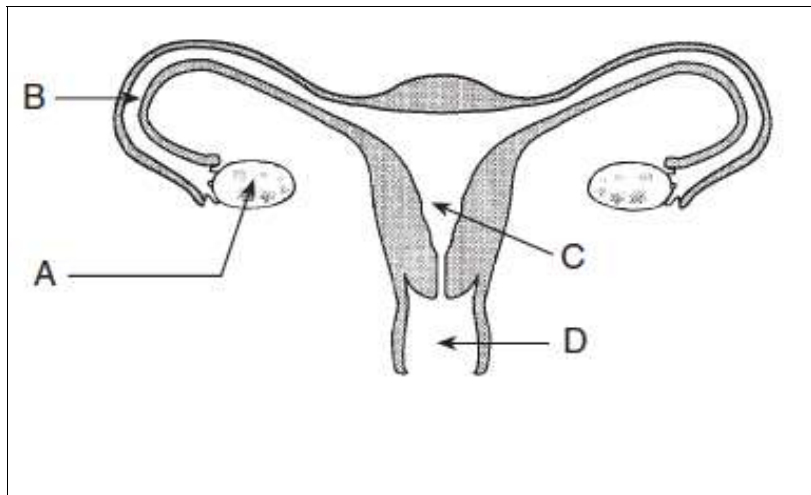
Data Base File Number: 863

Regents Date Aug2001-17.bmp

Aug2001

17 8/16/2001 S4K4

Answer 3



**vaccination**

662. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram illustrates activities taking place in the body of a human. Vaccinations usually stimulate the body to produce more of

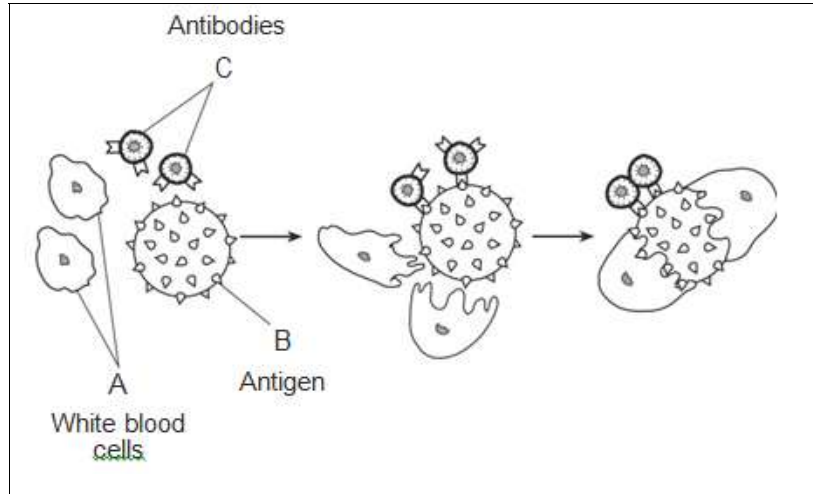
- (1) structure A, only
- (2) structure B, only
- (3) structures A and C, only
- (4) structures A, B, and C

Data Base File Number: 1211

Regents Date Aug2017-38.bmp

Aug2017  
38 8/17/2017 S4K5

Answer 3



**vaccination**

663. Base your answer to this question on the table shown and on your knowledge of biology. None of these volunteers ever had chicken pox. After the injection, there would most likely be antibodies to chicken pox in the bloodstream of volunteers

- (1) A and D, only
- (2) A, B, and D
- (3) C
- (4) D, only

Data Base File Number: 785

Regents Date Aug2002-37.bmp

Aug2002  
37 8/13/2002 S4K5

Answer 1

Volunteer	Injected with Dead Chicken Pox Virus	Injected with Dead Mumps Virus	Injected with Distilled Water
A	X		
B		X	
C			X
D	X	X	

## vaccination

1664. Base your answer to this question on the information and data table shown and on your knowledge of biology.

Measles: Eliminated? ---

Measles is a highly contagious viral disease. Infected people first experience a fever, cold-like symptoms, and a rash. Several complications can develop, such as ear infections, diarrhea, pneumonia, encephalitis (swelling of the brain), and death. Prior to the widespread use of the measles vaccine in the 1960s, it is estimated that 3-4 million people were infected every year. The Centers for Disease Control and Prevention declared measles eliminated in the United States in 2000. This was accomplished, in part, due to a highly effective vaccination program. However, since 2016 the disease has made a comeback, and there has been an increase in measles cases in recent years. The reason for the dramatic decline in the number of measles cases from the 1960s to 2010 in the United States was because the vaccine

- (1) contained pathogens to fight against this highly contagious virus
- (2) prevented the development of serious complications after infection
- (3) exposed many people to a weakened form of the measles virus, making them immune
- (4) contained an antibiotic that killed the measles virus, preventing its spread

Data Base File Number: 1406

Regents Date Jan2020-47.bmp

Jan2020

47 1/21/2020 S4K5

Answer 3

Number of Measles Cases  
2010-2016

Year	Number of Cases
2010	63
2011	220
2012	55
2013	187
2014	667
2015	188
2016	70

Source: [www.cdc.gov/measles/cases-outbreaks.html](http://www.cdc.gov/measles/cases-outbreaks.html)

## vaccination

665. Base your answer to this question on the graph shown and on your knowledge of biology. Which statement best explains a change in the incidence of disease in 1970?
- (1) Children were vaccinated against measles.
  - (2) New drugs cured diabetes.
  - (3) The bacteria that cause pneumonia developed a resistance to drugs.
  - (4) New technology helped to reduce the incidence of all three diseases.

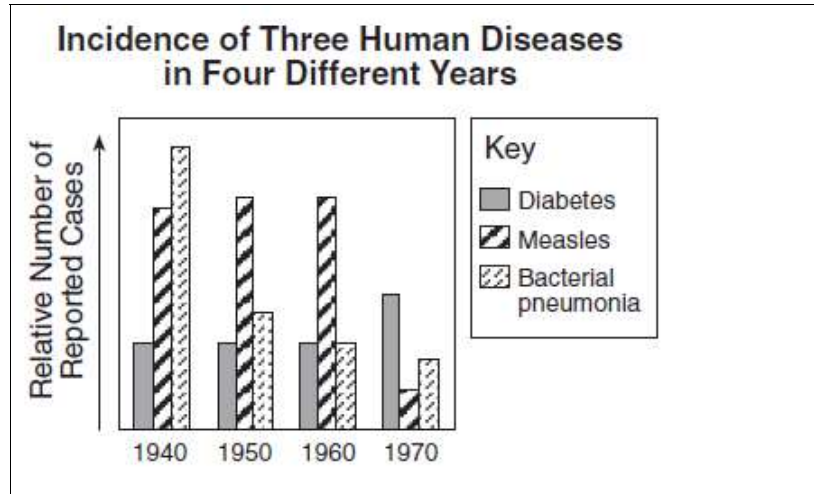
Data Base File Number: 591

Regents Date Aug2005-35.bmp

Aug2005

36 8/16/2005 S4K5

Answer 1



## vaccine

666. Base your answer to this question on the data table shown and on your knowledge of biology. What should be the specific expected result of administering these vaccines to child B?
- (1) Child B is susceptible to both measles and polio.
  - (2) Child B should be immune to measles, only.
  - (3) Child B should be immune to measles and polio.
  - (4) Child B should be immune to polio, only.

Data Base File Number: 628

Regents Date Jan2013-56.bmp

Jan2013

56 1/23/2013 S4K5

Answer 3

**Vaccines Received by Children**

Patient	Measles Vaccine	Polio Vaccine
child A	✓	
child B	✓	✓
child C		✓

## vaccine

667. The list shown includes three ways of controlling viral diseases in humans. Based on this information, which activity would contribute to the greatest protection against viruses?
- (1) producing a vaccine that is effective against interferon
  - (2) developing a method to stimulate the production of interferon in cells
  - (3) using interferon to treat a number of diseases caused by bacteria
  - (4) synthesizing a sulfa drug that prevents the destruction of bacteria by viruses

Data Base File Number: 813

Regents Date June2002-36.bmp

June2002

36 6/19/2002 S4K5

Answer 2

- Administering a vaccine containing a dead or weakened virus that stimulates the body to form antibodies against the virus
- Using chemotherapy (chemical agents) to kill viruses similar to the way in which sulfa drugs or antibiotics act against bacteria
- Relying on the action of interferon, which is produced in cells and protects the body against pathogenic viruses

## variation

668. The evolutionary pathways of ten different species are represented in the diagram shown. Which statement would most likely be correct, based on the information in the diagram?
- (1) Species C had many variations and lived in a stable, unchanging environment.
  - (2) Species D, C, and J are extinct.
  - (3) Species F evolved from species D.
  - (4) Species J had little variation and lived in a changing environment.

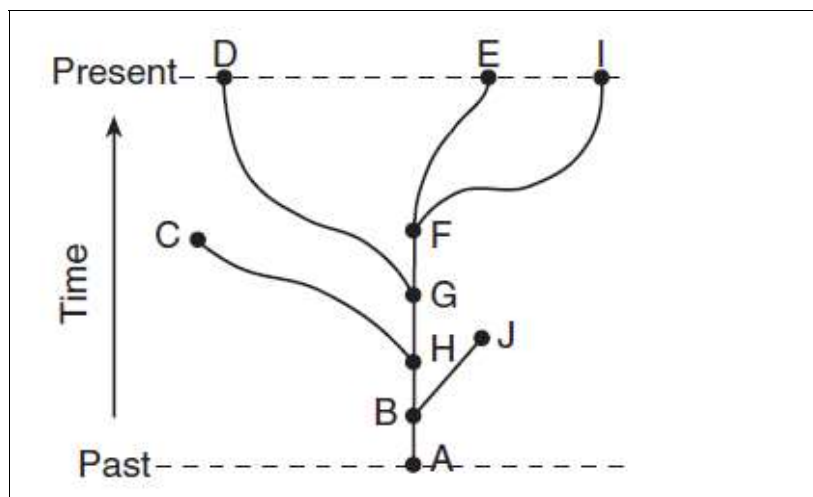
Data Base File Number: 1051

Regents Date August2015-37.b

Aug2015

37 8/12/2015 S4K3

Answer 4



variation

669. Base your answer to this question on the information given and on your knowledge of biology. The photograph shows two birds on a bird feeder. Studies have shown that the length of beaks within a songbird population may be influenced by the presence of bird feeders. When bird feeders were widely used in one area, birds were observed to have longer beaks. In an area where bird feeders were not used, the beaks of these species were of average length. The presence of bird feeders in an area would represent a

- (1) selecting agent
- (2) feedback mechanism
- (3) source of mutation
- (4) biological catalyst

Data Base 1530  
File Number:

Regents Date Aug2022-73.bmp

Aug2022

74 8/17/2022 LAB3

Answer 1



Source: <http://birdfeederhub.com/best-large-capacity-bird-feeders/>



variation

670. Base your answer to this questions on the information and graph shown and on your knowledge of biology. A small community that is heavily infested with mosquitoes was sprayed weekly with an insecticide for several months. Daily counts providing information on mosquito population size are represented in the graph as shown. Which statement best explains why some mosquitoes survived the first spraying?

- (1) The weather in early summer was probably cool.
- (2) Most of the mosquitoes were of reproductive age.
- (3) Environmental factors varied slightly as the summer progressed.
- (4) Natural variation existed within the population.

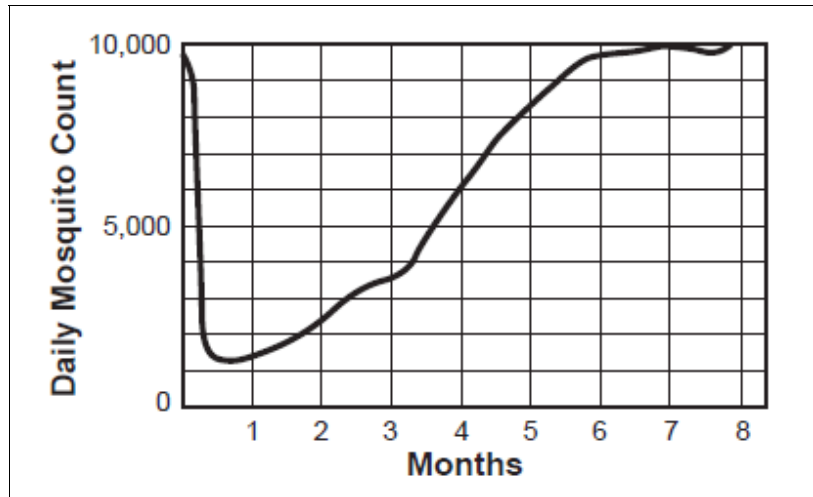
Data Base 855  
File Number:

Regents Date June2001-57.bmp

June2001

57 6/15/2001 S4K3

Answer 4



## vegetative propagation

671. Base your answer to this question on the diagram shown and on your knowledge of biology. The diagram (Shown as "A" in the Upper part of the diagram) represents a technique used by scientists today to maintain the genetic makeup of an organism. Which graph shown in "B", (Lower part of diagram) best represents the DNA content found in each cell in each of the stages in diagram "A". Above?

(1) 1

(3) 3

(2) 2

(4) 4

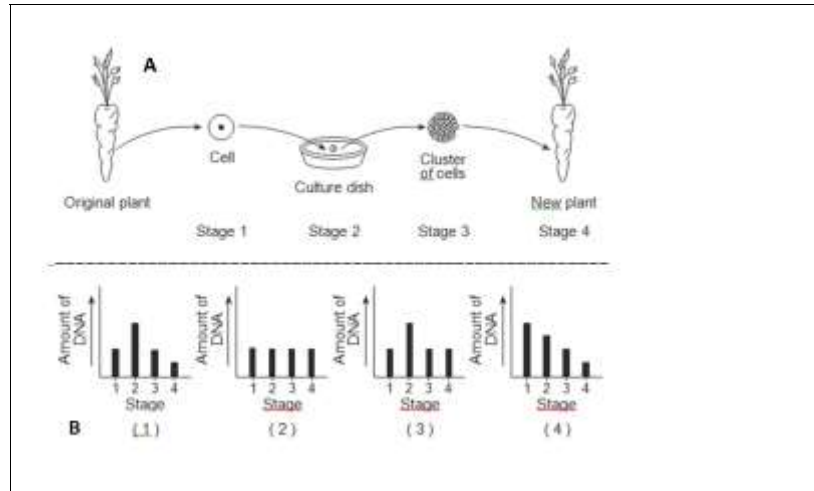
Data Base File Number: 1214

Regents Date Aug2017-50C.bm

Aug2017

50 8/17/2017 S4K2

Answer 2



## vegetative propagation

672. The diagram shown represents a technique used to produce carrots. Which reproductive process determines the traits present in the cluster of cells?

(1) meiosis

(3) fertilization

(2) mitosis

(4) differentiation

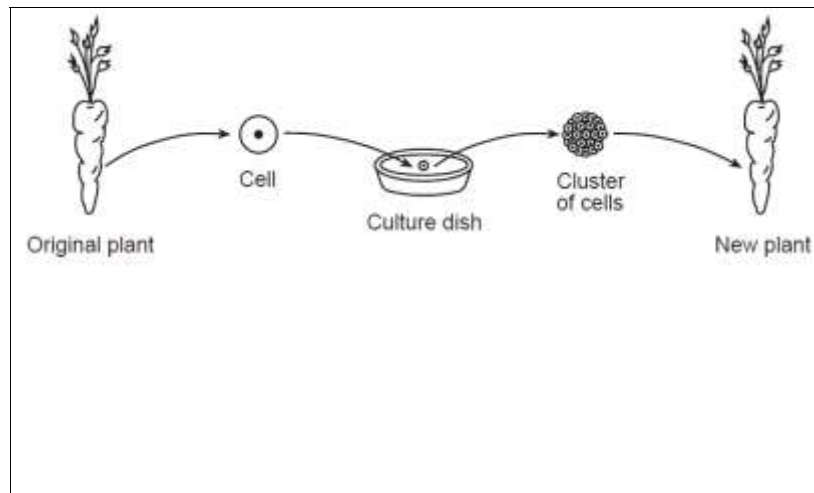
Data Base File Number: 937

Regents Date June2014-10.bmp

June2014

10 6/17/2014 S4K2

Answer 2



## vegetative propagation

673. A plant commonly referred to as "Mother of Thousands" has lost its ability to produce seeds. In order to reproduce, the edges of the plant's leaves asexually develop miniature plants that drop off and grow into mature plants. The cells of the offspring would have

- (1) half the genetic information, when compared to cells of the parent plant's leaves
- (2) the same genetic information, when compared to cells of the parent plant
- (3) twice as much genetic information as is present in the cells of the parent plant
- (4) incomplete genetic information, because the parent plant does not produce seeds

Data Base 1544  
File Number:

Regents Date Jan2023-29.bmp

Jan2023

29 1/24/2023 S4K4

Answer 2



Source: <http://www.guide-to-houseplants.com/mother-of-thousands.html>

## vegetative propagation

674. Spider plants can reproduce both sexually and asexually. The diagram shown represents a spider plant reproducing asexually by a method known as vegetative propagation. Which statement best describes the relationship between the parent plant and the offspring in the diagram?

- (1) The cells of the offspring contain half the amount of DNA as the cells of the parent plant.
- (2) The parent plant provides genetic material to the offspring through its gametes.
- (3) The cells of the offspring have the same genetic content as the cells of the parent plant.
- (4) The cells of the parent plant have more genetic diversity, compared to the cells of the offspring.

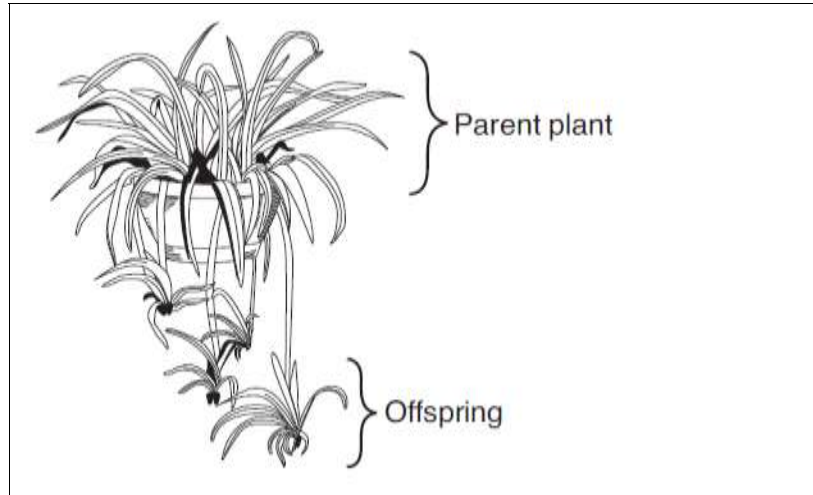
Data Base 875  
File Number:

Regents Date June2013-7.bmp

June2013

7 6/11/2013 S4K4

Answer 3



## vegetative propagation

675. A garlic bulb consisting of several smaller sections called cloves is shown in the diagram. If cloves are separated from the bulb and later planted in a garden, a new garlic bulb will grow from each. In this way, a home gardener could grow a whole crop of genetically identical garlic plants starting with one bulb. As a result of this procedure, the gardener would

- (1) soon have several varieties of garlic growing in his garden
- (2) need to buy new garlic cloves each year in order to keep growing garlic
- (3) have to fertilize the female garlic plants each year so the garlic plants could produce their own cloves
- (4) need to be aware that if any of his garlic plants became diseased, it could very likely infect the entire crop

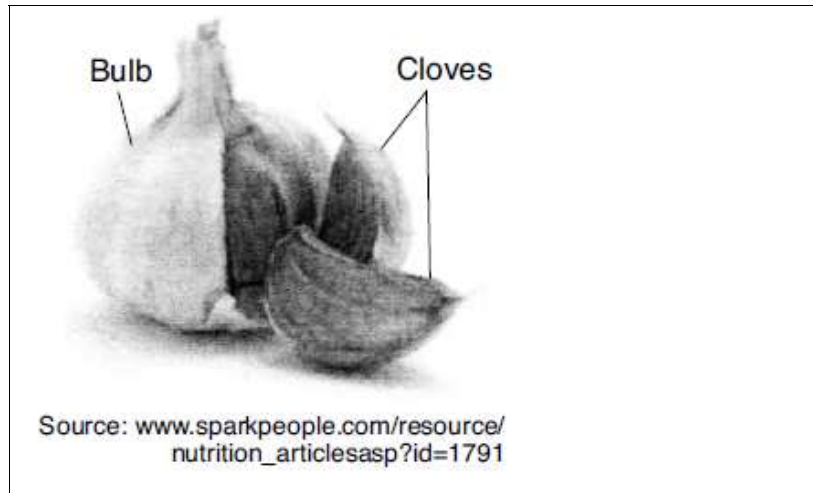
Data Base File Number: 1304

Regents Date Jan2019-18.bmp

Jan2019

18 1/22/2019 S4K4

Answer 4



## virus structure

676. Proteins on the surface of a human cell and on a bird influenza virus are represented in the diagram shown. What change in the bird influenza virus would allow it to infect this human cell?

- (1) The bird influenza virus would have to have some surface proteins that would be similar to this shape ----->
- (2) The bird influenza virus would have to have some surface proteins that would be similar to this shape -----<
- (3) The bird influenza virus would have to have some surface proteins that would be similar to this shape -----O
- (4) The bird influenza virus would not have to have any changes in its surface proteins.

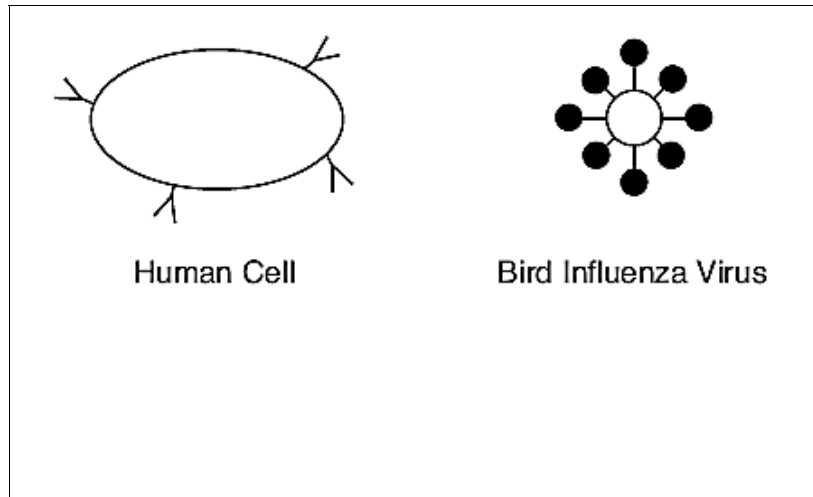
Data Base File Number: 110

Regents Date June08-53.bmp

June2008

53 6/24/2008 S4K1

Answer 1



## waste removal

677. Which structures in diagram I and diagram II carry out a similar life function?

- (1) 1 and C
- (2) 2 and D
- (3) 3 and A
- (4) 4 and B

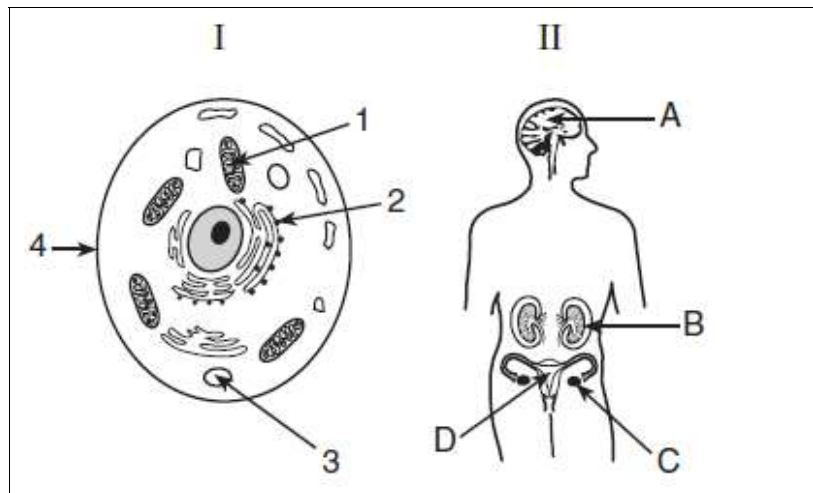
Data Base File Number: 555

Regents Date June2005-3.bmp

June2005

3 6/22/2005 S4K1

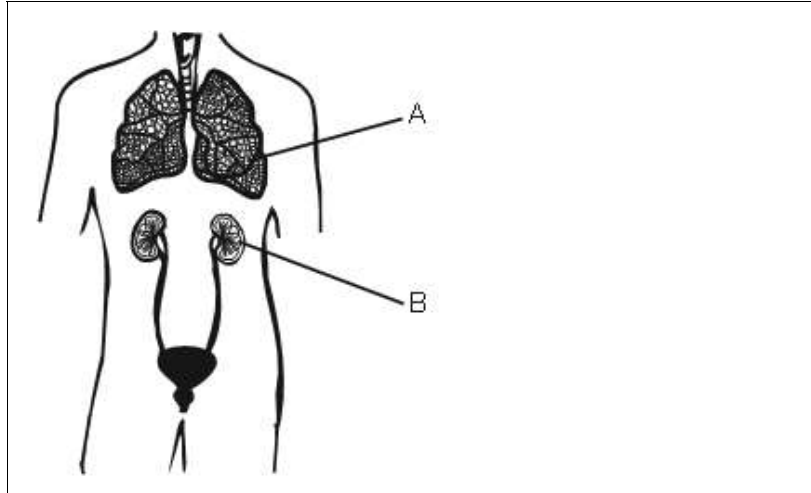
Answer 4



waste removal

678. Some organs of the human body are represented in the diagram shown. Which statement best describes the functions of these organs?

- (1) B pumps blood to A for gas exchange.
- (2) A and B both produce carbon dioxide, which provides nutrients for other body parts.
- (3) A releases antibodies in response to an infection in B.
- (4) The removal of wastes from both A and B involves the use of energy from ATP.



Data Base File Number: 183

Regents Date June09-18.bmp

June2009

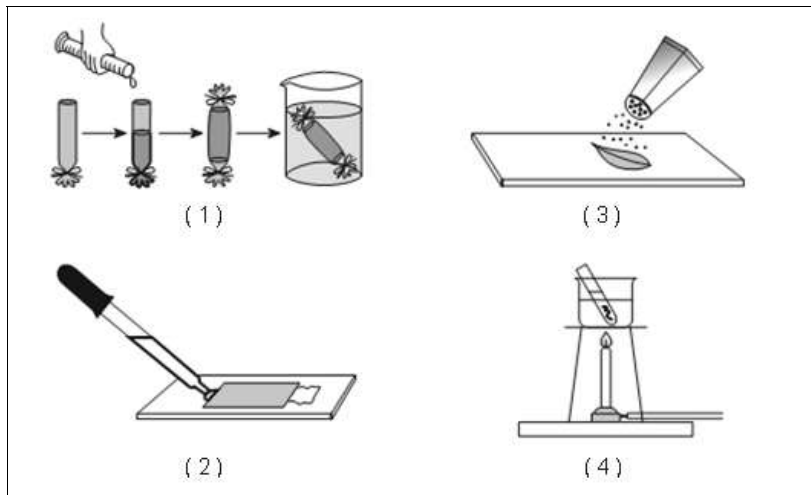
18 6/18/2009 S4K5

Answer 4

wet mount

679. A student makes a wet mount of some onion cells to be viewed using a light compound microscope. Which diagram best illustrates the technique that would most likely be used to add salt to these cells?

- (1) 1
- (2) 2
- (3) 3
- (4) 4



Data Base File Number: 208

Regents Date June09-67.bmp

June2009

67 6/18/2009 LABS

Answer 2

## wet mount

680. The diagram shows how a coverslip should be lowered onto some single-celled organisms during the preparation of a wet mount. Why is this a preferred procedure?

- (1) The coverslip will prevent the slide from breaking.
- (2) The organisms will be more evenly distributed.
- (3) The possibility of breaking the coverslip is reduced.
- (4) The possibility of trapping air bubbles is reduced.

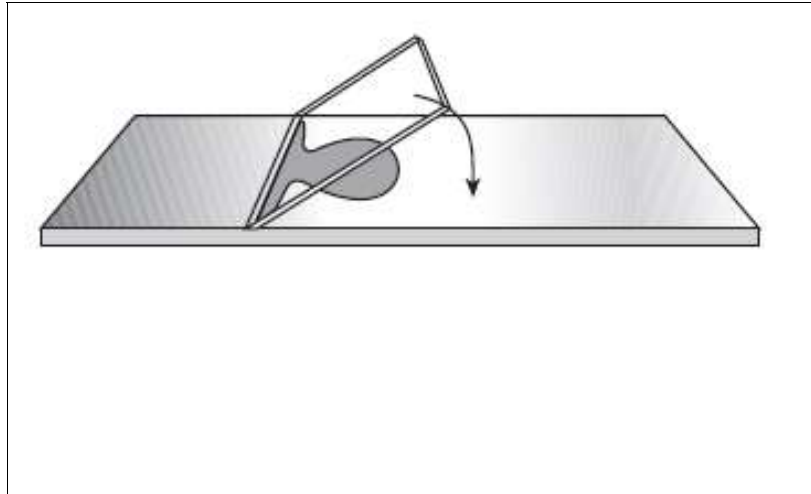
Data Base File Number: 460

Regents Date Jan2006-31.bmp

Jan2006

31 1/27/2006 LABA

Answer 4



## white blood cell

681. Base your answer to this question on the diagram shown of a slide of normal human blood and on your knowledge of biology. An increase in the production of the cells labeled A is a response to an internal environmental change. What change is most likely to cause this response?

- (1) A case of iron deficiency anemia.
- (2) An invasion of the body by microbes causing sickness.
- (3) A disease of the bone.
- (4) A cancerous tumor of the brain.

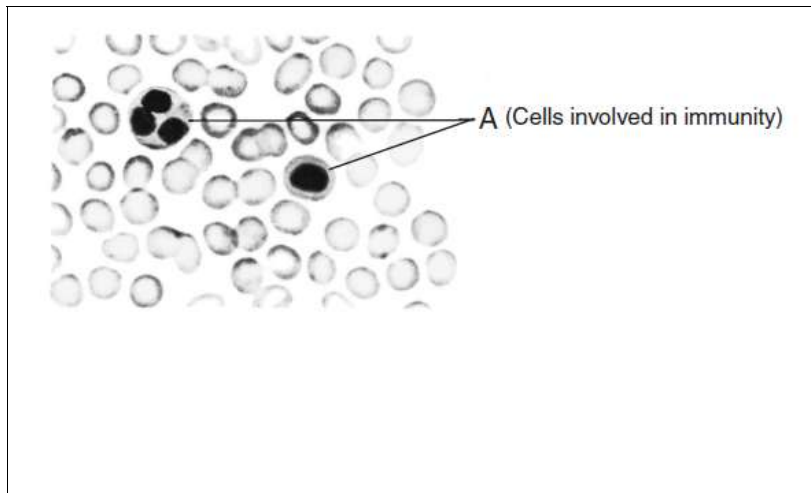
Data Base File Number: 720

Regents Date Jan2003-48.bmp

Jan2003

48 1/30/2003 S4K5

Answer 2





## white blood cell

682. Base your answer to this question on the structures in the diagram of human blood that help to maintain homeostasis in humans. What is one way a cell such as cell X helps to maintain homeostasis?

- (1) destroys antigens
- (2) transports oxygen
- (3) controls blood clotting
- (4) transports carbon dioxide

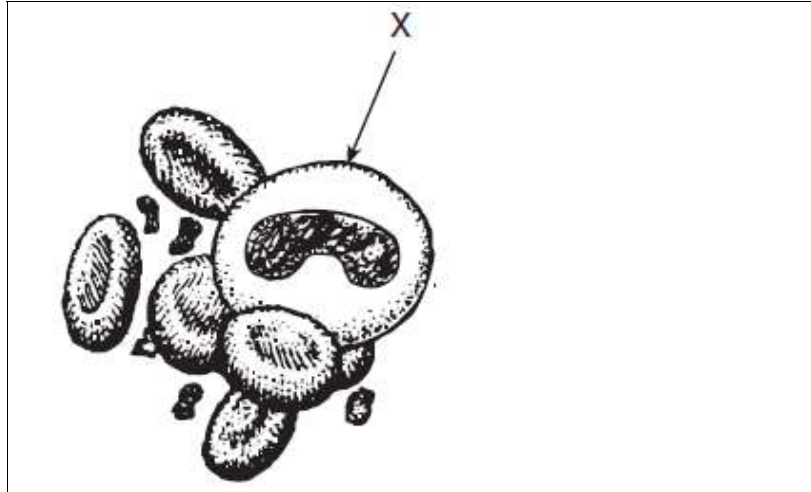
Data Base File Number: 748

Regents Date June2003-53.bmp

June2003

54 6/19/2003 S4K5

Answer 1



## white blood cell

683. The two reactions illustrated in the diagram shown often occur when a foreign substance enters the body. The cells labeled A and B are examples of cells known as

- (1) guard cells
- (2) reproductive cells
- (3) white blood cells
- (4) specialized skin cells

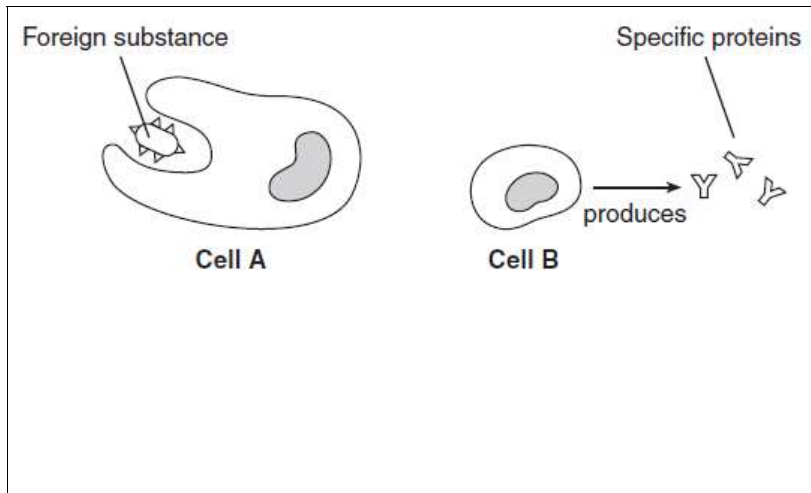
Data Base File Number: 1125

Regents Date August2016-10.b

Aug2016

10 8/18/2016 S4K5

Answer 3



## white blood cell

684. The diagram shown represents one type of white blood cell. This type of white blood cell ingests microbes. A function of another type of white blood cell is to

- (1) prevent the loss of blood from a wound
- (2) produce specialized molecules that mark invaders
- (3) increase the number of red blood cells in the blood
- (4) cause gene mutations that will increase immune responses

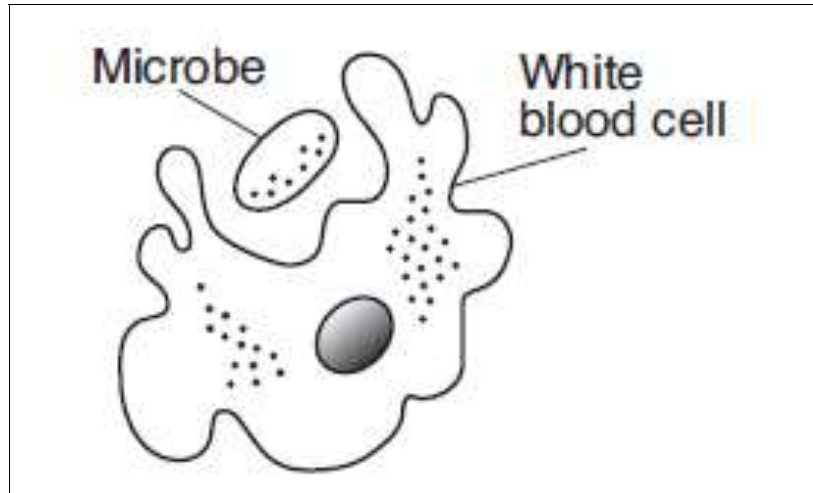
Data Base File Number: 906

Regents Date Aug2013-34.bmp

Aug2013

34 8/14/2013 S4K5

Answer 2



## white blood cell

685. The diagram shown represents a microscopic view of blood. Cell A protects the body by producing specific chemicals in response to pathogens. Cell A is

- (1) a red blood cell
- (2) a bacteria cell
- (3) an insulin-producing cell
- (4) a white blood cell

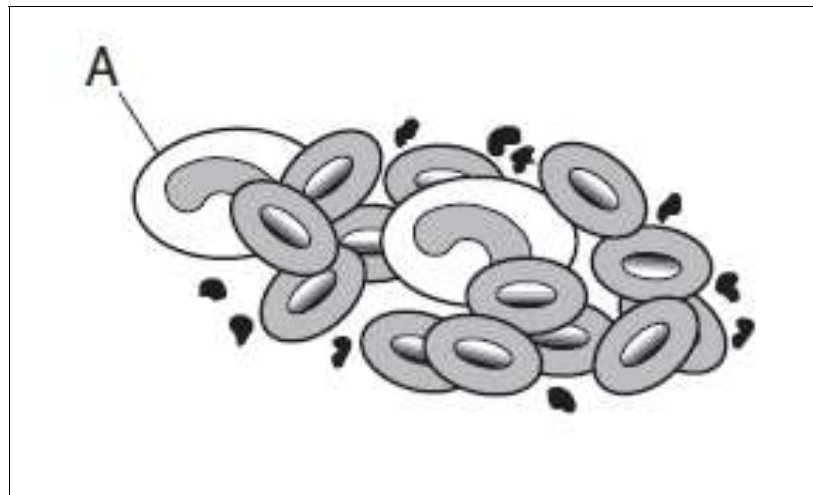
Data Base File Number: 381

Regents Date Jan2012-21.bmp

Jan2012

20 1/25/2012 S4K5

Answer 4



## zygote

686. The diagram shown represents some stages that occur in the formation of an embryo. Which statement best describes stage X?
- (1) Stage X is a zygote and contains half the number of chromosomes as the body cells of the parents.
  - (2) Stage X is formed by the process of meiosis and is known as a gamete.
  - (3) Stage X is a zygote and is formed as a result of the process of fertilization.
  - (4) Stage X is formed by mitosis and is known as an egg cell.

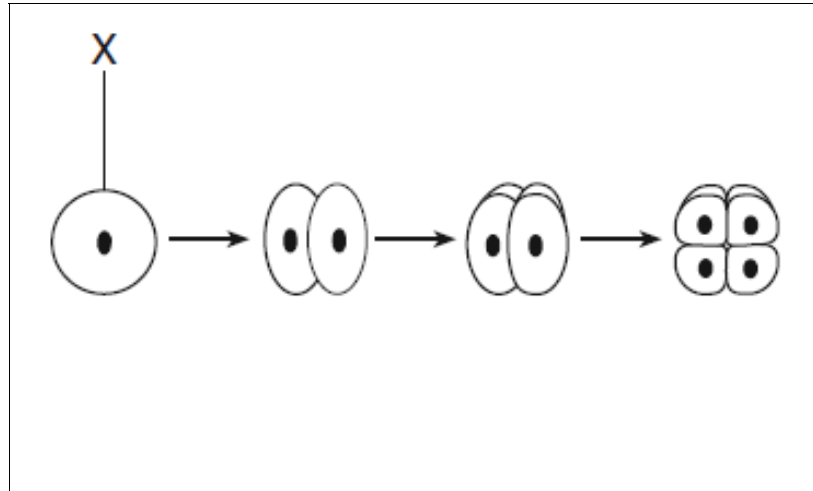
Data Base File Number: 620

Regents Date Jan2013-41.bmp

Jan2013

41 1/23/2013 S4K4

Answer 3



## zygote

687. Which phrase best describes a process represented in the diagram below?
- (1) a zygote dividing by mitosis
  - (2) a zygote dividing by meiosis
  - (3) a gamete dividing by mitosis
  - (4) a gamete dividing by meiosis

Data Base File Number: 640

Regents Date Jan2004-17.bmp

Jan2004

17 1/29/2004 S4K4

Answer 1

