

Biology Keyword / Question Dictionary - Living Environment

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abiotic

			Regents Date
		1. Abiotic factors that characterize a forest ecosystem include	Aug2008
		(1) light and biodiversity	2
S4K1		(2) temperature and amount of available water	Data Base File Number
		(3) types of producers and decomposers	
ANSWER	2	(4) pH and number of heterotrophs	132

abiotic

			Regents Date
		2. The ability to grow in size is a characteristic of living organisms. Although an icicle may grow in size over time, it is considered nonliving because there is	Aug2011
		(1) an increase in matter, but no increase in the number of icicles	1
S4K1		(2) an interaction between the icicle and the environment	Data Base File Number
		(3) no way for the icicle to move away from heat	
ANSWER	4	(4) no metabolic activity present	359

abiotic

			Regents Date
		3. In an ocean, the growth and survival of seaweed, small fish, and sharks depends on abiotic factors such as	Jan2007
		(1) sunlight, temperature, and minerals	23
S4K6		(2) sunlight, pH, and type of seaweed	Data Base File Number
		(3) number of decomposers, carbon dioxide, and nitrogen	
ANSWER	1	(4) number of herbivores, carbon, and food	64

abiotic

			Regents Date
		4. Abiotic factors that could affect the stability of an ecosystem could include	Jan2009
		(1) hurricanes, packs of wolves, and temperature	4
S4K1		(2) blizzards, heat waves, and swarms of grasshoppers	Data Base File Number
		(3) droughts, floods, and heat waves	
ANSWER	3	(4) species of fish, number of decomposers, and supply of algae	155

abiotic

5. Abiotic factors that affect the growth of grass in a lawn include
- (1) bacteria and soil
 - (2) earthworms and nutrients
 - (3) moisture and minerals
 - (4) fertilizer and decomposers

S4K6

ANSWER 3

Regents Date
Jan2010
21
Data Base File Number
243

abiotic

6. Plants are green because they contain the protein chlorophyll. A bucket was left on the lawn for one week. When the bucket was removed, the grass under the bucket had turned from green to a yellowish white color. This change is due to the interaction between the grass and
- (1) decomposer organisms in the soil, an abiotic factor
 - (2) the amount of sunlight, an abiotic factor
 - (3) increased moisture under the bucket, a biotic factor
 - (4) the metal composition of the bucket, a biotic factor

S4K2

ANSWER 2

Regents Date
Jan2012
12
Data Base File Number
400

abiotic

7. Which list contains only abiotic conditions that might be found in a pond ecosystem?
- (1) temperature of the water, green plant populations, dissolved minerals in the water
 - (2) temperature of the water, dissolved oxygen in the water, dissolved minerals in the water
 - (3) bacteria, dissolved minerals in the water, temperature of the water
 - (4) dissolved oxygen in the water, fish populations, insect populations

S4K6

ANSWER 2

Regents Date
Jan2020
2
Data Base File Number
1532

abiotic

8. Which factor would be an abiotic limiting factor for fish living in a lake in New York State?
- (1) amount of algae
 - (2) number of humans fishing
 - (3) number of fish predators
 - (4) acidity of the water

S4K1

ANSWER 4

Regents Date
Jan2023
2
Data Base File Number
1650

abiotic

9. Which process initially provides the link between an abiotic factor and the energy needs of an entire ecosystem?

- (1) respiration
- (2) photosynthesis
- (3) decomposition
- (4) predation

S4K5

ANSWER

2

Regents Date

June2011

19

Data Base File Number

342

abiotic

10. The increase of certain types of gases in the atmosphere has contributed to the problem of global warming. All these gases are

- (1) biotic factors
- (2) abiotic factors
- (3) organic factors
- (4) endangered factors

S4K6

ANSWER

2

Regents Date

June2014

5

Data Base File Number

1038

abiotic

11. As it grows from a seed to a mature plant, a plant will grow taller and thicker. Which are abiotic factors most responsible for the increase in the mass of the plant?

- (1) water, minerals, bacteria
- (2) sunlight, oxygen, plant receptors
- (3) minerals, water, plant enzymes
- (4) water, sunlight, carbon dioxide

S4K5

ANSWER

4

Regents Date

June2016

28

Data Base File Number

1231

abiotic

12. Each winter in the Adirondack Mountains, some of the salt applied to roadways gets washed into lakes. The increase in salt levels in areas where frogs breed has resulted in more male frogs hatching than females. This is an example of

- (1) asexual reproduction of male frogs
- (2) an abiotic factor affecting gene expression
- (3) the normal expression of a gene for female frogs
- (4) loss of genetic information for male frogs

S4K4

ANSWER

2

Regents Date

June2023

21

Data Base File Number

1689

abiotic

	13. Which situation is an example of an organism responding to an abiotic factor?	Regents Date June2023
S4K1	(1) Plants in a forest grow toward areas where there is more sunlight available.	4
	(2) Rabbits attract mates by performing a mating dance.	Data Base File Number
ANSWER 1	(3) Woodpeckers peck holes in the trunks of trees to find insects for food.	1677
	(4) Deer eat tree bark in winter when other food is scarce.	

absorption

	14. In the human body, oxygen is absorbed by the lungs and nutrients are absorbed by the small intestine. In a single-celled organism, this absorption directly involves the	Regents Date June2011
S4K6	(1) nucleus	28
	(2) chloroplasts	Data Base File Number
ANSWER 3	(3) cell membrane	351
	(4) chromosomes	

acid rain

	15. Acid rain is a major problem in the Adirondack Mountains. Evidence that acid rain negatively affected the Adirondack ecosystem is that	Regents Date Aug2018
S4K7	(1) this rain has increased the amount of water in Adirondack lakes	14
	(2) there has been a decrease in the variety of fish found in Adirondack lakes	Data Base File Number
ANSWER 2	(3) the amount of carbon dioxide in the air over the Adirondack Mountains has drastically decreased in recent years	1422
	(4) the number of heterotrophic organisms in Adirondack lakes has increased	

acid rain

	16. Changes in the chemical composition of the atmosphere that may produce acid rain are most closely associated with	Regents Date Jan2003
S4K7	(1) insects that excrete acids	34
	(2) runoff from acidic soils	Data Base File Number
ANSWER 3	(3) industrial smoke stack emissions	747
	(4) flocks of migrating birds	

acid rain

S4K7

ANSWER 3

17. Methods used to reduce sulfur dioxide emissions from smokestacks are an attempt by humans to
- (1) lessen the amount of insecticides in the environment
 - (2) eliminate diversity in wildlife
 - (3) lessen the environmental impact of acid rain
 - (4) use nonchemical controls on pest species

Regents Date

Jan2004

32

Data Base File Number

665

acid rain

S4K7

ANSWER 2

18. Which situation is a result of human activities?
- (1) decay of leaves in a forest adds to soil fertility
 - (2) acid rain in an area kills fish in a lake
 - (3) ecological succession following volcanic activity reestablishes an ecosystem
 - (4) natural selection on an island changes gene frequencies

Regents Date

Jan2007

26

Data Base File Number

67

acid rain

S4K6

ANSWER 3

19. In lakes in New York State that are exposed to acid rain, fish populations are declining. This is primarily due to changes in which lake condition?
- (1) size
 - (2) temperature
 - (3) pH
 - (4) location

Regents Date

Jan2009

18

Data Base File Number

165

acid rain

S4K7

ANSWER 3

20. The Cornell University News Service reported the following:
"The sugar maple is the most economically valuable tree in the eastern United States because of its high-priced lumber, syrup and tourist-attracting fall colors." The effects of acid rain now threaten the survival of these trees. This threat is the result of a human activity that has
- (1) introduced a foreign species by accident
 - (2) stabilized a forest ecosystem through technology
 - (3) weakened an ecosystem through pollution
 - (4) weakened a species by direct harvesting

Regents Date

June2018

20

Data Base File Number

1396

acid rain

Regents Date

June2023

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

----- Acid Rain -----

Acid rain comes in many forms: wet deposition, such as rain, snow, sleet, hail, and fog, and dry deposition, such as deposits of acid particles, aerosols, and gases. It is formed when

sulfur dioxide (SO₂) and nitrogen oxides (NO_x) combine with moisture in the atmosphere to produce sulfuric acid and nitric acid. Damage to aquatic and forest ecosystems, serious human illness, and the slow destruction of buildings and bridges have all been linked to acid rain. Two sources that contribute to producing acid rain include:

- Emissions from airplanes, automobiles, and industries
- Emissions of SO₂ and NO_x from power plants -----

Why does a change in the pH of lakes and forests, as a result of acid rain. Upset the dynamic equilibrium of these systems?

- (1) If the pH is altered, many organisms will not survive.
- (2) If the pH is altered, all reproduction stops.
- (3) If the pH is altered, oxygen levels in the air are greatly lowered.
- (4) If the pH is altered, plant mutations will occur.

56

S4K6

Data Base File Number

ANSWER

1

1702

acquired characteristic

Regents Date

Aug2003

22. People with cystic fibrosis inherit defective genetic information and cannot produce normal CFTR proteins. Scientists have used gene therapy to insert normal DNA segments that code for the missing CFTR protein into the lung cells of people with cystic fibrosis. Which statement does not describe a result of this therapy?

- (1) Altered lung cells can produce the normal CFTR protein.
- (2) Altered lung cells can divide to produce other lung cells with the normal CFTR gene.
- (3) The normal CFTR gene may be expressed in altered lung cells.
- (4) Offspring of someone with altered lung cells will inherit the normal CFTR gene.

12

S4K2

Data Base File Number

ANSWER

4

789

acquired characteristic

	23. A basketball player develops speed and power as a result of practice. This athletic ability will NOT be passed on to her offspring because	Regents Date Jan2007
S4K2	(1) muscle cells do not carry genetic information	24
	(2) mutations that occur in body cells are not inherited	Data Base File Number
ANSWER 4	(3) gametes do not carry complete sets of genetic information	
	(4) base sequences in DNA are not affected by this activity	65

acquired characteristic

	24. A weightlifter has spent years building his muscular strength. His newborn daughter has normal strength for a baby. Which statement best explains this situation?	Regents Date June2021
S4K2	(1) A daughter inherits most of her traits from her mother. The daughter's muscles are unlikely to resemble her father's.	10
	(2) The weightlifter's wife probably did not lift weights. Both parents must have this trait before the baby can inherit it.	Data Base File Number
ANSWER 4	(3) Babies do not have strong muscles. The daughter's muscles will be unusually strong in a few more months.	
	(4) The weightlifter's highly developed muscles resulted from exercise. A characteristic such as this will not be inherited.	1568

active transport

	25. If the concentration of sodium is greater outside a cell than inside the cell, which process could move sodium out of the cell?	Regents Date Aug2015
S4K2	(1) diffusion	9
	(2) carbohydrate synthesis	Data Base File Number
ANSWER 3	(3) active transport	
	(4) digestion	1156

active transport

26. The calcium concentration in the root cells of certain plants is higher than in the surrounding soil. Calcium may continue to enter the root cells of the plant by the process of

- (1) diffusion
- (2) respiration
- (3) active transport
- (4) protein synthesis

S4K1

ANSWER 3

Regents Date

Jan2012

2

Data Base File Number

390

active transport

27. The concentration of potassium is higher in red blood cells than in the surrounding blood plasma. This higher concentration is maintained by the process of

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

S4K1

ANSWER 4

Regents Date

Jan2014

1

Data Base File Number

998

adaptation

28. According to the theory of natural selection, why are some individuals more likely than others to survive and reproduce?

- (1) Some individuals pass on to their offspring new characteristics they have acquired during their lifetimes.
- (2) Some individuals are better adapted to exist in their environment than others are.
- (3) Some individuals do not pass on to their offspring new characteristics they have acquired during their lifetimes.
- (4) Some individuals tend to produce fewer offspring than others in the same environment.

S4K3

ANSWER 2

Regents Date

Aug2001

14

Data Base File Number

924

adaptation

29. When a particular white moth lands on a white birch tree, its color has a high adaptive value. If the birch trees become covered with black soot, the white color of this particular moth in this environment would most likely

- (1) retain its adaptive value
- (2) increase in adaptive value
- (3) change to a more adaptive black color
- (4) decrease in adaptive value

S4K3

ANSWER 4

Regents Date

Aug2004

24

Data Base File Number

714

adaptation

S4K3

30. The theory of biological evolution includes the concept that
- (1) species of organisms found on Earth today have adaptations not always found in earlier species
 - (2) fossils are the remains of present-day species and were all formed at the same time
 - (3) individuals may acquire physical characteristics after birth and pass these acquired characteristics on to their offspring
 - (4) the smallest organisms are always eliminated by the larger organisms within the ecosystem

Regents Date

Aug2004
15

Data Base File
Number

706

ANSWER

1

adaptation

S4K3

31. The crucian carp, a Scandinavian fish, thrives in shallow ponds that freeze over during winter. While other creatures in the pond die from lack of oxygen, these carp are able to obtain energy through a biochemical pathway that does not require oxygen. This characteristic is an example of a
- (1) feedback mechanism common to carnivores that inhabit shallow pond ecosystems
 - (2) favorable adaptive trait that has led to increased survival
 - (3) stage of succession that leads to a new community
 - (4) gene mutation that occurred because carp need to survive to maintain ecological stability

Regents Date

Aug2012

13

Data Base File
Number

454

ANSWER

2

adaptation

S4K3

32. In a certain species of insect, some individuals have flattened white disks on their bodies that protrude and interlock, resembling an orchid flower. This adaptation provides the insect with a better opportunity to capture its prey. If environmental conditions remain unchanged, it is most likely that, in future generations, the proportion of the population with this adaptation will
- (1) increase, only
 - (2) decrease, only
 - (3) increase, then decrease
 - (4) decrease, then increase

Regents Date

Aug2013

11

Data Base File
Number

978

ANSWER

1

adaptation

S4K3	33. Male turkeys are birds that naturally strut and display their large tail feathers, which attracts female turkeys. This display is an example of	Regents Date
		Aug2015
ANSWER	1	13
		Data Base File Number
	(1) a behavioral adaptation	1160
	(2) selective breeding	
	(3) asexual reproduction	
	(4) a learned behavior	

adaptation

S4K3	34. Which statement best illustrates a rapid biological adaptation that has actually occurred?	Regents Date
		Jan2003
ANSWER	1	14
		Data Base File Number
	(1) Pesticide-resistant insects have developed in certain environments.	734
	(2) Scientific evidence indicates that dinosaurs once lived on land.	
	(3) Paving large areas of land has decreased habitats for certain organisms.	
	(4) The characteristics of sharks have remained unchanged over a long period of time.	

adaptation

S4K3	35. When the adaptive characteristics of a species are insufficient to allow its survival, that species is likely to	Regents Date
		Jan2010
ANSWER	4	15
		Data Base File Number
	(1) mate with other species	238
	(2) produce a beneficial mutation	
	(3) form a fossil	
	(4) become extinct	

adaptation

S4K3	36. Mother rattlesnakes care for and protect their young. Baby rattlesnakes find safety in the coils of their mothers. Female snakes stay together for the first few weeks after giving birth. This gathering of female rattlesnakes provides a safe environment for newborn rattlers. This is an example of which type of adaptation?	Regents Date
		Jan2015
ANSWER	4	36
		Data Base File Number
	(1) structural	1119
	(2) nutritional	
	(3) molecular	
	(4) behavioral	

adaptation

S4K3	ANSWER 1	37. One explanation for the variety of organisms present on Earth today is that over time	Regents Date June2001
		(1) new species have adapted to fill available niches in the environment	17
		(2) evolution has caused the appearance of organisms that are similar to each other	Data Base File Number
		(3) each niche has changed to support a certain variety of organism	899
		(4) the environment has remained unchanged, causing rapid evolution	

adaptation

S4K3	ANSWER 4	38. When is extinction of a species most likely to occur?	Regents Date June2008
		(1) when environmental conditions remain the same and the proportion of individuals within the species that lack adaptive traits increases	14
		(2) when environmental conditions remain the same and the proportion of individuals within the species that possess adaptive traits increases	Data Base File Number
		(3) when environmental conditions change and the adaptive traits of the species favor the survival and reproduction of some of its members	113
		(4) when environmental conditions change and the members of the species lack adaptive traits to survive and reproduce	

adaptation

S4K4	ANSWER 4	39. Many female mammals, such as dogs, give birth to litters consisting of multiple offspring. All of the characteristics described below are reproductive adaptations that female dogs have for giving birth and caring for several offspring at once, EXCEPT	Regents Date June2021
		(1) a specialized structure for internal development of several young	15
		(2) several pairs of mammary glands that provide milk for their pups	Data Base File Number
		(3) ovaries capable of releasing many gametes at one time for fertilization	1571
		(4) a pancreas that produces excess insulin to trigger the release of eggs	

adaptation

Regents Date
June2022

40. Base your answers to this question on the passage given and on your knowledge of biology. "Bed Bugs...They're Back!"
Bed bugs aren't just a problem from centuries past. Bed bug infestations have been increasing for more than a decade. This has been largely due to the insects' ability to quickly develop resistance to the insecticides used to kill them. Bed bugs have a tough outer coat, called a cuticle, which helps protect them. Researchers have found that some resistant bed bugs have gene mutations that allow the cuticle to produce substances that break down the insecticides. Others have gene mutations that direct the building of biological pumps, which allow the cuticle to pump the harmful insecticide out of the bug. -----The substances which allow the bed bugs to break down insecticides and the biological pumps which remove the insecticides from the bed bugs are examples of
- (1) the failure of homeostasis
 - (2) genetic engineering
 - (3) biological adaptations
 - (4) selective breeding

S4K3

41

Data Base File
Number

1624

ANSWER 3

AIDS

Regents Date
Aug2001

41. Which disease damages the human immune system, leaving the body open to certain infectious agents?
- (1) flu
 - (2) AIDS
 - (3) chicken pox
 - (4) pneumonia

S4K5

20

Data Base File
Number

929

ANSWER 2

AIDS

Regents Date
Aug2002

42. Which condition would most likely result in a human body being unable to defend itself against pathogens and cancerous cells?
- (1) a genetic tendency toward a disorder such as diabetes
 - (2) a parasitic infestation of ringworm on the body
 - (3) the production of antibodies in response to an infection in the body
 - (4) the presence in the body of the virus that causes AIDS

S4K5

25

Data Base File
Number

824

ANSWER 4

AIDS

S4K5	ANSWER 1	43. People with AIDS are unable to fight multiple infections because the virus that causes AIDS	Regents Date Jan2002
		(1) weakens their immune systems	20
		(2) produces antibodies in their blood	Data Base File Number
		(3) attacks muscle tissue	868
		(4) kills pathogens	

AIDS

S4K5	ANSWER 3	44. Blood can be tested to determine the presence of the virus associated with the development of AIDS. This blood test is used directly for	Regents Date Jan2003
		(1) cure	19
		(2) treatment	Data Base File Number
		(3) diagnosis	737
		(4) prevention	

AIDS

S4K5	ANSWER 2	45. "Pneumocystis" is an organism normally found in the human lungs that can cause pneumonia. It seldom causes problems in individuals with healthy immune systems. However, people with AIDS sometimes become seriously ill with pneumonia. This is most likely due to the fact that individuals with AIDS have	Regents Date Jan2015
		(1) inherited a tendency to contract pneumonia	22
		(2) difficulty fighting off infections	Data Base File Number
		(3) an allergy to this organism	1109
		(4) hormones that strengthen the infection	

AIDS

S4K5	ANSWER 1	46. The virus that causes AIDS is damaging to the body because it	Regents Date June2009
		(1) targets cells that fight invading microbes	20
		(2) attacks specific red blood cells	Data Base File Number
		(3) causes an abnormally high insulin level	190
		(4) prevents the normal transmission of nerve impulses	

AIDS

			Regents Date
			June2014
			9
			Data Base File Number
			1042
S4K5	47.	Which type of pathogenic microbe causes AIDS?	
	(1)	a bacterium	
	(2)	a virus	
	(3)	a multicellular fungus	
	(4)	a single-celled algae	
ANSWER	2		

allergy

			Regents Date
			Aug2001
			25
			Data Base File Number
			933
S4K5	48.	In some individuals, the immune system attacks substances such as grass pollen that are usually harmless, resulting in	
	(1)	an allergic reaction	
	(2)	a form of cancer	
	(3)	an insulin imbalance	
	(4)	a mutation	
ANSWER	1		

allergy

			Regents Date
			Aug2002
			26
			Data Base File Number
			825
S4K5	49.	Scientific studies have indicated that there is a higher percentage of allergies in babies fed formula containing cow's milk than in breast-fed babies. Which statement represents a valid inference made from these studies?	
	(1)	Milk from cows causes allergic reactions in all infants.	
	(2)	Breast feeding prevents all allergies from occurring.	
	(3)	There is no relationship between drinking cow's milk and having allergies.	
	(4)	Breast milk most likely contains fewer substances that trigger allergies.	
ANSWER	4		

allergy

			Regents Date
			Aug2014
			26
			Data Base File Number
			1087
S4K5	50.	An allergic reaction to certain types of natural, unprocessed foods, such as peanuts, is caused by	
	(1)	a lack of digestive enzymes	
	(2)	a response to specific antigens	
	(3)	microorganisms living within the food	
	(4)	high levels of carbon dioxide in the air	
ANSWER	2		

allergy

S4K5	ANSWER 3	51. An immune response to an usually harmless environmental substance is known as	Regents Date Aug2018
		(1) an antigen	19
		(2) a vaccination	Data Base File Number
		(3) an allergy	1426
		(4) a mutation	

allergy

S4K5	ANSWER 4	52. Responses of the immune system to usually harmless environmental substances are known as	Regents Date Jan2013
		(1) antigen production	22
		(2) chromosomal mutations	Data Base File Number
		(3) pathogens	634
		(4) allergies	

allergy

S4K5	ANSWER 3	53. Which disorder could develop in the human body when the immune system attacks a usually harmless environmental substance?	Regents Date Jan2014
		(1) cancer	14
		(2) AIDS	Data Base File Number
		(3) an allergy	1008
		(4) an infection	

allergy

S4K5	ANSWER 2	54. One result of the ability of organisms to detect and appropriately respond to stimuli is	Regents Date Jan2023
		(1) an organ malfunction	9
		(2) an allergic reaction	Data Base File Number
		(3) dynamic equilibrium	1655
		(4) gene manipulation	

allergy

S4K5	ANSWER	3	55. Allergic reactions are most closely associated with (1) the action of circulating hormones (2) a low blood sugar level (3) immune responses to usually harmless substances (4) the shape of red blood cells	Regents Date
				June2002 21
				Data Base File Number
				847

allergy

S4K5	ANSWER	4	56. Many adults lack the ability to digest the milk sugar, lactose. Often, this is due to the insufficient production of the enzyme lactase, which breaks down lactose. This is not due to an allergy to milk. Milk allergies are different because they (1) are often not harmful to the person (2) result in a build-up of the substance in the body (3) are the result of the digestive system attacking the substance (4) result from an overreaction of the immune system to a harmless substance	Regents Date
				June2002 17
				Data Base File Number
				1614

alternate energy

S4K7	ANSWER	2	57. Some people see the benefit of wind energy as a clean alternative to fossil fuels for energy production. Others believe it is dangerous for migratory birds. These opinions best illustrate that decisions about alternate energy sources (1) will usually favor older methods of energy production over newer methods (2) must be made by weighing the risks and costs against the benefits (3) must be made by taking into account the present needs of the citizens without looking toward the future (4) should be the responsibility of each individual	Regents Date
				Jan2012 25
				Data Base File Number
				409

alternate fuel

		Regents Date
		Aug2014
S4K7	58. The increased use of wind turbines and solar collectors to generate electric power will	25
	(1) negatively affect ecosystems by increasing biodiversity	
	(2) negatively alter the chemical composition of soil and water	Data Base File Number
ANSWER	(3) reduce the amount of pollution that comes from the burning of fossil fuels	
3	(4) increase oil consumption for business and industry	1085

alternate fuel

		Regents Date
		Jan2010
S4K7	59. The increasing demands for fossil fuels has led government and businesses to consider several possibilities to solve the energy crisis. Which solution will reduce the impact of this crisis on the environment and future generations?	30
	(1) increase the number of drilling sites for crude oil in North America	
	(2) build more power plants away from population centers	Data Base File Number
ANSWER	(3) limit the number of people in each vehicle	
4	(4) develop alternative fuel sources that can be produced from renewable resources	250

amino acid chains

		Regents Date
		June2011
S4K5	60. Many biological catalysts, hormones, and receptor molecules are similar in that, in order to function properly, they must	25
	(1) interact with each other at a high pH	
	(2) interact with molecules that can alter their specific bonding patterns	Data Base File Number
ANSWER	(3) contain amino acid chains that fold into a specific shape	
3	(4) contain identical DNA base sequences	348

amino acid sequences

S4K1	61. The sequence of subunits in a protein is most directly dependent on the	(1) region in the cell where enzymes are produced	Regents Date
			Jan2004
ANSWER	2	(2) DNA in the chromosomes in a cell	7
		(3) type of cell in which starch is found	Data Base File Number
		(4) kinds of materials in the cell membrane	649

amino acid sequences

S4K2	62. Even though human proteins are synthesized from only 20 different amino acids, there are thousands of different proteins found in human cells. This great variety of proteins is possible because the	(1) size of a specific amino acid can vary within a protein	Regents Date
			Jan2016
ANSWER	3	(2) chemical composition of a specific amino acid can vary	10
		(3) sequence and number of amino acids can be different in each protein	Data Base File Number
		(4) same amino acid can have many different properties	1187

amino acid sequences

S4K2	63. Grasshopper mice feed on bark scorpions, but, unlike other mice, grasshopper mice are unaffected by the painful venom of the scorpion. Scientists have determined that these mice have one amino acid difference in their pain receptors, which causes the receptor to function differently and prevents feeling the pain associated with the scorpion venom. This change in protein function was originally caused by a change in	(1) molecular bases located in the nucleus	Regents Date
			June2024
ANSWER	1	(2) fat molecules in the cell membrane	33
		(3) the amino acids in the DNA	Data Base File Number
		(4) the genes located in the protein	1777

amino acids

S4K2	64. The basic building blocks of a protein are	(1) glucose molecules	Regents Date
			Aug2015
ANSWER	2	(2) amino acids	10
		(3) hotmones	Data Base File Number
		(4) fats	1157

amino acids

		Regents Date
		Jan2020
	65. There are over 2000 kinds of edible insects in the world, and they are becoming an increasingly popular source of protein. One cup of cricket flour contains over 28 grams of protein. The building blocks of the protein in cricket flour are	
S4K1	(1) amino acids	1
	(2) water	Data Base File Number
ANSWER 1	(3) simple sugars	1531
	(4) carbohydrates	

amino acids

		Regents Date
		June2019
	66. The expression of a trait is directly dependent on the	23
S4K2	(1) arrangement of amino acids in the protein synthesized	
	(2) shape of the subunits in the DNA molecule	Data Base File Number
ANSWER 1	(3) number of chromosomes present in the nucleus	1483
	(4) sequence of bases coded for by the ribosome	

antibiotic

		Regents Date
		Aug2011
	67. If the same antibiotic is used too many times, it can become less effective against a certain type of bacteria. This observation is best explained by the	
S4K3	(1) presence of pathogens in antibiotics	11
	(2) production of antibiotics by white blood cells	Data Base File Number
ANSWER 4	(3) replication of viruses that attack bacteria	364
	(4) survival and reproduction of unaffected bacteria	

antibiotic resistance

		Regents Date
		Aug2009
	68. When antibiotics were first developed, most infectious diseases could be controlled by them. Today, certain bacteria are resistant to many antibiotics. One possible explanation for this change is that	
S4K3	(1) the antibiotics killed most of the bacteria that did not have a genetic variation for resistance	13
	(2) the bacteria needed to change in order to produce more antibiotics	Data Base File Number
ANSWER 1	(3) some of the bacteria learned how to resist the antibiotics	208
	(4) antibiotics have become weaker over the years	

antibiotic resistance

69. Certain antibacterial soaps kill 99% of the bacteria present on hands. Constant use of these soaps could be harmful over time because

- (1) more pathogens may be resistant to the soap
- (2) microbes prevent viral diseases
- (3) large populations of pathogens are beneficial to the hands
- (4) the soap stimulates skin cell division

S4K3

ANSWER 1

Regents Date

Aug2013

7

Data Base File Number

975

antibiotic resistance

70. Antibiotics are substances used to help fight an infection of "Streptococcus", a bacterium that causes strep throat. Overuse of these antibiotics can

- (1) prevent future infections by these pathogens
- (2) cause a decrease in the production of enzymes
- (3) allow organic molecules to be synthesized
- (4) select for resistant organisms

S4K3

ANSWER 4

Regents Date

Aug2014

26

Data Base File Number

1086

antibiotic resistance

71. Medical professionals are concerned with the increase in the number of bacterial species that are resistant to antibiotics. Once resistance appears in a bacterial population, it spreads rapidly. This is most likely because

- (1) populations of resistant bacteria are small
- (2) exposure to antibiotics increases the rate of reproduction in bacteria
- (3) resistant bacteria are small when compared to non-resistant bacteria
- (4) resistant bacteria survive in greater numbers and pass the trait to their offspring

S4K3

ANSWER 4

Regents Date

June2015

26

Data Base File Number

1139

antibiotic resistance

		Regents Date
		June2016 17
S4K3	72. Which occurrence represents an example of evolution? (1) Exposure to radiation reduces the rate of mutation in leaf cells (2) A mutation in a liver cell causes a person to produce an enzyme that is less efficient. (3) Cells in a zygote eventually change into bone cells or skin cells. (4) Some antibiotics are almost useless, because pathogens have developed a resistance to these antibiotics.	Data Base File Number
ANSWER	4	1221

antibiotic resistance

		Regents Date
		June2021
S4K3	73. Base your answer to this question on the information given and on your knowledge of biology. A scientist added an antibiotic to a Petri dish containing bacterial colonies. A day later, the scientist noticed that many colonies had died, but a few remained. The scientist continued to observe the dish and noted that, eventually, the remaining colonies of bacteria increased in size. The survival of some bacterial colonies was most likely due to (1) the bacterial cells changing so that they could live (2) a resistance to the antibiotic (3) meiotic cell division in the bacteria (4) a DNA change caused by the antibiotic	Data Base File Number
ANSWER	2	49 1586

antibodies

		Regents Date
		Aug2019 30
S4K7	74. The role of antibodies in the human body is to (1) stimulate pathogen reproduction to produce additional white blood cells (2) increase the production of guard cells to defend against pathogens (3) promote the production of antigens to stimulate an immune response (4) recognize foreign antigens and mark them for destruction	Data Base File Number
ANSWER	4	1520

antibodies

S4K5	ANSWER 1	75. A relatively large number of antibodies in a blood sample would most likely indicate that there is	Regents Date	Aug2024
			Data Base File Number	21
		(1) an infection in the body		
		(2) a mutation in the lung		
		(3) a deficiency of carbon dioxide in the circulatory system		1800
		(4) an insufficient amount of a specific vitamin in the diet		

antibodies

S4K5	ANSWER 2	76. A part of the Hepatitis B virus is synthesized in the laboratory. This viral particle can be identified by the immune system as a foreign material but the viral particle is not capable of causing disease. Immediately after this viral particle is injected into a human it	Regents Date	Jan2004
			Data Base File Number	28
		(1) stimulates the production of enzymes that are able to digest the Hepatitis B virus		
		(2) triggers the formation of antibodies that protect against the Hepatitis B virus		662
		(3) synthesizes specific hormones that provide immunity against the Hepatitis B virus		
		(4) breaks down key receptor molecules so that the Hepatitis B virus can enter body cells		

antibodies

S4K5	ANSWER 2	77. It is recommended that people at risk for serious flu complications be vaccinated so that their bodies will produce	Regents Date	Jan2011
			Data Base File Number	29
		(1) antigens to fight the flu virus		
		(2) antibodies against the flu virus		326
		(3) toxins to fight the infection caused by the flu virus		
		(4) antibiotics to reduce symptoms caused by the flu virus		

antibodies

S4K5	ANSWER 3	78. The human immune system fights infection by releasing	Regents Date	Jan2014
			Data Base File Number	7
		(1) ATPs		
		(2) antibiotics		1003
		(3) antibodies		
		(4) antigens		

antibodies

S4K5	79. The diagnostic test for HIV, the virus that causes AIDS, involves testing the blood for antibodies associated with this pathogen. Antibodies are produced when the body	Regents Date
		Jan2019
		38
		Data Base File Number
ANSWER	3	1462
(1)	stimulates enzyme production	
(2)	secretes specific hormones	
(3)	detects foreign antigens	
(4)	synthesizes microbes	

antibodies

S4K5	80. Which statement does NOT identify a characteristic of antibodies?	Regents Date
		June2001
		26
		Data Base File Number
ANSWER	3	905
(1)	They are produced by the body in response to the presence of foreign substances.	
(2)	They may be produced in response to an antigen.	
(3)	They are nonspecific, acting against any foreign substance in the body.	
(4)	They may be produced by white blood cells.	

antibodies

S4K5	81. A new vaccine was developed and then tested on a large sample of individuals. This new vaccine will be considered effective if it helps prepare the body to fight future invasion by	Regents Date
		June2014
		17
		Data Base File Number
ANSWER	4	1048
(1)	inhibiting the response of red blood cells	
(2)	stimulating the reproduction of microbes	
(3)	inhibiting the action of immune cells	
(4)	stimulating the production of antibodies	

antibodies

S4K5	82. The typical response of the human body to an infection by bacteria is to	Regents Date
		June2018
		40
		Data Base File Number
ANSWER	4	1407
(1)	stimulate the production of antigens	
(2)	decrease the number of enzymes in the blood	
(3)	ignore the organisms, unless they are pathogens	
(4)	produce white blood cells and antibodies	

antibodies

S4K5	ANSWER 1	83. After a kidney transplant, special medications are taken. Otherwise, the patient's immune system might react to the transplanted kidney by	Regents Date June2022
		(1) producing specialized proteins that would attack the kidney	20
		(2) signaling the body to synthesize new DNA molecules	Data Base File Number
		(3) stimulating the circulatory system to attack red blood cells	1617
		(4) stimulating the kidney to produce reproductive hormones	

antibodies

S4K5	ANSWER 2	84. The human body fights an infection when a pathogen is detected. As a result, the pathogen stimulates the production of	Regents Date June2022
		(1) bacteria	9
		(2) antibodies	Data Base File Number
		(3) vaccines	1611
		(4) antibiotics	

antibodies

S4K5	ANSWER 4	85. Antibodies produced against one pathogen infecting the human body may not work against a different pathogen because antibodies are	Regents Date June2023
		(1) only produced once in the body so they can't work on any other infection	27
		(2) unable to produce effective antibiotics against the infection	Data Base File Number
		(3) made of DNA the second pathogen doesn't contain	1694
		(4) specific for the shape of the proteins present on a particular pathogen	

antigen / antibody

S1K2	ANSWER 3	86. A researcher needs information on antigen-antibody reactions. Searching for which phrase would best lead the researcher to information about these reactions?	Regents Date Aug2002
		(1) protein synthesis	36
		(2) energy sources in nature	Data Base File Number
		(3) white blood cell activity	832
		(4) DNA replication	

antigens

			Regents Date Aug2009
	87.	To replace burned skin, doctors can successfully transplant replacement skin taken from another part of the body of the burn victim. Which statement best explains why the transplanted skin is NOT rejected?	
S4K5	(1)	The transplanted skin is damaged, making the immune system nonfunctional.	18
	(2)	The antigens of the replacement skin are the same as those of the damaged skin.	Data Base File Number
ANSWER	(3)	Burn victims lose so much blood that white blood cells cannot cause an immune response.	
2	(4)	There is no blood supply to the skin, so mixing of antigens does not occur.	213

antigens

			Regents Date Aug2010
	88.	Drugs to reduce the risk of rejection are given to organ transplant patients because the donated organ contains	
S4K5	(1)	foreign antigens	19
	(2)	foreign antibodies	Data Base File Number
ANSWER	(3)	DNA molecules	
1	(4)	pathogenic microbes	293

antigens

			Regents Date Aug2015
	89.	Every time a child visited a cousin who has two cats, the child's eyes turned red, itched, and began to water. Then, the child began to have trouble breathing. It is most likely that the child reacted this way because	
S4K5	(1)	normally harmless cat antigens stimulated the immune system	22
	(2)	it is difficult for the respiratory system to filter cat antigens out of the inhaled air	Data Base File Number
ANSWER	(3)	cat antigens are a health hazard, since they always cause disease	
1	(4)	cat antigens stop the immune system from making antibodies, so bacteria cause these responses	1168

antigens

S4K4	ANSWER 2	90. When would exposure to a potentially harmful substance be most likely to damage many organs in a developing embryo? (1) during the last three months of pregnancy (2) during the early stages of pregnancy (3) during the formation of the zygote (4) during meiosis in both males and females	Regents Date Aug2016
			21
			Data Base File Number 1254

antigens

S4K5	ANSWER 3	91. An immune response is primarily due to the body's white blood cells recognizing (1) a hormone imbalance (2) abiotic organisms (3) foreign antigens (4) known antibiotics	Regents Date Aug2018
			2
			Data Base File Number 1412

antigens

S4K5	ANSWER 1	92. Certain microbes, foreign tissues, and some cancerous cells can cause immune responses in the human body because all three contain (1) antigens (2) enzymes (3) fats (4) cytoplasm	Regents Date June2003
			31
			Data Base File Number 773

antigens

S1K1	ANSWER 4	93. In an experiment, DNA from dead pathogenic bacteria was transferred into living bacteria that do not cause disease. These altered bacteria were then injected into healthy mice. These mice died of the same disease caused by the original pathogens. Based on this information, which statement would be a valid conclusion? (1) DNA is present only in living organisms. (2) DNA functions only in the original organism of which it was a part. (3) DNA changes the organism receiving the injection into the original organism. (4) DNA from a dead organism can become active in another organism.	Regents Date June2003
			39
			Data Base File Number 778

antigens

		Regents Date June2013
	94. A 6-year-old child ate a peanut butter sandwich at snack time in school. Five minutes later, her throat became swollen and she collapsed. This allergic reaction occurred because her body	
S4K5	(1) recognized an antigen in peanut butter and produced antibodies against it	24
	(2) digested the white blood cells that can recognize an antigen in peanut butter	Data Base File Number
ANSWER	(3) did not recognize an antigen in peanut butter and could not produce antibodies against it	
4	(4) recognized an antigen in peanut butter and produced an immune response	962

antigens

		Regents Date June2014
	95. Cells of the immune system are able to respond to the presence of invading organisms because they recognize the	
S4K5	(1) antigens present on the invaders	21
	(2) antibodies present in invading pathogens	Data Base File Number
ANSWER	(3) DNA pattern in the nuclei of viruses	
1	(4) antibiotics released from microbes	1052

antigens

		Regents Date June2023
	96. Which substances usually stimulate an immune response?	
S4K5	(1) antibodies	22
	(2) antigens	Data Base File Number
ANSWER	(3) carbon dioxide molecules	
2	(4) biological catalysts	1690

asexual

		Regents Date Aug2011
	97. Asexual reproduction produces offspring that each contain	14
S4K2	(1) genetic information from one parent	Data Base File Number
	(2) genetic information from two parents	
ANSWER	(3) less genetic information than either parent	
1	(4) a unique combination of genetic information	367

asexual reproduction

		Regents Date Aug2001
	98. Which phrases best identify characteristics of asexual reproduction?	11
S4K2	(1) one parent, union of gametes, offspring similar to but not genetically identical to the parent	
	(2) one parent, no union of gametes, offspring genetically identical to parents	Data Base File Number
ANSWER	(3) two parents, union of gametes, offspring similar to but not genetically identical to parents	
2	(4) two parents, no union of gametes, offspring genetically identical to parents	921

asexual reproduction

		Regents Date Aug2004
	99. A variation causes the production of an improved variety of apple. What is the best method to use to obtain additional apple trees of this variety in the shortest period of time?	25
S4K4	(1) selective breeding	
	(2) natural selection	Data Base File Number
ANSWER	(3) asexual reproduction	
3	(4) hormone therapy	715

asexual reproduction

		Regents Date Aug2006
	100. A certain bacterial colony originated from the division of a single bacterial cell. Each cell in this colony will most likely	15
S4K4	(1) express adaptations unlike those of the other cells	
	(2) replicate different numbers of genes	Data Base File Number
ANSWER	(3) have a resistance to different antibiotics	
4	(4) synthesize the same proteins and enzymes	532

asexual reproduction

		Regents Date Aug2009
	101. Thousands of genetically identical trees have been discovered growing in a remote, undisturbed mountain area in Colorado. These trees are most likely the result of	14
S4K2	(1) genetic engineering	
	(2) asexual reproduction	Data Base File Number
ANSWER	(3) meiotic cell division	
2	(4) biotechnology	209

asexual reproduction

		Regents Date
		Aug2015
		3
S4K2	102. When an organism reproduces asexually, it usually has	Data Base File Number
	(1) only one parent, and half as much DNA as the parent	
	(2) only one parent, and the same chromosome number as the parent	
ANSWER	(3) two parents, and twice as much DNA as either parent	1151
2	(4) two parents, and the same chromosome number as each parent	

asexual reproduction

		Regents Date
		Aug2023
		10
S4K2	103. Potato plants reproduce both sexually and asexually. Depending on the desired outcome, potato growers use both types of reproduction. A grower would most likely want the potato plants to reproduce asexually when	Data Base File Number
	(1) selectively breeding new potato varieties	
	(2) there is a disease affecting similar potatoes growing in the area	
ANSWER	(3) environmental conditions in the area are changing	1710
4	(4) potatoes with the same traits are desired	

asexual reproduction

		Regents Date
		Aug2024
		28
S4K4	104. Scientists have cloned many animals, such as cows, sheep, and chickens, from a single cell. Which natural process is most similar to these cloning techniques?	Data Base File Number
	(1) asexual reproduction	
	(2) genetic recombination	
ANSWER	(3) chromosome mutations	1805
1	(4) gamete production	

asexual reproduction

		Regents Date
		Jan2003
		5
S4K2	105. Certain bacteria produce a chemical that makes them resistant to penicillin. Since these bacteria reproduce asexually, they usually produce offspring that	Data Base File Number
	(1) can be destroyed by penicillin	
	(2) mutate into another species	
ANSWER	(3) are genetically different from their parents	730
4	(4) survive exposure to penicillin	

asexual reproduction

		Regents Date
		Jan2005
		9
S4K2	106. Strawberries can reproduce by means of runners, which are stems that grow horizontally along the ground. At the region of the runner that touches the ground, a new plant develops. The new plant is genetically identical to the parent because	Data Base File Number
	(1) it was produced sexually	
	(2) nuclei traveled to the new plant through the runner to fertilize it	
	(3) it was produced asexually	
ANSWER	(4) there were no other strawberry plants in the area to provide fertilization	548
3		

asexual reproduction

		Regents Date
		Jan2006
		16
S4K2	107. When a planarian (a type of worm) is cut in half, each half usually grows back into a complete worm over time. This situation most closely resembles	Data Base File Number
	(1) asexual reproduction in which a mutation has occurred	
	(2) sexual reproduction in which each half represents one parent	
	(3) asexual reproduction of a single-celled organism	
ANSWER	(4) sexual reproduction of a single-celled organism	484
3		

asexual reproduction

		Regents Date
		Jan2007
		13
S4K4	108. The LEAST genetic variation will probably be found in the offspring of organisms that reproduce using	Data Base File Number
	(1) mitosis to produce a larger population	
	(2) meiosis to produce gametes	
	(3) fusion of eggs and sperm to produce zygotes	
ANSWER	(4) internal fertilization to produce an embryo	56
1		

asexual reproduction

		Regents Date
		Jan2013
		19
S4K4	109. An organism that reproduces asexually will have offspring that have	Data Base File Number
	(1) the same genetic information as both of its parents	
	(2) different genetic information from either of its parents	
	(3) the same genes as its parent	
ANSWER	(4) different genes from its parent	631
3		

asexual reproduction

		Regents Date
		Jan2017
		24
S4K2		Data Base File Number
		1285
ANSWER	2	
	110. Female hammerhead sharks sometimes produce offspring by a type of asexual reproduction. These offspring	
	(1) are a result of the uniting of a male and a female gamete	
	(2) have cells that contain DNA found only in the female shark	
	(3) are considered to be a different species from the male parent	
	(4) have cells that contain genetic information from both parents	

asexual reproduction

		Regents Date
		Jan2023
		40
S4K2		Data Base File Number
		1670
ANSWER	4	
	111. Bacteria reproduce asexually by a process known as binary fission. In binary fission, the bacterium's single chromosome is copied and the cell splits in half, with each new cell receiving a copy of the chromosome. The biggest advantage that binary fission often has over sexual reproduction is that	
	(1) there is more genetic variety in the resulting cells	
	(2) the genetic material comes from two parents	
	(3) the offspring inherit only favorable genes	
	(4) a large number of identical offspring are produced	

asexual reproduction

		Regents Date
		June2005
		16
S4K2		Data Base File Number
		582
ANSWER	1	
	112. Which statement describes asexual reproduction?	
	(1) Adaptive traits are usually passed from parent to offspring without genetic modification.	
	(2) Mutations are not passed from generation to generation.	
	(3) It always enables organisms to survive in changing environmental conditions.	
	(4) It is responsible for many new variations in offspring.	

asexual reproduction

		Regents Date
		June2016
	113. The paramecium is a single-celled organism that reproduces asexually. The offspring of a paramecium usually contain	
S4K2	(1) only half of the genes of the parent cells	19
	(2) more DNA than the parent cell	Data Base File Number
ANSWER	(3) genetic material identical to that of the parent cell	
3	(4) fewer mutations than the parent cell	1223

asexual reproduction

		Regents Date
		June2021
	114. One of the largest and oldest organisms on Earth is located in Fishlake National Forest in Utah. Pando is an 80,000-year-old grove of aspen trees that covers 100 acres. Although it looks like a forest, DNA analysis of several of the "trees" has confirmed it is really just one huge organism. Therefore, the "trees" must have been reproduced	
S4K4	(1) sexually and have genetic variability	13
	(2) asexually and have genetic variability	Data Base File Number
ANSWER	(3) sexually and are genetically identical	
4	(4) asexually and are genetically identical	1570

asexual reproduction

		Regents Date
		June2024
	115. A colony of 47,000 quaking aspen trees, all connected by one root system, is considered to be Earth's most massive organism. When the trees are stressed, shoots are sent out from the roots and develop into new trees. Every new tree in this colony would contain	
S4K2	(1) the same genetic information, because it is produced asexually	2
	(2) the same genetic information, because it is produced sexually	Data Base File Number
ANSWER	(3) less genetic material, since it is produced from root cells	
1	(4) a different combination of genes, since it is produced from various roots	1758

atomic bond

S4K5	ANSWER 1	116. The energy in a starch molecule is stored (1) in the bonds between atoms (2) in the oxygen found in the molecule (3) when the carbon atoms break off (4) when water breaks this molecule apart	Regents Date June2016 38
			Data Base File Number 1233

ATP

S4K5	ANSWER 4	117. The energy an organism requires to transport materials and eliminate wastes is obtained directly from (1) DNA (2) starch (3) hormones (4) ATP	Regents Date Aug2001 15
			Data Base File Number 925

ATP

S4K5	ANSWER 1	118. To remain healthy, organisms must be able to obtain materials, change the materials, move the materials around, and get rid of waste. These activities directly require (1) energy from ATP (2) the replication of DNA (3) nutrients from inorganic sources (4) manipulation of altered genes	Regents Date Aug2002 22
			Data Base File Number 821

ATP

S4K5	ANSWER 1	119. Living organisms must be able to obtain materials, change the materials into new forms, remove poisons, and move needed material from one place to another. Many of these activities directly require (1) energy released from ATP (2) carbohydrates formed from receptor molecules (3) the synthesis of DNA (4) the breakdown of energy-rich inorganic molecules	Regents Date Aug2003 24
			Data Base File Number 796

ATP

		120. The rate at which all organisms obtain, transform, and transport materials depends on an immediate supply of	Regents Date Aug2007
		(1) ATP and enzymes	16
S4K5		(2) solar energy and carbon dioxide	Data Base File Number
ANSWER	1	(3) carbon dioxide and enzymes	13
		(4) ATP and solar energy	

ATP

		121. The energy required to assemble proteins and fats is directly supplied to body cells from	Regents Date Aug2024
		(1) all the colors of visible light	23
S4K5		(2) molecules of ATP contained within the cells	Data Base File Number
ANSWER	2	(3) all the DNA found in sex cells	1802
		(4) molecules of carbon dioxide produced by chloroplasts	

ATP

		122. The direct source of ATP for the development of a fetus is	Regents Date Jan2009
		(1) a series of chemical activities that take place in the mitochondria of fetal cells	39
S4K1		(2) a series of chemical activities that take place in the mitochondria of the uterine cells	Data Base File Number
ANSWER	1	(3) the transport of nutrients by the cytoplasm of the stomach cells of the mother	177
		(4) the transport of nutrients by the cytoplasm of the stomach cells of the fetus	

ATP

		123. The energy released when sugar molecules are broken down is stored in	Regents Date Jan2013
		(1) minerals	21
S4K5		(2) ATP	Data Base File Number
ANSWER	2	(3) DNA	633
		(4) wastes	

ATP

124. In the human body, carbon monoxide reduces the amount of oxygen that can be transported to cells. Breathing in too much carbon monoxide will most likely result in the production of

- (1) less ATP
- (2) less glucose
- (3) more DNA
- (4) more protein

S4K5

ANSWER

1

Regents Date

Jan2014

15

Data Base File Number

1009

ATP

125. It may be harmful when people compete to see who can hold their breath the longest under water. Without oxygen, brain cells

- (1) cannot make enough ATP
- (2) have too few mitochondria
- (3) make too many enzymes
- (4) have too much water

S4K5

ANSWER

1

Regents Date

Jan2020

24

Data Base File Number

1550

ATP

126. The removal of mitochondria from a typical animal cell would have an immediate effect on the cell's production of

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

S4K1

ANSWER

3

Regents Date

Jan2023

1

Data Base File Number

1649

ATP

127. ATP is a compound that is synthesized when

- (1) chemical bonds between carbon atoms are formed during photosynthesis
- (2) energy stored in chemical bonds is released during cellular respiration
- (3) energy stored in nitrogen is released, forming amino acids
- (4) digestive enzymes break amino acids into smaller parts

S4K5

ANSWER

2

Regents Date

**June2002
20**

Data Base File Number

846

ATP

128. The production of energy-rich ATP molecules is the direct result of

- (1) recycling light energy to be used in the process of photosynthesis
- (2) releasing the stored energy of organic compounds by the process of respiration
- (3) breaking down starch by the process of digestion
- (4) copying coded information during the process of protein synthesis

S4K5

ANSWER

2

Regents Date

June2005

23

Data Base File Number

586

ATP

129. Energy from organic molecules can be stored in ATP molecules as a direct result of the process of

- (1) cellular respiration
- (2) cellular reproduction
- (3) diffusion
- (4) digestion

S4K5

ANSWER

1

Regents Date

June2007

20

Data Base File Number

39

ATP

130. Which substance is the most direct source of the energy that an animal cell uses for the synthesis of materials?

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

S4K5

ANSWER

1

Regents Date

June2008

19

Data Base File Number

117

ATP

131. The temporary storage of energy in ATP molecules is part of which process?

- (1) cell division
- (2) cellular respiration
- (3) protein synthesis
- (4) DNA replication

S4K5

ANSWER

2

Regents Date

June2011

22

Data Base File Number

344

ATP

132. The energy used to obtain, transfer, and transport materials within an organism comes directly from
- (1) ATP
 - (2) DNA
 - (3) sunlight
 - (4) starch

S4K5

ANSWER

1

Regents Date

June2013

18

Data Base File Number

957

ATP

133. Cell membranes inside the cells that line the stomach pump hydrogen ions from areas of low concentration inside the cells to areas of higher concentration outside the cells. Which activity produces the ATP that makes this pumping possible?
- (1) cellular respiration
 - (2) active transport
 - (3) carbohydrate digestion
 - (4) enzyme synthesis

S4K1

ANSWER

1

Regents Date

June2023

13

Data Base File Number

1683

autotroph

134. What is the major environmental factor limiting the numbers of autotrophs at great depths in the ocean?
- (1) type of seafloor
 - (2) amount of light
 - (3) availability of minerals
 - (4) absence of biotic factors

S4K6

ANSWER

2

Regents Date

Aug2001

28

Data Base File Number

935

autotroph

135. Organisms that are able to manufacture organic nutrients from substances in the abiotic environment are classified as
- (1) heterotrophs
 - (2) fungi
 - (3) predators
 - (4) autotrophs

S4K1

ANSWER

4

Regents Date

Aug2009

1

Data Base File Number

198

autotroph

S4K5

ANSWER

3

136. Autotrophs differ from heterotrophs in that only autotrophs
- (1) require carbon dioxide for cellular respiration
 - (2) release oxygen as a product of cellular respiration
 - (3) synthesize nutrients using carbon dioxide and water
 - (4) break down sugars to assemble other molecules

Regents Date

Aug2016
2

Data Base File Number

1238

autotroph

S4K6

ANSWER

4

137. Most scientists agree that a large asteroid struck Earth around 65 million years ago. The impact sent large amounts of fine dust particles into the atmosphere, which reduced the amount of sunlight reaching the planet. This event would have the most immediate effect on
- (1) herbivores
 - (2) decomposers
 - (3) carnivores
 - (4) autotrophs

Regents Date

Aug2023

2

Data Base File Number

1704

autotroph

S4K5

ANSWER

4

138. Organisms that have the ability to use an atmospheric gas to produce an organic nutrient are known as
- (1) herbivores
 - (2) decomposers
 - (3) carnivores
 - (4) autotrophs

Regents Date

Jan2004

19

Data Base File Number

657

autotroph

S4K1

ANSWER

1

139. The dissolved carbon dioxide in a lake is used directly by
- (1) autotrophs
 - (2) parasites
 - (3) fungi
 - (4) decomposers

Regents Date

Jan2006
20

Data Base File Number

487

autotroph

140. Maple trees and tulips are classified as autotrophs because they both
- (1) produce gametes by the process of mitosis
 - (2) produce carbon dioxide and water as metabolic wastes
 - (3) are able to obtain complex organic materials from the environment
 - (4) are able to synthesize organic molecules from inorganic raw materials

S4K1

ANSWER

4

Regents Date

Jan2010

33

Data Base File Number

252

autotroph

141. Which process usually uses carbon dioxide molecules?
- (1) cellular respiration
 - (2) asexual reproduction
 - (3) active transport
 - (4) autotrophic nutrition

S4K6

ANSWER

4

Regents Date

June2004

24

Data Base File Number

687

autotroph

142. Which phrase is an example of autotrophic nutrition?
- (1) a cow eating grass in a field
 - (2) a mushroom digesting a dead log
 - (3) an apple tree making its own food
 - (4) a tapeworm feeding in the body of a dog

S4K6

ANSWER

3

Regents Date

June2011

1

Data Base File Number

330

autotroph

143. Autotrophs might survive when heterotrophs cannot, because autotrophs are able to
- (1) reproduce asexually
 - (2) become dormant
 - (3) exist without respiration
 - (4) make their own food

S4K1

ANSWER

4

Regents Date

June2014

7

Data Base File Number

1040

autotroph

144. in a pond, which process performed by organisms produces oxygen for the aquatic ecosystem?
- (1) respiration
 - (2) replication
 - (3) active transport
 - (4) autotrophic nutrition

S4K6

ANSWER

4

Regents Date

June2019

35

Data Base File Number

1488

autotroph / heterotroph

145. 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. Euglena can be classified as both
- (1) an autotroph and a parasite
 - (2) a decomposer and a heterotroph
 - (3) a producer and a parasite
 - (4) an autotroph and a heterotroph

S4K1

ANSWER

4

Regents Date

Jan2012

33

Data Base File Number

415

autotroph / heterotroph

146. Some sea slugs store chloroplasts obtained from algae they have ingested. The chloroplasts continue to carry out photosynthesis within the slugs. What advantage would this activity be to these sea slugs?
- (1) The slugs with chloroplasts can synthesize some of their own food.
 - (2) The slugs with chloroplasts no longer need to carry out respiration.
 - (3) The chloroplasts provide the slugs with camouflage that protects them from UV radiation.
 - (4) The chloroplasts contain enzymes that allow the slugs to digest starch.

S4K5

ANSWER

1

Regents Date

Jan2013

20

Data Base File Number

632

bacteria / killing

		Regents Date
		Jan2010
		5
S4K1	147. A piece of refrigerated, cooked meat will remain safe to eat for a longer period of time than a refrigerated piece of raw meat of similar size. Which statement is a valid inference based on this information?	Data Base File Number
	(1) Cooking meat kills many bacteria and fungi.	
	(2) Cool temperatures stimulate the growth of microbes on raw meat.	
	(3) Raw meat cannot be preserved.	
ANSWER	(4) Cooked meat contains antibodies that destroy decomposers.	230
1		

bacterial evolution

		Regents Date
		June2008
		8
S4K3	148. Species of bacteria can evolve more quickly than species of mammals because bacteria have	Data Base File Number
	(1) less competition	
	(2) more chromosomes	
	(3) lower mutation rates	
ANSWER	(4) higher rates of reproduction	110
4		

base pairing

		Regents Date
		Jan2020
		39
S4K2	149. In a DNA molecule, if 38% of the molecular bases are C (cytosine), what percent of the bases are T (thymine)?	Data Base File Number
	(1) 12	
	(2) 24	
	(3) 38	
ANSWER	(4) 62	1554
1		

base sequences

		Regents Date
		Aug2015
		24
S4K2	150. A DNA segment removed from neurospora (a pink mold) contained the base sequence G-T-C-C-A-T-G-C-A. A similar segment of DNA removed from neurospora that had been exposed to radiation for several hours had the base sequence G-T-C-C-A-T. This change in the base sequence is an example of	Data Base File Number
	(1) a deletion	
	(2) an insertion	
	(3) a substitution	
ANSWER	(4) a replication	1170
1		

base sequences

151. A biotechnology tool, known as CRISPR-Cas9, allows scientists to precisely edit genes. In order to edit genes, CRISPR-Cas9 must be able to
- (1) alter the base sequence of DNA
 - (2) prevent cells from differentiating
 - (3) block cell receptors from receiving signals
 - (4) change the rate at which a cell uses ATP

S4K2

ANSWER 1

Regents Date

Aug2022

13

Data Base File Number

1636

base sequences

152. A sequence of mRNA bases that can produce a certain protein was found to be: UUU GGG CCC AUA What is the sequence of DNA that would produce this sequence of mRNA bases.
- (1) AAA CCC GGG TAT
 - (2) UUU GGG CCC AAA
 - (3) GCA AAA UUU TTT
 - (4) AAA GGG TTT UUU

LAB1

ANSWER 1

Regents Date

Aug2023

78

Data Base File Number

1726

base sequences

153. A cell begins to produce a new type of protein. This is most likely due to an alteration of the
- (1) structure of the cell membrane
 - (2) sequence of bases in a section of a chromosome
 - (3) chemical makeup of the cytoplasm
 - (4) shape of the antibodies produced by the nucleus

S4K2

ANSWER 2

Regents Date

Jan2015

35

Data Base File Number

1118

base sequences

154. Sexually reproducing organisms pass on genetic information as a
- (1) long chain of amino acids
 - (2) complex series of inorganic proteins
 - (3) sequence of complex sugars
 - (4) sequence of the bases A, T, C, and G

S4K2

ANSWER 4

Regents Date

Jan2020

17

Data Base File Number

1544

base sequences

		Regents Date
		RBS2021
		1
RBS		Data Base File Number
ANSWER	3	1594
	155. The complementary base pairs of nucleic acids are as follows. DNA codes are A-T, and C-G. RNA codes are A-U, and C-G. A laboratory analyzed a nucleic acid and determined that the percent of uracil (U) was 20%. What would be the percentage of Guanine (G) in this sample?	
	(1) 10%	
	(2) 20%	
	(3) 30%	
	(4) 40%	

biochemical processes

		Regents Date
		Jan2012
		18
S4K1		Data Base File Number
ANSWER	2	406
	156. Scientists have found that although plants require light to carry on photosynthesis, very high levels of sunlight can kill some plants. This illustrates that many biochemical processes may occur	
	(1) more rapidly when temperatures are very high	
	(2) within a specific range of conditions	
	(3) best in the absence of abiotic factors	
	(4) even if homeostasis is disrupted	

biodiversity

		Regents Date
		Aug2003
		31
S4K6		Data Base File Number
ANSWER	1	801
	157. Which factor has the greatest influence on the variety of species that survive in different regions of a marine habitat?	
	(1) depth of light penetration	
	(2) daily fluctuations in temperature	
	(3) size of predators	
	(4) average annual rainfall	

biodiversity

		Regents Date
		Aug2004
		22
S4K6		Data Base File Number
ANSWER	3	712
	158. A greater stability of the biosphere would most likely result from	
	(1) decreased finite resources	
	(2) increased deforestation	
	(3) increased biodiversity	
	(4) decreased consumer populations	

biodiversity

S4K7	159. Cutting down a rain forest and planting agricultural crops, such as coffee plants, would most likely result in	Regents Date
		Aug2005
		26
		Data Base File Number
ANSWER	1	612

biodiversity

S4K6	160. Deforestation of areas considered to be rich sources of genetic material could limit future agricultural and medical advances due to	Regents Date
		Aug2008
		30
		Data Base File Number
ANSWER	4	151

biodiversity

S4K2	161. A particular species of shark normally reproduces sexually. In captivity, it was found that a female could also reproduce asexually. One NEGATIVE result from asexual reproduction is	Regents Date
		Aug2010
		17
		Data Base File Number
ANSWER	4	291

biodiversity

S4K6	162. Which consequence could most likely be associated with a decrease in biodiversity in an area?	Regents Date
		Aug2011
		24
		Data Base File Number
ANSWER	4	374

biodiversity

163. Ethanol-fueled vehicles have increased in popularity as people try to be more environmentally responsible. Ethanol can be made from corn. Some farmers are clearing forests and planting large expanses of corn to meet the rising demand. Which statement describes a likely result of this increased corn production?

- (1) There will be a reduction in the biodiversity of areas that are converted to grow corn.
- (2) The corn will produce more carbon dioxide than it uses, contributing to global warming.
- (3) Insect biodiversity in the area will increase.
- (4) Growing more corn will increase the nutrient content of the soil.

S4K7

ANSWER 1

Regents Date

Aug2013

29

Data Base File Number

994

biodiversity

164. Which environmental change would cause the greatest reduction in the biodiversity of a large ecosystem?

- (1) building a new home
- (2) building a new store in a shopping mall
- (3) widespread use of pesticides
- (4) widespread recycling programs

S4K7

ANSWER 3

Regents Date

Aug2014

22

Data Base File Number

1083

biodiversity

165. A researcher concludes from a 10-year study that the biodiversity of an ecosystem had increased. Which set of observations represents evidence for this claim?

- (1) There were more niches and greater stability in the ecosystem.
- (2) There were more niches and less energy lost as heat in the ecosystem.
- (3) There were fewer niches for decomposers and less stability.
- (4) There were fewer niches for consumers and greater cycling of materials.

S4K6

ANSWER 1

Regents Date

Aug2016

26

Data Base File Number

1258

biodiversity

166. Homeowners have been encouraged to learn how to identify invasive plants and to remove them if they find them. The most likely reason for removing invasive plants is to

- (1) allow only one type of native plant to grow
- (2) preserve biodiversity
- (3) eliminate unfamiliar food sources
- (4) increase the rate of ecological succession

S4K7

ANSWER 2

Regents Date

Aug2017

14

Data Base File Number

1335

biodiversity

167. By measuring the colors of light reflected by different tree species in a forest, scientists can determine the amount of biodiversity present in different areas. Maintaining biodiversity is important because it

- (1) reduces the carrying capacity of a forest ecosystem
- (2) guarantees that all species within a forest ecosystem will survive
- (3) increases the number of predators that control the population size of prey
- (4) ensures the availability of a variety of genetic material

S4K6

ANSWER 4

Regents Date

Aug2022

14

Data Base File Number

1637

biodiversity

168. An ecosystem will most likely remain stable if

- (1) it has more predators than prey
- (2) it has a high level of biodiversity
- (3) biotic factors decrease
- (4) finite resources decrease

S4K6

ANSWER 2

Regents Date

Jan2002
24

Data Base File Number

871

biodiversity

169. Increased efforts to conserve areas such as rain forests are necessary in order to

- (1) protect biodiversity
- (2) promote extinction of species
- (3) exploit finite resources
- (4) increase industrialization

S4K6

ANSWER 1

Regents Date

Jan2003

32

Data Base File Number

745

biodiversity

170. Some organizations are buying up sections of forest land. Once purchased, these sections of forest will never be cut down. The main reason for protecting these sections of forest is to

- (1) cause the extinction of undesirable animal species
- (2) prevent these trees from reproducing too fast
- (3) maintain the diversity of the living environment
- (4) provide more land for agricultural purposes

S4K7

ANSWER 3

Regents Date

Jan2005

24

Data Base File Number

560

biodiversity

171. A forest is cut down and is replaced by a cornfield. A NEGATIVE consequence of this practice is

- (1) an increase in the carbon dioxide released into the atmosphere
- (2) an increase in the size of predators
- (3) a decrease in biodiversity
- (4) a decrease in the amount of soil that is washed away during rainstorms

S4K7

ANSWER 3

Regents Date

Jan2006

30

Data Base File Number

496

biodiversity

172. One advantage of biodiversity in an ecosystem is that it

- (1) guarantees that the largest organisms will dominate the area
- (2) ensures a large amount of identical genetic material
- (3) develops relationships between organisms that are always positive over long periods of time
- (4) increases the chance that some organisms will survive a major change in the environment

S4K3

ANSWER 4

Regents Date

Jan2010

24

Data Base File Number

246

biodiversity

173. Researchers have reported that the number of different species of fish found in certain areas of the ocean has been greatly reduced over the past 50 years. This situation is an example of

- (1) a loss of biodiversity
- (2) an increase in ecological succession
- (3) a lack of differentiation
- (4) an increased carrying capacity

S4K7

ANSWER 1

Regents Date

Jan2011

10

Data Base File Number

312

biodiversity

S4K7	174. Environmentalists are hoping to protect endangered organisms by calling for a reduction in the use of pesticides, because loss of these organisms would	Regents Date	Jan2012
			27
		Data Base File Number	
			411
		ANSWER	3
	(1) increase the mutation rate in plants		
	(2) cause pesticides to become more toxic to insects		
	(3) reduce biodiversity in various ecosystems		
	(4) decrease the space and resources available to other organisms		

biodiversity

S4K6	175. People living in and around the Amazon rain forest have used parts of the gaviola tree to prepare medicines. Research is being conducted to determine if this tree can provide cures for many types of cancer. Continued destruction of rain forests might	Regents Date	Jan2014
			19
		Data Base File Number	
			1013
		ANSWER	1
	(1) reduce biodiversity and remove organisms with the potential to help humans		
	(2) increase biodiversity and remove damaged and diseased trees		
	(3) reduce biodiversity and increase the reproductive rates of all organisms		
	(4) increase biodiversity and ecosystem stability where humans plant crops		

biodiversity

S4K7	176. The Nature Conservancy is an organization that protects a variety of habitats around the world. A project this organization would probably support is one that	Regents Date	Jan2015
			28
		Data Base File Number	
			1112
		ANSWER	2
	(1) uses endangered animals for medical research		
	(2) protects the biodiversity of areas for future generations		
	(3) alters habitats for industry and housing		
	(4) prevents animal species from migrating to other habitats		

biodiversity

177. Humans have an effect on ecosystems when they use native grasslands or forested areas for farming or urban use. One negative effect of these changes on the ecosystem is that there will be

- (1) less biodiversity
- (2) more homes
- (3) successful economic growth
- (4) increased food production

S4K7

ANSWER 1

Regents Date

Jan2018

2

Data Base File Number

1349

biodiversity

178. The passenger pigeons In the U.S. traveled in flocks sometimes larger than a billion birds. The enormous flock sizes helped protect them from predation by foxes, lynx, owls, and falcons. It also helped them outcompete other animals (squirrels, chipmunks) for chestnuts and acorns, their main food source. The passenger pigeon became extinct in the U.S. as a result of over hunting. A direct result of the rapid decline of the passenger pigeon population was most likely

- (1) an increase in owl and falcon populations
- (2) an increase in chipmunk and squirrel populations
- (3) a decrease in fox and chipmunk populations
- (4) a decrease in squirrel and chestnut tree populations

S4K1

ANSWER 2

Regents Date

Jan2019

32

Data Base File Number

1460

biodiversity

179. Maintaining a rich variety of genetic material that may lead to discoveries useful to humans can be ensured by

- (1) preserving biodiversity
- (2) increasing cloning
- (3) asexual reproduction
- (4) selective breeding

S4K6

ANSWER 1

Regents Date

Jan2020

20

Data Base File Number

1547

biodiversity

180. Compared to a natural forest, the wheat field of a farmer LACKS

- (1) heterotrophs
- (2) significant biodiversity
- (3) autotrophs
- (4) stored energy

S4K6

ANSWER 2

Regents Date

June2001

30

Data Base File Number

908

biodiversity

S4K6	181. The widest variety of genetic material that can be used by humans for future agricultural or medical research would most likely be found in	Regents Date June2002		
			(1) a large field of a genetically engineered crop	28
			(2) an ecosystem having significant biodiversity	Data Base File Number
			(3) a forest that is planted and maintained by a forest service	
			(4) areas that contain only one or two species	
ANSWER 2				

biodiversity

S4K7	182. Water from nearby rivers or lakes is usually used to cool down the reactors in nuclear power plants. The release of this heated water back into the river or lake would most likely result in	Regents Date June2005		
			(1) an increase in the sewage content in the water	24
			(2) a change in the biodiversity in the water	Data Base File Number
			(3) a change in the number of mutations in plants growing near the water	
			(4) a decrease in the amount of sunlight necessary for photosynthesis in the water	
ANSWER 2				

biodiversity

S4K7	183. Farming reduces the natural biodiversity of an area, yet farms are necessary to feed the world's human population. This situation is an example of	Regents Date June2008		
			(1) poor land use	26
			(2) a trade-off	Data Base File Number
			(3) conservation	
			(4) a technological fix	
ANSWER 2				

biodiversity

S4K6	184. A serious threat to biodiversity is	Regents Date June2010		
			(1) habitat destruction	25
			(2) maintenance of food chains	Data Base File Number
			(3) competition within a species	
			(4) a stable population size	
ANSWER 1				

biodiversity

185. Which activity would reduce biodiversity in a forest ecosystem?
- (1) adding plants that are naturally resistant to insects
 - (2) protecting wildflowers from logging activities
 - (3) replacing harvested trees with young trees that are naturally found in the forest
 - (4) clearing a large area and planting one species of hardwood tree that can be used for lumber

Regents Date
June2012

28

Data Base File
Number

436

S4K7

ANSWER 4

biodiversity

186. Deforestation most directly results in
- (1) an increase in oxygen in the atmosphere
 - (2) a decrease in soil erosion
 - (3) a decrease in biodiversity in the area
 - (4) an increase in the absorption of carbon dioxide

Regents Date
June2014
23

Data Base File
Number

1054

S4K7

ANSWER 3

biodiversity

187. Palm oil, produced from palm trees, is not only a biofuel, but is also used in food additives, cosmetics, and lubricants. Palm tree plantations are now cultivated in areas that were formerly natural forests. One ecological concern raised by this expansion is that
- (1) the natural forest ecosystem may harm the palm trees
 - (2) the use of the land for agriculture will increase the biodiversity of the area
 - (3) humans are changing the basic processes of the palm trees
 - (4) planting large expanses of one crop reduces the biodiversity of the area

Regents Date
June2015

9

Data Base File
Number

1128

S4K7

ANSWER 4

biodiversity

188. When a natural disaster destroys a stable ecosystem, the area is temporarily less stable than before. This is most likely due to
- (1) a decrease in biodiversity
 - (2) an increase in the number of food chains
 - (3) an increase in the number of species
 - (4) a decrease in the rate of mutation

Regents Date
June2016

22

Data Base File
Number

1225

S4K6

ANSWER 1

biodiversity

		189. Throughout New York State, some farmers have switched from growing a variety of vegetable crops to growing a single crop, such as corn. Other farmers are concerned that such a practice will make it more likely that an entire crop could be lost to disease or infestation by an insect pest. This is a valid concern because this practice	Regents Date June2018
S4K7		(1) reduces the biodiversity of their fields	28
		(2) increases the number of decomposers in their fields	Data Base File Number
ANSWER	1	(3) decreases the need to import food	
		(4) increases the number of invasive species	1400

biodiversity

		190. A DECREASE in the biodiversity of an ecosystem usually leads to	Regents Date June2021
S4K6		(1) an increase in predator and prey populations	4
		(2) the elimination of material cycling	Data Base File Number
ANSWER	3	(3) a decrease in stability	
		(4) an increase in dynamic equilibrium	1563

biological control

		191. Which method of controlling populations of mosquitoes most likely involves the least risk of causing damage to the environment?	Regents Date Aug2002
S4K7		(1) draining swamps where mosquitoes deposit eggs	35
		(2) spraying adult mosquitoes with pesticides from airplanes	Data Base File Number
ANSWER	3	(3) releasing more predators of mosquitoes native to mosquito habitats	
		(4) spraying oil on wet areas where mosquitoes breed	831

biological control

192. A new bird species is introduced to control an insect pest. A NEGATIVE consequence of this action is that the new bird species may

- (1) limit the population of the pest insect
- (2) consume beneficial insects
- (3) disrupt mineral availability in the ecosystem
- (4) cause an increase of pesticide-resistant insects

S4K7

ANSWER 2

Regents Date

Aug2011

29

Data Base File Number

379

biological control

193. An alternative to the use of insecticides to combat the Mediterranean fruit fly is the Sterile Insect Technique (SIT). SIT involves the sterilization of male insects by radiation, which prevents the formation of functional male gametes. When these male insects mate with female insects of the same species, the result would be that

- (1) only female offspring would be produced
- (2) no offspring would be produced
- (3) the offspring would have a reduced number of chromosomes
- (4) the offspring would no longer be sterile

S4K4

ANSWER 2

Regents Date

Aug2014

16

Data Base File Number

1078

biological control

194. Large numbers of white-tailed deer on Long Island are infested with ticks that transmit Lyme disease to other mammals. One attempt to control reproduction in these ticks has been the release of large numbers of sterilized male ticks. When compared to using pesticides, this method to control ticks would

- (1) cause more environmental pollution
- (2) lead to a decrease in the deer population
- (3) be less likely to harm the environment
- (4) result in an increase in the tick population

S4K7

ANSWER 3

Regents Date

Aug2022

16

Data Base File Number

1638

biological control

		Regents Date June2003
	195. Communities have attempted to control the size of mosquito populations to prevent the spread of certain diseases such as malaria and encephalitis. Which control method is most likely to cause the LEAST ecological damage?	
S4K7	(1) draining the swamps where mosquitoes breed	34
	(2) spraying swamps with chemical pesticides to kill mosquitoes	Data Base File Number
ANSWER	(3) spraying oil over swamps to suffocate mosquito larvae	
4	(4) increasing populations of native fish that feed on mosquito larvae in the swamps	776

biological control

		Regents Date June2024
	196. A species of predatory wasp is introduced to control an insect pest. A possible NEGATIVE consequence of this action is that the new predatory wasp may	
S4K7	(1) limit the population of the insect pest	30
	(2) prey on beneficial insects	Data Base File Number
ANSWER	(3) disrupt mineral availability in the ecosystem	
2	(4) cause an increase in pesticide-resistant plants	1776

biological organization

		Regents Date June2011
	197. Which sequence represents the levels of biological organization from smallest to largest?	
S4K1	(1) organism -> cell -> tissue->organelle -> organ system -> organ	10
	(2) organ system -> organ -> organism -> cell -> tissue -> organelle	Data Base File Number
ANSWER	(3) organelle -> organ system -> cell -> organism -> tissue -> organ	
4	(4) organelle -> cell -> tissue -> organ -> organ system -> organism	337

biotic factor

		Regents Date Aug2004
	198. One biotic factor that limits the carrying capacity of any habitat is the	
S4K6	(1) availability of water	21
	(2) level of atmospheric oxygen	Data Base File Number
ANSWER	(3) activity of decomposers	
3	(4) amount of soil erosion	711

biotic factor

- 199.** One biotic factor that affects consumers in an ocean ecosystem is
- (1) number of autotrophs
 - (2) temperature variation
 - (3) salt content
 - (4) pH of water

S4K6

ANSWER 1

Regents Date
Jan2008
23
Data Base File Number
89

biotic factor

- 200.** Which statement illustrates a biotic resource interacting with an abiotic resource?
- (1) A rock moves during an earthquake.
 - (2) A sea turtle transports a pilot fish to food.
 - (3) A plant absorbs sunlight, which is used for photosynthesis.
 - (4) A wind causes waves to form on a lake.

S4K6

ANSWER 3

Regents Date
June2002
25
Data Base File Number
850

biotic factor

- 201.** Competition for biotic resources can be illustrated by organisms fighting for a limited amount of
- (1) air to breathe
 - (2) water to drink
 - (3) mates for breeding
 - (4) space for nesting

S4K6

ANSWER 3

Regents Date
June2011
24
Data Base File Number
346

biotic factor

- 202.** Many biotic factors affect individuals in a population. An example of an organism being directly affected by a biotic factor is
- (1) a squirrel cannot find a mate
 - (2) a flood washes away a maple tree
 - (3) a plant is in a dark room
 - (4) a chipmunk finds a rock pile to use for a home

S4K6

ANSWER 1

Regents Date
June2017
12
Data Base File Number
1310

cancer

203. Base your answer to this question on the information given and on your knowledge of biology. --- In the early twentieth century, many people believed that a deep tan was a sign of good health. However, in the 1940s, the rate of skin cancer began to increase and reached significant proportions by the 1970s. At this time, scientists began to realize how damaging those deep tans could really be. Currently, it is estimated that ultraviolet radiation from the sun is responsible for more than 90% of skin cancers. Many of the deaths due to this type of cancer can be prevented. The cure rate for skin cancer is almost 100% when treated early. Reducing exposure to harmful ultraviolet radiation helps to prevent it." --- Which statement concerning ultraviolet radiation is NOT correct?
- (1) It may damage the skin.
 - (2) It is absorbed by the skin.
 - (3) It stimulates the skin to produce antibodies
 - (4) Ultraviolet radiation may cause skin cancer.

S1K1

ANSWER 3

Regents Date

June2001

48

Data Base File Number

913

cancer

204. Which characteristic is common to most types of cancer?
- (1) production of low levels of ATP
 - (2) inadequate levels of antigens
 - (3) rapid and uncontrolled cell division
 - (4) destruction of red blood cells

S4K5

ANSWER 3

Regents Date

June2022
8

Data Base File Number

1610

carbon dioxide / oxygen cycle

205. In nature, during a 24-hour period, green plants CONTINUOUSLY use
- (1) carbon dioxide, only
 - (2) both carbon dioxide and oxygen
 - (3) oxygen, only
 - (4) neither carbon dioxide nor oxygen

S4K5

ANSWER 3

Regents Date

Aug2002

21

Data Base File Number

820

carbon dioxide / oxygen cycle

206. Which human activity would have the most direct impact on the oxygen-carbon dioxide cycle?
- (1) reducing the rate of ecological succession
 - (2) decreasing the use of water
 - (3) destroying large forest areas
 - (4) enforcing laws that prevent the use of leaded gasoline

S4K7

ANSWER 3

Regents Date

June2002

31

Data Base File Number

853

carbon dioxide / oxygen cycle

	207. Photosynthesis and cellular respiration both involve the gases carbon dioxide and oxygen. Which statement best identifies how these gases are involved in the two processes?	Regents Date June2023
S4K5	(1) Photosynthesis and cellular respiration both use carbon dioxide and release oxygen.	26
	(2) Cellular respiration uses oxygen and releases carbon dioxide, while photosynthesis uses carbon dioxide and releases oxygen.	Data Base File Number
ANSWER 2	(3) Cellular respiration uses carbon dioxide and releases oxygen, while photosynthesis uses oxygen and releases carbon dioxide.	
	(4) Photosynthesis and cellular respiration both use oxygen and release carbon dioxide.	1693

carbon dioxide levels

	208. A human activity that could significantly DECREASE the amount of carbon dioxide in the air is	Regents Date Aug2013
S4K7	(1) increasing the use of fossil fuel	28
	(2) controlling insect pests that eat stored grain	Data Base File Number
ANSWER 4	(3) burning garbage and trash to generate electricity	
	(4) preserving and expanding forest habitats that shelter wildlife	993

carbon dioxide levels

	209. The most likely result of completely removing carbon dioxide from the environment of a plant is that sugar production will	Regents Date Aug2017
S4K6	(1) continue at the same rate	12
	(2) increase and oxygen production will also increase	Data Base File Number
ANSWER 4	(3) increase and oxygen production will stay the same	
	(4) decrease and eventually stop	1333

carbon dioxide levels

		Regents Date
		Jan2004
		33
S4K7	210. Deforestation will most directly result in an immediate increase in	Data Base File Number
	(1) atmospheric carbon dioxide	666
ANSWER	(2) atmospheric ozone	
1	(3) wildlife populations	
	(4) renewable resources	

carbon dioxide levels

		Regents Date
		June2017
		6
S4K7	211. The burning of fossil fuels has harmed the environment by	Data Base File Number
	(1) decreasing acid rain in the northeast United States	1305
ANSWER	(2) adding carbon dioxide to the atmosphere	
2	(3) increasing biodiversity in the lakes and ponds of the Adirondacks	
	(4) depleting the ozone shield directly over western New York State	

carnivore

		Regents Date
		Aug2016
		27
S4K6	212. The final consumers in many food webs are	Data Base File Number
	(1) autotrophs	1259
ANSWER	(2) hosts	
4	(3) herbivores	
	(4) carnivores	

carrying capacity

		Regents Date
		Aug2004
		3
S4K1	213. The size of a mouse population in a natural ecosystem tends to remain relatively constant due to	Data Base File Number
	(1) the carrying capacity of the environment	696
ANSWER	(2) the lack of natural predators	
1	(3) cycling of energy	
	(4) increased numbers of decomposers	

carrying capacity

S4K6	ANSWER 3	214. The number of organisms that an area of land can sustain over a long period of time is known as	(1) ecological succession	Regents Date Aug2019
			(2) its finite resources	43
		(3) its carrying capacity	Data Base File Number	
		(4) evolutionary change	1523	

carrying capacity

S4K6	ANSWER 2	215. In reference to an ecosystem, the phrase "carrying capacity" refers to	(1) storing extra food for the winter	Regents Date Jan2002
			(2) the number of organisms a habitat can support	42
		(3) transporting food to organisms in an area	Data Base File Number	
		(4) the maximum possible weight of an individual organism	882	

carrying capacity

S4K6	ANSWER 4	216. The carrying capacity of a given environment is LEAST dependent upon	(1) recycling of materials	Regents Date Jan2003
			(2) the available energy	31
		(3) the availability of food and water	Data Base File Number	
		(4) daily temperature fluctuations	744	

carrying capacity

S4K6	ANSWER 3	217. Ten breeding pairs of rabbits are introduced onto an island with no natural predators and a good supply of water and food. What will most likely happen to the rabbit population?	(1) It will remain relatively constant due to equal birth and death rates	Regents Date Jan2006
			(2) It will die out due to an increase in the mutation rate.	22
		(3) It will increase until it exceeds carrying capacity.	Data Base File Number	
		(4) It will decrease and then increase indefinitely.	489	

carrying capacity

Regents Date

Jan2013

218. A scientist was studying a population of fish in a pond over a period of 10 years. He observed that the population increased each year for 3 years, and then remained nearly constant for the rest of the study. The best explanation for this observation is that the population had

- (1) stopped reproducing
- (2) reached carrying capacity
- (3) mutated into a different species
- (4) run out of food and migrated to a different pond

24

Data Base File Number

636

S4K6

ANSWER

2

carrying capacity

Regents Date

Jan2017

219. The Mississippi River Delta wetlands ecosystem is home to a large number of fish, birds, and other aquatic organisms. During the last century, this ecosystem has seen a decrease in wetland areas and species diversity due to land development, agriculture, and flooding. Conservation groups have been working to reconnect the Mississippi River with its flood plain and restore lost wetlands. One result of restoring wetland areas in this ecosystem would be

- (1) an increase in abiotic factors that would cause organisms to develop new adaptations
- (2) the development of an ecosystem that will prevent invasive species from settling there
- (3) an increase in the carrying capacity of the ecosystem for wetland organisms
- (4) to prevent the organisms that live in this ecosystem from competing for food and shelter

19

Data Base File Number

1281

S4K6

ANSWER

3

carrying capacity

Regents Date

Jan2020

220. Which statement best describes a characteristic of the carrying capacity of an ecosystem?

- (1) It can be illustrated with a food web.
- (2) It allows organisms to produce populations of unlimited size.
- (3) It is determined directly by an organism's reproductive success.
- (4) It is limited by the habitat's available energy and nutrients.

22

Data Base File Number

1549

S4K6

ANSWER

4

carrying capacity

S4K6	221. An environment can support only as many organisms as the available energy, minerals, and oxygen will allow. Which term is best described by this statement? (1) biological feedback (2) carrying capacity (3) homeostatic control (4) biological diversity	Regents Date
		June2003
		33
		Data Base File Number
ANSWER 2		775

carrying capacity

S4K1	222. Which statement best describes what is most likely to occur if an animal population grows larger than the carrying capacity of its environment? (1) The birth rate will increase. (2) Both the birth rate and death rate will decrease. (3) The death rate will increase. (4) Neither the birth rate nor the death rate will decrease.	Regents Date
		June2017
		11
		Data Base File Number
ANSWER 3		1309

carrying capacity

S4K6	223. The carrying capacity of an environment may be DECREASED by (1) maintaining biodiversity (2) replacing lost minerals (3) removing dead organisms (4) preventing deforestation	Regents Date
		June2021
		2
		Data Base File Number
ANSWER 3		1562

carrying capacity

S4K6	224. When the carrying capacity for a species in a habitat is reached, the population of the species levels off. This slowing of the rate of growth is most likely due to (1) limited resources (2) renewable energy (3) an increase in decomposers (4) a lack of competition	Regents Date
		June2022
		1
		Data Base File Number
ANSWER 1		1603

catalyst / enzymes

S4K2

ANSWER 1

225. In the body of a human, the types of chemical activities occurring within cells are most dependent on the
- (1) biological catalysts present
 - (2) size of the cell
 - (3) number of chromosomes in the cell
 - (4) kind of sugar found on each chromosome

Regents Date

Aug2005

7

Data Base File Number

597

catalyst / enzymes

S4K5

ANSWER 3

226. Plants such as the Venus flytrap produce chemical compounds that break down insects into substances that are usable by the plant. The chemical compounds that break down the insects are most likely
- (1) fats
 - (2) minerals
 - (3) biological catalysts
 - (4) complex carbohydrates

Regents Date

Aug2008

27

Data Base File Number

148

catalyst / enzymes

S4K2

ANSWER 4

227. Which molecules are needed to cut and copy segments of DNA?
- (1) reproductive hormones
 - (2) carbohydrates
 - (3) antibodies
 - (4) biological catalysts

Regents Date

Aug2016

8

Data Base File Number

1244

catalyst / enzymes

S4K5

ANSWER 3

228. Photosynthesis and respiration are alike in that they both
- (1) require the Sun as a direct source of energy
 - (2) result in the production of glucose molecules
 - (3) require specific catalysts
 - (4) occur within mitochondria

Regents Date

Jan2015

18

Data Base File Number

1105

catalyst / enzymes

		Regents Date
		June2006
		13
		Data Base File Number
		509
S4K5	229. All chemical breakdown processes in cells directly involve	
	(1) reactions that are controlled by catalysts	
	(2) enzymes that are stored in mitochondria	
	(3) the production of catalysts in vacuoles	
	(4) enzymes that have the same genetic base sequence	
ANSWER	1	

cell complexity

		Regents Date
		Aug2016
		1
		Data Base File Number
		1237
S4K1	230. Which sequence represents structures organized from most complex to least complex?	
	(1) chloroplast → guard cell → leaf → oak tree	
	(2) guard cell → chloroplast → leaf → oak tree	
	(3) oak tree → guard cell → leaf → chloroplast	
	(4) oak tree → leaf → guard cell → chloroplast	
ANSWER	4	

cell complexity

		Regents Date
		Jan2010
		2
		Data Base File Number
		228
S4K1	231. Which structures are listed in order from the least complex to the most complex?	
	(1) plant cell, leaf, chloroplast, rose bush	
	(2) chloroplast, plant cell, leaf, rose bush	
	(3) chloroplast, leaf, plant cell, rose bush	
	(4) rose bush, leaf, plant cell, chloroplast	
ANSWER	2	

cell division

		Regents Date
		Jan2015
		25
		Data Base File Number
		1110
S4K5	232. Nicotine is only one of the many toxic chemicals inhaled while smoking. What effect can such toxic chemicals have on the body?	
	(1) They stimulate an increase in height.	
	(2) They stimulate uncontrolled cell division.	
	(3) They eliminate carbon dioxide from cells.	
	(4) They eliminate chromosomes from many cells.	
ANSWER	2	

cell function

		Regents Date
		Aug2009
		5
		Data Base File Number
		202
S4K1	233. The function of a cell depends primarily on its	
	(1) lifespan	
	(2) color	
	(3) structure	
	(4) movement	
ANSWER	3	

cell function

		Regents Date Aug2016
	234. Recently, researchers from Stanford University have changed mouse skin cells into mouse nerve cells. This was accomplished by inserting genes that control the synthesis of certain proteins into the skin cells. This type of research is often successful in advancing knowledge regarding the functioning of human cells because	
S4K1	(1) cells present in humans often function in similar ways to cells present in other organisms	31
	(2) cells from different types of organisms function differently when transplanted into humans	Data Base File Number
ANSWER	(3) the cells in all complex organisms contain the same genes and function in similar ways	
1	(4) cellular research using mice can always be applied to human cells since all complex organisms produce the same proteins	1263

cell genetics

		Regents Date June2004
	235. Which statements best describe the relationship between the terms CHROMOSOMES, GENES, and NUCLEI?	
S4K2	(1) Chromosomes are found on genes. Genes are found in nuclei.	4
	(2) Chromosomes are found in nuclei. Nuclei are found in genes.	Data Base File Number
ANSWER	(3) Genes are found on chromosomes. Chromosomes are found in nuclei.	
3	(4) Genes are found in nuclei. Nuclei are found in chromosomes.	677

cell membrane

		Regents Date Aug2010
	236. Which set of functions is directly controlled by the cell membrane?	
S4K1	(1) protein synthesis, respiration, digestion of food molecules	4
	(2) active transport, recognition of chemical messages, protection	Data Base File Number
ANSWER	(3) enzyme production, elimination of large molecules, duplication of DNA codes	
2	(4) release of ATP molecules, regulation of cell reproduction, food production	282

cell membrane

S4K1

ANSWER

4

237. A function of cell membranes in humans is the
- (1) synthesis of the amino acids
 - (2) production of energy
 - (3) replication of genetic material
 - (4) recognition of certain chemicals

Regents Date

Aug2014
1

Data Base File Number

1066

cell membrane

S4K1

ANSWER

1

238. A child with cystic fibrosis has an altered protein in his cells that stops chloride ions from leaving the cells. This protein most likely affects the functioning of
- (1) cell membranes
 - (2) nuclei
 - (3) mitochondria
 - (4) ribosomes

Regents Date

Aug2017

9

Data Base File Number

1331

cell membrane

LAB5

ANSWER

2

239. Cell membranes are said to be selectively permeable. Which statement best explains what selectively permeable means?
- (1) The cell membrane prevents any harmful substance from entering the cell.
 - (2) The cell membrane lets certain substances enter the cell and keeps certain substances out of the cell.
 - (3) The cell membrane allows only large molecules to diffuse into the cell.
 - (4) The cell membrane has pores that let only water and glucose into the cell and carbon dioxide out.

Regents Date

Jan2014

75

Data Base File Number

1032

cell membrane

S4K1

ANSWER

4

240. During gas exchange, the cell membrane of a single-celled organism has the same function as which organ system in humans?
- (1) nervous
 - (2) reproductive
 - (3) digestive
 - (4) respiratory

Regents Date

Jan2016

3

Data Base File Number

1180

cell membrane

241. Some viruses attack cells by attaching to their outer covering, entering, and taking over their genetic "machinery". Viruses are able to invade cells after first attaching to their

- (1) nuclear membrane
- (2) cell membrane
- (3) genetic machinery
- (4) viral proteins

S4K1

ANSWER 2

Regents Date

Jan2020

18

Data Base File Number

1545

cell membrane

242. Which statement regarding the functioning of the cell membrane of all organisms is NOT correct?

- (1) The cell membrane forms a boundary that separates the cellular contents from the outside environment.
- (2) The cell membrane is capable of receiving and recognizing chemical signals.
- (3) The cell membrane forms a barrier that keeps all substances that might harm the cell from entering the cell.
- (4) The cell membrane controls the movement of molecules into and out of the cell.

S4K1

ANSWER 3

Regents Date

June2001

6

Data Base File Number

890

cell membrane

243. One primary function of the cell membrane is

- (1) regulating the flow of simple sugars into or out of the cell
- (2) synthesizing substances by breaking down cell organelles
- (3) storing carbohydrates, water, and starches for future use
- (4) digesting carbohydrates, fats, and protein

S4K1

ANSWER 1

Regents Date

June2018

35

Data Base File Number

1403

cell membrane

244. The respiratory system of an elephant functions in a similar way to which organelle in a single-celled organism?

- (1) cell membrane
- (2) nucleus
- (3) vacuole
- (4) chloroplast

S4K1

ANSWER 1

Regents Date

June2021

1

Data Base File Number

1561

cell organization

		Regents Date
		Jan2016
		5
S4K1		Data Base File Number
ANSWER	2	1182
	245. Which sequence represents structures organized from least complex to most complex?	
	(1) nerve cell → nucleus → nervous system → brain	
	(2) nucleus → nerve cell → brain → nervous system	
	(3) brain → nervous system → nucleus → nerve cell	
	(4) nervous system → brain → nerve cell → nucleus	

cell structure

		Regents Date
		Aug2013
		4
S4K1		Data Base File Number
ANSWER	2	973
	246. Which cell structures are correctly paired with their functions?	
	(1) The mitochondria produce enzymes, and ribosomes transport them	
	(2) The ribosomes make proteins, and the nucleus stores genetic information.	
	(3) The cell membrane makes enzymes, and cytoplasm transports them.	
	(4) The vacuole stores genetic information, and chloroplasts make proteins.	

cell structure

		Regents Date
		Jan2004
		53
S4K2		Data Base File Number
ANSWER	3	673
	247. Arrange the following structures from largest to smallest. a chromosome a nucleus a gene	
	(1) gene, chromosome, nucleus	
	(2) chromosome, nucleus, gene	
	(3) nucleus, chromosome, gene	
	(4) gene, nucleus, chromosome	

cell structure

		Regents Date
		Jan2005
		4
S4K2		Data Base File Number
ANSWER	3	544
	248. Which sequence of terms represents a DECREASE from the greatest number of structures to the least number of structures present in a cell?	
	(1) nucleus → gene → chromosome	
	(2) gene → nucleus → chromosome	
	(3) gene → chromosome → nucleus	
	(4) chromosome → gene → nucleus	

cells / specialized

		Regents Date
		Aug2011
		33
S4K1	249. Specialized cells and organs are necessary in multicellular organisms because in these organisms	Data Base File Number
	(1) fewer cells are in direct contact with the external environment	
	(2) all cells are in direct contact with the external environment	
	(3) a body type evolved that relied on fewer body cells	
ANSWER	(4) a body type evolved that required larger sized cells	382
1		

cells / specialized

		Regents Date
		Jan2002
		1
S4K1	250. Which statement accurately compares cells in the human circulatory system to cells in the human nervous system?	Data Base File Number
	(1) Cells in the circulatory system carry out the same life function for the organism as cells in the nervous system.	
	(2) Cells in the circulatory system are identical in structure to cells in the nervous system.	
	(3) Cells in the nervous system are different in structure from cells in the circulatory system, and they carry out different specialized functions.	
ANSWER	(4) Cells in the nervous system act independently, but cells in the circulatory system function together.	856
3		

cellular communication

		Regents Date
		Jan2002
		4
S4K1	251. Communication between cells is affected if there is decreased ability to produce	Data Base File Number
	(1) digestive enzymes and gametes	
	(2) antibodies and chloroplasts	
	(3) hormones and nerve impulses	
ANSWER	(4) antibiotics and guard cells	859
3		

cellular communication

		Regents Date
		Jan2003
		4
S4K1		Data Base File Number
ANSWER	1	729
	252. Nerve cells are essential to an animal because they directly provide	
	(1) communication between cells	
	(2) transport of nutrients to various organs	
	(3) regulation of reproductive rates within other cells	
	(4) an exchange of gases within the body	

cellular communication

		Regents Date
		Jan2008
		3
S4K1		Data Base File Number
ANSWER	4	76
	253. Two primary agents of cellular communication are	
	(1) chemicals made by blood cells and simple sugars	
	(2) hormones and carbohydrates	
	(3) enzymes and starches	
	(4) hormones and chemicals made by nerve cells	

cellular communication

		Regents Date
		Jan2017
		27
S4K1		Data Base File Number
ANSWER	2	1288
	254. Molecules in a certain medication attach to receptors on nerve cells. This prevents the normal chemical signal from binding to the receptor. One immediate result of taking this medication might be a disruption in the ability of	
	(1) the body to produce reproductive cells	
	(2) cells to communicate with each other	
	(3) cells to synthesize proteins	
	(4) the body to convert inorganic material into organic nutrients	

chemical bonds

		Regents Date
		Aug2012
		21
S4K5		Data Base File Number
ANSWER	3	461
	255. More energy can be released from a fat molecule than from a glucose molecule because the fat molecule contains more	
	(1) genes	
	(2) organic compounds	
	(3) chemical bonds	
	(4) mitochondria	

chemical bonds

		Regents Date
		Aug2017
		3
S4K5	256. Organisms contain compounds such as proteins, starches, and fats. The chemical bonds in these compounds can be a source of	Data Base File Number
ANSWER	(1) amino acids	1327
3	(2) simple sugars	
	(3) energy	
	(4) enzymes	

chemical bonds

		Regents Date
		June2003
		13
S4K5	257. In heterotrophs, energy for the life processes comes from the chemical energy stored in the bonds of	Data Base File Number
ANSWER	(1) water molecules	763
3	(2) oxygen molecules	
	(3) organic compounds	
	(4) inorganic compounds	

chemical bonds

		Regents Date
		June2007
		19
S4K5	258. Which part of a molecule provides energy for life processes?	Data Base File Number
ANSWER	(1) carbon atoms	38
3	(2) oxygen atoms	
	(3) chemical bonds	
	(4) inorganic nitrogen	

chemical message

		Regents Date
		Jan2004
		4
S4K1	259. Hormones and secretions of the nervous system are chemical messengers that	Data Base File Number
ANSWER	(1) store genetic information	647
4	(2) carry out the circulation of materials	
	(3) extract energy from nutrients	
	(4) coordinate system interactions	

chemical stimulus

	260. When an ant in a colony dies, the live ants will throw the dead ant out of the anthill. If a live ant from the colony, ant X, is sprayed with a chemical characteristic of dead ants, the live ants will repeatedly throw this ant out of the anthill until they can no longer detect the chemical on ant X. What is the best explanation for this behavior?	Regents Date June2015
S4K5	(1) The ants are responding to a chromosomal mutation in ant X.	16
	(2) The chemical is exhibiting a feedback mechanism.	Data Base File Number
ANSWER 4	(3) The live ants must continue this behavior until they have eliminated ant X.	1134
	(4) The chemical acts as a stimulus for a particular behavior.	

chemical structure

	261. Enzymes, antibodies, and receptor molecules all have different functions. However, they are alike in that they	Regents Date Aug2024
S4K5	(1) all are involved in cellular respiration	26
	(2) have a shape that is specific to their function	Data Base File Number
ANSWER 2	(3) are classified as carbohydrates	1804
	(4) are important in animals but not plants	

chemical structure

	262. Which statement describes a similarity between all enzymes, antibodies, and hormones?	Regents Date June2012
S4K5	(1) Their chemical structure is critical to their ability to function.	24
	(2) Their ability to replicate identical copies ensures continuation of the species.	Data Base File Number
ANSWER 1	(3) They work better at 100°C than 37°C.	435
	(4) They are made by and carried by the blood.	

chemistry

	263. In what way are photosynthesis and cellular respiration similar?	Regents Date June2008
S4K5	(1) They both occur in chloroplasts.	15
	(2) They both require sunlight.	Data Base File Number
ANSWER 3	(3) They both involve organic and inorganic molecules.	114
	(4) They both require oxygen and produce carbon dioxide.	

chloroplast

264. Scientists studying ocean organisms are discovering new and unusual species. Which observation could be used to determine that an ocean organism carries out autotrophic nutrition?

- (1) Chloroplasts are visible inside the cells.
- (2) Digestive organs are visible upon dissection.
- (3) The organism lives close to the surface.
- (4) The organism synthesizes enzymes to digest food.

S4K6

ANSWER 1

Regents Date

Aug2008

1

Data Base File Number

131

chloroplast

265. A sea slug found along the eastern coast of North America is known to have an interesting relationship with algae. The sea slug incorporates part of the algae into its tissues. This allows the sea slug to directly use energy from the Sun. Which structures from the algae would the sea slug need to take in to accomplish this?

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

S4K5

ANSWER 3

Regents Date

Jan2024

28

Data Base File Number

1741

chromatography

266. To separate leaf pigments, a biologist should use

- (1) chromatography
- (2) dissection
- (3) an electronic balance
- (4) a dichotomous key

S1K2

ANSWER 1

Regents Date

Aug2002

2

Data Base File Number

808

chromosome

267. Which statement best describes a human chromosome?

- (1) It is made of amino acid subunits that form genes.
- (2) It contains genes that may code for the production of enzymes.
- (3) It is normally passed to the next generation through a placenta.
- (4) It varies in function from one generation to the next.

S4K2

ANSWER 2

Regents Date

Aug2011

6

Data Base File Number

362

chromosome

268. Which statement is correct concerning hereditary information?
- (1) A chromosome is composed of many genes.
 - (2) A gene is composed of many chromosomes.
 - (3) Each chromosome carries the same information.
 - (4) Each gene carries the same information.

Regents Date

Aug2015

6

Data Base File Number

1153

S4K2

ANSWER

1

chromosome

269. Chromosomes can be described as
- (1) large molecules that have only one function
 - (2) folded chains of bonded glucose molecules
 - (3) reproductive cells composed of molecular bases
 - (4) coiled strands of genetic material

Regents Date

Jan2008

8

Data Base File Number

80

S4K2

ANSWER

4

chromosome

270. Base your answer to this question on the passage given and on your knowledge of biology.
- Copy Cat
In February 2002, Cc — the first-ever cloned cat — was introduced to the public by researchers at Texas A&M University. The kitten had been born December 22, 2001, but announcement of the successful cloning was delayed until the animal had completed its shot series and its immune system was fully developed. In the cloning process, DNA [the nucleus] was transplanted from the 2-year-old donor mother cat into an egg cell whose nucleus had been removed. This embryo then was implanted into the surrogate mother cat. ...
Source: Discover Science Almanac. 2003:452-453.
Editors of Discover Science Magazine. Stonesong Press: New York, NY.
If a donor cat was black and the surrogate mother was white, then the cloned cat would likely be
- (1) white, due to the color of the surrogate mother cat
 - (2) white, due to mutations of the cloned cat
 - (3) black, due to having the same DNA as the donor cat
 - (4) black and white, due to mixing of the genes of the two cats during the cloning process

Regents Date

Jan2023

39

Data Base File Number

1669

S4K2

ANSWER

3

chromosome

271. Which statement best describes a chromosome?
- (1) It is a gene that has thousands of different forms.
 - (2) It has genetic information contained in DNA.
 - (3) It is a reproductive cell that influences more than one trait.
 - (4) It contains hundreds of genetically identical DNA molecules.

Regents Date

June2009
28

S4K2

Data Base File
Number

196

ANSWER 2

chromosome

272. A student used a microscope to observe cell division in onion cells. The student noticed that as the new cells formed, they contained rod-shaped chromosomes. It is necessary for onion cells to contain chromosomes because chromosomes
- (1) are composed of genes that contain the instructions for an organism's traits
 - (2) are made of carbohydrates and are needed as an energy source
 - (3) direct the production of inorganic molecules within the cell
 - (4) are composed of lipids that contain stored nutrients for the new cell

Regents Date

June2017

S4K2

41

Data Base File
Number

1324

ANSWER 1

chromosome

273. In the human, the sex chromosomes are X and Y. A normal male has a genotype of XY and a normal female is XX. If a normal egg is fertilized by a normal sperm, which sex cell determines the sex of the next generation?
- (1) egg cell
 - (2) sperm cell
 - (3) egg or sperm cell
 - (4) egg and sperm cell

Regents Date

RBS2021

RBS

1

Data Base File
Number

1595

ANSWER 2

chromosome

Regents Date

RBS2021

274. Base your answer to this question on the information given and your knowledge of biology. Chromosomes contain DNA and control all physical and chemical processes in humans. The chromosomes are the "blueprint" (directions) for every body part and process. The "ends" of each chromosome are "protected" from damage by structures called TELOMERES. Their job is to stop the ends of chromosomes from fraying or sticking to each other, much like the plastic tips on the ends of shoelaces. Telomeres also play an important role in making sure our DNA gets copied properly when cells divide. The word "telomere" means "end part". There is a telomere on both ends of each chromosome. Research has shown that as a person AGES (gets older), the telomeres become LESS PROTECTIVE and progressively shorter in length after each cell division. What is likely to happen if the telomeres cannot protect chromosome "ends" from damage?

RBS

- (1) Chromosomes will repair themselves.
- (2) No harmful effects will occur.
- (3) Abnormal conditions in the body, usually related to aging are likely to occur.
- (4) Chromosomes will not be able to replicate.

1

Data Base File
Number

ANSWER

3

1592

chromosome / crossing over

Regents Date

Jan2003

275. During meiosis, crossing-over (gene exchange between chromosomes) may occur. Crossing over usually results in

S4K3

- (1) overproduction of gametes
- (2) fertilization and development
- (3) the formation of identical offspring
- (4) variation within the species

15

Data Base File
Number

ANSWER

4

735

chromosome / number

Regents Date

Aug2001

276. Most cells in the body of a fruit fly contain eight chromosomes. How many of these chromosomes were contributed by each parent of the fruit fly?

S4K4

- (1) 8
- (2) 2
- (3) 16
- (4) 4

19

Data Base File
Number

ANSWER

4

928

chromosome / number

	277. Compared to human cells resulting from mitotic cell division, human cells resulting from meiotic cell division would have	Regents Date Aug2003
S4K4	(1) twice as many chromosomes	22
	(2) the same number of chromosomes	Data Base File Number
ANSWER 3	(3) one-half the number of chromosomes	795
	(4) one-quarter as many chromosomes	

chromosome / number

	278. A human skin cell contains 46 chromosomes. A frog sperm cell contains 12 chromosomes. Which pair of numbers shows the chromosome number of a normal gamete from each of these species?	Regents Date Aug2014
S4K2	(1) human 46; frog 12	9
	(2) human 46; frog 24	Data Base File Number
ANSWER 4	(3) human 23; frog 24	1071
	(4) human 23; frog 12	

chromosome / number

	279. Sometimes, a person is born with one or more extra chromosomes in each cell. This usually results in abnormalities because the affected person has	Regents Date Aug2015
S4K1	(1) a reduced number of genes in cell nuclei	30
	(2) fewer cell mutations than a person with a normal chromosome number	Data Base File Number
ANSWER 3	(3) more genes in each cell than a person with a normal chromosome number	1175
	(4) less DNA in cell nuclei, but more proteins in cell mitochondria	

chromosome / number

	280. Human egg cells are most similar to human sperm cells in their	Regents Date Jan2004
S4K4	(1) degree of motility	21
	(2) amount of stored food	Data Base File Number
ANSWER 3	(3) chromosome number	659
	(4) shape and size	

chromosome / number

281. Compared to a normal body cell, a normal egg cell contains
- (1) the same number of chromosomes
 - (2) half the number of chromosomes
 - (3) twice the number of chromosomes
 - (4) four times the number of chromosomes

S4K2

ANSWER 2

Regents Date

Jan2014

4

Data Base File Number

1000

chromosome / number

282. Base your answer to this question on the passage given and on your knowledge of biology.
- Copy Cat
In February 2002, Cc — the first-ever cloned cat — was introduced to the public by researchers at Texas A&M University. The kitten had been born December 22, 2001, but announcement of the successful cloning was delayed until the animal had completed its shot series and its immune system was fully developed. In the cloning process, DNA [the nucleus] was transplanted from the 2-year-old donor mother cat into an egg cell whose nucleus had been removed. This embryo then was implanted into the surrogate mother cat. ...
Source: Discover Science Almanac. 2003:452-453.
Editors of Discover Science Magazine. Stonesong Press: New York, NY.
- Which statement represents an explanation for why it is necessary to remove the nucleus from the egg cell used during the cloning process?
- (1) If the egg cell nucleus remains in the cell, then there will be three copies of all cat chromosomes in the cloned cat.
 - (2) If the egg cell nucleus is not removed, it will be impossible to predict the color of the cloned cat
 - (3) Removing the egg cell nucleus from the egg cell will cause the cell to become a body cell.
 - (4) If the egg cell nucleus is not removed, then the cloned cat will always develop into a male.

S4K2

ANSWER 1

Regents Date

Jan2023

38

Data Base File Number

1668

chromosome / number

283. Each of the cells present in a woman contains a complete set of chromosomes. The only exceptions are her
- (1) skin cells
 - (2) egg cells
 - (3) nerve cells
 - (4) lung cells

S4K4

ANSWER 2

Regents Date

Jan2023

19

Data Base File Number

1664

chromosome / number

S4K3	284. Which two structures of a frog would most likely have the same chromosome number? (1) skin cell and fertilized egg cell (2) zygote and sperm cell (3) kidney cell and egg cell (4) liver cell and sperm cell	Regents Date
		June2007
		15
		Data Base File Number
ANSWER	1	35

chromosome number / diploid

S4K4	285. In sexually reproducing species, the number of chromosomes in each body cell remains the same from one generation to the next as a direct result of (1) meiosis and fertilization (2) mitosis and mutation (3) differentiation and aging (4) homeostasis and dynamic equilibrium	Regents Date
		June2004
		15
		Data Base File Number
ANSWER	1	683

circulatory

S4K1	286. Which system in a multicellular organism functions most like the cytoplasm in a single-celled organism? (1) immune (2) reproductive (3) nervous (4) circulatory	Regents Date
		Aug2018
		15
		Data Base File Number
ANSWER	4	1423

circulatory

S4K1	287. Human body systems interact with each other. The list below illustrates the results of one body system functioning normally. • Muscle cells receive oxygen. • Nerve cells receive glucose. • Lungs get rid of carbon dioxide. • Some gland cells send chemical signals to organs. Which body system most directly enables all these functions to occur? (1) circulatory system (2) excretory system (3) digestive system (4) immune system	Regents Date
		Aug2024
		12
		Data Base File Number
ANSWER	1	1794

circulatory

288. In humans, two organ systems work together to move oxygen throughout the body and deliver it to cells. Which system directly delivers oxygen to body cells?

- (1) nervous
- (2) digestion
- (3) respiratory
- (4) circulatory

S4K1

ANSWER

4

Regents Date

Jan2024

5

Data Base File Number

1732

circulatory

289. Which body system is correctly paired with its function?

- (1) excretory --- produces antibodies to fight disease-causing organisms
- (2) digestive --- produces hormones for storage and insulation
- (3) circulatory --- transports materials for energy release in body cells
- (4) respiratory --- collects waste material for digestion

S4K1

ANSWER

3

Regents Date

June2010

3

Data Base File Number

257

circulatory

290. After exercising outside on a cold day, a student noticed that his fingers were not as cold as when he started. One possible explanation for this phenomenon would be that exercising

- (1) causes more sweat to be produced, which cools the body
- (2) increases the blood circulation, causing body parts to feel warmer
- (3) increases the breathing rate to remove waste products
- (4) decreases the amount of energy needed, so the fingers feel warmer

LAB2

ANSWER

2

Regents Date

June2024

73

Data Base File Number

1782

clone

291. One way to produce large numbers of genetically identical offspring is by

- (1) cloning
- (2) fertilization
- (3) changing genes by agents such as radiation or chemicals
- (4) inserting a DNA segment into a different DNA molecule

S4K4

ANSWER

1

Regents Date

Aug2001

18

Data Base File Number

927

clone

S1K1	292. Scientists have cloned sheep but have not yet cloned a human. The best explanation for this situation is that	(1) the technology to clone humans has not been explored	Regents Date
			Aug2001
			2
			Data Base File Number
			915
ANSWER	3	(2) human reproduction is very different from that of other mammals	
		(3) there are many ethical problems involved in cloning humans	
		(4) cloning humans would take too long	

clone

S4K4	293. From a single monkey, an animal breeder claims that he has successfully cloned two monkeys. He displays the two monkeys, a male and a female, to the public. The claim of the breeder should be rejected because the monkeys	(1) are twins	Regents Date
			Aug2003
			21
			Data Base File Number
			794
ANSWER	3	(2) have the same parents	
		(3) are of two different sexes	
		(4) developed from more than one sperm cell	

clone

S4K4	294. Which statement best describes a population of organisms if cloning is the only method used to reproduce this population?	(1) The population would be more likely to adapt to a changing environment.	Regents Date
			Aug2008
			4
			Data Base File Number
			134
ANSWER	2	(2) There would be little chance for variation within the population.	
		(3) The population would evolve rapidly.	
		(4) The mutation rate in the population would be rapid.	

clone

295. Modern technology could be used to clone pet dogs and cats. The cloned animals would resemble the original pets because

- (1) the genes of the new animals are different from those of the original pets
- (2) half of the genetic information of the new animals is the same as that of the original pets
- (3) the new animals have mutations not found in the original pets
- (4) the new animals have the same genetic information as the original pets

S4K4

ANSWER

4

Regents Date

Aug2012

16

Data Base File Number

457

clone

296. Sheep were the first species of mammals to be cloned. Which statement about cloned sheep is correct?

- (1) Different kinds of body cells in a cloned sheep contain different DNA.
- (2) Cloned sheep cannot produce offspring if they are mated with noncloned sheep.
- (3) Two sheep cloned from the same parent cannot mate and have offspring.
- (4) Many cells in cloned sheep have two identical nuclei, instead of a single nucleus.

S4K4

ANSWER

3

Regents Date

Aug2014

18

Data Base File Number

1079

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

Bye - Bye Bananas?

The world's most popular type of banana is facing a major health crisis. According to a new study, a disease caused by a powerful fungus is killing the Cavendish banana, which accounts for 99% of the banana market around the globe. The disease, called tropical race 4 (TR4), has affected banana crops in southeast Asia for decades. In recent years, it has spread to the Middle East and the African nation of Mozambique. Now experts fear the disease will show up in Latin America, where the majority of the world's bananas are grown. Once a banana plant is infected with TR4, it cannot get nourishment from water and nutrients, and basically dies of thirst. TR4 lives in soil, and can easily end up on a person's boots. If the contaminated boots are then worn on a field where Cavendish bananas are grown, the disease could be transferred. Once a field has been contaminated with the disease, you can't grow Cavendish bananas there anymore, Randy Ploetz [scientist] says. "The disease lasts a long time in the soil."

...But Cavendish [banana] is also particularly vulnerable to TR4. The banana is grown in what is called monoculture. "You see a big field of bananas and each one is genetically identical to its neighbor" Ploetz says. "And they are all uniformly susceptible to this disease. So once one plant gets infected, it just runs like wildfire throughout that entire plantation."

Source:<http://www.timeforkids.com/new/bye-bye-bananas/3311666>. Why is the entire Cavendish banana crop worldwide is particularly vulnerable to the TR4 fungus?

S4K3

57

Data Base File
Number

ANSWER 1

- (1) All of the banana plants are genetically identical (clones).
- (2) All of the banana plants are not genetically identical.
- (3) There are many variations in the banana plants.
- (4) The fungus cannot mutate.

1525

clone

S4K4	298. The nucleus is removed from a body cell of one organism and is placed in an egg cell that has had its nucleus removed. This process, which results in the production of organisms that are genetically alike, is known as	Regents Date
		Jan2002
ANSWER	1	18
		Data Base File Number
		866

clone

S4K4	299. Which phrase does NOT describe cells cloned from a carrot?	Regents Date
		Jan2004
ANSWER	2	20
		Data Base File Number
		658

clone

S4K5	300. Which transplant method would prevent the rejection of tissue after an organ transplant?	Regents Date
		Jan2006
ANSWER	1	21
		Data Base File Number
		488

clone

S4K4	301. Which situation is LEAST likely to result in new inherited characteristics?	Regents Date
		Jan2011
ANSWER	3	17
		Data Base File Number
		316

clone

302. Scientists have successfully cloned animals, including large mammals such as sheep. Which statement provides the most likely reason that a human has NOT yet been cloned?

- (1) Humans have DNA that is structurally very different from other mammals.
- (2) Cloning can only be performed on animals that normally reproduce asexually.
- (3) Human genes are made of too many different types of simple sugars.
- (4) Some people consider human genetic experiments unethical.

Regents Date

Jan2014

36

S4K4

Data Base File Number

ANSWER

4

1025

clone

303. Certain animal species that are endangered or threatened have been cloned. Closely related species have been used to carry the embryos of the endangered species. This process of increasing the population size of a species in danger of becoming extinct is an example of a

- (1) natural method to decrease ecosystem stability
- (2) natural method of controlling the population of an endangered species
- (3) technological fix to increase habitat destruction
- (4) technological fix for the problem of endangered species

Regents Date

Jan2015

29

S4K7

Data Base File Number

ANSWER

4

1113

clone

304. Base your answer to this question on the information given and on your knowledge of biology. Increased food production is essential to feed the growing human population. Some experts suggest that technology will be the answer. One application of technology is to clone a single plant to produce large numbers of it to grow as a single crop. How could using cloning to produce a single crop actually lead to a loss of the entire crop?

- (1) Clones are always susceptible to a killing disease.
- (2) Clones are always genetically inferior.
- (3) Clones are genetically identical and could be damaged or killed by the same pathogen.
- (4) Clones are unstable plants.

Regents Date

Jan2017

60

S4K7

Data Base File Number

ANSWER

3

1297

clone

305. "Dolly" is a sheep developed from an egg cell of her mother that had its nucleus replaced by a nucleus from a body cell of her mother. As a result of this technique, Dolly is

- (1) no longer able to reproduce
- (2) genetically identical to her mother
- (3) able to have a longer lifespan
- (4) unable to mate

S4K4

ANSWER 2

Regents Date

June2002

18

Data Base File Number

845

clone

306. Individual cells can be isolated from a mature plant and grown with special mixtures of growth hormones to produce a number of genetically identical plants. This process is known as

- (1) cloning
- (2) meiotic division
- (3) recombinant DNA technology
- (4) selective breeding

S4K4

ANSWER 1

Regents Date

June2003

24

Data Base File Number

768

clone

307. Cloning an individual usually produces organisms that

- (1) contain dangerous mutations
- (2) contain identical genes
- (3) are identical in appearance and behavior
- (4) produce enzymes different from the parent

S4K4

ANSWER 2

Regents Date

June2004

1

Data Base File Number

674

clone

308. Which statement best explains the observation that clones produced from the same organism may NOT be identical?

- (1) Events in meiosis result in variation.
- (2) Gene expression can be influenced by the environment.
- (3) Differentiated cells have different genes.
- (4) Half the genetic information in offspring comes from each parent.

S4K2

ANSWER 2

Regents Date

June2007

6

Data Base File Number

28

clone

309. A scientist claimed that he had cloned a guinea pig to produce two offspring, a male and a female. The claim is not valid because

- (1) guinea pigs can reproduce both sexually and asexually
- (2) the two offspring are not identical copies of the original guinea pig
- (3) each of the offspring had half the genetic information of the original guinea pig
- (4) none of the genetic information came from the original guinea pig

S4K4

ANSWER 2

Regents Date

June2012

18

Data Base File Number

429

clone

310. Which process produces only identical offspring?

- (1) meiotic cell division
- (2) selective breeding
- (3) cloning
- (4) fertilization

S4K4

ANSWER 3

Regents Date

June2015

5

Data Base File Number

1126

common ancestor

311. Caffeine is a compound found in the seeds of many different plants, such as coffee beans, cola nuts, and cacao beans (the source of chocolate). The presence of this chemical in all three types of plants suggests that these plants

- (1) inherited identical mutations
- (2) share a common ancestry
- (3) were exposed to the same type of radiation in the past
- (4) were cloned from a caffeine plant

S4K3

ANSWER 2

Regents Date

Aug2015

12

Data Base File Number

1159

common ancestor

Regents Date
Jan2015

312. Base your answer to this questions on the passage given and on your knowledge of biology. -----
Most animal fossils include hard body parts such as teeth and bones. Until recently, scientists had little hope that soft tissue could be preserved in the bones. A team of scientists has removed soft tissue containing a collagen protein from the leg bone of a 68-million-year-old fossil from a dinosaur, "Tyrannosaurus rex". The technique of mass spectrometry was used to identify the sequences of certain molecules in several small fragments of the dinosaur collagen protein.
The molecular sequences were compared to those of modern animals. The scientist found that the collagen protein of the "Tyrannosaurus rex" more closely resembled the collagen protein found in modern chickens than that in some other modern animals. ----- When the scientists compared the molecular sequences in the collagen proteins of the "Tyrannosaurus rex" to those of modern animals, they were most likely seeking information about

S1KA

- (1) patterns of behavior
- (2) reproductive cycles
- (3) common ancestry
- (4) changing environmental conditions

49

Data Base File Number

1120

ANSWER

3

common ancestor

Regents Date
June2012

313. Certain chemicals, such as cytochrome C, are found within cells of all living organisms. The biochemical structure of cytochrome C in ground finches and in tree finches is very similar. This suggests that tree finches and ground finches have

LAB3

- (1) identical DNA
- (2) a common ancestor
- (3) evolved at the same time
- (4) the same nesting site

73

Data Base File Number

442

ANSWER

2

common ancestor

Regents Date
June2021

- 314.** Base your answer to this question on the passage given and on your knowledge of biology.
A recent study of Darwin’s finches in the Galapagos Islands identified the gene, HMGA2, that is involved in beak size. It played a role in which finches feeding on smaller seeds survived a severe drought in 2004-2005. Following the drought, the average size of the medium ground finch beak decreased. This change was traced directly to changes in the frequency of the HMGA2 gene. Previous studies have shown that HMGA2 affects body size in animals, including dogs and horses, and even humans. One possible reason that such diverse species could be affected by the HMGA2 gene is that
- (1) they all lived on the Galapagos Islands
 - (2) they share a common ancestor
 - (3) the drought caused the formation of the gene
 - (4) the gene allowed all these species to grow larger

LAB3

76

Data Base File Number

1588

ANSWER 2

competition

Regents Date
Aug2004

- 315.** Cattail plants in freshwater swamps in New York State are being replaced by purple loosestrife plants. The two species have very similar environmental requirements. This observation best illustrates
- (1) variations within a species
 - (2) dynamic equilibrium
 - (3) random recombination
 - (4) competition between species

S4K6

20

Data Base File Number

710

ANSWER 4

competition

Regents Date
Aug2009

- 316.** What will most likely occur if two different plant species compete for the same requirements in an ecosystem?
- (1) They will usually develop different requirements.
 - (2) One species may adapt to a different environment.
 - (3) One species may be eliminated from that ecosystem.
 - (4) They will alter the environment so that they can both survive in that ecosystem.

S4K6

21

Data Base File Number

216

ANSWER 3

competition

317. The wetland plant purple loosestrife was imported to North America from Europe. Since its introduction, the loosestrife has spread, which has resulted in a dramatic decline in the biological diversity of native wetland plants. A likely reason for the spread of the purple loosestrife is that it can

- (1) successfully compete with native herbivores for food
- (2) serve as an excellent food source for native herbivores
- (3) successfully compete with native plants for space
- (4) prevent the migration of native plants

Regents Date

Aug2013

3

S4K6

Data Base File Number

ANSWER

3

989

competition

318. Base your answer to this question on the information given and on your knowledge of biology. There are two different species of finch that live on the same small island, species A and species B. Both species successfully feed and reproduce on the island. Species A nests in pine trees and eats large seeds. Species B nests in hollowed-out dead logs and eats small insects. Both bird species A and species B can most likely survive on the same small island because they

- (1) use different resources and, therefore, they do not compete
- (2) mate with each other, keeping both populations constant
- (3) compete for food, but do not compete for shelter
- (4) eat the same food, but feed at different times of the day

Regents Date

Aug2015

80

LAB3

Data Base File Number

ANSWER

1

1177

competition

319. Which statement best describes a situation where competition occurs in an ecosystem?

- (1) A deer outruns an attacking wolf.
- (2) A deer, during the winter, consumes tree bark.
- (3) A deer and a rabbit consume grass in a field.
- (4) A deer and a rabbit are both startled by a hawk flying overhead.

Regents Date

Aug2016

14

S4K1

Data Base File Number

ANSWER

3

1248

competition

- 320.** Which statement best describes the process of competition?
- (1) It may be for abiotic or biotic resources.
 - (2) It is not affected by changes in the environment.
 - (3) It always occurs between members of different species.
 - (4) It allows nutrients in an ecosystem to move from herbivores to autotrophs.

S4K1

ANSWER 1

Regents Date

Aug2022

23

Data Base File Number

1643

competition

- 321.** In a stable, long-existing community, the establishment of a single species per niche is most directly the result of
- (1) parasitism
 - (2) interbreeding
 - (3) competition
 - (4) overproduction

S4K6

ANSWER 3

Regents Date

Jan2003

21

Data Base File Number

738

competition

- 322.** Growing exotic (nonnative) plant species in parks and gardens could lead directly to an increase in the
- (1) biodiversity of the autotrophs that feed on them
 - (2) populations of native carnivores
 - (3) competition between them and native producers
 - (4) breeding between them and native herbivores

S4K7

ANSWER 3

Regents Date

Jan2013

27

Data Base File Number

638

competition

323. In early spring, many wildflowers begin to grow, produce flowers, and release seeds. The leaves of the wildflowers make food before the leaves of the trees in the area begin to develop. The early growth pattern of the wildflowers would likely result in

S4K1

- (1) decreased competition for sunlight between the trees and the wildflowers
- (2) decreased competition for suitable temperature between the trees and the wildflowers
- (3) increased competition for space between the trees and the wildflowers
- (4) increased competition for oxygen between the trees and the wildflowers

Regents Date

Jan2015

3

Data Base File Number

1096

ANSWER

3

competition

324. Organisms that live on land rarely compete for

S4K1

- (1) food
- (2) space
- (3) water
- (4) oxygen

Regents Date

Jan2020
14

Data Base File Number

1542

ANSWER

4

competition

325. Which interaction is an example of competition between two species?

S4K6

- (1) mice and chipmunks eating sunflower seeds at a bird feeder
- (2) mold growing on a tree that has fallen in the forest
- (3) a coyote feeding on the remains of a squirrel killed on the road
- (4) a lion stalking, killing, and eating a zebra

Regents Date

Jan2024

9

Data Base File Number

1734

ANSWER

1

competition

326. Competition between two species occurs when

S4K6

- (1) mold grows on a tree that has fallen in the forest
- (2) chipmunks and squirrels eat sunflower seeds in a garden
- (3) a crow feeds on the remains of a rabbit killed on the road
- (4) a lion stalks, kills, and eats an antelope

Regents Date

June2009
24

Data Base File Number

193

ANSWER

2

competition

327. Maple leaf beetles and willow leaf beetles are named for the type of tree where they live and reproduce. They look identical to each other when observed, but experiments have shown that willow beetles would starve before eating maple leaves. This is an example of specialization that would directly reduce
- (1) variation
 - (2) competition
 - (3) adaptation
 - (4) replication

S4K3

ANSWER

2

Regents Date

June2014

14

Data Base File Number

1045

competition

328. Base your answer to this question on the passage below and on your knowledge of biology. Ocean-dwelling (marine) iguanas and land iguanas inhabit the Galapagos Islands. Some scientists believe that both types of iguanas diverged from a common ancestor. Marine iguanas eat algae. Land iguanas feed on cacti. Algae are more abundant in the ocean than cacti are on the islands. Both species lay their eggs in the sand. Rats, cats, and goats have been introduced to the islands by humans. Rats feed on iguana eggs, cats eat baby iguanas, and goats eat cacti. Identify one organism in the Galapagos Islands that directly limits the population of both the marine iguanas and land iguanas.
- (1) rats
 - (2) goats
 - (3) cacti
 - (4) algae

S4K6

ANSWER

1

Regents Date

June2015

64

Data Base File Number

1147

competition

329. An example of competition between members of two different species is
- (1) mold growing on a dead tree that has fallen in the forest
 - (2) purple loosestrife plants growing in the same wet areas as cattail plants
 - (3) a coyote feeding on the remains of a deer that died of starvation
 - (4) two male turkeys displaying mating behaviors to attract a female turkey

S4K1

ANSWER

2

Regents Date

June2018

14

Data Base File Number

1391

competition

LAB3

ANSWER

1

330. Over the years, human activity introduced organisms such as goats and other herbivores to the Galapagos Islands. The addition of these invasive organisms caused the tortoise species to be threatened because there was
- (1) an increase in competition for food sources
 - (2) a decrease in ecological succession
 - (3) an increase in the availability of vegetation
 - (4) a decrease in direct harvesting

Regents Date

June2019

82

Data Base File Number

1497

competition

S4K7

ANSWER

3

331. A new species of floating photosynthetic algae was accidentally introduced into a pond ecosystem. It gradually replaced all the original algal species. A possible reason for the replacement could be that the new species
- (1) outcompeted the original algae populations for prey present in the ecosystem
 - (2) required more resources than the original algae populations in the pond
 - (3) out competed the original algae populations for abiotic factors
 - (4) is less adapted to the pond ecosystem than the original algae populations

Regents Date

June2022

30

Data Base File Number

1622

competition

S4K6

ANSWER

4

332. Which statement best illustrates direct competition within a species?
- (1) A chipmunk is caught and eaten by a hungry fox.
 - (2) A deer attempts to escape a mountain lion that is chasing it.
 - (3) Two muskrats mate and produce a litter of offspring.
 - (4) Several squirrels eat acorns from the oak tree where they live.

Regents Date

June2022

19

Data Base File Number

1616

complex molecules

		Regents Date
		Jan2009
		21
S4K5	333. Which statement describes starches, fats, proteins, and DNA?	Data Base File Number
	(1) They are used to store genetic information	
	(2) They are complex molecules made from smaller molecules	
	(3) They are used to assemble larger inorganic materials.	
ANSWER	(4) They are simple molecules used as energy sources.	166
2		

complexity

		Regents Date
		Aug2008
		8
S4K1	334. Which sequence shows a decreasing level of complexity?	Data Base File Number
	(1) organs → organism → cells → tissues	
	(2) organism → cells → organs → tissues	
	(3) cells → tissues → organs → organism	
ANSWER	(4) organism → organs → tissues → cells	138
4		

complexity

		Regents Date
		Jan2015
		4
S4K1	335. Which sequence best represents increasing complexity?	Data Base File Number
	(1) tissues → cells → organelles → organs	
	(2) cells → organelles → organs → organism	
	(3) organelles → cells → tissues → organs	
ANSWER	(4) organism → cells → tissues → organelles	1097
4		

conservation

		Regents Date
		Aug2001
		31
S4K7	336. In some areas, foresters plant one tree for every tree they cut. This activity is an example of	Data Base File Number
	(1) lack of management of nonrenewable natural resources	
	(2) a good conservation practice for renewable natural resources	
	(3) a good conservation practice for nonrenewable natural resources	
ANSWER	(4) lack of concern for renewable natural resources	937
2		

conservation

337. For centuries, humans have used resources from coastal areas and open ocean waters. An example of an activity that would promote the conservation of coastal areas and ocean resources is

S4K7

ANSWER 3

- (1) harvesting large numbers of different fish species
- (2) allowing all-terrain vehicles access to beach areas
- (3) creating protected zones of natural grasses and shrubs in beach areas
- (4) encouraging the construction of factories along the ocean shoreline

Regents Date

Aug2017

19

Data Base File Number

1336

conservation

338. Large rebates and low-cost loans have been made available to homeowners to install solar panels to heat their homes. The use of these incentives benefits ecosystems because it

S4K7

ANSWER 1

- (1) encourages conservation of resources
- (2) reduces the need for recycling
- (3) promotes the use of nonrenewable resources
- (4) discourages the use of alternative energy

Regents Date

Jan2011

11

Data Base File Number

313

conservation

339. New York State charges consumers a fee when purchasing beverages sold in aluminum cans and plastic bottles. This money is returned to purchasers when they return these items for recycling. Programs such as these are an attempt to

S4K7

ANSWER 2

- (1) encourage people to spend more money on their beverages
- (2) conserve the resources these containers are made from
- (3) reduce the amount of carbon dioxide produced by deforestation
- (4) totally eliminate the use of reusable containers

Regents Date

June2019

9

Data Base File Number

1475

consumer

340. Base your answer to this question on the information given and on your knowledge of biology. Thirty grams of hay (dried grasses) were boiled in 500 milliliters of water, placed in a culture dish, and allowed to stand. The next day, a small sample of pond water was added to the mixture of boiled hay and water. The dish was then covered and its contents observed regularly. Bacteria fed on the nutrients from the boiled hay. As the populations of bacteria increased rapidly, the clear mixture soon became cloudy. One week later, microscopic examination of samples from the culture showed various types of protozoa (single-celled organisms) eating the bacteria. The protozoa that fed on the bacteria can best be described as

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

S4K6

ANSWER

4

Regents Date

Aug2004

49

Data Base File Number

723

consumer

341. A corn field includes corn plants, mice, hawks, and various insects, fungi, and bacteria. Which nutritional role is correctly paired with organisms that carry out that role?

- (1) heterotrophs - corn and bacteria
- (2) producers - insects and fungi
- (3) consumers - mice and insects
- (4) decomposers - hawks and bacteria

S4K1

ANSWER

3

Regents Date

Jan2019

26

Data Base File Number

1456

consumer / producer

342. A fruit fly is classified as a consumer rather than as a producer because it is unable to

- (1) reproduce asexually
- (2) synthesize its own food
- (3) release energy stored in organic molecules
- (4) remove wastes from its bod

S4K1

ANSWER

2

Regents Date

Aug2017

1

Data Base File Number

1325

consumer / producer

S4K1	ANSWER 4	343. A relationship between a consumer and producer is best illustrated by a	Regents Date Jan2012
		(1) snake eating a bird	19
		(2) tree absorbing minerals	Data Base File Number
		(3) fungus breaking down wastes	407
		(4) deer eating grass	

consumer / producer

S4K1	ANSWER 1	344. Bighorn sheep, "Ovis canadensis", are a majestic symbol of the mountainous West. They browse at high altitudes and in steep, rocky areas from Texas to British Columbia. The feeding activity of the bighorn sheep is best described as	Regents Date Jan2014
		(1) consumers feeding on autotrophs	49
		(2) decomposers feeding on consumers	Data Base File Number
		(3) autotrophs feeding on decomposers	1027
		(4) autotrophs feeding on heterotrophs	

control

S1K2	ANSWER 3	345. Which statement describes the best procedure to determine if a vaccine for a disease in a certain bird species is effective?	Regents Date Aug2001
		(1) Vaccinate 100 birds and expose all 100 to the disease.	1
		(2) Vaccinate 100 birds and expose only 50 of them to the disease.	Data Base File Number
		(3) Vaccinate 50 birds, do not vaccinate 50 other birds, and expose all 100 to the disease.	914
		(4) Vaccinate 50 birds, do not vaccinate 50 other birds, and expose only the vaccinated birds to the disease.	

control

346. To test the effect of hormones on plant growth, six potted plant seedlings of the same species were measured and then sprayed with auxin (a growth hormone). After four weeks of growth under ideal conditions, the plants were measured again. To set up a proper control for this experiment, the investigator should

LABA

- (1) spray the same plants with different amounts of auxin
- (2) spray auxin on six plant seedlings of the same species and grow them in the dark for four weeks
- (3) wash the auxin off three of the plants after two weeks
- (4) grow another six plant seedlings of the same species under the same conditions, spraying them with distilled water only

Regents Date

Jan2002

62

Data Base File Number

884

ANSWER

4

control

347. A company that manufactures a popular multivitamin wanted to determine whether their multivitamin had any side effects. For its initial study, the company chose 2000 individuals to take one of their multivitamin tablets per day for one year. Scientists from the company surveyed the participants to determine whether they had experienced any side effects. The greatest problem with this procedure is that

S4K2

- (1) only one brand of vitamin was tested
- (2) the study lasted only one year
- (3) the sample size was not large enough
- (4) no control group was used

Regents Date

Jan2011

32

Data Base File Number

327

ANSWER

4

control

348. In an experiment to determine the effect of exercise on pulse rate, a student checks his pulse rate before and after exercising for several minutes. The purpose of checking his pulse rate before exercising is that it

LAB2

- (1) serves as the conclusion for the experiment
- (2) is needed to justify the sample size
- (3) serves as a control for the experiment
- (4) is needed to formulate a hypothesis

Regents Date

June2014

81

Data Base File Number

1064

ANSWER

3

controlled experiment

Regents Date
Aug2010

349. A student conducted an experiment to determine if listening to different types of music would affect pulse rate. She thought that pulse rate would change with different types of music. Each person participating in her experiment listened to seven different selections of music for 30 seconds each. The pulse rates were taken after each 30-second interval of music. Based on her experiment, the student concluded that a person's pulse rate changed when listening to different types of music. The component missing from this experiment is a

LABS

- (1) prediction
- (2) hypothesis
- (3) control group
- (4) research plan

68
Data Base File Number
305

ANSWER 3

controlled experiment

Regents Date
Jan2008

350. The first trial of a controlled experiment allows a scientist to isolate and test

S1K2

- (1) a logical conclusion
- (2) a variety of information
- (3) a single variable
- (4) several variables

32
Data Base File Number
96

ANSWER 3

controlled experiment

Regents Date
Jan2008

351. Which procedure would most likely provide valid results in a test to determine if drug A would be effective in treating cancer in white mice?

S1K2

- (1) injecting 1 mL of drug A into 100 white mice with cancer
- (2) injecting 1 mL of drug A into 100 white mice with cancer and 0.5 mL of drug X into 100 white mice without cancer
- (3) injecting 1 mL of drug A into 100 white mice with cancer and 0.5 mL of drug X into 100 white mice with cancer
- (4) injecting 1mL of drug A into 100 white mice with cancer and 1 mL of distilled water into another group of 100 white mice with cancer

5
Data Base File Number
78

ANSWER 4

current events

S4K5	352. Scientists have genetically altered a common virus so that it can destroy the most lethal type of brain tumor without harming the healthy tissue nearby. This technology is used for all of the following except	Regents Date
		Jan2007
		21
		Data Base File Number
ANSWER	4	62

cytoplasm

S4K1	353. The cytoplasm in a cell carries out a function similar to a function of which human system?	Regents Date
		Aug2011
		5
		Data Base File Number
ANSWER	3	361

cytoplasm

S4K1	354. The cytoplasm in a single-celled organism and the circulatory system in a human both	Regents Date
		Jan2015
		7
		Data Base File Number
ANSWER	3	1098

cytoplasm

S4K1	355. Materials are transported within a single-celled organism by the	Regents Date
		June2015
		1
		Data Base File Number
ANSWER	2	1123

data analysis

LAB2

ANSWER 4

- 356.** A student collected data from an experiment on muscle fatigue. In order to interpret these data, the student should
- (1) ignore the data because they do not support their hypothesis
 - (2) recalculate the data so that the numbers are easier to work with
 - (3) share the data with a student who has none
 - (4) organize the data into a table or graph

Regents Date

Jan2017

73

Data Base File Number

1298

decomposer

S4K6

ANSWER 3

- 357.** In an ecosystem, nutrients would be recycled if they were transferred directly from herbivores to carnivores to
- (1) hosts
 - (2) prey
 - (3) decomposers
 - (4) autotrophs

Regents Date

Aug2003

28

Data Base File Number

800

decomposer

S4K7

ANSWER 1

- 358.** Some homeowners mow their lawns during the summer, collect the grass clippings and dispose of them in a landfill. Instead of taking the clippings to a landfill, a more ecologically sound procedure would be to
- (1) leave the clippings to decompose in the lawn to form materials that enrich the soil
 - (2) spray the clippings in the lawn with imported microbes that use them for food
 - (3) burn the clippings and add the ashes to the soil
 - (4) throw the clippings into a stream or river to provide extra food for organisms living there

Regents Date

Aug2004

18

Data Base File Number

708

decomposer

S4K6

ANSWER 1

- 359.** What would most likely happen if most of the bacteria and fungi were removed from an ecosystem?
- (1) Nutrients resulting from decomposition would be reduced.
 - (2) Energy provided for autotrophic nutrition would be reduced.
 - (3) The rate of mutations in plants would increase.
 - (4) Soil fertility would increase.

Regents Date

Aug2006

14

Data Base File Number

531

decomposer

360. Fungi are decomposers that play an important role in the maintenance of an ecosystem. The role of fungi is important because they
- (1) synthesize energy-rich compounds that are directly used by producers
 - (2) break down materials that can then be used by other organisms
 - (3) limit the number of plants that can perform photosynthesis in an area
 - (4) are competitors of other consumers such as herbivores

Regents Date

Aug2017

29

Data Base File Number

1343

S4K1

ANSWER 2

decomposer

361. Stability within an ecosystem is achieved partially by the presence of organisms that break down important molecules and make them available for other organisms to use. These organisms are
- (1) plants
 - (2) herbivores
 - (3) scavengers
 - (4) decomposers

Regents Date

Aug2018

27

Data Base File Number

1432

S4K6

ANSWER 4

decomposer

362. Which group of organisms in an ecosystem fills the niche of recycling organic matter back to the environment?
- (1) carnivores
 - (2) decomposers
 - (3) producers
 - (4) predators

Regents Date

Aug2019

20

Data Base File Number

1512

S4K1

ANSWER 2

decomposer

363. In a balanced ecosystem, what microscopic organisms are essential to recycle organic chemicals back to the soil?
- (1) heterotrophs
 - (2) autotrophs
 - (3) producers
 - (4) decomposers

Regents Date

Jan2003

52

Data Base File Number

752

S4K6

ANSWER 4

decomposer

S4K6	364. What is the role of bacteria and fungi in an ecosystem? (1) they make ATP (2) they are decomposers (3) they are autotrophs (4) they carry out photosynthesis	Regents Date Jan2004 52
		Data Base File Number 672
ANSWER	2	

decomposer

S4K1	365. Which type of organism can obtain energy directly from any of the other organisms in an ecosystem? (1) herbivore (2) decomposer (3) producer (4) carnivore	Regents Date Jan2010 1
		Data Base File Number 227
ANSWER	2	

decomposer

S4K1	366. Which statement describes an activity of a decomposer? (1) A mushroom digests and absorbs nutrients from organic matter. (2) A sunflower uses nutrients from the soil to make proteins. (3) A snail scrapes algae off rocks in an aquarium. (4) A hawk eats and digests a mouse.	Regents Date Jan2012 1
		Data Base File Number 389
ANSWER	1	

decomposer

S4K6	367. Many families now use compost to make the soil in their gardens more fertile. They collect vegetable scraps and yard trimmings, place them in a compost pile or special container, and let them decompose. The organisms primarily responsible for decomposing the vegetable scraps and yard trimmings are (1) plant parasites (2) autotrophs (3) bacteria and fungi (4) scavengers and viruses	Regents Date Jan2014 21
		Data Base File Number 1015
ANSWER	3	

decomposer

S4K1	368. Decomposers are necessary in a food chain because they	(1) manufacture food by photosynthesis	Regents Date
			Jan2015
			2
			Data Base File Number
ANSWER	2	(2) return nutrients to the ecosystem	1095
		(3) absorb energy from the Sun	
		(4) produce organic nutrients	

decomposer

S4K6	369. An ecosystem is self-sustaining as long as organisms have sufficient quantities of energy, oxygen, minerals, and water. When organisms die, some of these materials are recycled back to plants in the ecosystem primarily through the activity of	(1) predators	Regents Date
			Jan2016
			4
			Data Base File Number
ANSWER	2	(2) decomposers	1181
		(3) pathogens	
		(4) parasites	

decomposer

S4K6	370. Decomposers are important in the environment because they	(1) convert large molecules into simpler molecules that can then be recycled	Regents Date
			June2003
			32
			Data Base File Number
ANSWER	1	(2) release heat from large molecules so that the heat can be recycled through the ecosystem	774
		(3) can take in carbon dioxide and convert it into oxygen	
		(4) convert molecules of dead organisms into permanent biotic parts of an ecosystem	

decomposer

S4K1	371. Decomposers are necessary in an ecosystem because they	(1) produce food for plants by the process of photosynthesis	Regents Date
			June2010
			23
			Data Base File Number
ANSWER	4	(2) provide energy for plants by the process of decay	271
		(3) can rapidly reproduce and evolve	
		(4) make inorganic materials available to plants	

decomposer

S4K6	372. Which statement best describes the role of decomposers?	Regents Date
	(1) They convert carbon dioxide and water to glucose.	June2014
	(2) They break down organic compounds into products used by other organisms	26
	(3) They release oxygen to the atmosphere.	Data Base File Number
ANSWER	2	1057
	(4) They provide energy for the synthesis of proteins.	

decomposer

S4K6	373. Which activity is an example of a decomposer recycling organic compounds back into the environment?	Regents Date
	(1) A tree synthesizes starch from simpler molecules.	June2019
	(2) A bacterial cell performs photosynthesis.	1
	(3) A bird digests proteins from its food.	Data Base File Number
ANSWER	4	1468
	(4) A fungus breaks down the body of a dead animal.	

deforestation

S4K7	374. Forest ecosystems help regulate climate, prevent soil erosion, and play a role in the cycling of water. Since the 18th century, humans have cleared nearly half of Earth's forests. Which statement best describes the effects of this deforestation?	Regents Date
	(1) It affects only the species of animals that live there.	Aug2023
	(2) It disrupts many natural processes that humans depend on.	20
	(3) It increases plant biodiversity in nearby ecosystems.	Data Base File Number
ANSWER	2	1718
	(4) It increases human reliance on renewable resources.	

deforestation

	375. Deforestation is a major cause of soil loss. Without trees and other plants to hold the soil in place, it either washes or blows away. Governments, international organizations, and others are working to decrease the rate of deforestation. In addition to slowing the rate of soil loss, another potential benefit of this action would be	Regents Date June2023
S4K7	(1) a decrease in atmospheric carbon dioxide levels	43
ANSWER 1	(2) more land available for agriculture	Data Base File Number
	(3) a decrease in the amount of firewood for heating	1701
	(4) more locations for the construction of new homes	

dependent variable

	376. An experiment was carried out to determine whether drinking caffeinated soda increases pulse rate. The pulse rates of two groups of people at rest were measured. Group A was then given caffeinated soda and Group B was given caffeine-free soda. One hour after drinking the soda, the pulse rates were measured. The participants in the experiment were all the same age, and they were all given the same amount of soda. The dependent variable in this experiment is the	Regents Date Aug2010
LABS	(1) type of soda given to each group	69
ANSWER 3	(2) amount of soda given to each group	Data Base File Number
	(3) pulse rate of each group	306
	(4) age of participants in each group	

dependent variable

	377. In an experiment to test the effect of exercise on the number of times a clothespin can be squeezed in 1 minute, the dependent variable would be the	Regents Date Aug2012
LAB1	(1) test subject	81
ANSWER 3	(2) amount of exercise	Data Base File Number
	(3) number of squeezes	474
	(4) clothespit	

dependent variable

Regents Date

Aug2022

378. Base your answer to this question on the information given and on your knowledge of biology. A student hypothesized that the pulse rates of his classmates would increase after walking. The student then obtained pulse rates from five classmates after they walked for 15 minutes. The data, in beats per minute, were recorded as: 78, 68, 84, 88, and 90. What is the dependent variable in this investigation?

LAB2

- (1) pulse rate
- (2) walking
- (3) 15 minute time interval
- (4) age of the students

78

Data Base File Number

1648

ANSWER

1

dependent variable

Regents Date

Jan2020

379. An experiment is carried out to determine how different pH values of soil will affect the growth of tomato plants. In this experiment, the dependent variable could be the

LABA

- (1) height of the tomato plants
- (2) pH of the soil
- (3) specific variety of tomato plants used
- (4) pH of enzymes in tomato leaf cells

31

Data Base File Number

1551

ANSWER

1

dependent variable

Regents Date

June2019

380. In the lab activity "Making Connections", an experiment was designed to test the effect of exercise on the ability to squeeze a clothespin. The number of times the clothespin was squeezed served as the

LAB2

- (1) independent variable
- (2) dependent variable
- (3) hypothesis
- (4) control

75

Data Base File Number

1495

ANSWER

2

development

			Regents Date June2008
	381.	Although all of the cells of a human develop from one fertilized egg, the human is born with many different types of cells. Which statement best explains this observation?	
S4K2	(1)	Developing cells may express different parts of their identical genetic instructions.	3
	(2)	Mutations occur during development as a result of environmental conditions.	Data Base File Number
ANSWER	(3)	All cells have different genetic material.	
1	(4)	Some cells develop before other cells.	105

development / organism

			Regents Date June2005
	382.	Most mammals have adaptations for	18
S4K4	(1)	internal fertilization and internal development of the fetus	
	(2)	internal fertilization and external development of the fetus	Data Base File Number
ANSWER	(3)	external fertilization and external development of the fetus	
1	(4)	external fertilization and internal development of the fetus	584

diabetes

			Regents Date June2012
	383.	Complications from diabetes can include nerve cell damage and poor blood flow, especially in the feet and legs. In individuals with diabetes, wounds usually take longer than normal to heal. One reason for the change in wound healing time in a diabetic is that	
S4K1	(1)	elevated hormone levels block the synthesis of glucose in immune cells	32
	(2)	nerve damage increases absorption of glucose by healthy cells	Data Base File Number
ANSWER	(3)	poor circulation reduces the supply of nutrients and oxygen to the cells	
3	(4)	decreased enzyme production slows protein synthesis in pancreatic cells	440

dialysis

			Regents Date June2016
	384.	A student filled a dialysis tube with 97% water solution and sealed the ends. The tube and its contents had a mass of 55 grams. The student placed the tube in a solution, and the mass of the tube and its contents increased to 60 grams. Into which solution was the dialysis tube placed?	
		(1) 0% water	75
LAB5		(2) 95% water	Data Base File Number
ANSWER	4	(3) 97% water	1236
		(4) 99% water	

differentiation

			Regents Date Aug2001
	385.	Although all the body cells in an animal contain the same hereditary information, they do not all look and function the same way. The cause of this difference is that during differentiation	
		(1) embryonic cells use different portions of their genetic information	13
S4K2		(2) the number of genes increases as embryonic cells move to new locations	Data Base File Number
ANSWER	1	(3) embryonic cells delete portions of chromosomes	923
		(4) genes in embryonic body cells mutate rapidly	

differentiation

			Regents Date Aug2002
	386.	After a series of cell divisions, an embryo develops different types of body cells such as muscle cells, nerve cells, and blood cells. This development occurs because	
		(1) the genetic code changes as the cells divide	12
S4K2		(2) different segments of the genetic instructions are used to produce different types of cells	Data Base File Number
ANSWER	2	(3) different genetic instructions are synthesized to meet the needs of new types of cells	816
		(4) some parts of the genetic materials are lost as a result of fertilization	

differentiation

- 387.** The development of specialized tissues and organs in a multicellular organism directly results from
- (1) cloning
 - (2) differentiation
 - (3) meiosis
 - (4) evolution

S4K4

ANSWER 2

Regents Date
Aug2004
11
Data Base File Number
702

differentiation

- 388.** The human brain, kidney, and liver all develop from the same zygote. This fact indicates that cells formed by divisions of the zygote are able to
- (1) differentiate
 - (2) mutate
 - (3) undergo cloning
 - (4) be fertilized

S4K4

ANSWER 1

Regents Date
Aug2005
15
Data Base File Number
604

differentiation

- 389.** Which statement indicates that different parts of the genetic information are used in different kinds of cells, even in the same organism?
- (1) The cells produced by a zygote usually have different genes.
 - (2) As an embryo develops, various tissues and organs are produced.
 - (3) Replicated chromosomes separate during gamete formation.
 - (4) Offspring have a combination of genes from both parents.

S4K2

ANSWER 2

Regents Date
Aug2006
7
Data Base File Number
525

differentiation

- 390.** In an embryo, the formation of many types of tissues and organs occurs as a result of the process of
- (1) fertilization
 - (2) genetic sorting
 - (3) differentiation
 - (4) gene recombination

S4K4

ANSWER 3

Regents Date
Aug2015
20
Data Base File Number
1166

differentiation

S4K4

ANSWER 3

- 391.** The process of differentiation is best described as the
- (1) production of a genetically identical copy of an organism
 - (2) change in shape of a protein due to high temperatures
 - (3) process by which cells specialize and develop into a specific type of cell
 - (4) process in which genes are made and transferred into other organisms

Regents Date

**Aug2022
21**

**Data Base File
Number**

1641

differentiation

S4K2

ANSWER 3

- 392.** Research has shown that certain body cells, known as stem cells, can develop into a variety of specialized cells. Various factors can cause stem cells to develop into different types of mature cells. These different types of mature cells result from
- (1) different antibodies and mitotic cell division
 - (2) identical genetic codes and meiotic cell division
 - (3) different environments of the cells and the functioning of different parts of the genetic code
 - (4) similar steps in the development of the cells and a reduction in the number of chromosomes in each cell

Regents Date

Jan2005

11

**Data Base File
Number**

550

differentiation

S4K2

ANSWER 3

- 393.** Beta cells in the pancreas and human skin cells both contain the insulin gene. The beta cells can make insulin; however, skin cells cannot. Which process is responsible for this gene being expressed in one cell type and NOT in another cell type?
- (1) mitosis
 - (2) replication
 - (3) differentiation
 - (4) meiosis

Regents Date

Jan2015

12

**Data Base File
Number**

1102

differentiation

S4K4	394. Some plants increase in height due to changes in specialized regions of cells in the tips of their branches. The processes that result in these changes include	Regents Date
		Jan2016
ANSWER	4	18
		Data Base File Number
		1192

differentiation

S4K4	395. After a zygote is formed, specialization of cells occurs. Through which process do the cells of a zygote become specialized?	Regents Date
		June2016
ANSWER	4	15
		Data Base File Number
		1219

differentiation

S4K4	396. The development of organs and tissues from a zygote includes	Regents Date
		June2018
ANSWER	1	18
		Data Base File Number
		1394

differentiation

S4K4	397. A multicellular organism has cells that perform various roles in that organism. This is most likely due to the	Regents Date
		June2023
ANSWER	1	28
		Data Base File Number
		1695

differentiation

S4K4

ANSWER

3

- 398.** The process of differentiation occurs when
- (1) two different cells, a sperm cell and an egg cell, combine to produce a zygote
 - (2) different zygotes are formed each time that an egg and sperm unite
 - (3) different kinds of cells and tissues form during embryonic development
 - (4) two different sexes are present among the offspring, after sexual reproduction

Regents Date

**June2024
5**

**Data Base File
Number**

1760

diffusion

S4K5

ANSWER

1

- 399.** Base your answer to this question on the information given and on your knowledge of biology. In a class, each student made three models of the small intestine using three artificial membrane tubes. They filled each of the three tubes with equal amounts of water, starch, protein, and vitamin C. They added starch-digesting enzyme to tube 1. They added protein-digesting enzyme to tube 2. No enzyme was added to tube 3. The ends of the membrane tubes were sealed and the tubes were soaked for 24 hours in beakers of pure water. The beakers were numbered 1, 2, and 3, corresponding to the number of the tube they contained. At the end of the experiment, the students removed the tubes and tested the water in the beakers for the presence of nutrients. Sugar would most likely be present in the water in
- (1) beaker 1, only
 - (2) beaker 2, only
 - (3) beakers 1 and 3, only
 - (4) beakers 1, 2, and 3

Regents Date

Jan2005

31

**Data Base File
Number**

564

diffusion

LAB5

ANSWER

3

- 400.** A substance is most likely to diffuse into a cell when
- (1) it is a large organic food molecule such as protein or starch
 - (2) it is enclosed in an organelle such as a vacuole
 - (3) the concentration of the substance is greater outside the cell than inside
 - (4) the pH of the substance is greater than the pH of the cell

Regents Date

**Jan2012
75**

**Data Base File
Number**

419

diffusion

401. A characteristic common to both diffusion and active transport is that
- (1) enzymes are required
 - (2) oxygen is moved across a membrane
 - (3) ATP is needed
 - (4) the movement of molecules occurs

S4K1

ANSWER

4

Regents Date

Jan2017

13

Data Base File Number

1278

diffusion

402. Carbon dioxide and water molecules enter a green plant cell and glucose leaves the cell through the process of
- (1) respiration
 - (2) digestion
 - (3) active transport
 - (4) diffusion

S4K1

ANSWER

4

Regents Date

Jan2017

37

Data Base File Number

1293

diffusion

403. A saltwater aquarium contained a variety of saltwater fish and plants. Members of a species of small fish from a freshwater stream were accidentally added to the saltwater tank. Within an hour, all of the fish that were added were dead, while the saltwater fish were still healthy. The freshwater fish most likely died because they
- (1) became severely dehydrated due to the process of diffusion
 - (2) swelled up and died due to taking in too much water
 - (3) had no freshwater organisms to eat in the saltwater tank, so they died of starvation
 - (4) ate all of the plants in the tank, so there was no longer oxygen in the water

S4K1

ANSWER

1

Regents Date

Jan2024

15

Data Base File Number

1751

diffusion

404. Which term correctly identifies the process by which molecules move through a dialysis tube membrane?
- (1) paper chromatography
 - (2) active transport
 - (3) diffusion
 - (4) digestion

LAB5

ANSWER

3

Regents Date

June2016

74

Data Base File Number

1235

diffusion / active transport

		Regents Date
		Jan2018
		15
S4K1	405. The processes of diffusion and active transport are both used to	Data Base File Number
	(1) break down molecules to release energy	
	(2) move molecules into or out of cells of the body	
ANSWER	(3) bring molecules into cells when they are more concentrated outside of the cell	1359
2	(4) move molecules against a concentration gradient, using ATP molecules	

diffusion / membrane

		Regents Date
		Jan2013
		3
S4K1	406. Which molecule can diffuse from the digestive tract into the human bloodstream without first being digested?	Data Base File Number
	(1) protein	
	(2) starch	
ANSWER	(3) fat	620
4	(4) glucose	

digestion

		Regents Date
		Aug2001
		4
S4K1	407. The main function of the human digestive system is to	Data Base File Number
	(1) rid the body of cellular waste materials	
	(2) process organic molecules so they can enter cells	
ANSWER	(3) break down glucose in order to release energy	917
2	(4) change amino acids into proteins and carbohydrates	

digestion

		Regents Date
		Aug2001
		30
S4K6	408. An owl cannot entirely digest the animals upon which it preys. Therefore, each day it expels from its mouth a pellet composed of materials such as fur, bones, and cartilage. By examining owl pellets, ecologists are able to determine the	Data Base File Number
	(1) autotrophs that owls prefer	
	(2) organisms that feed on owls	
ANSWER	(3) pathogens that affect owls	936
4	(4) consumers that owls prefer	

digestion

409. Organ systems of the human body interact to maintain a balanced internal environment. As blood flows through certain organs of the body, the composition of the blood changes because of interactions with those organs. Which change in the composition of the blood occurs as it flows through the digestive system?

- (1) oxygen levels increase
- (2) blood absorbs nutrients
- (3) carbon dioxide increases
- (4) hemoglobin increases

S4K1

ANSWER

2

Regents Date

Jan2005

55

Data Base File Number

566

digestion

410. Which process must first take place in order for the proteins in foods to be used by body cells?

- (1) digestion
- (2) storage
- (3) synthesis
- (4) excretion

S4K4

ANSWER

1

Regents Date

June2018

8

Data Base File Number

1389

digestion

411. The end products resulting from the action of amylase digesting starch would be

- (1) starches and proteins
- (2) carbon dioxide and water
- (3) amino acids
- (4) simple sugars

S4K2

ANSWER

4

Regents Date

June2023

38

Data Base File Number

1698

digestion

412. People with cystic fibrosis have decreased levels of some digestive enzymes in their small intestines. It is essential that they take enzyme supplements in order to prevent malnutrition. These enzymes are an important part of the digestive process because they

- (1) break down foods so that nutrients can be absorbed and used
- (2) contain vitamins and other nutrients necessary for a healthy diet
- (3) allow the person to synthesize large, inorganic nutrient molecules
- (4) are the building blocks of carbohydrates and other nutrient molecules

S4K1

ANSWER

1

Regents Date

June2024

16

Data Base File Number

1768

direct harvesting

S4K7	413. Direct harvesting occurs when	(1) pine trees are cut from a forest for use as lumber	Regents Date Aug2022 19
		(2) corn is planted in a newly plowed field	Data Base File Number 1640
		(3) zebra mussels are accidentally imported to the Great Lakes	
		(4) roots of plants continually take in water	
ANSWER	1		

direct harvesting

S4K3	414. Base your answers to this question on the passage given and on your knowledge of biology. - Plants of the snow lotus species, "Saussurea laniceps", are used in Tibet and China to produce traditional medicines. These plants bloom just once, at the end of a seven-year life span. Collectors remove the taller blooming plants, which they consider to have the best medicinal value. Some scientists are concerned that the continual selection and removal of the tall plants from natural ecosystems may result in a change in the average height of the snow lotus in future populations. The removal of the taller plants is an example of	(1) genetic engineering	Regents Date June2011
		(2) direct harvesting	Data Base File Number 357
		(3) selective breeding	
		(4) asexual reproduction	
ANSWER	2		

disease

S4K5	415. In 1995, during an Ebola virus outbreak, approximately 80% of the infected individuals died. Which statement is an inference that could be made based on this information?	(1) The individuals who survived were able to produce antibodies against the Ebola virus	Regents Date Jan2009
		(2) The individuals who survived were not exposed to the Ebola antigens.	Data Base File Number 167
		(3) Eighty percent of the population had a natural immunity to the Ebola virus.	
		(4) Eighty percent of the population was infected with a viral antigen.	
ANSWER	1		

disease

416. Some diseases and their causes are listed below. Which disease would individuals have the greatest difficulty preventing in themselves?

- (1) A. Flu -- influenza virus
- (2) B. Lung cancer -- smoking
- (3) C. Cystic fibrosis -- genes
- (4) D. Dysentery -- parasitic ameba

S4K5

ANSWER

3

Regents Date

June2011

5

Data Base File Number

334

disease

417. Typhoid fever, a disease that causes headaches, digestive upset, and a high fever, is caused by the bacterium "Salmonella typhi". Typhoid can be spread from person to person by contaminated water or food or by a lack of cleanliness. Since the 19th century, the number of individuals infected with this disease has decreased. Which statement best explains why the number of people with this disease and other bacterial diseases has decreased over the last 100 years?

- (1) Scientists have corrected the damaged genes that cause typhoid fever and other infectious diseases.
- (2) Public health officials have placed better controls on the use of the toxic substances that cause these diseases.
- (3) Typhoid fever, like most other bacterial diseases, is often caused by a lack of proper nutrition.
- (4) Personal habits, such as hand washing, have greatly reduced contamination from bacteria.

S4K5

ANSWER

4

Regents Date

June2014

22

Data Base File Number

1053

diversity

418. Areas with many different niches will most likely have

- (1) large numbers of organisms that will become extinct
- (2) no organisms that will become extinct
- (3) little diversity among the organisms
- (4) great diversity among the organisms

S4K3

ANSWER

4

Regents Date

Aug2003
20

Data Base File Number

793

diversity

Regents Date

Aug2024

419. Base your answer to this question on the information given and on your knowledge of biology.
The Albany Pine Bush
The Pine Bush is an inland pine barrens ecosystem in the Albany-Schenectady area of New York State. This ecosystem normally consists of pitch pine trees, a tall shrub layer with scrub oak trees, and a low shrub layer with blueberries, blackberries, grasses, and other low-growing plants.
Today it is protected as a preserve because it is one of the largest examples of the 20 inland pine barrens ecosystems remaining in the world. A number of rare or endangered species of animals live there. Only about 42% of the Pine Bush is still a true pine bush ecosystem, while the rest are areas which have had other species, such as cherry and maple trees, and various shrubs, slowly move in over the years. The area has been maintained as a pine bush ecosystem as a result of periodic fires that kill off outside species. The primary reason the occurrence of periodic fires helps to maintain the Pine Bush ecosystem is because the fires

S4K7

- (1) allow other types of plants and animals to move into the Pine Bush ecosystem
- (2) discourage developers from building houses or bringing industry to the Pine Bush
- (3) maintain the diversity of plants that are well adapted to the Pine Bush ecosystem
- (4) kill most of the plants and animals adapted to live in the Pine Bush

50

Data Base File Number

ANSWER

3

1808

diversity

Regents Date

Jan2019

420. The removal of the predator populations from an ecosystem would most likely result in

S4K1

- (1) a decrease in all the prey populations
- (2) an increase in all the producer populations
- (3) an increase in ecosystem diversity
- (4) a decrease in ecosystem diversity

22

Data Base File Number

ANSWER

4

1453

diversity

421. Some scientists have collected and stored seeds for many types of food-producing plants. The purpose of this is to
- (1) increase the destruction of environments
 - (2) continue the deforestation of world ecosystems
 - (3) decrease the dependence on plants for food
 - (4) preserve the diversity of plant species

S4K7

ANSWER 4

Regents Date
June2015

40
Data Base File Number
1144

DNA

422. When a person's teeth are being x rayed, other body parts of this person are covered with a protective lead blanket to prevent
- (1) loss of hair
 - (2) increase in cell size
 - (3) changes in DNA molecules
 - (4) changes in glucose structure

S4K3

ANSWER 3

Regents Date
Aug2001

7
Data Base File Number
919

DNA

423. To determine the identity of their biological parents, adopted children sometimes request DNA tests. These tests involve comparing DNA samples from the child to DNA samples taken from the likely parents. Possible relationships may be determined from these tests because the
- (1) base sequence of the father determines the base sequence of the offspring
 - (2) DNA of parents and their offspring is more similar than the DNA of nonfamily members
 - (3) position of the genes on each chromosome is unique to each family
 - (4) mutation rate is the same in closely related individuals

S4K2

ANSWER 2

Regents Date
Aug2001

12
Data Base File Number
922

DNA

424. For which organic compounds must information be encoded in DNA for green plants to synthesize the other three compounds?
- (1) sugars
 - (2) starches
 - (3) fats
 - (4) proteins

S4K2

ANSWER 4

Regents Date
Aug2002

5
Data Base File Number
811

DNA

- 425.** If a set of instructions that determines all of the characteristics of an organism is compared to a book, and a chromosome is compared to a chapter in the book, then what might be compared to a paragraph in the book?
- (1) a starch molecule
 - (2) an egg
 - (3) an amino acid
 - (4) a DNA molecule

S4K2

ANSWER

4

Regents Date

Aug2003

10

Data Base File Number

787

DNA

- 426.** A certain protein is found in mitochondria, chloroplasts, and bacteria. This provides evidence that plants and bacteria
- (1) have some similar DNA base sequences
 - (2) can use carbon dioxide to make proteins
 - (3) digest proteins into simple sugars
 - (4) contain certain pathogenic microbes

S4K3

ANSWER

1

Regents Date

Aug2007

14

Data Base File Number

11

DNA

- 427.** All cells in an embryo have the same DNA. However, the embryonic cells form organs, such as the brain and the kidneys, which have very different structures and functions. These differences are the results of
- (1) having two types of cells, one type from each parent
 - (2) rapid mitosis causing mutations in embryo cells
 - (3) new combinations of cells resulting from meiosis
 - (4) certain genes being expressed in some cells and not in others

S4K2

ANSWER

4

Regents Date

Aug2007

11

Data Base File Number

8

DNA

- 428.** The DNA of a human cell can be cut and rearranged by using
- (1) a scalpel
 - (2) electrophoresis
 - (3) hormones
 - (4) enzymes

S4K2

ANSWER

4

Regents Date

Aug2008

13

Data Base File Number

141

DNA

429. Which sequence correctly represents the arrangement of structures containing genetic material, from the largest to the smallest size?

- (1) chromosome → gene → nucleus
- (2) nucleus → chromosome → gene
- (3) gene → chromosome → nucleus
- (4) gene → nucleus → chromosome

S4K2

ANSWER 2

Regents Date

Aug2012

6

Data Base File Number

448

DNA

430. The DNA of a fly and the DNA of a gorilla are made up of subunits that are

- (1) arranged in the same order in both species
- (2) arranged in chains of the same length in both species
- (3) different bases in each of the two species
- (4) in different sequences in each of the two species

S4K2

ANSWER 4

Regents Date

Aug2012

7

Data Base File Number

449

DNA

431. Which factor would cause two specialized tissues that contain identical chromosomes to function differently?

- (1) Specific sections of DNA molecules in the chromosomes are activated.
- (2) All of the sections of DNA molecules in the chromosomes are activated.
- (3) Specific sections of the amino acid molecules in the cytoplasm are activated.
- (4) All of the amino acid molecules in the cytoplasm are activated.

S4K2

ANSWER 1

Regents Date

Aug2013

8

Data Base File Number

976

DNA

Regents Date
Aug2024

432. Base your answer to this question on the information given and on your knowledge of biology. Some research indicates that there is a 75% increase in the risk for developing skin cancer if an individual starts using tanning devices such as tanning beds before the age of 30. Since these devices use UV radiation, a federal government agency has issued a proposal to reclassify UV radiation emitting tanning devices into a category that has stricter regulations. ONE reason why the use of these devices could increase the risk of developing skin cancer is

- (1) UV radiation can change the DNA in skin cells.
- (2) UV radiation is abiotic.
- (3) UV radiation is invisible.
- (4) UV radiation is symbiotic to skin cells.

S4K5

60

Data Base File
Number

1809

ANSWER

1

DNA

Regents Date
Jan2003

433. Base your answer to this question on the passage included and your knowledge of biology. -- They Sure Do Look Like Dinosaurs --
When making movies about dinosaurs, film producers often use ordinary lizards and enlarge their images thousands of times. We all know, however, that while they look like dinosaurs and are related to dinosaurs, lizards are not actually dinosaurs. Recently, some scientists have developed a hypothesis that challenges this view. These scientists believe that some dinosaurs were actually the same species as some modern lizards that had grown to unbelievable sizes. They think that such growth might be due to a special type of DNA called repetitive DNA, often referred to as "junk" DNA because scientists do not understand its functions. These scientists studied pumpkins that can reach sizes of nearly 1,000 pounds and found them to contain large amounts of repetitive DNA. Other pumpkins that grow to only a few ounces in weight have very little of this kind of DNA. In addition, cells that reproduce uncontrollably have almost always been found to contain large amounts of this type of DNA. -- Which kind of cells would most likely contain large amounts of repetitive DNA?

- (1) red blood cells
- (2) cancer cells
- (3) nerve cells
- (4) cells that are unable to reproduce

S1K3

60

Data Base File
Number

753

ANSWER

2

DNA

- 434.** A sudden change in the DNA of a chromosome can usually be passed on to future generations if the change occurs in a
- (1) skin cell
 - (2) liver cell
 - (3) sex cell
 - (4) brain cell

S4K2

ANSWER 3

Regents Date

Jan2003

6

Data Base File Number

731

DNA

- 435.** The genetic code of a DNA molecule is determined by a specific sequence of
- (1) ATP molecules
 - (2) sugar molecules
 - (3) chemical bonds
 - (4) molecular bases

S4K2

ANSWER 4

Regents Date

Jan2004

9

Data Base File Number

651

DNA

- 436.** Which statement best describes the relationship between cells, DNA, and proteins?
- (1) Cells contain DNA that controls the production of proteins.
 - (2) DNA is composed of proteins that carry coded information for how cells function.
 - (3) Proteins are used to produce cells that link amino acids together into DNA.
 - (4) Cells are linked together by proteins to make different kinds of DNA molecules.

S4K2

ANSWER 1

Regents Date

Jan2005

2

Data Base File Number

543

DNA

- 437.** A characteristic of a DNA molecule that is not characteristic of a protein molecule is that the DNA molecule
- (1) can replicate itself
 - (2) can be very large
 - (3) is found in nuclei
 - (4) is composed of subunits

S4K2

ANSWER 1

Regents Date

Jan2006

4

Data Base File Number

477

DNA

438. Cells that develop from a single zygote all contain identical DNA molecules. However, some of these cells will develop differently because

- (1) different groups of cells containing the DNA may be exposed to different environmental conditions
- (2) only the DNA in certain cells will replicate
- (3) some of the DNA in some of the cells will be removed by chemical reactions
- (4) DNA is functional in only 10% of the cells in the body

S4K2

ANSWER 1

Regents Date

Jan2008

13

Data Base File Number

83

DNA

439. In a DNA sample, 15% of the bases are thymine (T). What percentage of the bases in this sample are adenine (A)?

- (1) 15%
- (2) 30%
- (3) 35%
- (4) 85%

S4K2

ANSWER 1

Regents Date

Jan2012

38

Data Base File Number

417

DNA

440. Before they can pass from a parent cell to its offspring cells, the inherited instructions that a human cell carries must first be

- (1) Before they can pass from a parent cell to its offspring cells, the inherited instructions that a human cell carries must first be
- (2) broken down and made into DNA molecules
- (3) used to make specific protein molecules that form genes
- (4) accurately replicated

S4K2

ANSWER 4

Regents Date

Jan2018

22

Data Base File Number

1364

DNA

441. The process by which a cell copies its DNA before it divides is

- (1) mutation
- (2) diffusion
- (3) replication
- (4) respiration

S4K2

ANSWER 3

Regents Date

Jan2019

43

Data Base File Number

1465

DNA

442. DNA normally contains four different molecular bases. Long strands consisting of only the molecular base cytosine (C) are placed in a beaker under conditions that allow for protein synthesis. After a period of time, the contents of the beaker are analyzed, and the proteins present are composed entirely of the amino acid proline. This finding best supports the claim that

- (1) most proteins are composed of only one type of amino acid
- (2) the amino acid proline is composed only of the molecular base cytosine
- (3) a mutation occurred in the test tube during this experiment
- (4) CCC codes for the amino acid proline

LAB1

ANSWER

4

Regents Date

Jan2024

81

Data Base File Number

1756

DNA

443. A medical test indicates that a patient has a defective protein. This condition is most likely due to a change in the directions coded in the

- (1) number of hydrogen atoms in starch molecules
- (2) sequence of inorganic molecules
- (3) number of carbon atoms in sugar molecules
- (4) sequence of subunits in DNA

S4K2

ANSWER

4

Regents Date

June2001

4

Data Base File Number

888

DNA

444. A small amount of DNA was taken from a fossil of a mammoth found frozen in glacial ice. Genetic technology can be used to produce a large quantity of identical DNA from this mammoth's DNA. In this technology, the original DNA sample is used to

- (1) stimulate differentiation in other mammoth cells
- (2) provide fragments to replace certain human body chemicals
- (3) act as a template for repeated replication
- (4) trigger mitosis to obtain new base sequences

S4K2

ANSWER

3

Regents Date

June2001

12

Data Base File Number

894

DNA

- 445.** When DNA separates into two strands, the DNA would most likely be directly involved in
- (1) replication
 - (2) fertilization
 - (3) differentiation
 - (4) evolution

S4K2

ANSWER 1

Regents Date
June2003
10
Data Base File Number
760

DNA

- 446.** In the human pancreas, acinar cells produce digestive enzymes and beta cells produce insulin. The best explanation for this is that
- (1) a mutation occurs in the beta cells to produce insulin when the sugar level increases in the blood
 - (2) different parts of an individual's DNA are used to direct the synthesis of different proteins in different types of cells
 - (3) lowered sugar levels cause the production of insulin in acinar cells to help maintain homeostasis
 - (4) the genes in acinar cells came from one parent while the genes in beta cells came from the other parent

S4K2

ANSWER 2

Regents Date
June2004
10
Data Base File Number
679

DNA

- 447.** The largest amount of DNA in a plant cell is contained in
- (1) a nucleus
 - (2) a chromosome
 - (3) a protein molecule
 - (4) an enzyme molecule

S4K2

ANSWER 1

Regents Date
June2005
7
Data Base File Number
579

DNA

- 448.** Hereditary traits are transmitted from generation to generation by means of
- (1) specific sequences of bases in DNA in reproductive cells
 - (2) proteins in body cells
 - (3) carbohydrates in body cells
 - (4) specific starches making up DNA in reproductive cells

S4K2

ANSWER 1

Regents Date
June2006
7
Data Base File Number
505

DNA

- 449.** A change in the base subunit sequence during DNA replication can result in
- (1) variation within an organism
 - (2) rapid evolution of an organism
 - (3) synthesis of antigens to protect the cell
 - (4) recombination of genes within the cell

S4K2

ANSWER

1

Regents Date

June2007

7

Data Base File Number

29

DNA

- 450.** Asexually reproducing organisms pass on hereditary information as
- (1) sequences of A, T, C, and G
 - (2) chains of complex amino acids
 - (3) folded protein molecules
 - (4) simple inorganic sugars

S4K2

ANSWER

1

Regents Date

June2008

7

Data Base File Number

109

DNA

- 451.** If 15% of a DNA sample is made up of thymine, T, what percentage of the sample is made up of cytosine, C?
- (1) 15%
 - (2) 35%
 - (3) 70%
 - (4) 85%

S4K2

ANSWER

2

Regents Date

June2010

7

Data Base File Number

260

DNA

- 452.** DNA is able to control cellular activities most directly by regulating the process of
- (1) meiotic division
 - (2) protein synthesis
 - (3) active transport
 - (4) selective breeding

S4K2

ANSWER

2

Regents Date

June2014

12

Data Base File Number

1043

DNA

453. A man is exposed to large amounts of ultraviolet radiation while sunbathing at the beach. This exposure causes a genetic change in the DNA of a skin cell. In the future, this change can be passed on to

- (1) his male and female children
- (2) his male children, only
- (3) all cells in his body
- (4) his skin cells, only

S4K3

ANSWER

4

Regents Date

June2015

8

Data Base File Number

1127

DNA

454. A scientist analyzes the bases in a segment of DNA from a human skin cell to determine if it codes for a protein. The base A is 12% of the bases in this segment of DNA. Calculate the percentage of bases that would be C.

- (1) 12%
- (2) 24%
- (3) 38%
- (4) 50%

S4K2

ANSWER

3

Regents Date

June2016

4.2

Data Base File Number

1234

DNA

455. DNA replication occurs in preparation for

- (1) mitosis, only
- (2) meiosis, only
- (3) both mitosis and meiosis
- (4) neither mitosis nor meiosis

S4K4

ANSWER

4

Regents Date

June2016

4

Data Base File Number

1212

DNA

456. Animals and green plants are similar in that they

- (1) both carry out heterotrophic nutrition
- (2) all produce offspring by asexual reproduction
- (3) both use DNA to transmit hereditary information to offspring
- (4) all require oxygen to carry out photosynthesis

S4K1

ANSWER

3

Regents Date

June2019

19

Data Base File Number

1480

DNA / base pairing

		Regents Date Aug2003
	457. What determines the kind of genes an organism possesses?	9
S4K2	(1) type of amino acids in the cells of the organism	
	(2) sequence of the subunits A, T, C, and G in the DNA of the organism	Data Base File Number
ANSWER	(3) size of simple sugar molecules in the organs of the organism	786
2	(4) shape of the protein molecules in the organelles of the organism	

DNA / base pairing

		Regents Date Aug2019
	458. A sample of DNA from a human skin cell contains 32% cytosine (C) bases. Approximately what percentage of the bases in this sample will be thymine (T)?	12
S4K2	(1) 18	
	(2) 24	Data Base File Number
ANSWER	(3) 32	1509
1	(4) 36	

DNA / base pairing

		Regents Date Jan2023
	459. DNA is formed using four kinds of base subunits. In a double-stranded segment of DNA, the percentage of the base C is 18%. What is the approximate percentage of base T?	5
S4K2	(1) 18%	
	(2) 32%	Data Base File Number
ANSWER	(3) 36%	1653
2	(4) 64%	

DNA base sequences

		Regents Date Aug2023
	460. Which statement correctly describes an organism's genetic information?	19
S4K2	(1) DNA molecules contain four subunits known as genes.	
	(2) Chromosomes are made entirely of protein.	Data Base File Number
ANSWER	(3) Genes are made of long sequences of chromosomes.	1717
4	(4) DNA contains combinations of four base subunits.	

DNA base sequences

		461. Ultraviolet light can alter the DNA segments of genes in the skin cells of an individual. Which statement best describes a direct result of these alterations?	Regents Date Aug2024
S4K2		(1) Any cells produced from the altered skin cells will have the same alterations.	22
		(2) All the offspring of the individual will have the same skin cell alterations.	Data Base File Number
ANSWER	1	(3) These alterations will spread to all the other cells in the body.	1801
		(4) The sex cells of the individual will have the same alterations.	

DNA base sequences

		462. A change in the order of DNA bases that code for a respiratory protein will most likely cause	Regents Date Jan2003
S4K2		(1) the production of a starch that has a similar function	7
		(2) the digestion of the altered gene by enzymes	Data Base File Number
ANSWER	3	(3) a change in the sequence of amino acids determined by the gene	732
		(4) the release of antibodies by certain cells to correct the error	

DNA base sequences

		463. Genes involved in the production of abnormal red blood cells have an abnormal sequence of	Regents Date Jan2005
S4K2		(1) ATP molecules	10
		(2) amino acids	Data Base File Number
ANSWER	4	(3) sugars	549
		(4) bases	

DNA base sequences

		464. Relationships between plant species may most accurately be determined by comparing the	Regents Date Jan2008
LABS		(1) habitats in which they live	67
		(2) structure of guard cells	Data Base File Number
ANSWER	3	(3) base sequences of DNA	100
		(4) shape of their leaves	

DNA base sequences

		Regents Date
		Jan2017
		21
S4K2	465. The instructions for the genetic traits of an organism are directly determined by the	Data Base File Number
	(1) numbers of A, T, C, and G units in a sugar molecule	1282
ANSWER	(2) sequence of bases in DNA molecules	
2	(3) length of a DNA molecule	
	(4) way the bases are paired in the two strands of a DNA molecule	

DNA base sequences

		Regents Date
		Jan2019
		82
LAB1	466. A rare tropical plant was found to have medicinal properties. A search was conducted to find other plants that are closely related to the rare plant. Which combination of characteristics would best identify the plant most closely related to the original one?	Data Base File Number
	(1) shape of seeds, number of flower petals, leaf pigments	1467
ANSWER	(2) number of flower petals, positive reaction to a specific enzyme	
3	(3) leaf pigments, sequence of DNA bases, positive reaction to a specific enzyme	
	(4) presence of DNA bases, internal stem structure, shape of seeds	

DNA base sequences

		Regents Date
		Jan2019
		39
S4K2	467. Body cells include nerve cells and muscle cells. Each makes a number of different proteins. For example, nerve cells make cholinesterase and muscle cells make myosin. Which statement best compares the DNA normally found in these two types of cells in an individual?	Data Base File Number
	(1) The two cells have identical DNA sequences and use the same section of the DNA to make these two proteins.	1463
ANSWER	(2) The two cells have identical DNA sequences, but use different sections of the DNA to make these two proteins.	
2	(3) The two cells have different DNA sequences, but use the same section of the DNA to make these two proteins.	
	(4) The two cells have different DNA sequences and use different sections of the DNA to make these two proteins.	

DNA base sequences

		Regents Date June2001
	468. Which situation would most directly affect future generations naturally produced by a maple tree?	14
S4K3	(1) Ultraviolet radiation changes the DNA sequence within some leaves of the tree.	
	(2) Ultraviolet radiation changes the DNA sequence within the gametes of some flowers of the tree.	Data Base File Number
ANSWER	(3) An increase in temperature reduces the number of cell divisions in the roots.	896
2	(4) Rapidly growing cells just under the bark are exposed to radiation, causing changes in genetic material.	

DNA base sequences

		Regents Date June2003
	469. The instructions for the traits of an organism are coded in the arrangement of	11
S4K2	(1) glucose units in carbohydrate molecules	
	(2) bases in DNA in the nucleus	Data Base File Number
ANSWER	(3) fat molecules in the cell membrane	761
2	(4) energy-rich bonds in starch molecules	

DNA base sequences

		Regents Date June2005
	470. Synthesis of a defective protein may result from an alteration in	5
S4K2	(1) vacuole shape	
	(2) the number of mitochondria	Data Base File Number
ANSWER	(3) a base sequence code	577
3	(4) cellular fat concentration	

DNA bases

		Regents Date Aug2022
	471. PCR, Polymerase Chain Reaction, is a method for carrying out DNA replication. In order to perform this technique, a scientist would need	9
S4K2	(1) a DNA template, ATP, and 20 different amino acid subunits	
	(2) enzymes, several types of simple sugars, and starch molecules	Data Base File Number
ANSWER	(3) a DNA template, enzymes, and subunits with A, G, T, and C bases	1633
3	(4) enzymes, specific receptor molecules, and several hormones	

DNA bases

472. A normal sequence of DNA bases in a single human skin cell is CATGGC. If this sequence replicates in this cell and becomes GATGGC, this alteration will most likely be passed to

- (1) every cell that develops from it
- (2) all human body cells
- (3) offspring of the human
- (4) all skin cells of this person

S4K2

ANSWER

1

Regents Date

Jan2015

11

Data Base File Number

1101

DNA bases

473. Which cellular change in an organism could be inherited by the next generation?

- (1) a change in the ribosomes in the pancreas of a squirrel
- (2) the deletion of a single DNA base in a sperm cell of a trout
- (3) a decrease in the size of a vacuole in a rose leaf cell
- (4) the transfer of a piece of a chromosome in the skin cell of a raccoon

S4K3

ANSWER

2

Regents Date

June2017

22

Data Base File Number

1317

dynamic equilibrium

474. The action of insulin on sugar levels in the blood helps to

- (1) interfere with homeostasis
- (2) maintain dynamic equilibrium
- (3) coordinate enzyme production
- (4) regulate digestion of protein

S4K5

ANSWER

2

Regents Date

Aug2013

22

Data Base File Number

987

dynamic equilibrium

475. A person usually experiences small variations in body temperature over a 24-hour period. These variations in temperature are an example of

- (1) an immune response
- (2) genetic differences between individuals
- (3) an adaptation to global warming
- (4) dynamic equilibrium

S4K5

ANSWER

4

Regents Date

Aug2015

28

Data Base File Number

1173

dynamic equilibrium

- 476.** Which change is an example of maintaining dynamic equilibrium?
- (1) A plant wilts when more water is lost from the leaves than is lost by the roots.
 - (2) A plant turns yellow when light levels are very low.
 - (3) Insulin is released when glucose levels in the blood are high.
 - (4) A person sweats when the environmental temperature is low.

S4K5

ANSWER 3

Regents Date

Aug2017

2

Data Base File Number

1326

dynamic equilibrium

- 477.** Which situation is not an example of the maintenance of a dynamic equilibrium in an organism?
- (1) Guard cells contribute to the regulation of water content in a geranium plant.
 - (2) Water passes into an animal cell causing it to swell
 - (3) The release of insulin lowers the blood sugar level in a human after eating a big meal.
 - (4) A runner perspires while running a race on a hot summer day.

S4K5

ANSWER 2

Regents Date

Jan2004

30

Data Base File Number

663

dynamic equilibrium

- 478.** When the human body is responding to stress, the hormone adrenaline is released. A short time later, the body returns to normal. This is an example of how a human
- (1) reacts to an antibody
 - (2) develops genetic variation in body cells
 - (3) maintains cellular organization
 - (4) maintains dynamic equilibrium

S4K5

ANSWER 4

Regents Date

Jan2017

4

Data Base File Number

1269

dynamic equilibrium

S4K5	479. When a certain plant is without water for an extended period of time, guard cells close openings in the leaves of the plant. This activity conserves water and illustrates	Regents Date
		June2004
ANSWER	3	23
		Data Base File Number
		686
	(1) cellular communication involving the action of nerve cells and receptor sites	
	(2) an increase in rate of growth due to a low concentration of water	
	(3) maintenance of a dynamic equilibrium through detection and response to stimuli	
	(4) a response to one biotic factor in the environment	

dynamic equilibrium

S4K5	480. Carbon dioxide makes up less than 1 percent of Earth's atmosphere, and oxygen makes up about 20 percent. These percentages are maintained most directly by	Regents Date
		June2009
ANSWER	1	13
		Data Base File Number
		185
	(1) respiration and photosynthesis	
	(2) the ozone shield	
	(3) synthesis and digestion	
	(4) energy recycling in ecosystems	

dynamic equilibrium

S4K5	481. Some people with spinal cord injuries do not sweat below the area of the injury. Without the ability to sweat, the human body temperature begins to rise. Which statement would best describe this situation?	Regents Date
		June2010
ANSWER	4	22
		Data Base File Number
		270
	(1) Feedback mechanisms regulate blood sugar levels.	
	(2) Gene mutations are increased.	
	(3) Energy from ATP is not available	
	(4) Dynamic equilibrium is disrupted	

dynamic equilibrium

S4K5	482. The failure of the human body to effectively maintain dynamic equilibrium can result in	Regents Date
		June2013
ANSWER	4	19
		Data Base File Number
		958
	(1) reproductive success	
	(2) gene manipulation	
	(3) differentiation	
	(4) disease	

dynamic equilibrium

		Regents Date
		June2024
	483. Organisms maintain internal stability in a changing environment. To do this, they make a series of adjustments. The process of making these continual adjustments is referred to as	
S4K5	(1) cellular respiration	13
	(2) active transport	Data Base File Number
ANSWER 4	(3) natural selection	
	(4) dynamic equilibrium	1766

ecological niche

		Regents Date
		Jan2011
	484. Two species of animals with a similar appearance live in the same habitat but do not compete for food. This is because they most likely	
S4K6	(1) reproduce at different times of the year	27
	(2) are the same size	Data Base File Number
ANSWER 3	(3) occupy different ecological niches	
	(4) are active at night	324

ecological succession

		Regents Date
		Aug2010
	485. Abandoned railroad tracks are overgrown with weeds. Ten years later there are small aspen trees growing in the middle of the tracks. This change is an example of	
S4K6	(1) ecological succession	29
	(2) biological evolution	Data Base File Number
ANSWER 1	(3) genetic variation	
	(4) heterotrophic nutrition	301

ecological succession

		Regents Date
		Aug2012
	486. Shawangunk Grasslands National Wildlife Refuge has been developed from an abandoned airport to restore habitat for six species of birds that require an area rich in tall grasses. Workers must continually remove trees that are beginning to invade the area as a result of	
S4K6	(1) direct harvesting	25
	(2) genetic engineering	Data Base File Number
ANSWER 4	(3) evolutionary change	
	(4) ecological succession	465

ecological succession

487. Abandoned farmland that once grew corn is now covered with bushes and small trees. These observed changes resulted directly from

- (1) evolutionary change
- (2) ecological succession
- (3) loss of biodiversity
- (4) selective breeding

S4K6

ANSWER

2

Regents Date

Aug2016

28

Data Base File Number

1260

ecological succession

488. Scientists have studied the return of plant life on Mount St. Helens ever since the volcano erupted in 1980. Wildflowers began colonizing the area, followed by shrubs and small trees. Scientists predict that it will likely take hundreds of years before the area returns to a forest dominated by fir and hemlock trees. These changes are an example of

- (1) humans degrading an ecosystem by removing wildflowers
- (2) the loss of genetic variation in a plant species
- (3) the growth of a forest through ecological succession
- (4) the biological evolution of wildflowers, shrubs, and trees

S4K6

ANSWER

3

Regents Date

Aug2017

11

Data Base File Number

1332

ecological succession

489. Under the supervision of experts, certain areas in a nature preserve are regularly exposed to frequent, low-intensity fires. These controlled fires maintain specific populations of plants by directly

- (1) increasing the consumption of finite resources
- (2) decreasing the carbon dioxide level in the atmosphere
- (3) stopping the process of evolution
- (4) interfering with the process of ecological succession

S4K6

ANSWER

4

Regents Date

Aug2018

24

Data Base File Number

1429

ecological succession

Regents Date
Jan2006

490. Lichens are composed of two organisms, a fungus that cannot make its own food and algae that contain chlorophyll. Lichens may live on the bark of trees or even on bare rock. They secrete acids that tend to break up the rock they live on, helping to produce soil. As soil accumulates from the broken rock and dead lichens, other organisms, such as plants, may begin to grow. The ability of lichens to alter their environment, enabling other organisms to grow and take their places in that environment, is one step in the process of

S4K6

- (1) biological evolution
- (2) ecological succession
- (3) maintenance of cellular communication
- (4) differentiation in complex organisms

36

Data Base File Number
497

ANSWER **2**

ecological succession

Regents Date
Jan2016

491. Which situation is most likely to lead to ecological succession?

S4K6

- (1) The fish populations in a large lake remain the same for many years.
- (2) Hunters are allowed to hunt wolves, with no limits, for one season.
- (3) The amount of industrialization increased in an area, resulting in the increased burning of fossil fuels.
- (4) A farmer who has planted corn for many years retires, and the field is left abandoned.

25

Data Base File Number

1197

ANSWER **4**

ecological succession

Regents Date
Jan2018

492. Which statement describes an event that would most severely disrupt the process of ecological succession in an area?

S4K6

- (1) The season changes from spring into summer.
- (2) Native plants are planted in an abandoned field.
- (3) Plants and animals begin to colonize a newly formed volcanic island.
- (4) A dam is built on a river to form a reservoir.

14

Data Base File Number

1358

ANSWER **4**

ecological succession

493. If the grass in the front yard of an abandoned house is not cut for several years, the yard may become overgrown with taller grasses, bushes, and shrubs. This is an example of the process of

- (1) evolution
- (2) homeostasis
- (3) ecological succession
- (4) direct harvesting

S4K6

ANSWER 2

Regents Date

Jan2019

5

Data Base File Number

1439

ecological succession

494. A new island formed by volcanic action may eventually become populated with biotic communities as a result of

- (1) a decrease in the amount of organic material present
- (2) decreased levels of carbon dioxide in the area
- (3) the lack of abiotic factors in the area
- (4) the process of ecological succession

S4K6

ANSWER 4

Regents Date

June2003

30

Data Base File Number

772

ecological succession

495. Many years ago, a volcanic eruption killed many plants and animals on an island. Today the island looks much as it did before the eruption. Which statement is the best possible explanation for this?

- (1) Altered ecosystems regain stability through the evolution of new plant species.
- (2) Destroyed environments can recover as a result of the process of ecological succession.
- (3) Geographic barriers prevent the migration of animals to island habitats.
- (4) Destroyed ecosystems always return to their original state.

S4K6

ANSWER 2

Regents Date

June2006

24

Data Base File Number

514

ecological succession

496. In New York State, small farms that were abandoned many years ago have become hardwood forests. This is an example of

- (1) local deforestation
- (2) biotechnology
- (3) ecological succession
- (4) habitat loss

S4K6

ANSWER 3

Regents Date

June2013

2

Data Base File Number

944

ecological succession

497. Which sequence of events best represents ecological succession?

- (1) A squirrel eats acorns, and a hawk eats the squirrel.
- (2) Grass grows on a sand dune and is slowly replaced by shrubs.
- (3) After many years of planting corn in the same field, minerals present in the soil are used up.
- (4) The decomposition of plant material releases nutrients, and other plants use these nutrients.

S4K6

ANSWER

2

Regents Date

June2021

20

Data Base File Number

1576

ecological succession

498. A farmer stopped maintaining a field that was once used to grow crops. Over time, the field eventually became a forest. These changes best illustrate the process of

- (1) ecological succession
- (2) nutrient recycling
- (3) decomposition
- (4) competition

S4K6

ANSWER

1

Regents Date

June2022

5

Data Base File Number

1607

ecology

499. Base your answer to this question on the following passage and on your knowledge of biology. Mayflies belong to a group of insects known as Ephemeroptera, which means "shortlived wings". They have been given this name because the adult, the only stage that has wings, lives for only a few days. The aquatic juvenile form of most mayfly species lives for several years under rocks in streams that have high levels of dissolved oxygen. The juveniles feed on microscopic photosynthetic organisms. Juveniles supply food for trout and other stream fish. Millions of adult mayflies emerge from stream water in early summer. The adults have wings for flight, but lack functional mouth parts. Their energy supply comes from food stored in their bodies. Birds and bats eat adult mayflies. Adult mayflies mate, lay eggs, and die within a few days. Adult mayflies are unable to

- (1) take in food
- (2) move from place to place
- (3) form ATP
- (4) form gametes

S4K5

ANSWER

1

Regents Date

Aug2011

50

Data Base File Number

388

ecology

		Regents Date
		Jan2005
		30
S4K7	500. Humans are responsible for some of the NEGATIVE changes that occur in nature because they	Data Base File Number
	(1) have encouraged the development of wildlife refuges and parks	563
ANSWER	(2) have passed laws to preserve the environment	
4	(3) are able to preserve scarce resources	
	(4) are able to modify habitats more than any other species	

ecology / producers

		Regents Date
		June2010
		24
S4K6	501. A manatee is a water-dwelling herbivore on the list of endangered species. If manatees were to become extinct, what would be the most likely result in the areas where they had lived?	Data Base File Number
	(1) The biodiversity of these areas would not be affected.	272
ANSWER	(2) Certain producer organisms would become more abundant in these areas.	
2	(3) Other manatees would move into these areas and restore the population.	
	(4) Predators in these areas would occupy higher levels on the energy pyramid	

ecology interaction

		Regents Date
		Jan2007
		22
S4K6	502. Many species of plants interact with harmless underground fungi. The fungi enable the plants to absorb certain essential minerals and the plants provide the fungi with carbohydrates and other nutrients. This describes an interaction between a	Data Base File Number
	(1) parasite and its host	63
ANSWER	(2) predator and its prey	
4	(3) scavenger and a decomposer	
	(4) producer and a consumer	

ecology interaction

			Regents Date
			Jan2014
			20
S4K6	503.	A fundamental concept of ecology is that living organisms	
	(1)	are independent and do not interact with each other or with the physical environment	
	(2)	do not interact with other living organisms, but do interact with the physical environment	Data Base File Number
	(3)	interact with each other, but do not interact with the physical environment	
ANSWER	4	(4)	1014
		interact with other living organisms and interact with the physical environment	

ecosystem

			Regents Date
			Aug2003
			33
S4K7	504.	Which set of statements best illustrates a material cycle in a self-sustaining ecosystem?	
	(1)	In summer, growing plants remove magnesium ions from the soil to make chlorophyll. In autumn, these plants release magnesium when they die and decompose. In spring, new plants will grow in this same area.	
	(2)	Trees do not live in a desert ecosystem where there is not enough water present in the sandy soil to support their growth. Trees can live in a desert oasis.	Data Base File Number
	(3)	DDT is sprayed on a forest ecosystem to control the mosquito population. After a year, the level of DDT is found to be much higher in the tissues taken from a hawk than in the tissues taken from a mouse in this ecosystem.	
ANSWER	1	(4)	802
		Plants trap the Sun's energy in the chemical bonds of organic molecules. This energy is then used for plant metabolic activities.	

ecosystem

			Regents Date
			Aug2007
			30
S4K6	505.	Ecosystems will have a greater chance of maintaining equilibrium over a long period of time if they have	
	(1)	organisms imported by humans from other environments	
	(2)	a sudden change in climate	Data Base File Number
	(3)	a diversity of organisms	
ANSWER	3	(4)	21
		predators eliminated from the food chain	

ecosystem

S4K1	506. Which condition would most likely upset the stability of an ecosystem? validation rules	(1) a cycling of elements between organisms and the environment	Regents Date	Aug2007
				1
			Data Base File Number	
				1
ANSWER	4			

ecosystem

S4K6	507. Which statement describes a situation that leads to stability within an ecosystem?	(1) Carbon dioxide and water are released only by abiotic sources in the ecosystem.	Regents Date	Aug2007
				25
			Data Base File Number	
				17
ANSWER	2			

ecosystem

S4K6	508. In December 2004, a tsunami (giant wave) destroyed many of the marine organisms along the coast of the Indian Ocean. What can be expected to happen to the ecosystem that was most severely hit by the tsunami?	(1) The ecosystem will change until a new stable community is established.	Regents Date	Aug2008
				28
			Data Base File Number	
				149
ANSWER	1			

ecosystem

509. Which factor would have the greatest effect on the flow of energy into an ecosystem?

- (1) a large decrease in the amount of sunlight available
- (2) a large increase in the number of carnivores
- (3) a small increase in the number of decomposers
- (4) a small decrease in the amount of minerals available

S4K1

ANSWER 1

Regents Date

Aug2009

2

Data Base File Number

199

ecosystem

510. In order for an ecosystem to remain stable there must be

- (1) drastic modifications to the environment
- (2) interrelationships and interdependencies among organisms
- (3) limited biodiversity
- (4) gradual changes in the climate

S4K1

ANSWER 2

Regents Date

Aug2012

26

Data Base File Number

466

ecosystem

511. The organisms in a pond and the physical factors influencing them best describe

- (1) a population
- (2) an ecosystem
- (3) a biosphere
- (4) a food chain

S4K1

ANSWER 2

Regents Date

Aug2013

1

Data Base File Number

972

ecosystem

512. Years ago, an article was written titled "Medicine Chest in the Jungle". This article most likely described the

- (1) potential for ecosystems to be a source for new drugs
- (2) dangers of poisonous jungle plants and animals
- (3) deforestation of jungles for the development of large pharmacies
- (4) use of antibiotics to treat certain disorders in trees

S4K6

ANSWER 1

Regents Date

Aug2013

26

Data Base File Number

991

ecosystem

S4K1	513. Forests, mountains, rivers, and marshes are examples of the wide variety of ecosystems in New York State. The diversity of these ecosystems is most likely the result of	Regents Date	Aug2014
			2
		Data Base File Number	
			1067
ANSWER	1		
	(1) the variety of abiotic conditions in these regions		
	(2) interactions between producers and decomposers		
	(3) increased efforts to protect endangered species		
	(4) a lack of competition between the heterotrophs living there		

ecosystem

S4K1	514. In a sewage treatment facility, an optimal environment is maintained for the survival of naturally occurring species of microorganisms. These organisms can then break the sewage down into relatively harmless wastewater. For these microorganisms, the wastewater facility serves as	Regents Date	Aug2019
			22
		Data Base File Number	
			1514
ANSWER	3		
	(1) its carrying capacity		
	(2) a food chain		
	(3) an ecosystem		
	(4) an energy pyramid		

ecosystem

S4K6	515. The element carbon and its compounds are constantly cycled between the living and nonliving parts of the ecosystem. This cycling is important because	Regents Date	Aug2023
			24
		Data Base File Number	
			1722
ANSWER	2		
	(1) without carbon dioxide in the atmosphere, the ozone shield would break down completely		
	(2) carbon is a component of DNA, proteins, and other compounds essential for living organisms		
	(3) the process of photosynthesis releases carbon dioxide into the atmosphere, where it can be taken in by animals for the process of respiration		
	(4) carbon is required by humans to make all of the same proteins that all other mammals synthesize		

ecosystem

516. Which statement explains why the organisms in some ecosystems, such as rainforests, deserts, and oceans, are different from each other?

S4K1

- (1) The living organisms in each ecosystem have different needs and produce the physical conditions that they require.
- (2) Each ecosystem contains different types of living organisms that change each of the physical conditions present there.
- (3) They all have the same physical conditions present, but the living organisms use them in different ways.
- (4) Each ecosystem contains different physical conditions that determine the type of living organisms present there.

Regents Date

Aug2024

9

Data Base File Number

1791

ANSWER

4

ecosystem

517. In an ecosystem, which component is NOT recycled?

S4K6

- (1) water
- (2) energy
- (3) oxygen
- (4) carbon

Regents Date

**Jan2003
28**

Data Base File Number

741

ANSWER

2

ecosystem

518. Which condition would cause an ecosystem to become UNSTABLE?

S4K1

- (1) only heterotrophic organisms remain after a change in the environment
- (2) a slight increase in the number of heterotrophic and autotrophic organisms occurs
- (3) a variety of nonliving factors are used by the living factors
- (4) biotic and abiotic resources interact

Regents Date

Jan2003

3

Data Base File Number

728

ANSWER

1

ecosystem

519. Read the following statement in quotes. --- "Natural ecosystems provide an array of basic processes that affect humans." -- Which statement does NOT support this quotation?

S4K7

ANSWER 3

- (1) Bacteria of decay help recycle materials.
- (2) Trees add to the amount of atmospheric oxygen.
- (3) Treated sewage is less damaging to the environment than untreated sewage.
- (4) Lichens and mosses living on rocks help to break the rocks down, forming soil.

Regents Date
Jan2003

30
Data Base File Number

743

ecosystem

520. An established ecosystem may remain stable over hundreds of years because

S4K1

ANSWER 4

- (1) species interdependence is absent
- (2) there is a lack of variety in the species
- (3) no competition exists between the species
- (4) there are natural checks on species

Regents Date
Jan2005

5
Data Base File Number

545

ecosystem

521. Carbon dioxide containing carbon-14 is introduced into a balanced aquarium ecosystem. After several weeks, carbon-14 will most likely be present in

S4K6

ANSWER 3

- (1) the plants, only
- (2) the animals, only
- (3) both the plants and animals
- (4) neither the plants nor animals

Regents Date
Jan2007

25
Data Base File Number

66

ecosystem

522. When brown tree snakes were accidentally introduced onto the island of Guam, they had no natural predators. These snakes sought out and ate many of the eggs of insect-eating birds. What probably occurred following the introduction of the brown tree snakes?

S4K6

ANSWER 2

- (1) The bird population increased.
- (2) The insect population increased.
- (3) The bird population began to seek a new food source.
- (4) The insect population began to seek a new food source.

Regents Date
Jan2007

1
Data Base File Number

46

ecosystem

- 523.** Which component of a stable ecosystem can NOT be recycled?
- (1) oxygen
 - (2) water
 - (3) energy
 - (4) nitrogen

S4K6

ANSWER 3

Regents Date
Jan2008
23
Data Base File Number
90

ecosystem

- 524.** Which sequence of natural events is likely to lead to ecosystem stability?
- (1) sexual reproduction -> genetic variation -> biodiversity -> ecosystem stability
 - (2) asexual reproduction -> genetic variation -> cloning -> ecosystem stability
 - (3) genetic variation -> asexual reproduction -> biodiversity -> ecosystem stability
 - (4) genetic variation -> sexual reproduction -> cloning -> ecosystem stability

S4K6

ANSWER 1

Regents Date
Jan2009
27
Data Base File Number
171

ecosystem

- 525.** Which statement represents a characteristic of an ecosystem that is NOT likely to sustain itself?
- (1) The Sun provides the needed energy.
 - (2) Energy is transferred from plants to animals
 - (3) There are more consumers than producers.
 - (4) There are interactions between biotic and abiotic factors.

S4K6

ANSWER 3

Regents Date
Jan2012
23
Data Base File Number
408

ecosystem

- 526.** Sugar maples and white pines are two different tree species that often grow side by side in the Adirondack Mountains. Which statement concerning these trees is correct?
- (1) Since they are both trees, they can interbreed.
 - (2) Since they are not closely related, they do not compete with one another.
 - (3) Even though they are both trees, each plays a different role in the ecosystem.
 - (4) They utilize totally different abiotic resources.

S4K6

ANSWER 3

Regents Date
Jan2014
18
Data Base File Number
1012

ecosystem

527. Which statement best describes how a major change in the size of one population affects an ecosystem?

- (1) It will immediately affect every population and the physical conditions.
- (2) It will affect the physical conditions, but not the other populations.
- (3) It could directly or indirectly affect the physical conditions and any population.
- (4) It affects every population, not the physical conditions.

S4K6

ANSWER

3

Regents Date

Jan2016

15

Data Base File Number

1190

ecosystem

528. In August 2010, the Asian clam was discovered in Lake George. It is not native to that area. A single clam can reproduce and release hundreds of offspring in a day. Fish and crayfish eat the clams but cannot keep pace with the rate at which the clams reproduce. The introduction of the Asian clam into Lake George is

- (1) positive, because it adds to the stability of the ecosystem
- (2) positive, because the fish and crayfish would otherwise not have food
- (3) negative, because it decreases water pollution in the lake
- (4) negative, because it competes with native clam species and reduces stability

S4K6

ANSWER

4

Regents Date

Jan2017

8

Data Base File Number

1273

ecosystem

529. Peach blossom pollinations could be at risk if there is a total loss of honeybee populations in areas where peaches are grown. Honeybees are an important pollinator of peaches. Which action would be most likely to help peach growers stay in business and be able to produce good-sized crops of peaches?

S4K3

- (1) Hire scientists to find a way to kill other pollinating insects in the area so there are more peach blossoms for the honeybees to pollinate.
- (2) Hire researchers to identify which other native insects are able to pollinate peach blossoms and find a way to increase their populations.
- (3) Encourage the peach growers to plant other kinds of fruit instead of peaches.
- (4) Genetically engineer peach trees to be able to reproduce without producing any fruit (peaches) or seeds.

Regents Date

Jan2017

41

Data Base File Number

1295

ANSWER

2

ecosystem

530. Carbon dioxide and oxygen are important resources in ecosystems and are

S4K6

- (1) recycled through the activity of living and nonliving systems
- (2) stored in the animals of the ecosystem
- (3) lost due to the activities of decomposers
- (4) released by the process of photosynthesis

Regents Date

Jan2018

21

Data Base File Number

1363

ANSWER

1

ecosystem

531. A rich variety of genetic material in an ecosystem will

S4K6

- (1) reduce the biodiversity of the ecosystem
- (2) decrease the carrying capacity of the ecosystem
- (3) reduce the likelihood of future medical discoveries
- (4) increase the chances that some organisms will survive change

Regents Date

Jan2019

16

Data Base File Number

1448

ANSWER

4

ecosystem

532. Which statement best describes a characteristic of an ecosystem?

- (1) It must have producers and consumers but not decomposers.
- (2) It is stable because it has consumers to recycle energy.
- (3) It always has two or more different autotrophs filling the same niche.
- (4) It must have organisms that carry out autotrophic nutrition.

Regents Date
June2002

5

Data Base File Number

837

S4K6

ANSWER 4

ecosystem

533. If humans remove carnivorous predators such as wolves and coyotes from an ecosystem, what will probably be the first observable result?

- (1) The natural prey will die off.
- (2) Certain plant populations will increase.
- (3) Certain herbivores will exceed carrying capacity.
- (4) The decomposers will fill the predator niche.

Regents Date
June2004

28

Data Base File Number

690

S4K7

ANSWER 3

ecosystem

534. What impact do the amounts of available energy, water, and oxygen have on an ecosystem?

- (1) They act as limiting factors.
- (2) They are used as nutrients.
- (3) They recycle the residue of dead organisms.
- (4) They control environmental temperature.

Regents Date
June2006

23

Data Base File Number

513

S4K6

ANSWER 1

ecosystem

535. The removal of nearly all the predators from an ecosystem would most likely result in

- (1) an increase in the number of carnivore species
- (2) a decrease in new predators migrating into the ecosystem
- (3) a decrease in the size of decomposers
- (4) an increase in the number of herbivores

Regents Date
June2006

30

Data Base File Number

517

S4K7

ANSWER 4

ecosystem

536. In 1859, a small colony of 24 rabbits was brought to Australia. By 1928 it was estimated that there were 500 million rabbits in a 1-million square mile section of Australia. Which statement describes a condition that probably contributed to the increase in the rabbit population?

S4K6

ANSWER 4

- (1) The rabbits were affected by many limiting factors.
- (2) The rabbits reproduced by asexual reproduction.
- (3) The rabbits were unable to adapt to the environment.
- (4) The rabbits had no natural predators in Australia.

Regents Date

June2007

30

Data Base File Number

44

ecosystem

537. Which statement describes a role of fungi in an ecosystem?

S4K1

ANSWER 3

- (1) They transfer energy to decaying matter.
- (2) They release oxygen into the ecosystem.
- (3) They recycle chemicals from dead organisms.
- (4) They synthesize organic nutrients from inorganic substances.

Regents Date

June2007

1

Data Base File Number

24

ecosystem

538. Which factor has the greatest influence on the type of ecosystem that will form in a particular geographic area?

S4K1

ANSWER 2

- (1) genetic variations in the animals
- (2) climate conditions
- (3) number of carnivores
- (4) percentage of nitrogen gas in the atmosphere

Regents Date

June2008

25

Data Base File Number

120

ecosystem

539. A stable pond ecosystem would not contain

S4K1

ANSWER 4

- (1) materials being cycled
- (2) oxygen
- (3) decomposers
- (4) more consumers than producers

Regents Date

June2008

2

Data Base File Number

104

ecosystem

540. Rabbits are herbivores that are not native to Australia. Their numbers have increased steadily since being introduced into Australia by European settlers. One likely reason the rabbit population was able to grow so large is that the rabbits

S4K7

ANSWER 3

- (1) were able to prey on native herbivores
- (2) reproduced more slowly than the native animals
- (3) successfully competed with native herbivores for food
- (4) could interbreed with the native animals

Regents Date

June2008

30

Data Base File Number

124

ecosystem

541. In an ecosystem, the growth and survival of organisms are dependent on the availability of the energy from the Sun. This energy is available to organisms in the ecosystem because

S4K6

ANSWER 1

- (1) producers have the ability to store energy from light in organic molecules
- (2) consumers have the ability to transfer chemical energy stored in bonds to plants
- (3) all organisms in a food web have the ability to use light energy
- (4) all organisms in a food web feed on autotrophs

Regents Date

June2008

24

Data Base File Number

119

ecosystem

542. If several species of carnivores are removed from an ecosystem, the most likely effect on the ecosystem will be

S4K6

ANSWER 3

- (1) an increase in the kinds of autotrophs
- (2) a decrease in the number of abiotic factors
- (3) a decrease in stability among populations
- (4) an increase in the rate of succession

Regents Date

June2009

26

Data Base File Number

194

ecosystem

543. A sequence of events associated with ecosystem stability is represented as: sexual reproduction -> genetic variation -> biodiversity -> ecosystem stability The ARROWS in this sequence should be read as

- (1) leads to
- (2) reduces
- (3) prevents
- (4) simplifies

S4K6

ANSWER

1

Regents Date

June2009

9

Data Base File Number

183

ecosystem

544. Owls periodically expel a mass of undigested material known as a pellet. A student obtained several owl pellets from the same location and examined the animal remains in the pellets. He then recorded the number of different prey animal remains in the pellets. The student was most likely studying the

- (1) evolution of the owl
- (2) social structure of the local owl population
- (3) role of the owl in the local ecosystem
- (4) life cycle of the owl

S4K6

ANSWER

3

Regents Date

June2009

7

Data Base File Number

182

ecosystem

545. Which statement best describes bat populations in a stable ecosystem?

- (1) They are held in check by environmental factors.
- (2) They are producers that rely indirectly on other producers.
- (3) They are not limited by natural predators.
- (4) They are not dependent on other species.

S4K1

ANSWER

1

Regents Date

June2012

16

Data Base File Number

427

ecosystem

546. Which characteristic of a geographic region would have the greatest influence on the type of ecosystem that forms in that region?

- (1) ratio of autotrophs to heterotrophs
- (2) concentration of atmospheric oxygen
- (3) number of food chains
- (4) climatic conditions

S4K6

ANSWER

4

Regents Date

June2012

17

Data Base File Number

428

ecosystem

- 547.** Fishermen have harvested certain fish to the point where the population of that fish is decreasing. This level of direct harvesting could cause
- (1) ecosystems to be improved for future generations
 - (2) ecosystems to be severely damaged
 - (3) the restoration of environmental stability
 - (4) all other fish species to increase in number

S4K7

ANSWER 2

Regents Date
June2015

10

Data Base File Number

1129

ecosystem

- 548.** The flow of energy in an ecosystem is best described as energy moving in
- (1) one direction from the Sun to the producers and then to the consumers
 - (2) one direction from a consumer to a producer and then to the Sun as heat and light
 - (3) two directions between the producers that are present
 - (4) two directions, back and forth, between the producers and the consumers

S4K1

ANSWER 1

Regents Date
June2015

3

Data Base File Number

1124

ecosystem

- 549.** Populations of aspen trees in the western United States are being destroyed by an unexplained illness. The altered landscape is affecting the animals that live there. Populations of deer mice are increasing greatly in these areas. Unfortunately, these mice often carry a virus that is deadly to humans. This scenario best illustrates that
- (1) a change in the environment always results in disease
 - (2) humans are the cause of the breakdown of this ecosystem
 - (3) the stability of this ecosystem is limited by the amount of water available
 - (4) every population in an ecosystem is linked with other populations

S4K4

ANSWER 4

Regents Date
June2016

18

Data Base File Number

1222

ecosystem

550. Which method of collecting data would provide the most accurate information about how an ecosystem is being affected by human development?

S4K7

- (1) The people in the neighborhood record the number of birds they see in the area both before and after the construction of a new building.
- (2) Deer in the area are identified before construction so that scientists can see where they go after the building is finished.
- (3) More trees are planted in the area around the construction site to allow the animals a new place to live.
- (4) The population size is recorded for each species present in the construction area before and after the building is completed.

Regents Date

June2017

7

Data Base File Number

1306

ANSWER

4

ecosystem

551. As energy moves through a forest ecosystem, it flows from

S4K6

- (1) heterotrophs to autotrophs
- (2) animals to plants
- (3) herbivores to carnivores
- (4) carnivores to autotrophs

Regents Date

June2023

20

Data Base File Number

1688

ANSWER

3

ecosystem

552. A decrease in predators within an ecosystem would lead to an increase in herbivores. The increase in herbivores would cause a decrease in

S4K1

- (1) decomposers
- (2) prey
- (3) consumers
- (4) producers

Regents Date

June2024

10

Data Base File Number

1764

ANSWER

4

ecosystem / altered

S4K7	553. Imported animal species often disrupt an ecosystem because in their new environment, they will most likely	(1) eliminate the genetic variation of the autotrophs	Regents Date
			Aug2003
			34
			Data Base File Number
ANSWER	3	(2) increase the number of mutations in the herbivores	803
		(3) have no natural enemies	
		(4) be unable to produce offspring	

ecosystem / altered

S4K6	554. A certain species of plant serves as the only food for the young larvae of a particular species of butterfly. In a large field, a disease kills all the members of this plant species. As a result of the plant disease, the butterfly population will most likely	(1) quickly adapt to eat other plants	Regents Date
			Aug2019
			2
			Data Base File Number
ANSWER	2	(2) disappear from the area	1499
		(3) evolve to form a new species	
		(4) enter the adult stage more quickly	

ecosystem / altered

S4K5	555. The process of transferring energy during respiration occurs in a series of steps. This prevents too much heat from being released at one time. Maintaining an appropriate temperature is beneficial to an organism because	(1) enzymes need a proper range of temperatures to catalyze vital reactions	Regents Date
			Aug2019
			25
			Data Base File Number
ANSWER	1	(2) cellular waste products can only be excreted in cooler temperatures	1516
		(3) hormones can only produce antibodies if temperatures are not excessive	
		(4) nutrients diffuse faster into cells when temperatures are lower	

ecosystem / altered

			Regents Date
			Jan2010
			25
S4K6			Data Base File Number
ANSWER	2		
	556.	In 1960, an invasive species of fish was introduced into the stable ecosystem of a river. Since then, the population of a native fish species has declined. This situation is an example of an	
	(1)	ecosystem that has recovered	
	(2)	ecosystem altered through the activities of an organism	
	(3)	environmental impact caused by physical factors	
	(4)	ecological niche without competition	247

ecosystem / altered

			Regents Date
			Jan2019
			9
S4K6			Data Base File Number
ANSWER	2		
	557.	Recently, oil from a wrecked tanker resulted in a disaster in ecosystems containing many unique species. The potential loss of these species could result in	
	(1)	an increase in the variety of genetic material available	
	(2)	a decrease in organisms available for scientific research	
	(3)	an increase in the stability of the affected ecosystems	
	(4)	a decrease in pollution affecting the land and water	1442

ecosystem / altered

			Regents Date
			Jan2023
			18
S4K7			Data Base File Number
ANSWER	2		
	558.	Destruction of ocean habitats by pollution today means that the organisms living there may not survive in the future. By polluting the oceans, humans are	
	(1)	helping advance economic gains by using resources wisely	
	(2)	altering the equilibrium of ocean ecosystems	
	(3)	decreasing the rate of species extinction	
	(4)	increasing the stability of the oceans	1663

ecosystem / altered

S4K7	559. One important reason that humans have such a significant effect on Earth's ecosystems is that humans	(1) remove large amounts of carbon dioxide from the air	Regents Date
			Jan2024
			10
			Data Base File Number
			1735
ANSWER	3	(2) are able to increase the amount of finite resources	
		(3) can modify the environment through technology	
		(4) reproduce faster than other animal species	

ecosystem / altered

S4K6	560. In an ecosystem, the presence of many different species is critical for the survival of some forms of life when	(1) ecosystems remain stable over long periods of time	Regents Date
			June2003
			27
			Data Base File Number
			770
ANSWER	2	(2) significant changes occur in the ecosystem	
		(3) natural selection does not occur	
		(4) the finite resources of Earth increase	

ecosystem / altered

S4K7	561. Humans have altered ecosystems by activities that are sometimes deliberate and sometimes accidental. In the United States, humans have altered ecosystems by introducing invasive species that outcompete native species. Which activity resulted in the accidental introduction of an invasive species?	(1) importing Japanese knotweed because it has an attractive flower	Regents Date
			June2014
			33
			Data Base File Number
			1060
ANSWER	2	(2) transporting zebra mussels to the Great Lakes by discharging water taken on in European ports to stabilize large ships	
		(3) releasing Chinese mitten crabs in the Hudson River to establish them as a food source	
		(4) planting purple loosestrife that was brought here from Europe as a source of medicine	

ecosystem / altered

Regents Date
June2015

562. The Eurasian water milfoil is a nonnative species, which was once commonly sold as an aquarium plant, and is now found growing in many lakes in New York State. It has few natural enemies, and grows rapidly, crowding out many native species. This plant ruins fishing areas and interferes with boating and other water sports. This is an example of

S4K6

- (1) human consumption of finite resources
- (2) an unintended consequence of adding an organism to an ecosystem
- (3) an abiotic factor having a negative effect on an ecosystem
- (4) the introduction of a species that has increased the long-term biodiversity of an ecosystem

30

Data Base File Number

1142

ANSWER 2

ecosystem / altered

Regents Date
June2022

563. When an altered ecosystem is left undisturbed, the most likely result would be

S4K4

- (1) the gradual evolution of all of the original species
- (2) a rapid return to the original ecosystem
- (3) the elimination of all of the predator species
- (4) a gradual shift toward a stable ecosystem

23

Data Base File Number

1619

ANSWER 4

ecosystem / carrying capacity

Regents Date
Aug2008

564. The size of a frog population in a pond remains fairly constant over a period of several years because of

S4K6

- (1) decreasing competition
- (2) environmental carrying capacity
- (3) excessive dissolved oxygen
- (4) the depth of water

26

Data Base File Number

147

ANSWER 2

ecosystem / equilibrium

Regents Date
Aug2010

565. An ecosystem that has almost the same number and type of organisms for many years is exhibiting

S4K6

- (1) feedback
- (2) global instability
- (3) environmental change
- (4) equilibrium

1

Data Base File Number

280

ANSWER 4

ecosystem / equilibrium

	566.	The presence of wastes, such as plastic bags and motor oil, in lakes and streams miles away from developed areas suggests that	Regents Date Aug2011
S4K7	(1)	ecosystems are interconnected and human action can alter ecosystem equilibrium	28
	(2)	recycling programs have failed to conserve biotic resources	Data Base File Number
ANSWER	(3)	natural processes can alter ecosystem stability	
1	(4)	direct harvesting practices have led to irreversible destruction of ecosystems	378

ecosystem / equilibrium

	567.	Which statement best describes an ecosystem maintaining a state of approximate equilibrium?	Regents Date June2013
S4K1	(1)	Nutrients from decayed organisms are recycled in a forest ecosystem.	26
	(2)	All the frog species in a South American rain forest become extinct.	Data Base File Number
ANSWER	(3)	A mutation spreads through a species of bacterium, making them unable to decompose wastes.	
1	(4)	Mice are released into a field ecosystem as food for a declining predator population.	964

ecosystem / equilibrium

	568.	The emerald ash borer is an insect that is thought to have been accidentally brought to the United States from China in shipping containers. It attacks ash trees, eventually killing the trees, destroying an important part of the ecosystem. The presence of the emerald ash borer in the United States can be used as an example of how humans have	Regents Date June2017
S4K7	(1)	purposely introduced an insect to correct a problem in an ecosystem	4
	(2)	used an insect to remove one insect species and replace it with another	Data Base File Number
ANSWER	(3)	worked to increase the biodiversity in a particular area	
4	(4)	altered the equilibrium in an ecosystem by introducing a new species	1304

ecosystem / equilibrium

Regents Date
June2019

569. Some birds have recently modified their migratory behavior. Instead of flying to warmer climates during the winter months, the birds are remaining in northern areas where they can consume discarded food that is abundant in landfills. As a result of this change in migratory behavior, many insect populations that the birds normally feed on in the warmer climate areas are now increasing. This is an example of human activity

S4K7

- (1) interfering with ecological succession
- (2) increasing competition for infinite resources
- (3) disrupting the homeostasis of organisms
- (4) altering the equilibrium of ecosystems

8

Data Base File Number

1474

ANSWER

4

ecosystem / equilibrium

Regents Date
June2021

570. Which human activity has the potential to greatly affect the equilibrium of an ecosystem?

S4K7

- (1) cutting down a few small evergreen trees and using them to make holiday decorations
- (2) mowing the playing fields in a city park
- (3) washing a car with a detergent-based cleaner
- (4) emptying an aquarium containing many nonnative fish of several species into a local lake

21

Data Base File Number

1577

ANSWER

4

ecosystem / stable

Regents Date
Aug2003

571. In a certain ecosystem, rattlesnakes are predators of prairie dogs. If the prairie dog population started to increase, how would the ecosystem most likely regain stability?

S4K1

- (1) The rattlesnake population would start to decrease.
- (2) The rattlesnake population would start to increase.
- (3) The prairie dog population would increase rapidly.
- (4) The prairie dog population would begin to prey on the rattlesnakes.

7

Data Base File Number

784

ANSWER

2

ecosystem / stable

S4K6	572. Which statement describes all stable ecosystems? (1) Herbivores provide energy for the autotrophs. (2) The populations of predators are dependent on the populations of their prey. (3) The number of autotrophs equals the number of heterotrophs. (4) Consumers synthesize ATP from light energy.	Regents Date Aug2005 28
		Data Base File Number
		ANSWER 2
		614

ecosystem / stable

S4K6	573. A stable ecosystem is characterized by having (1) predators that outnumber their prey (2) a continual input of energy (3) limited autotrophic nutrition (4) no competition between species	Regents Date Aug2010 22
		Data Base File Number
		ANSWER 2
		295

ecosystem / stable

S4K1	574. Which statement describes a situation that would reduce the stability of a forest ecosystem? (1) A fierce predator is removed from the ecosystem. (2) The number of producers remains constant in the ecosystem. (3) Organisms frequently interact within the ecosystem. (4) The energy in the ecosystem flows from the Sun.	Regents Date Aug2015 1
		Data Base File Number
		ANSWER 1
		1149

ecosystem / stable

S4K7	575. Which activity would eventually result in a stable ecosystem? (1) deforestation in an area to increase space for the species living there (2) mowing a large field so it can be used for recreation (3) allowing native plants to grow undisturbed in an abandoned field (4) spraying pesticides on a field at the end of each growing season	Regents Date Aug2017 20
		Data Base File Number
		ANSWER 3
		1337

ecosystem / stable

S4K6	576. A stable ecosystem can have high biodiversity because each species in that ecosystem	Regents Date
		Aug2018
ANSWER 1	(1) occupies a different niche	26
	(2) inhabits a different environment	Data Base File Number
	(3) is part of a different community	1431
	(4) lives in a different biosphere	

ecosystem / stable

S4K1	577. Wolves are important predators in some ecosystems. If wolves are removed from their environment, the ecosystem is in danger of becoming unstable due to	Regents Date
		Aug2024
ANSWER 1	(1) a reduction of autotrophs when the number of herbivores is not being kept in check by the wolves	2
	(2) a decrease in the number of herbivores because they will not be able to reach carrying capacity	Data Base File Number
	(3) an increase in the biodiversity of the remaining animal and plant species	1785
	(4) some species of herbivores taking over the niche the wolves occupied	

ecosystem / stable

S4K6	578. For a natural ecosystem to be self-sustaining, many essential chemical elements must be	Regents Date
		Jan2002
ANSWER 4	(1) converted to energy	35
	(2) changed into fossil fuels such as oil and coal	Data Base File Number
	(3) permanently removed from the environment	881
	(4) cycled between organisms and the environment	

ecosystem / stable

S4K7	579. Which statement concerning ecosystems is correct?	(1) Stable ecosystems that are changed by natural disaster will slowly recover and may again become stable if left alone for a long period of time.	Regents Date
			Jan2004 34
ANSWER	1	(2) Competition does not influence the number of organisms that live in ecosystems.	Data Base File Number
		(3) Climatic change is the principal cause of habitat destruction in ecosystems in the last fifty years.	667
		(4) Stable ecosystems, once changed by natural disaster, will never recover and become stable again, even if left alone for a long period of time.	

ecosystem / stable

S4K6	580. Which statement best describes what happens to energy and molecules in a stable ecosystem?	(1) Both energy and molecules are recycled in an ecosystem.	Regents Date
			Jan2004 31
ANSWER	4	(2) Neither energy nor molecules are recycled in an ecosystem.	Data Base File Number
		(3) Energy is recycled and molecules are continuously added to the ecosystem.	664
		(4) Energy is continuously added to the ecosystem and molecules are recycled	

ecosystem / stable

S4K3	581. A stable ecosystem would not contain	(1) materials being cycled	Regents Date
			Jan2009 2
ANSWER	2	(2) consumers without producers	Data Base File Number
		(3) decomposers	153
		(4) a constant source of energy	

ecosystem / stable

Regents Date

Jan2016

582. Base your answer to this questions on the information given and on your knowledge of biology. Since 1980, the vulture population in India has declined from 40 million to 60 thousand due to poisoning by a pain reliever used in cattle. If only 1% of the cattle carcasses fed on by vultures are animals that have been treated with the drug, it can lead to a drastic decline in the vulture population. The grim picture is that over 10% of the carcasses have been found to contain this drug. Vultures feed exclusively on the carcasses of dead animals. This helps to prevent the spread of diseases such as rabies and anthrax among wildlife, livestock, and humans. Without as many vultures present, other scavengers such as dogs have moved in and taken advantage of the newly available food. The abundance of these other scavengers has led to an increase in the number of cases of human rabies and an outbreak of tuberculosis, anthrax, and foot-and-mouth disease. These diseases are not spread to humans by vultures. The best explanation for the increase in rabies, anthrax, and other diseases in humans is that the

S4K1

- (1) decrease in the number of vultures has upset ecosystem stability
- (2) vulture population is being killed off by an increase in cases of human rabies
- (3) vultures are changing their feeding role from scavenger to decomposer
- (4) people are consuming scavengers that have eaten diseased vultures

49

Data Base File Number

ANSWER

1

1206

ecosystem / stable

Regents Date

Jan2024

25

583. A self-sustaining ecosystem in a glass tank must include

S4K6

- (1) producers, decomposers, light, and water
- (2) herbivores, consumers, decomposers, and water
- (3) decomposers, heterotrophs, light, water, and carbon
- (4) heterotrophs, water, and carbon dioxide

Data Base File Number

ANSWER

1

1739

ecosystem / stable

S4K3	584. In a stable ecosystem, each niche is usually occupied by only one species. The species occupying a particular niche is able to continue to remain there as a direct result of	Regents Date
		Jan2024
ANSWER	2	2
		Data Base File Number
	(1) ecological succession	1729
	(2) favorable adaptations	
	(3) a new mutation	
	(4) selective breeding	

ecosystem / stable

S4K6	585. One characteristic of a stable ecosystem is	Regents Date
		June2017
ANSWER	2	2
		Data Base File Number
	(1) a high number of predators	1302
	(2) an interdependence of organisms	
	(3) a lack of biodiversity	
	(4) an increase in human interference	

ecosystem / stable

S4k1	586. Maintaining stability in an ecosystem most likely depends on	Regents Date
		June2023
ANSWER	3	25
		Data Base File Number
	(1) a high level of diversity and few resources	1692
	(2) little diversity and rapid ecological succession	
	(3) a high level of diversity and multiple ecological niches	
	(4) little diversity and multiple extinctions	

ecosystem / stable

S4K6	587. Humans have negatively affected the ecosystem that many small mammals like fishers (similar to a mink) occupy. An altered or changed ecosystem can	Regents Date
		June2024
ANSWER	2	43
		Data Base File Number
	(1) never recover or become stable again	1781
	(2) usually recover gradually to a point of long-term stability	
	(3) never recover unless there is a decrease in biodiversity	
	(4) usually recover quickly into the same ecosystem as it was previously	

ecosystem stable

		Regents Date Aug2024
	588. The American Museum of Natural History has an exhibit called the Ecosystem Sphere. It is a huge glass globe that was assembled in 1999. Populations of algae, bacteria, and little shrimp were sealed with water and air inside. The Ecosystem Sphere is kept in a well-lit area. Although the sphere has never been opened, groups of each kind of organism are still alive inside it. The most likely reason for this is because the populations have	
S4K6	(1) remained in separate areas of the sphere and do not interact	19
	(2) adapted so that they do not require food	Data Base File Number
ANSWER 4	(3) a constant source of energy because they cannot recycle gases and materials	
	(4) a constant source of energy and recycle gases and materials	1798

electrophoresis

		Regents Date Aug2019
	589. If scientists want to determine the similarities in the DNA fragments in several plant species, they should	
LAB1	(1) add salt water to cells from each plant	76
	(2) analyze electrophoresis results	Data Base File Number
ANSWER 2	(3) compare seed structures of the plants	
	(4) compare seed structures of the plants	1530

electrophoresis

		Regents Date Jan2008
	590. Electrophoresis is a method of	75
LABS	(1) separating DNA fragments	Data Base File Number
	(2) changing the genetic code of an organism	
ANSWER 1	(3) indicating the presence of starch	103
	(4) separating colored compounds on a strip of paper	

electrophoresis

		Regents Date June2008
	591. In preparation for an electrophoresis procedure, enzymes are added to DNA in order to	
LABS	(1) convert the DNA into gel	68
	(2) cut the DNA into fragments	Data Base File Number
ANSWER 2	(3) change the color of the DNA	
	(4) produce longer sections of DNA	128

electrophoresis

		Regents Date
		June2012
		82
LAB1	592. DNA samples can be separated according to size using the technique of	Data Base File Number
	(1) chromatography	
	(2) electrophoresis	
	(3) replication	
	(4) dissection	444
ANSWER	2	

electrophoresis

		Regents Date
		June2013
		76
LAB1	593. Which technique could be used to determine the relative number of bases in fragments taken from a sample of DNA?	Data Base File Number
	(1) electrophoresis	
	(2) cloning	
	(3) paper chromatography	
	(4) light microscopy	971
ANSWER	1	

embryo

		Regents Date
		Aug2011
		37
S4K4	594. Abnormalities present in the cells that line the uterus may prevent the production of offspring by directly interfering with the	Data Base File Number
	(1) development of the embryo	
	(2) differentiation of gametes into zygotes	
	(3) secretion of estrogen by the ovary	
	(4) production and release of egg cells	386
ANSWER	1	

embryo

		Regents Date
		Jan2017
		1
S4K1	595. For a human zygote to become an embryo, it must undergo	Data Base File Number
	(1) fertilization	
	(2) recombination	
	(3) meiotic divisions	
	(4) mitotic divisions	1266
ANSWER	4	

embryo

			Regents Date June2019
	596.	A German measles (rubella) epidemic during the years 1963 to 1965 resulted in approximately 30,000 babies being born with birth defects. The specific cause of these birth defects was most likely	
S4K4	(1)	the development of rubella virus infections in embryos	3
	(2)	the failure of zygotes infected with rubella to develop	Data Base File Number
ANSWER	(3)	mutations in the nerve cells of pregnant females at the time of the rubella epidemic	
1	(4)	an increase in the amount of time needed for healthy embryonic development	1469

embryonic development

			Regents Date Jan2008
	597.	Which sequence represents the correct order of processes that result in the formation and development of an embryo?	
S4K4	(1)	meiosis -> fertilization -> mitosis	14
	(2)	mitosis -> fertilization -> meiosis	Data Base File Number
ANSWER	(3)	fertilization -> meiosis -> mitosis	
1	(4)	fertilization -> mitosis -> meiosis	84

embryonic development

			Regents Date June2001
	598.	During the last months of pregnancy, the brain of a human embryo undergoes an essential "growth spurt." Which action by the mother would most likely pose the greatest threat to the normal development of the nervous system of the embryo at this time?	
S4K4	(1)	spraying pesticides in the garden	21
	(2)	taking prescribed vitamins on a daily basis	Data Base File Number
ANSWER	(3)	maintaining a diet high in fiber and low in fat	
1	(4)	not exercising	902

embryonic development

S4K4	599. In animals, the normal development of an embryo is dependent on	<p>(1) fertilization of a mature egg by many sperm cells</p> <p>(2) production of new cells having twice the number of chromosomes as the zygote</p> <p>(3) production of body cells having half the number of chromosomes as the zygote</p> <p>(4) mitosis and the differentiation of cells after fertilization has occurred</p>	Regents Date
			June2003
			21
			Data Base File Number
ANSWER	4		766

embryonic development

S4K4	600. Which statement about embryonic organ development in humans is accurate?	<p>(1) It is affected primarily by the eating habits and general health of the father.</p> <p>(2) It may be affected by the diet and general health of the mother.</p> <p>(3) It will not be affected by any medication taken by the mother in the second month of pregnancy.</p> <p>(4) It is not affected by conditions outside the embryo.</p>	Regents Date
			June2007
			18
			Data Base File Number
ANSWER	2		60

embryonic development

S4K4	601. Which sequence represents the order of some events in human development?	<p>(1) zygote -> sperm -> tissues -> egg</p> <p>(2) fetus -> tissues -> zygote -> egg</p> <p>(3) zygote -> tissues -> organs -> fetus</p> <p>(4) sperm -> zygote -> organs -> tissues</p>	Regents Date
			June2009
			14
			Data Base File Number
ANSWER	3		186

embryonic development

		Regents Date
		June2021
	602.	
	In humans, embryonic development during the first two months is more sensitive to environmental factors than during the remaining months. The best explanation for this statement is that	
S4K4	(1) during the first two months, organs are being formed and any unusual change during cell division can interfere with normal development	18
	(2) the genes that control development function only during the first two months of development	Data Base File Number
ANSWER	(3) no changes occur in a developing fetus after the second month	
1	(4) organ development is not affected by environmental factors after the second month	1574

energy / home

		Regents Date
		June2010
	603.	
	Because of an attractive tax rebate, a homeowner decides to replace an oil furnace heating system with expensive solar panels. The trade-offs involved in making this decision include	
S4K7	(1) high cost of solar panels, reduced fuel costs, and lower taxes	30
	(2) low cost of solar panels, increased fuel costs, and higher taxes	Data Base File Number
ANSWER	(3) increased use of fuel, more stable ecosystems, and less availability of solar radiation	
1	(4) more air pollution, increased use of solar energy, and greater production of oil	277

energy consumption

		Regents Date
		Jan2009
	604.	
	Which human activity is correctly paired with its likely future consequence?	
S4K7	(1) overfishing in the Atlantic - increase in supply of flounder and salmon as food for people	30
	(2) development of electric cars or hybrid vehicles - increased rate of global warming	Data Base File Number
ANSWER	(3) use of fossil fuels - depletion of underground coal, oil, and natural gas supplies	
3	(4) genetically engineering animals - less food available to feed the world's population	174

energy consumption

S4K5	605. The major role of carbohydrates in the human diet is to	(1) form the membranes that surround mitochondria	Regents Date
			June2018 27
ANSWER	3	(2) act as a catalyst for cellular reactions	Data Base File Number
		(3) supply energy for the body	1399
		(4) provide building blocks for amino acids	

energy consumption

S4K6	606. A hummingbird may need to consume up to 50% of its body weight in sugar each day, just to meet its energy needs. Some of this energy is stored and some is used for metabolic activities, but much of the energy is	(1) converted into amino acids needed for the production of starch	Regents Date
			June2021
ANSWER	2	(2) released as heat energy back into the hummingbird's environment	Data Base File Number
		(3) changed into radiant energy, which can be used by plants for photosynthesis	1580
		(4) used to synthesize inorganic compounds necessary for cellular respiration	

energy consumption

S4K6	607. One reason energy must be constantly added to a stable ecosystem is because some energy is	(1) lost at each feeding level	Regents Date
			June2022
ANSWER	1	(2) incorporated into fossil fuels	Data Base File Number
		(3) destroyed by decomposers	1615
		(4) digested by herbivores	

energy transfer

S4K6	608. Which energy transfer is LEAST likely to be found in nature?	(1) consumer to consumer	Regents Date
			Aug2002
ANSWER	4	(2) producer to consumer	Data Base File Number
		(3) host to parasite	826
		(4) predator to prey	

energy transfer

609. Fat molecules typically contain long chains of carbon atoms. Animals tend to store fats for use when food resources are scarce. This is an advantage to the animal because

S4K5

ANSWER 1

- (1) much energy can be gained by breaking the bonds between atoms in the fats
- (2) fats give off carbon dioxide that can be used by the muscles
- (3) amino acids from fat synthesis are more easily digested than carbohydrates
- (4) energy can only be created by digesting fats

Regents Date

Aug2018

17

Data Base File Number

1424

energy transfer

610. Which sequence best represents the flow of energy through an ecosystem?

S4K6

ANSWER 1

- (1) Sun → green plants → herbivores → carnivores
- (2) Sun → herbivores → producers → consumers
- (3) green plants → carnivores → consumers → herbivores
- (4) consumers → carnivores → herbivores → producers

Regents Date

Jan2016

23

Data Base File Number

1196

energy transfer

611. Evidence suggests that a large meteorite hit Earth 65 million years ago, causing a layer of dust to block the Sun, cooling the planet. It is estimated that 70% of all plant and animal species, including the dinosaurs, died off as a result. The best explanation for the deaths of these organisms is that

S4K6

ANSWER 2

- (1) consumers require sunlight to make sugars in order to survive
- (2) the amount of energy available to the biosphere was decreased
- (3) energy is produced only by plants
- (4) all animals eat plants for energy

Regents Date

Jan2023

4

Data Base File Number

1652

energy transfer

S4K6 ANSWER 4	612. In the transfer of energy from the Sun to ecosystems, which molecule is one of the first to store this energy?	Regents Date June2007
	(1) protein	25
	(2) fat	Data Base File Number
	(3) DNA	42
	(4) glucose	

energy transfer

S4K1 ANSWER 3	613. An individual eats a hamburger. Which two systems must interact to transfer the nutrients in the hamburger to human muscle tissue?	Regents Date June2016
	(1) respiratory and excretory	5
	(2) digestive and immune	Data Base File Number
	(3) digestive and circulatory	1213
	(4) circulatory and respiratory	

energy transfer

S4K6 ANSWER 3	614. The sequence that best illustrates the flow of energy through an ecosystem is	Regents Date June2017
	(1) sunlight → plant → wolf → rabbit	21
	(2) plant → sunlight → rabbit → wolf	Data Base File Number
	(3) sunlight → plant → rabbit → wolf	1316
	(4) wolf → rabbit → plant → sunlight	

energy transfer

S4K1 ANSWER 3	615. Which two body systems provide humans with the raw materials necessary for their cells to release energy?	Regents Date June2023
	(1) muscular and skeletal	1
	(2) endocrine and nervous	Data Base File Number
	(3) digestive and respiratory	1675
	(4) reproductive and circulatory	

environment / stability

- 616.** Which factor is LEAST likely to contribute to an increase in the rate of evolution?
- (1) presence of genetic variations in a population
 - (2) environmental selection of organisms best adapted to survive
 - (3) chromosomal recombinations
 - (4) a long period of environmental stability

S4K3

ANSWER

4

Regents Date

Aug2005

12

Data Base File Number

602

environment / stability

- 617.** Base your answer to this question on the information given and on your knowledge of biology.
- Biomass Energy**
Biomass is the term for all living, or recently living, materials coming from plants and animals that can be used as a source of energy. Biomass can be burned to produce heat and used to make electricity. The most common materials used for biomass energy are wood, plants, decaying materials, and wastes, including garbage and food waste. Burning the wood and plant matter does produce some air pollutants. Biomass contains energy that originally came from the Sun. Some biomass can be converted into liquid biofuels. These biofuels can be used to power cars and machinery. In a community, before biomass is widely used as an energy source, several experts, including an ecologist, are hired to provide specific information. The ecologist would most likely be asked about
- (1) the cost of producing the fuel compared with the profit when the fuel is sold
 - (2) whether the fuel will be widely accepted by consumers
 - (3) what effect the production of the fuel will have on the environmen
 - (4) the time it will take to produce large amounts of the fuel

S4K7

ANSWER

3

Regents Date

Aug2019

50

Data Base File Number

1524

environment / stability

		Regents Date
		Jan2020
	618. Scientists who have examined the fossil record have noted that some species have changed very little over long periods of geologic time. The lack of change in such organisms is most likely because	
S4K3	(1) all members of their population were genetically identical, and they lived in a rapidly changing environment	12
	(2) there was a large amount of variation in their population, and the environment changed frequently	Data Base File Number
ANSWER	(3) they could move between different environments when food supplies became scarce	
4	(4) the environment that they lived in remained the same, and they were well-adapted to it	1540

environmental factor

		Regents Date
		Aug2019
	619. Carnivorous plants, such as pitcher plants and sundews, live in bogs where many other organisms cannot. Due to the high rate of decomposition occurring in bogs, the environment is acidic and contains very little oxygen and nutrients. The bogs only support certain types of organisms because	
S4K6	(1) organisms in an environment are not limited by available energy and resources	9
	(2) the growth and survival of organisms depends upon specific physical conditions	Data Base File Number
ANSWER	(3) favorable gene mutations only occur when organisms live in harsh environments	
2	(4) photosynthetic organisms can only inhabit environments that have a low acidity	1506

environmental factor

		Regents Date
		Aug2022
	620. Killer whales are an endangered species. The decline in the whales' numbers has been linked to poor nutrition, resulting in the inability to maintain a pregnancy. This risk to developing whale embryos is most likely a result of	
S4K4	(1) an environmental factor not associated with the embryo's genes	12
	(2) an infection caused by the embryo's exposure to a pathogen	Data Base File Number
ANSWER	(3) faults in the genes of the embryo itself	
1	(4) toxins that are introduced into the mother from the embryo's blood	1635

environmental factor

S4K5	621. The photic sneeze reflex, an inherited trait, causes some people to sneeze when they are exposed to bright sunlight. In the photic sneeze reflex, the sunlight acts as	Regents Date	
		Aug2023	
		(1) the effect of an environmental factor resulting in a genetic trait	3
		(2) a biotic factor being passed from parent to offspring	Data Base File Number
(3) an environmental factor stimulating a response	1705		
ANSWER	3	(4) the recombination of genes resulting from sexual reproduction	

environmental factor

S4K6	622. Birch bolete is a fungus that normally grows on the roots of birch trees in New York State. During the life of the fungus and the birch, each organism receives nutrients from the various biochemical processes of the other. According to this information, it can be inferred that these two species	Regents Date	
		June2015	
		(1) are both predators	33
		(2) require the same amount of sunlight	Data Base File Number
(3) require a similar soil pH	1143		
ANSWER	3	(4) recycle the remains of dead organisms	

environmental factor

S4K4	623. Rabbits produce large numbers of offspring during each reproductive season, yet the number of rabbits within a given population changes very little from year to year. The stability of the population size is most likely the result of	Regents Date	
		June2015	
		(1) the development of mutations in young rabbits	17
		(2) environmental factors that keep the population in check	Data Base File Number
(3) rabbits continuing to reproduce when the population is large	1135		
ANSWER	2	(4) the survival of more female rabbits than male rabbits	

environmental influence

- 624.** A boy inherits genes for tallness, but his growth is limited as a result of poor nutrition. This is an example of
- (1) an inherited disorder
 - (2) environmental influence on gene expression
 - (3) expression of a hidden trait
 - (4) a characteristic controlled by more than one pair of genes

S4K2

ANSWER 2

Regents Date

Aug2009

7

Data Base File Number

204

environmental influence

- 625.** Scientists have discovered that the Oklahoma salamander, "Eurycea tynnerensis", develops into its adult form in streams where the streambeds are made of fine, tightly packed gravel. Salamanders living in streams with streambeds made of large, loosely packed gravel remain immature. This situation is an example of
- (1) the production of gametes
 - (2) faulty genes found in aquatic organisms
 - (3) development influenced by the environment
 - (4) the production of new organisms by environmental engineering

S4K4

ANSWER 3

Regents Date

Aug2010

13

Data Base File Number

287

environmental influence

- 626.** Wildflowers grow and reproduce during the spring snowmelt in the desert region of Death Valley, California. Which environmental factor would most likely have the greatest influence on these activities?
- (1) percentage of nitrogen in the atmosphere
 - (2) number of plant species in the area
 - (3) variety of scavengers in the ecosystem
 - (4) amount of time that water is present

S4K1

ANSWER 4

Regents Date

Jan2016

14

Data Base File Number

1189

environmental influence

627. A student wondered if butterflies would show any differences in their wing color if, as caterpillars, they were grown in the dark or grown in bright white light. Which statement would be a possible hypothesis for an experiment to test this idea?

Regents Date

Jan2018

S1K2

- (1) Caterpillars exposed to bright white light will show more blue and green in their wings when they become butterflies than caterpillars kept in the dark.
- (2) Will caterpillars kept in the dark have brighter wings when they become butterflies than caterpillars exposed to bright white light?
- (3) Ten caterpillars will be kept in the dark and ten caterpillars will be exposed to bright white light and allowed to develop into butterflies.
- (4) Results show that caterpillars kept in the dark and those exposed to bright white light had the same wing color when they became butterflies.

36

Data Base File Number

ANSWER

1

1374

environmental influence

628. When deciding on new environmental policies and laws, which term is used to describe the comparison between benefits and costs of human activities?

Regents Date

Jan2019

S4K7

- (1) technology
- (2) trade-off
- (3) climate change
- (4) industrialization

4

Data Base File Number

ANSWER

2

1438

environmental influence

629. Scientists examined 39 tree species from warm and cold areas of Earth, and found that the trees were able to regulate their leaf temperatures, keeping them about 21°C. This meant that the leaves were able to be cooler than their environment in warm areas, but warmer than the environment in cool areas. This is an example of

Regents Date

Jan2024

S4K5

- (1) maintaining homeostasis by responding to environmental change
- (2) controlling carbon dioxide release during daylight hours
- (3) decreasing evaporation for cooling during evening hours
- (4) failing to respond to environmental conditions

26

Data Base File Number

ANSWER

1

1740

environmental influence

Regents Date

June2013

630. Base your answer to this question on the information given and on your knowledge of biology. The Galapagos pink land iguana, *Conolophus marthae* (*C. marthae*), is native to only one of the Galapagos Islands. Its entire range is currently limited to Wolf Volcano on Isabella Island. The iguana was first discovered on this island in 1986. Genetic studies of the animal began sometime later, and it was identified as a species separate from other iguana populations on the Galapagos in 2009. Its population might have been as high as 100 in 1986, but now there might be as few as 10 of the animals left alive. Other evidence indicates that this species could have diverged from another line of iguanas about 5.7 million years ago. After that, the other line of iguanas diverged into two other species, *C. pallidus* and *C. subcristatus*. One likely reason for the existence of these pink land iguanas today is that their ancestors

S4K3

- (1) had the same variations as other iguanas but, after a long period of changing environmental conditions, mutated to the pink form when the environment eventually stabilized
- (2) had variations not present in other iguanas that allowed them to live in a particular environment more successfully than the other iguanas
- (3) lived on several other islands long ago, but migrated to Isabella Island around 1980 to have the environment to themselves, without predators to harm them
- (4) found that they were less visible to predators if they made themselves pink to blend in with the plants growing around them

40

Data Base File Number

ANSWER

2

969

environmental influence

			Regents Date June2014
	631.	Several goldfish were kept in a small aquarium for several years. The fish grew to be approximately 6 centimeters long in the first year, and after that, growth in length stopped. These fish were later transferred to a large pond. In the pond, the goldfish grew much larger, reaching lengths of around 25 centimeters. Which statement provides the best explanation for the increased growth of the fish in the pond?	
S4K2		(1) Chemicals present in the pond increased the amount of DNA in the fish, causing the growth increase.	6
		(2) The expression of genetic information in the fish was influenced by their surroundings.	Data Base File Number
ANSWER	2	(3) The fish expressed and passed on only those characteristics that enabled them to survive in the new environment.	
		(4) The size of the fish depended only on their food supply and not on their DNA.	1039

environmental protection

			Regents Date Jan2012
	632.	Which action by humans could improve the quality of the air?	
S4K7		(1) building homes that use only oil furnaces for heat	30
		(2) buying cars that get more miles per gallon of gasoline	Data Base File Number
ANSWER	2	(3) increasing the number of coal-burning power plants that generate electricity	
		(4) cutting down forests to clear land for factories	414

environmental protection

			Regents Date Jan2024
	633.	Which would most likely control an insect pest and be the LEAST harmful to the environment?	
S4K7		(1) eliminating the plants that the insect pest feeds on	18
		(2) using traps baited with sex hormones that attract the insect pest	Data Base File Number
ANSWER	2	(3) releasing imported insects that prey on the insect pest	
		(4) spraying areas with insecticides that affect the insect pest	1752

environmental quality

		Regents Date Aug2009
	634. In an attempt to improve environmental quality, local officials in a county in New York State want to build a garbage-to-steam plant. At the plant,garbage would be burned to produce energy, but air pollution would also be produced. In order to decide whether or not to build this plant, the community must consider	
S4K7	(1) the trade-offs involved	28
	(2) new genetic technology	Data Base File Number
ANSWER 1	(3) the natural process of succession	223
	(4) energy flow between organisms	

enzyme

		Regents Date Aug2002
	635. Which statement describes all enzymes?	23
S4K5	(1) They control the transport of materials.	Data Base File Number
	(2) They provide energy for chemical reactions.	822
ANSWER 3	(3) They affect the rate of chemical reactions.	
	(4) They absorb oxygen from the environment.	

enzyme

		Regents Date Aug2002
	636. The pancreas is an organ connected to the digestive tract of humans by a duct (tube) through which digestive enzymes flow. These enzymes are important to the digestive system because they	
S4K1	(1) form proteins needed in the stomach	7
	(2) form the acids that break down food	Data Base File Number
ANSWER 3	(3) change food substances into molecules that can pass into the bloodstream and cells	812
	(4) change food materials into wastes that can be passed out of the body	

enzyme

		Regents Date Aug2006
	637. Meat tenderizer contains an enzyme that interacts with meat. If meat is coated with tenderizer and then placed in a refrigerator for a short time, how would the enzyme be affected?	
S4K5	(1) It would be broken down.	3
	(2) Its activity would slow down	Data Base File Number
ANSWER 2	(3) Its shape would change.	523
	(4) It would no longer act as an enzyme.	

enzyme

638. Enzyme molecules normally interact with substrate molecules. Some medicines work by blocking enzyme activity in pathogens. These medicines are effective because they

- (1) are the same size as the enzyme
- (2) are the same size as the substrate molecules
- (3) have a shape that fits into the enzyme
- (4) have a shape that fits into all cell receptors

S4K5

ANSWER

3

Regents Date

Aug2007

4

Data Base File Number

4

enzyme

639. The enzyme amylase will affect the breakdown of carbohydrates, but it will not affect the breakdown of proteins. The ability of an enzyme molecule to interact with specific molecules is most directly determined by the

- (1) shapes of the molecules involved
- (2) number of molecules involved
- (3) sequence of bases present in ATP
- (4) amount of glucose present in the cell

S4K5

ANSWER

1

Regents Date

Aug2011

19

Data Base File Number

370

enzyme

640. Which statement best describes enzymes?

- (1) Every enzyme controls many different reactions.
- (2) The rate of activity of an enzyme might change as pH changes.
- (3) Temperature changes do not affect enzymes.
- (4) Enzymes are produced from the building blocks of carbohydrates.

S4K5

ANSWER

2

Regents Date

Aug2012

20

Data Base File Number

460

enzyme

641. Chemicals that help chemical reactions occur at faster rates in living organisms are known as

- (1) biotic resources
- (2) simple sugars
- (3) oxygen molecules
- (4) organic catalysts

S4K5

ANSWER

4

Regents Date

Aug2013

21

Data Base File Number

986

enzyme

642. The organic compounds that scientists use to cut, copy, and move segments of DNA are

- (1) carbohydrates
- (2) enzymes
- (3) hormones
- (4) starches

S4K2

ANSWER

2

Regents Date

Aug2018

4

Data Base File Number

1414

enzyme

643. Snake venom is modified saliva containing enzymes and other proteins that break down tissue surrounding the bite and destroy blood cells. If bitten, the damage caused by this type of venom would most likely be slowed by

- (1) applying ice to the area where the patient was bitten
- (2) having the patient drink a large amount of water
- (3) forcing the patient to vomit, in order to remove the venom
- (4) increasing the rate of blood flow by having the patient exercise

S4K5

ANSWER

1

Regents Date

Aug2023

22

Data Base File Number

1720

enzyme

644. Luciferin is a molecule that, when broken down in fireflies, produces heat and light. The rate at which luciferin is broken down in cells is controlled by

- (1) a carbohydrate
- (2) a simple sugar
- (3) an enzyme
- (4) a complex fat

S4K5

ANSWER

3

Regents Date

Jan2002

3

Data Base File Number

858

enzyme

645. All cells of an organism are engaged in many different chemical reactions. This fact is best supported by the presence in each cell of thousands of different kinds of

- (1) enzymes
- (2) nuclei
- (3) chloroplasts
- (4) organelles

S4K5

ANSWER

1

Regents Date

Jan2006

24

Data Base File Number

491

enzyme

646. Experiments revealed the following information about a certain molecule: (a) It can be broken down into amino acids. (b) It can break down proteins into amino acids. (c) It is found in high concentrations in the small intestine of humans. Based on this information, this molecule is most likely

- (1) an enzyme
- (2) an inorganic compound
- (3) a hormone
- (4) an antigen

S4K5

ANSWER

1

Regents Date

Jan2007

19

Data Base File Number

61

enzyme

647. Cytochrome c is an enzyme located in the mitochondria of many types of cells in many different animals.. Cytochrome c is most likely a

- (1) protein molecule
- (2) material containing genes
- (3) carbohydrate that is absorbed by cells
- (4) component of the membrane around the cell.

S4K1

ANSWER

1

Regents Date

Jan2008

70

Data Base File Number

102

enzyme

648. The sweet taste of freshly picked corn is due to the high sugar content in the kernels. Enzyme action converts about 50% of the sugar to starch within one day after picking. To preserve its sweetness, the freshly picked corn is immersed in boiling water for a few minutes, and then cooled. Which statement most likely explains why the boiled corn kernels remain sweet?

- (1) Boiling destroys sugar molecules so they cannot be converted to starch.
- (2) Boiling kills a fungus on the corn that is needed to convert sugar to starch.
- (3) Boiling activates the enzyme that converts amino acids to sugar.
- (4) Boiling deactivates the enzyme responsible for converting sugar to starch.

S4K5

ANSWER

4

Regents Date

Jan2008

22

Data Base File Number

88

enzyme

649. Base your answer to this question on the information given and on your knowledge of biology. -- Organisms living in a bog environment must be able to tolerate nitrogen-poor, acidic conditions. Bog plants such as the Venus flytrap and sundew are able to obtain their nitrogen by attracting and consuming insects. These plants produce chemicals that break down the insects into usable compounds. The chemicals present in the plants that break down the insects are most likely

- (1) fats
- (2) hormones
- (3) enzymes
- (4) carbohydrates

S4K5

ANSWER

3

Regents Date

Jan2010

37

Data Base File Number

253

enzyme

650. The function of a specific enzyme is most directly influenced by its

- (1) molecular size
- (2) physical shape
- (3) carrying capacity
- (4) stored energy

S4K5

ANSWER

2

Regents Date

Jan2014

8

Data Base File Number

1004

enzyme

651. Which statement is most likely correct regarding soil bacteria that inhabit the polar regions of Earth?

- (1) They do not carry out the process of respiration.
- (2) They contain enzymes that function at low temperatures.
- (3) They are part of the abiotic resources of that ecosystem.
- (4) They do not reproduce.

S4K5

ANSWER

2

Regents Date

Jan2016

17

Data Base File Number

1191

enzyme

652. A scientist plans to cut a segment of DNA so that it can be inserted into the DNA of a bacterium, a single-celled organism. The scientist needs to use a special type of organic molecule to perform this cutting process. This molecule is

- (1) a lipid
- (2) a carbohydrate
- (3) an enzyme
- (4) a hormone

S4K2

ANSWER

3

Regents Date

Jan2016

7

Data Base File Number

1184

enzyme

653. Many disorders are due to the inability of an individual to break down a particular chemical. Sometimes these disorders can be treated by giving the affected individual the appropriate

- (1) enzymes
- (2) antigens
- (3) chromosomes
- (4) organelles

S4K5

ANSWER

1

Regents Date

Jan2019

21

Data Base File Number

1452

enzyme

654. A liver cell can make enzymes that a heart cell can NOT make because liver cells

- (1) digest large, complex molecules
- (2) contain more DNA than heart cells
- (3) use different genes than the heart cells use
- (4) remove carbon dioxide from blood

S4K2

ANSWER

3

Regents Date

June2011

7

Data Base File Number

335

enzyme

655. The protein called endolysin is an enzyme thought to destroy bacteria by breaking down their cell walls. The protein endolysin belongs to which group of chemical substances?

- (1) hormones
- (2) receptors
- (3) biological catalysts
- (4) molecular bases

S4K5

ANSWER

3

Regents Date

June2018

39

Data Base File Number

1406

enzyme / substrate

			Regents Date Aug2018
	656.	To prepare for an experiment, ten different sources of food were sterilized and kept in a sterile container. Bacteria of the same species were placed on each of the ten different food sources and kept at 26°C for two days. During this time, bacteria grew in nine of the containers. Based on this observation, the scientist could conclude that	
S4K5	(1)	all ten food sources used in the experiment are capable of supporting this species of bacteria	35
	(2)	the temperature varied greatly in nine of the containers during this experiment	Data Base File Number
ANSWER	(3)	only the container that failed to grow any bacteria was prepared correctly	
4	(4)	this species of bacteria synthesizes enzymes needed to digest the food in nine of the ten containers	1435

enzyme / substrate

			Regents Date Aug2023
	657.	Cellulose is the chemical name for the fiber found in fruits and vegetables. Cellulose is similar in structure to starch. It is most likely that humans can digest starch but NOT cellulose because	
S4K1	(1)	cellulose molecules are too big to be absorbed into cells	43
	(2)	humans have enzymes to break down starch, but not cellulose	Data Base File Number
ANSWER	(3)	humans have only starch-digesting ribosomes in their digestive system	
2	(4)	humans convert excess cellulose to glucose	1725

enzyme / substrate

			Regents Date Aug2024
	658.	In humans, lactose is broken down into glucose and galactose in the presence of a particular enzyme. It is most likely that the enzyme that breaks down lactose	
S4K5	(1)	breaks down several other types of food in the stomach	5
	(2)	is involved in other reactions when the temperature and pH are ideal	Data Base File Number
ANSWER	(3)	helps in the synthesis of complex sugars during autotrophic nutrition	
4	(4)	is not involved in other types of reactions because enzymes are specific	1788

enzyme / substrate

		Regents Date
		Jan2023
		33
S4K5		Data Base File Number
ANSWER	4	1667
	659.	An enzyme that rapidly breaks down a protein molecule in the stomach may break down that same protein much more slowly in the small intestine or mouth because
	(1)	the enzyme is digested in those locations
	(2)	no protein molecules are located in the small intestine or the mouth
	(3)	the enzyme changes to fit different molecules in different locations
	(4)	the stomach may have a more suitable environment for the enzyme to work

enzyme reaction

		Regents Date
		Aug2019
		27
S4K5		Data Base File Number
ANSWER	3	1517
	660.	Fruits and vegetables exposed to air begin to brown because of a chemical reaction in their cells. This may result in these foods being thrown out. Some people have found that adding lemon juice (citric acid) to apple slices keeps them from turning brown. The prevention of browning is likely the result of
	(1)	increasing the concentration of enzymes
	(2)	increasing the temperature
	(3)	slowing the rate of enzyme action
	(4)	maintaining the pH

enzyme structure

		Regents Date
		Aug2001
		26
S4K5		Data Base File Number
ANSWER	1	934
	661.	A characteristic shared by all enzymes, hormones, and antibodies is that their function is determined by the
	(1)	shape of their molecules
	(2)	DNA they contain
	(3)	inorganic molecules they contain
	(4)	organelles present in their structure

enzyme structure

		Regents Date
		Aug2006
		28
S4K5		Data Base File Number
ANSWER	1	539
	662.	Which condition is necessary for enzymes and hormones to function properly in the human body?
	(1)	These chemicals must have a specific shape.
	(2)	These chemicals must be able to replicate.
	(3)	Body temperature must be above 40°C.
	(4)	Body pH must be above 10.

enzyme structure

663. Shrimp that live in the cold waters off Alaska will die if introduced into warm water. One likely reason these shrimp do not survive is that enzymes in the shrimp
- (1) start to replicate
 - (2) change shape
 - (3) are composed of fat molecules that melt
 - (4) break down into small starch molecules

S4K5

ANSWER

2

Regents Date

Aug2015

23

Data Base File Number

1169

enzyme structure

664. Base your answer to this question on the passage shown and on your knowledge of biology.
- Lead Poisoning
- Two pathways by which lead can enter the human body are ingestion and inhalation. Once in the bloodstream, lead is distributed to parts of the body including the brain, bones, and teeth. One reason that lead is toxic is that it interferes with the functioning of a variety of enzymes. It acts like metals such as calcium and iron and replaces them, changing the molecular structure of these enzymes. In the case of calcium, lead is absorbed through the same cell membrane channels that take in calcium. Lead affects children and adults in different ways. Even low lead levels in children can cause many different problems, including nervous system damage, learning disabilities, decreased intelligence, poor bone growth, and death. In adults, high levels of lead can cause hearing problems, memory and concentration problems, muscle and joint pain, brain damage, and death. It wasn't until 1971 that steps were taken against the use of lead with the passage of the Lead Poisoning Prevention Act. However, lead is still a public health risk today. How could the presence of lead in body cells interfere with the ability of enzymes to function?

- (1) The enzyme changes shape.
- (2) The enzyme does not change shape.
- (3) The enzyme disappears.
- (4) The enzyme mutates.

S4K5

ANSWER

1

Regents Date

Aug2019

60

Data Base File Number

1526

enzyme structure

Regents Date

Jan2006

665. Base your answer to this question on the information given and on your knowledge of biology. -- Where is the Beef? Out Being Irradiated -- E. coli bacteria in food cause an estimated 73,000 cases of infection leading to some deaths in the United States each year. Until recently, the only way to guarantee meat free of E. coli was to heat it to 160°F, which kills E. coli. The rare hamburgers preferred by many people are not heated to this temperature, and just a few E. coli may cause severe illness. Recently, ground beef has been decontaminated by irradiation using electron beam technology. The packaged ground beef is scanned by an electron beam that disrupts the genetic structure of the pathogens. This kills them or leaves them unable to reproduce. This process is considered safe and has been endorsed by various governmental groups in this country as well as the World Health Organization. Irradiation is effective in preserving only certain foods, such as herbs, wheat flour, fresh fruits, vegetables, and some meats. Although some methods of irradiation can change the taste of some foods, this is not an effect of electron beam technology on ground beef. Opponents of irradiating food are concerned that the process may result in the formation of chemicals that may be harmful or result in a loss of vitamins. Supporters claim that irradiation is safe and should be considered as just another technique for preservation of food. Which specific group of molecules in bacteria would be interfered with by heating them to 160°F?

- (1) carbohydrates and fats
- (2) enzymes and proteins
- (3) ATP and DNA
- (4) glucose and fructose

S1K1

56

Data Base File Number

ANSWER

2

500

enzyme structure

Regents Date

Jan2017

666. A fully functioning enzyme molecule is arranged in a complex three-dimensional shape. This shape determines the

- (1) specific type of molecule it interacts with during a reaction
- (2) rate at which the enzyme breaks down during a reaction it regulates
- (3) pH of all body systems
- (4) temperature of the products of the reaction it regulates

S4K5

6

Data Base File Number

ANSWER

1

1271

ethics

667. In the United States, there has been relatively little experimentation involving the insertion of genes from other species into human DNA. One reason for the lack of these experiments is that

S1K1

- (1) the subunits of human DNA are different from the DNA subunits of other species
- (2) there are many ethical questions to be answered before inserting foreign genes into human DNA
- (3)) inserting foreign DNA into human DNA would require using techniques completely different from those used to insert foreign DNA into the DNA of other mammals
- (4)) inserting foreign DNA into human DNA would require using techniques completely different from those used to insert foreign DNA into the DNA of other mammals

Regents Date

June2008

32

Data Base File Number

125

ANSWER

2

evolution

668. In a sexually reproducing species, evolution could occur as a result of

S4K3

- (1) modification of genes in body cells
- (2) modification of genes in sex cells
- (3) increased reproduction among individuals with identical chromosomes
- (4) recombination of genes in cells reproducing by mitosis

Regents Date

Aug2014

19

Data Base File Number

1080

ANSWER

2

evolution

669. According to the theory of biological evolution, most present-day species of organisms

S4K3

- (1) developed from similar, smaller prehistoric organisms
- (2) have always existed in the form they have today
- (3) developed from fossils of the other organisms
- (4) descended from earlier, different species of organisms

Regents Date

Aug2014

10

Data Base File Number

1072

ANSWER

4

evolution

670. Which two factors could lead to the evolution of a species over time?

- (1) overproduction of offspring and no variation
- (2) changes in the genes of body cells and extinction
- (3) struggle for survival and fossilization
- (4) changes in the genes of sex cells and survival of the fittest

S4K3

ANSWER

4

Regents Date

Aug2018

10

Data Base File Number

1418

evolution

671. Scientists compared fossil remains of a species that lived 5,000 years ago with members of the same species living today. Scientists concluded that this species had changed very little over the entire time period. Which statement best accounts for this lack of change?

- (1) The environment changed significantly and those offspring without favorable characteristics died.
- (2) The environment changed significantly, but the species had no natural enemies for a long period of time.
- (3) The environment did not change significantly and those offspring expressing new characteristics survived their natural enemies.
- (4) The environment did not change significantly and those offspring expressing new characteristics did not survive.

S4K3

ANSWER

4

Regents Date

Jan2005

13

Data Base File Number

552

evolution

672. Which statement is most closely related to the modern theory of evolution?

- (1) Characteristics that are acquired during life are passed to offspring by sexual reproduction.
- (2) Evolution is the result of mutations and recombination, only.
- (3) Organisms best adapted to a changed environment are more likely to reproduce and pass their genes to offspring.
- (4) Asexual reproduction increases the survival of species.

S4K3

ANSWER

3

Regents Date

Jan2007

11

Data Base File Number

54

evolution

673. Cytochrome c is an enzyme located in the mitochondria of many types of cells. The mitochondria of tuna fish, molds, moths, dogs, horses, chickens and humans all contain cytochrome c. The fact that all of these organisms contain Cytochrome c could lead to the inference that that

S4K4

ANSWER 2

- (1) Cytochrome c is essential for the reproduction of all organisms
- (2) these organisms have all evolved from an ancestor that produced Cytochrome c
- (3) mutations in genes that code for Cytochrome c always occur during DNA replication.
- (4) only heterotrophs make Cytochrome c

Regents Date
Jan2008

69

Data Base File Number

101

evolution

674. Scientists in the United States, Europe, and Africa have now suggested that the hippopotamus is a relative of the whale. Earlier studies placed the hippo as a close relative of wild pigs, but recent studies have discovered stronger evidence for the connection to whales. This information suggests that

S4K3

ANSWER 4

- (1) genetic engineering was involved in the earlier theories
- (2) structural evidence is the best evolutionary factor to consider
- (3) natural selection does not occur in hippopotamuses
- (4) scientific explanations are tentative and subject to change

Regents Date
Jan2009

1

Data Base File Number

152

evolution

675. Evidence that best supports the theory of biological evolution was obtained from the

S4K3

ANSWER 2

- (1) investigation of environmental niches
- (2) study of fossil records
- (3) comparison of the number of cells in organisms
- (4) analysis of food chains and food webs

Regents Date
Jan2014

6

Data Base File Number

1002

evolution

S4K3	676. An example of a population in which evolution could take place in a relatively short period of time could be	Regents Date
		Jan2019
		13
		Data Base File Number
ANSWER	1	1446
(1)	pathogenic bacteria exposed to antibiotics	
(2)	oak trees in a stable ecosystem	
(3)	elephants living in a wildlife preserve	
(4)	algae grown under constant conditions	

evolution

S4K3	677. If mitotic cell division is the only way a particular species of single-celled organism can reproduce, it is most likely that	Regents Date
		June2004
		11
		Data Base File Number
ANSWER	2	680
(1)	mutations can not occur in this species	
(2)	the rate of evolution in this species is slower than in one that reproduces sexually	
(3)	the number of organisms of this species in an area will remain constant	
(4)	this species belongs to the animal kingdom	

evolution

S4K3	678. What will most likely occur as a result of changes in the frequency of a gene in a particular population?	Regents Date
		June2009
		11
		Data Base File Number
ANSWER	2	184
(1)	ecological succession	
(2)	biological evolution	
(3)	global warming	
(4)	resource depletion	

evolution

S4K4	679. Which statement provides evidence that evolution is still occurring at the present time?	Regents Date
		June2010
		28
		Data Base File Number
ANSWER	3	276
(1)	The extinction rate of species has decreased in the last 50 years.	
(2)	Many bird species and some butterfly species make annual migrations.	
(3)	New varieties of plant species appear more frequently in regions undergoing climatic change.	
(4)	Through cloning, the genetic makeup of organisms can be predicted.	

evolution

S4K3	ANSWER 1	680. Many scientists suggest that billions of years ago, life on Earth began with	Regents Date June2012
		(1) simple, single-celled organisms	30
		(2) simple, multicellular organisms	Data Base File Number
		(3) complex, single-celled organisms	438
		(4) complex, multicellular organisms	

evolution

S4K3	ANSWER 3	681. Evolution of a species could occur as a result of changes in the	Regents Date June2015
		(1) DNA in muscle cells	13
		(2) base sequences in liver cells	Data Base File Number
		(3) genes in an egg cell	1131
		(4) number of chromosomes in a fetal bone cell	

evolution / genetic

S4K2	ANSWER 2	682. Throughout the history of life on Earth, many processes have resulted in new traits in organisms. Which list shows some of these processes in order from the oldest to the most recently used?	Regents Date Aug2011
		(1) gene manipulation, natural selection, selective breeding	35
		(2) natural selection, selective breeding, gene manipulation	Data Base File Number
		(3) natural selection, gene manipulation, selective breeding	384
		(4) selective breeding, gene manipulation, natural selection	

evolution / genetic

S4K3	ANSWER 2	683. A genetic change that occurs in a body cell of a mouse will not contribute to the evolution of the species because	Regents Date Jan2020
		(1) body cell mutations will cause the cell to die before it reproduces	11
		(2) the evolution of a species can result from changes in reproductive cells, not body cells	Data Base File Number
		(3) random changes are repaired by enzymes before they are passed on to offspring	1539
		(4) the evolution of a species is caused by natural selection, not genetic variation	

evolution / similarities

684. A shark and a dolphin have similarly shaped bodies and fins. However, these two organisms are not closely related: The shark is a fish, and the dolphin is a mammal. Some species may have similar body structures even if they are not related because they evolved in

S4K3

- (1) similar environments and specific traits increased their chances of survival.
- (2) similar environments and were exposed to factors that caused exactly the same mutations
- (3) different environments, but tried to adapt in the same ways so they could survive
- (4) different environments, but ate similar foods that affected their growth and development

ANSWER

1

Regents Date

June2017

25

Data Base File Number

1320

evolution inheritance

685. The females of certain species of turtles will sneak into a nest of alligator eggs to lay their own eggs and then leave, never to return. When the baby turtles hatch, they automatically hide from the mother alligator guarding the nest and go to the nearest body of water when it is safe to do so. Which statement best explains the behavior of these baby turtles?

S4K3

- (1) More of the turtles' ancestors who acted in this way survived to reproduce, passing this behavioral trait to their offspring.
- (2) The baby turtles are genetically identical, so they behave the same way
- (3) Turtles are not capable of evolving, so they repeat the same behaviors generation after generation.
- (4) The baby turtles' ancestors who learned to behave this way taught the behaviors to their offspring

ANSWER

1

Regents Date

Aug2008

17

Data Base File Number

145

evolution mechanism

686. In a population of birds, the percentage of individuals having a certain gene changes from 20% to 60% over the span of several hundred years. This situation will most likely affect the rate of

S4K3

- (1) biological evolution
- (2) asexual reproduction
- (3) gene mutation
- (4) ecological succession

ANSWER

1

Regents Date

Aug2013

14

Data Base File Number

980

evolution mechanism

		Regents Date
		Jan2004
		18
S4K3	687. Which species is most likely to survive changing environmental conditions?	Data Base File Number
	(1) a species that has few variations	
	(2) a species that reproduces sexually	
	(3) a species that competes with similar species	
ANSWER	(4) a species that has a limited life span	656

evolution mechanism

		Regents Date
		Jan2014
		27
S4K3	688. One possible explanation for the fact that some simple, one-celled organisms did not evolve into complex, multicellular organisms is that	Data Base File Number
	(1) energy flow in an ecosystem requires simple autotrophic organisms	
	(2) the reproductive rate of single-celled organisms is too fast for change to occur	
	(3) these organisms possessed traits that enabled them to survive in a changing environment	
ANSWER	(4) stability within an ecosystem requires the presence of a variety of different species	1019

evolution pathway

		Regents Date
		Aug2015
		11
S4K3	689. Over time, data that support the successful evolution of a species would include observations that describe	Data Base File Number
	(1) an increase in the genetic changes occurring in body cells	
	(2) a decrease in the genetic variety carried in sex cells	
	(3) an increase in the proportion of offspring that have favorable characteristics	
ANSWER	(4) a decrease in the proportion of the population that has beneficial traits	1158

evolution pathway

		Regents Date
		Jan2006
	690. Scientists hypothesize that cabbage, broccoli, cauliflower, and radishes developed along a common evolutionary pathway. Which observation would best support this hypothesis?	
LAB1	(1) Fossils of these plants were found in the same rock layer.	65
	(2) Chloroplasts of these plants produce a gas.	Data Base File Number
ANSWER	(3) These plants live in the same environment.	501
4	(4) These plants have similar proteins.	

evolution pathway

		Regents Date
		Jan2013
	691. In2007, scientists broke open a fossil of a dinosaur bone and found some preserved tissues. Analysis showed that some proteins in these tissues are very similar to proteins found in modern chickens. The conclusion that these dinosaurs are related to modern chickens is based on	
S4K3	(1) molecular similarities	13
	(2) natural selection	Data Base File Number
ANSWER	(3) similarities in behavior	626
1	(4) the occurrence of mutations	

evolution pathway

		Regents Date
		June2001
	692. The first life-forms to appear on Earth were most likely	
S4K3	(1) complex single-celled organisms	16
	(2) complex multicellular organisms	Data Base File Number
ANSWER	(3) simple single-celled organisms	898
3	(4) simple multicellular organisms	

evolution theory

		Regents Date
		Aug2010
	693. Which statement is best supported by the theory of evolution?	
S4K3	(1) Genetic alterations occur every time cell reproduction occurs.	14
	(2) The fossil record provides samples of every organism that ever lived	Data Base File Number
ANSWER	(3) Populations that have advantageous characteristics will increase in number.	288
3	(4) Few organisms survive when the environment remains the same.	

evolution theory

		Regents Date
		Jan2017
		14
S4K3	694. The theory of evolution states that	Data Base File Number
	(1) species that are extinct have no biological relationship to living species	
	(2) different animal species always interbreed to form new and different species	
ANSWER	(3) species change over time, sometimes developing into new species	
3	(4) the environment of Earth is constant over time	1279

evolution theory

		Regents Date
		June2002
		14
S4K3	695. Which statement represents the major concept of the biological theory of evolution?	Data Base File Number
	(1) A new species moves into a habitat when another species becomes extinct.	
	(2) Every period of time in Earth's history has its own group of organisms.	
ANSWER	(3) Present-day organisms on Earth developed from earlier, distinctly different organisms.	
3	(4) Every location on Earth's surface has its own unique group of organisms.	842

evolutionary change

		Regents Date
		Aug2004
		14
S4K3	696. Which characteristics of a population would most likely indicate the lowest potential for evolutionary change in that population?	Data Base File Number
	(1) sexual reproduction and few mutations	
	(2) sexual reproduction and many mutations	
ANSWER	(3) asexual reproduction and few mutations	
3	(4) asexual reproduction and many mutations	705

evolutionary change

		Regents Date
		Aug2011
		13
S4K3	697. When changes occur in the genes of sex cells, these changes	Data Base File Number
	(1) lead to mutations in the parent organism	
	(2) are always harmful to the offspring	
ANSWER	(3) can be the basis for evolutionary change	
3	(4) only affect asexually reproducing organisms	366

evolutionary change

		Regents Date
		Jan2009
		15
S4K3	698. Limited resources contribute to evolutionary change in animals by increasing	Data Base File Number
	(1) genetic variation within the population	
	(2) competition between members of the species	
ANSWER	(3) the carrying capacity for the species	163
2	(4) the rate of photosynthesis in the population	

evolutionary change

		Regents Date
		Jan2010
		11
S4K3	699. Which reproductive pattern would be associated with a species that is most likely to undergo rapid evolutionary change?	Data Base File Number
	(1) asexual reproduction with a short reproductive cycle	
	(2) sexual reproduction with a short reproductive cycle	
ANSWER	(3) asexual reproduction with a long reproductive cycle	234
2	(4) sexual reproduction with a long reproductive cycle	

evolutionary change

		Regents Date
		June2007
		69
S4K3	700. Evolutionary changes have been observed in beak size in a population of medium ground finches in the Galapagos Islands. Given a choice of small and large seeds, the medium ground finch eats mostly small seeds which are easier to crush. However, during dry years, all seeds are in short supply. Small seeds are quickly consumed, so the birds are left with a diet of large seeds. Studies have shown that this change in diet may be related to an increase in the average size of the beak of the medium ground finch. Base your answer to this question on the information given and on your knowledge of biology. The most likely explanation for the increase in average beak size of the medium ground finch is that the	Data Base File Number
	(1) trait is inherited and birds with larger beaks have greater reproductive success	
	(2) birds acquired larger beaks due to the added exercise of feeding on large seeds	
ANSWER	(3) birds interbred with larger-beaked species and passed on the trait	45
1	(4) lack of small seeds caused a mutation which resulted in a larger beak	

evolutionary change

	701. The fossil record of ancient life forms provides scientific evidence of	Regents Date June2013
S4K3	(1) direct harvesting	6
	(2) selective breeding	Data Base File Number
ANSWER 4	(3) gene manipulation	946
	(4) evolutionary changes	

evolutionary relationship

	702. The presence of some similar structures in all vertebrates suggests that these vertebrates	Regents Date Aug2005
S4K3	(1) all develop at the same rate	9
	(2) evolved from different animals that appeared on Earth at the same time	Data Base File Number
ANSWER 4	(3) all develop internally and rely on nutrients supplied by the mother	599
	(4) may have an evolutionary relationship	

evolutionary relationship

	703. To determine evolutionary relationships between organisms, a comparison would most likely be made between all of the characteristics below except	Regents Date Aug2008
S4K3	(1) methods of reproduction	15
	(2) number of their ATP molecules	Data Base File Number
ANSWER 2	(3) sequences in their DNA molecules	144
	(4) structure of protein molecules present	

evolutionary relationship

	704. Which observation could best be used to indicate an evolutionary relationship between two species?	Regents Date Jan2009
S4K3	(1) They have similar base sequences.	11
	(2) They have similar fur color.	Data Base File Number
ANSWER 1	(3) They inhabit the same geographic regions.	159
	(4) They occupy the same niche.	

evolutionary relationship

	705. When comparing characteristics of two organisms, which evidence would be considered the strongest for supporting a possible evolutionary relationship?	Regents Date June2018
LAB1	(1) The two organisms are the same color.	75
	(2) The two organisms are the same height.	Data Base File Number
ANSWER 3	(3) The two organisms produce many of the same proteins.	1409
	(4) The two organisms are found in the same locations.	

excretory system

	706. Which system is correctly paired with its function?	Regents Date Aug2010
S4K1	(1) immune system --- intake and distribution of oxygen to cells of the body	2
	(2) excretory system --- remove potentially dangerous materials from the body	Data Base File Number
ANSWER 2	(3) digestive system --- transport energy-rich molecules to cells	281
	(4) circulatory system --- produce building blocks of complex compounds	

excretory system

	707. What will most likely happen to wastes containing nitrogen produced as a result of the breakdown of amino acids within liver cells of a mammal?	Regents Date Jan2007
S4K1	(1) They will be digested by enzymes in the stomach.	2
	(2) They will be removed by the excretory system.	Data Base File Number
ANSWER 2	(3) They will be destroyed by specialized blood cells.	47
	(4) They will be absorbed by mitochondria in nearby cells.	

experimental testing

	708. Which activity would be an appropriate first step when designing an experiment?	Regents Date Aug2015
S1K1	(1) reporting a conclusion based on multiple experimental trials	21
	(2) researching the problem, using information from a variety of sources	Data Base File Number
ANSWER	(3) creating a data table to organize experimental observations	1167
2	(4) repeating the experiment with a different hypothesis	

experimental testing

	709. Base your answers to this question on the information given and on your knowledge of biology. Female mosquitoes spread diseases when they bite humans to obtain blood. It is only the females that do the biting. Research is being conducted to alter the DNA of male mosquitoes. These altered males could then mate with normal female mosquitoes. All of the resulting female offspring would have wing defects that prevent them from flying. One assumption from this research is that the	Regents Date Jan2014
S4K2	(1) altered males would begin to bite humans and spread the diseases	34
	(2) female offspring would be unable to bite humans, since they cannot fly	Data Base File Number
ANSWER	(3) altered males would not be able to reproduce	1024
2	(4) female offspring would become larger in size	

experimental testing

	710. In an appropriately designed experiment, a scientist is able to test the effect of	Regents Date Jan2017
S1K2	(1) a single variable	35
	(2) multiple variables	Data Base File Number
ANSWER	(3) the hypothesis	1292
1	(4) scientific observations	

experimental testing

		Regents Date
		June2002
	711. An experimental design included references from prior experiments, materials and equipment, and step-by-step procedures. What else should be included before the experiment can be started?	
S1K2	(1) a set of data	2
	(2) a conclusion based on data	Data Base File Number
ANSWER	(3) safety precautions to be used	
3	(4) an inference based on results	834

experimental testing

		Regents Date
		June2008
	712. The development of an experimental research plan should not include a	
S1K1	(1) list of safety precautions for the experiment	33
	(2) list of equipment needed for conducting the experiment	Data Base File Number
ANSWER	(3) procedure for the use of technologies needed for the experiment	
4	(4) conclusion based on data expected to be collected in the experiment	126

extinction

		Regents Date
		Aug2007
	713. Extinction of a species could result from	
S4K3	(1) evolution of a type of behavior that produces greater reproductive success	15
	(2) synthesis of a hormone that controls cellular communication	Data Base File Number
ANSWER	(3) limited genetic variability in the species	
3	(4) fewer unfavorable mutations in the species	12

extinction

		Regents Date
		Aug2007
	714. One irreversible effect of both deforestation and water pollution on the environment is the	
S4K7	(1) extinction of species	23
	(2) thinning of the ozone shield	Data Base File Number
ANSWER	(3) depletion of atmospheric carbon dioxide levels	
1	(4) increase in renewable resources	16

extinction

715. A species that lacks the variation necessary to adapt to a changing environment is more likely to
- (1) develop many mutated cells
 - (2) become extinct over time
 - (3) begin to reproduce sexually
 - (4) develop resistance to diseases

S4K3

ANSWER 2

Regents Date

Aug2010

16

Data Base File Number

290

extinction

716. Examination of ancient rock layers at a certain location reveals many different fossils. Which conclusion can be drawn concerning the species that formed these fossils?
- (1) Only the predators are still present.
 - (2) Many of them are now extinct.
 - (3) They produced offspring that were all genetically identical.
 - (4) They had no variations due to mutations.

S4K3

ANSWER 2

Regents Date

Aug2012

14

Data Base File Number

455

extinction

717. Extinction occurs when the environment changes and
- (1) a species can reproduce successfully
 - (2) an individual has adaptive characteristics insufficient to allow survival
 - (3) all members of a species are no longer living
 - (4) one individual produces some offspring that evolve into a new species

S4K3

ANSWER 3

Regents Date

Aug2014

13

Data Base File Number

1075

extinction

718. A scientist at a large natural history museum has a collection of fossils that were found throughout the world. Only a few of the fossils represent species that are still alive on Earth today. One reason for this is that
- (1) most of the species that have ever lived on Earth are alive today
 - (2) most of the species that have ever lived on Earth are extinct
 - (3) fossils of only extinct species have been found
 - (4) species alive today will not form any fossils for future discovery by scientists

S4K3

ANSWER 2

Regents Date

Aug2015

14

Data Base File Number

1161

extinction

- 719.** Which statement describing a cause of extinction includes the other three?
- (1) Members of the extinct species were unable to compete for food.
 - (2) Members of the extinct species were unable to conceal their presence by camouflage.
 - (3) Members of the extinct species lacked adaptations essential for survival.
 - (4) Members of the extinct species were too slow to escape from predators.

S4K3

ANSWER 3

Regents Date
Jan2005

12

Data Base File Number

551

extinction

- 720.** A certain plant species, found only in one particular stream valley in the world, has a very shallow root system. An earthquake causes the stream to change its course so that the valley in which the plant species lives becomes very dry. As a result, the species dies out completely. The effect of this change on this plant species is known as
- (1) evolution
 - (2) extinction
 - (3) mutation
 - (4) succession

S4K3

ANSWER 2

Regents Date
Jan2006

15

Data Base File Number

483

extinction

- 721.** Woolly mammoths became extinct thousands of years ago, while other species of mammals that existed at that time still exist today. These other species of mammals most likely exist today because, unlike the mammoths that
- (1) produced offspring that all had identical inheritable characteristics
 - (2) did not face a struggle for survival
 - (3) learned to migrate to new environments
 - (4) had certain inheritable traits that enabled them to survive

S4K3

ANSWER 4

Regents Date
Jan2007

14

Data Base File Number

57

extinction

722. According to the fossil record, which statement is accurate?
- (1) Most of the species that have lived on Earth no longer exist.
 - (2) Most of the species that have lived on Earth still exist today.
 - (3) Fossils of species that never existed can be found.
 - (4) Fossils of species that never existed, but will exist in the future, can be found.

Regents Date

Jan2013

18

S4K3

Data Base File Number

630

ANSWER

1

extinction

723. The Extinction of the Passenger Pigeon
 In the early 1800s, the passenger pigeon was the most abundant bird species in North America. These pigeons traveled in flocks sometimes larger than a billion birds. The enormous flock sizes helped protect them from predation by foxes, lynx, owls, and falcons. It also helped them outcompete other animals (squirrels, chipmunks) for chestnuts and acorns, their main food source. Unfortunately, this flocking behavior made the passenger pigeons easy targets for the people who killed them for food. The invention of the telegraph to broadcast flock locations to hunters and the expansion of the railroads to ship the pigeons to new food markets had devastating results. By the 1890s, their numbers had dwindled dramatically, with flocks only numbering in the hundreds. In 1914, the passenger pigeon became extinct when the last member of the species died at the Cincinnati Zoo. Which factor contributed LEAST to the extinction of the passenger pigeon species?
- (1) laws that banned the hunting of passenger pigeons to sell in new markets
 - (2) improved communication technology, which tracked the pigeon flocks
 - (3) expansion of the railroads, which opened up new markets for selling pigeons
 - (4) increased use of the passenger pigeons as a food source for humans

Regents Date

Jan2019

31

S4K7

Data Base File Number

1459

ANSWER

1

extinction

S4K3

ANSWER

1

- 724.** Which statement is best supported by fossil records?
- (1) Many organisms that lived in the past are now extinct.
 - (2) Species occupying the same habitat have identical environmental needs.
 - (3) The struggle for existence between organisms results in changes in populations.
 - (4) Structures such as leg bones and wing bones can originate from the same type of tissue found in embryos.

Regents Date

**June2001
15**

**Data Base File
Number**

897

extinction

S4K3

ANSWER

2

- 725.** Which population of organisms would be in greatest danger of becoming extinct?
- (1) A population of organisms having few variations living in a stable environment.
 - (2) A population of organisms having few variations living in an unstable environment.
 - (3) A population of organisms having many variations living in a stable environment
 - (4) A population of organisms having many variations living in an unstable environment.

Regents Date

June2003

20

**Data Base File
Number**

765

extinction

S4K3

ANSWER

1

- 726.** Which factor contributed most to the extinction of many species?
- (1) changes in the environment
 - (2) lethal mutations
 - (3) inability to evolve into simple organisms
 - (4) changes in migration patterns

Regents Date

June2005

11

**Data Base File
Number**

570

extinction

S4K3

ANSWER

3

- 727.** A certain species has little genetic variation. The rapid extinction of this species would most likely result from the effect of
- (1) successful cloning
 - (2) gene manipulation
 - (3) environmental change
 - (4) genetic recombination

Regents Date

June2007

14

**Data Base File
Number**

34

extinction

S4K3	728. Ecologists are concerned that the golden-winged warbler population is at a dangerously low level. One reason this could lead to extinction of this warbler is that	Regents Date	June2018
			34
		Data Base File Number	
			1402
ANSWER	2		
	(1) after a species becomes extinct, it won't be able to carry out its role in the ecosystem		
	(2) there may not be enough diversity among the birds for the species to be able to survive an environmental change		
	(3) extinction always occurs when populations begin to decrease in number		
	(4) an increase in biodiversity within a population often causes the population to be classified as threatened or endangered		

extinction

LAB1	729. In many parts of the world, plants are used as a source of medicine. Many of these plants are in danger of becoming extinct. It is therefore important for researchers to	Regents Date	June2019
			74
		Data Base File Number	
			1494
ANSWER	2		
	(1) collect and dry all the medicinal plants to preserve them for future use		
	(2) search for other plant species that could be used as a new source of that medicine		
	(3) use the plants now while we still have them		
	(4) apply fertilizer to reduce the numbers of the plants that grow in the wild		

feedback

S4K5	730. Which statement does NOT describe an example of a feedback mechanism that maintains homeostasis?	Regents Date	Aug2004
			19
		Data Base File Number	
			709
ANSWER	2		
	(1) The guard cells close the openings in leaves, preventing excess water loss from a plant.		
	(2) White blood cells increase the production of antigens during an allergic reaction.		
	(3) Increased physical activity increases heart rate in humans.		
	(4) The pancreas releases insulin, helping humans to keep blood sugar levels stable.		

feedback

S4K5	731. Feedback interactions in the human body are important because they	(1) determine the diversity necessary for evolution to occur	Regents Date
			Aug2005
			22
			Data Base File Number
ANSWER	4	(2) direct the synthesis of altered genes that are passed on to every cell in the body	
		(3) regulate the shape of molecules involved in cellular communication	
		(4) keep the internal body environment within its normal range	610

feedback

S4K5	732. Sweating is a process that helps cool the body during strenuous exercise. This is an example of	(1) recycling of gases	Regents Date
			Aug2011
			22
			Data Base File Number
ANSWER	4	(2) cellular respiration	
		(3) gene malfunction	
		(4) a feedback mechanism	372

feedback

S4K5	733. An increase in the level of hormone A causes an increase in the level of hormone B. The increase in the level of hormone B then causes a decrease in the level of hormone A. This process is an example of	(1) a failure to maintain homeostasis	Regents Date
			Aug2014
			20
			Data Base File Number
ANSWER	4	(2) the breakdown of chemicals	
		(3) a disruption in cellular coordination	
		(4) a feedback mechanism	1081

feedback

S4K5	734. Feedback mechanisms are best described as processes that help	(1) reduce hormone levels to below normal in the blood	Regents Date
			Jan2002
			21
			Data Base File Number
ANSWER	4	(2) destroy hormones in the blood	
		(3) directly control muscle contraction in the leg	
		(4) keep body conditions near a normal, steady state	869

feedback

		Regents Date Jan2016
	735. Plants that live in hot, dry climates have evolved mechanisms to help conserve limited water supplies. One example is the closing of leaf openings by guard cells during the day to decrease water loss from their leaves. This detection of and response to an environmental stimulus is an example of	
S4K5	(1) a feedback mechanism	22
	(2) a genetic mutation	Data Base File Number
ANSWER	(3) an organ malfunction	1195
1	(4) an allergic reaction	

feedback

		Regents Date Jan2018
	736. The pancreas in the human body releases the hormone insulin on a regular daily basis in response to changing blood sugar levels. This biological process is known as	
S4K5	(1) a feedback mechanism	50
	(2) an immune response	Data Base File Number
ANSWER	(3) biochemical digestion	1380
1	(4) ATP production	

feedback

		Regents Date Jan2019
	737. Which statement is an example of a feedback mechanism in humans?	
S4K5	(1) An increase in the level of blood sugar results in the pancreas increasing the amount of insulin it secretes.	20
	(2) Increased exposure to pathogenic bacteria results in an increase in the number of red blood cells produced.	Data Base File Number
ANSWER	(3) An increase in exercise results in a decrease in the rate of respiration.	1451
1	(4) Increased muscle activity results in a decrease in heart rate.	

feedback

738. Anabolic Steroids ----
Anabolic steroids are hormones that affect muscle growth. Many athletes take synthetic anabolic steroids, in hopes of developing larger muscles so they can perform better at their sport. These hormones can act like the hormone testosterone. When men take an excess of anabolic steroids, they can have an increase in feminine features. This is due to the fact that the excess of these chemicals signals the male body to stop producing testosterone. This signal in the male body to stop producing testosterone is an example of

- (1) an underproduction of estrogen
- (2) a feedback mechanism
- (3) an overproduction of testosterone
- (4) a decrease in anabolic steroid use

S4K1

ANSWER

2

Regents Date

Jan2020

33

Data Base File Number

1552

feedback

739. When a person is threatened, the pituitary gland releases a hormone that stimulates the adrenal glands to release stress hormones. These stress hormones can cause a temporary increase in heart rate. This is an example of

- (1) an enzyme interaction
- (2) a feedback mechanism
- (3) an immune-system response
- (4) an allergic reaction

S4K5

ANSWER

2

Regents Date

Jan2023

28

Data Base File Number

1666

feedback

740. Test anxiety and stress can trigger many responses in the human body. It can stimulate increased heart and respiratory rates and increased sweating. These physical responses to increased stress are examples of

- (1) competition
- (2) infections
- (3) gene manipulation
- (4) feedback mechanisms

S4K5

ANSWER

4

Regents Date

Jan2024

24

Data Base File Number

1738

feedback

	741. Which process illustrates a feedback mechanism in plants?	Regents Date June2006
S4K5	(1) Chloroplasts take in more nitrogen, which increases the rate of photosynthesis.	21
	(2) Chloroplasts release more oxygen in response to a decreased rate of photosynthesis.	Data Base File Number
ANSWER	(3) Guard cells change the size of leaf openings, regulating the exchange of gases.	511
3	(4) Guard cells release oxygen from the leaf at night.	

feedback

	742. Riding a bicycle requires balance and constant adjustment and monitoring by the rider in order to continue cycling. Successfully riding a bicycle most directly results from the ability to	Regents Date June2013
S4K5	(1) sexually reproduce	21
	(2) grow and develop	Data Base File Number
ANSWER	(3) detect and respond to change	960
3	(4) metabolize food for energy	

feedback

	743. If body temperature is too high, some blood vessels increase in size and sweat glands will excrete sweat, resulting in a lower body temperature. These changes are an example of	Regents Date June2018
S4K5	(1) a learned behavior	3
	(2) feedback mechanisms	Data Base File Number
ANSWER	(3) an inherited disorder	1386
2	(4) genetic mutations	

fermentation

	744. A student prepared a test tube containing yeast, glucose, and water. After 24 hours, the test tube was analyzed for the presence of several substances. What substance would the student expect to find if respiration occurred in the test tube?	Regents Date Jan2011
S4K5	(1) a hormone	37
	(2) starch	Data Base File Number
ANSWER	(3) nitrogen	328
4	(4) carbon dioxide	

fertilization

S4K4	745. What normally happens immediately after fertilization in sexual reproduction? (1) specialization of cells to form a fetus from an egg (2) production of daughter cells having twice the number of chromosomes as the parent cell (3) production of daughter cells having half the number of chromosomes as the parent cell (4) division of cells resulting in the development of an embryo from a zygote	Regents Date June2010 17
		Data Base File Number 266
		ANSWER 4

fertilization

S4K2	746. Which expression correctly represents a reproductive process that usually occurs in humans where $2n$ is equal to the number of chromosomes in each body cell? (1) $n + n \rightarrow n$ (2) $n + n \rightarrow 2n$ (3) $n + 2n \rightarrow 2n$ (4) $2n + 2n \rightarrow 4n$	Regents Date June2014 18
		Data Base File Number 1049
		ANSWER 2

fertilization

S4K4	747. The inability of sperm cells to move normally could prevent the production of offspring by interfering with (1) meiosis (2) mitosis (3) fertilization (4) differentiation	Regents Date June2014 8
		Data Base File Number 1041
		ANSWER 3

fetal development

S4K4	748. The characteristics of a developing fetus are most influenced by (1) gene combinations and their expression in the embryo (2) hormone production by the father (3) circulating levels of white blood cells in the placenta (4) milk production in the mother	Regents Date Aug2004 28
		Data Base File Number 718
		ANSWER 1

fetal development

S4K4	749. Which situation involves a risk to a fetus due to the mother smoking during pregnancy? (1) decreased digestive activity in the stomach of the fetus (2) a decrease in the amount of oxygen in the ovary of the mother (3) inhalation of secondhand smoke by the fetus (4) toxins in the bloodstream of the mother	Regents Date Aug2010
		18
		Data Base File Number
		292
ANSWER	4	

fetal development

S4K4	750. The drinking of alcoholic beverages by a pregnant woman is harmful to the development of her fetus. This is most damaging early in a pregnancy because during this time (1) the lungs of the fetus become functional (2) alcohol can easily enter the mouth of the fetus (3) many of the essential organs of the fetus are forming (4) the fetus cannot excrete wastes	Regents Date Aug2011
		17
		Data Base File Number
		368
ANSWER	3	

fetal development

S4K4	751. Which two structures are directly involved in the normal development of a human fetus? (1) uterus and placenta (2) oviducts and ovaries (3) testes and ovaries (4) placenta and stomach	Regents Date Aug2023
		18
		Data Base File Number
		1716
ANSWER	1	

fetal development

S4K4	752. Exposure to toxins during early stages of pregnancy is more likely to cause birth defects than exposure in late pregnancy because (1) essential organs form during early development (2) the uterus provides more protection in late pregnancy (3) the placenta forms during late pregnancy (4) meiosis occurs rapidly during early development	Regents Date Jan2012
		14
		Data Base File Number
		402
ANSWER	1	

fetus blood

		Regents Date Aug2009
	753. Which statement best describes the relationship between the blood of a human fetus and the blood of the mother?	17
S4K4	(1) Their blood systems are separate only at certain times in development and connected at other times.	
	(2) The blood flows directly from the mother into the fetus.	Data Base File Number
ANSWER	(3) Their blood systems are separate and no materials are exchanged.	212
4	(4) Their blood systems are separate, but certain materials pass from one to the other.	

finite resources

		Regents Date Aug2011
	754. New fuels are being produced by converting corn and grasses into compounds containing alcohols that can be broken down for energy in various engines. The purpose of this research is to	27
S4K6	(1) reduce the use of finite resources	
	(2) increase the rate of air pollution	Data Base File Number
ANSWER	(3) reduce the rate of homeostasis in organisms	377
1	(4) cause a loss of biodiversity in the rain forests	

finite resources

		Regents Date Aug2013
	755. The finite resources of Earth are often affected by increasing human consumption. These finite resources are	15
S4K7	(1) not renewable over a short period of time	
	(2) the products of rapid human population growth	Data Base File Number
ANSWER	(3) the result of deforestation	981
1	(4) needed to degrade ecosystems	

finite resources

		Regents Date Jan2005
	756. The reason that organisms can NOT produce populations of unlimited size is that	19
S4K6	(1) the resources of Earth are finite	
	(2) there is no carrying capacity on Earth	Data Base File Number
ANSWER	(3) species rarely compete with one another	557
1	(4) interactions between organisms are unchanging	

finite resources

S4K6	757. A finite resource in the environment that keeps a population from steadily increasing is known as	Regents Date
		Jan2016
ANSWER	2	8
		Data Base File Number
	(1) dynamic equilibrium	1185
	(2) a limiting factor	
	(3) a reproductive enzyme	
	(4) ecological succession	

finite resources

S4K7	758. Nonrenewable resources are	Regents Date
		June2016
ANSWER	4	24
		Data Base File Number
	(1) not finite and are not depleted over time	1227
	(2) not finite and are depleted over time	
	(3) finite and are not depleted over time	
	(4) finite and are depleted over time	

food chain

S4K6	759. One arctic food chain consists of polar bears, fish, seaweed, and seals. Which sequence demonstrates the correct flow of energy between these organisms?	Regents Date
		Jan2004
ANSWER	3	22
		Data Base File Number
	(1) seals → seaweed → fish → polar bears	660
	(2) fish → seaweed → polar bears → seals	
	(3) seaweed → fish → seals → polar bears	
	(4) polar bears → fish → seals → seaweed	

food chain

S4K6	760. Which statement best describes the flow of energy and the movement of chemical compounds in an ecosystem?	Regents Date
		Jan2010
ANSWER	3	22
		Data Base File Number
	(1) Energy flows into living organisms and remains there, while chemical compounds are transferred from organism to organism.	244
	(2) Chemical compounds flow in one direction in a food chain and energy is produced.	
	(3) Energy is transferred from organism to organism in a food chain and chemical compounds are recycled.	
	(4) Energy flows out of living organisms and is lost, while chemical compounds remain permanently inside organisms.	

food chain

S4K6

ANSWER

2

- 761.** Which process occurs at each link in a food chain?
- (1) All the energy is stored in a newly made structure.
 - (2) Some energy is released into the environment as heat.
 - (3) Chemical energy is recycled.
 - (4) Atoms cycle among living organisms, producing energy.

Regents Date

**Jan2019
10**

**Data Base File
Number**

1443

food chain

S4K6

ANSWER

1

- 762.** Which group would most likely be represented in a food chain?
- (1) biotic factors
 - (2) abiotic factors
 - (3) inorganic compounds
 - (4) finite resources

Regents Date

June2012

23

**Data Base File
Number**

434

food pyramid

S4K6

ANSWER

1

- 763.** In an energy pyramid, why is there less energy available at each level going from BOTTOM to TOP in the pyramid?
- (1) Energy is lost at each level as heat.
 - (2) Energy is lost at each level because there are fewer number of organisms.
 - (3) Energy is lost at each level because there is no sun.
 - (4) Energy is lost at each level because water levels decrease.

Regents Date

June2018

51

**Data Base File
Number**

1408

food web

764. El Niño is a short-term climatic change that causes ocean waters to remain warm when they should normally be cool. The warmer temperatures disrupt food webs and alter weather patterns. Which occurrence would most likely result from these changes?

S4K6

ANSWER

2

- (1) Some species would become extinct, and other species would evolve to take their place.
- (2) Some populations in affected areas would be reduced, while other populations would increase temporarily.
- (3) The flow of energy through the ecosystem would remain unchanged.
- (4) The genes of individual organisms would mutate to adapt to the new environmental conditions.

Regents Date

Aug2001

34

Data Base File Number

940

food web

765. A food web is more stable than a food chain because a food web

S4K6

ANSWER

3

- (1) transfers all of the producer energy to herbivores
- (2) reduces the number of niches in the ecosystem
- (3) includes alternative pathways for energy flow
- (4) includes more consumers than producers

Regents Date

Aug2002

3

Data Base File Number

809

food web

766. One season, there was a shortage of producers in a food web. As a result, the number of deer and wolves decreased. The reason that both the deer and wolf populations declined is that

S4K1

ANSWER

3

- (1) producers are not as important as consumers in a food web
- (2) more consumers than producers are needed to support the food web
- (3) organisms in this food web are interdependent
- (4) populations tend to stay constant in a food web

Regents Date

Aug2008

3

Data Base File Number

133

food web

	767. Some of the energy taken in by an organism is not available to other organisms in a food web. Energy that is not available to other organisms in a food web is energy that is	Regents Date Aug2009
S4K6	(1) stored in the remains of a dead animal	22
	(2) lost to the environment as heat	Data Base File Number
ANSWER 2	(3) stored in eggs produced during sexual reproduction	
	(4) produced in muscle tissue during the growth of an organism	217

food web

	768. Cane toads are native to parts of Central and South America. They were introduced to Australia in the 1930s to help control cane beetles. Cane toads have lethal toxins in their skin and release them from glands when attacked by predators. Cane toads disrupt food webs in Australia because they	Regents Date Aug2023
S4K7	(1) reduce populations of local species	25
	(2) increase the stability of ecosystems	Data Base File Number
ANSWER 1	(3) preserve beetles that feed on crops	
	(4) provide a potential source of medicine	1723

food web

	769. Which type of model provides the most complete representation of the feeding relationships within a community?	Regents Date Jan2002
S4K6	(1) a material cycle	23
	(2) a predator-prey association	Data Base File Number
ANSWER 4	(3) a food chain	
	(4) a food web	870

food web

	770. In a typical forest food web in New York State, what is the original source of energy?	Regents Date Jan2003
S4K6	(1) chemical bonds in sugar molecules	51
	(2) enzymatic reactions	Data Base File Number
ANSWER 3	(3) the Sun	
	(4) chemical reactions of bacteria	751

food web

771. A student could best demonstrate knowledge of how energy flows throughout an ecosystem by
- (1) drawing a food web using specific organisms living in a pond
 - (2) conducting an experiment that demonstrates the process of photosynthesis
 - (3) labeling a diagram that illustrates ecological succession
 - (4) making a chart to show the role of bacteria in the environment

Regents Date

Jan2004

2

S1K3

Data Base File Number

645

ANSWER

1

food web

772. The greatest number of relationships between the organisms in an ecosystem is best shown in
- (1) a food chain
 - (2) an energy pyramid
 - (3) a food web
 - (4) an ecological succession diagram

Regents Date

Jan2011

1

S4K1

Data Base File Number

307

ANSWER

3

food web

773. After feeding at the surface of the ocean during the day, many ocean organisms migrate to deeper waters. While there, they release ammonia in their urine. Many bacteria use the nitrogen from the ammonia as they make amino acids, which eventually end up in food chains on both land and water. These amino acids may even be used in humans. Which statement best explains these observations?
- (1) Chemical elements, including nitrogen, pass through food webs and are combined and recombined in different ways.
 - (2) Chemical elements, including nitrogen, are removed from food webs and eliminated from ecosystems.
 - (3) Nitrogen is transferred directly from bacteria to humans.
 - (4) All elements in the ocean remain there and are not transferred to other ecosystems.

Regents Date

Jan2018

13

S4K6

Data Base File Number

1357

ANSWER

1

food web

774. In a food web, which type of organism receives energy from the other three types?

- (1) producer
- (2) carnivore
- (3) decomposer
- (4) herbivore

S4K1

ANSWER 3

Regents Date

Jan2019

7

Data Base File Number

1440

fossil

775. Fossils provide evidence that

- (1) life on Earth millions of years ago was more complex than life is today
- (2) the changes that will occur in species in the future are easy to predict
- (3) many species of organisms that lived long ago are now extinct
- (4) most species of organisms that lived long ago are exactly the same today

S4K3

ANSWER 3

Regents Date

Aug2016

16

Data Base File Number

1250

fossil

776. Studying fossils provides evidence for evolution because fossils

- (1) take a long time to form
- (2) can show patterns of biological change over time
- (3) always contain complete DNA sequences
- (4) found in the same area are usually closely related to each other

S4K3

ANSWER 2

Regents Date

Aug2022

1

Data Base File Number

1627

fossil

777. Information that scientists are able to obtain from the fossil record includes

- (1) confirmation that Earth is 4.5 million years old
- (2) data supporting the hypothesis that animal species do not change over time
- (3) the exact means by which life on Earth began
- (4) evidence about past environments and the history of life

S4K3

ANSWER 4

Regents Date

June2022

21

Data Base File Number

1618

fossil

S4K3	778. If scientists wanted to study the physical characteristics of an extinct animal that once lived in a specific area, the best source of information would be to investigate	Regents Date
		June2023
		14
		Data Base File Number
ANSWER	4	1684
(1)	plants living in habitats similar to those of long ago	
(2)	the producer organisms living in that area at the current time	
(3)	the animals that live in that area today	
(4)	the fossil record of that area	

fossil

RBS	779. Carbon-14 radioactive dating has been a valuable scientific tool to date fossils containing Carbon up to 50,000 years of age. The half-life of Carbon-14 is 5,730 years. Carbon-14 dating of an old piece of wood indicated the age of the wood to be 50,000 years old. How many Carbon-14 half-lives have passed for this sample?	Regents Date
		RBS2021
		1
		Data Base File Number
ANSWER	4	1597
(1)	1.73	
(2)	2.73	
(3)	4.73	
(4)	8.73	

fossil fuels

S4K7	780. Fossil fuels have been used for years as a source of energy. Even though there are many negative issues associated with the use of fossil fuels, they continue to be used to a great extent. This is most likely because	Regents Date
		Aug2015
		29
		Data Base File Number
ANSWER	1	1174
(1)	they have been commercially available as an energy source	
(2)	there are alternatives to these types of fuels	
(3)	they have had a positive effect on global temperatures	
(4)	fossil fuels can be burned to produce large quantities of carbon dioxide	

fossil fuels

781. On Long Island, several businesses use geothermal technology. This involves taking heat from within Earth and using it to heat buildings. One benefit of this technology is that it

- (1) contributes to global warming
- (2) reduces the ozone shield
- (3) reduces dependence on fossil fuels
- (4) decreases resources for many species

S4K7

ANSWER 3

Regents Date

Aug2016

30

Data Base File Number

1262

fossil fuels

782. The use of solar panels has increased in the last ten years. A benefit of using solar energy would include

- (1) adding more carbon dioxide to the atmosphere
- (2) using less fossil fuel to meet energy needs
- (3) using a nonrenewable source of energy
- (4) releasing more gases for photosynthesis

S4K7

ANSWER 2

Regents Date

Aug2019

21

Data Base File Number

1513

fossil fuels

783. Building large manufacturing facilities can affect ecosystems by increasing the

- (1) atmospheric quality
- (2) biodiversity in the area
- (3) demand for resources such as fossil fuels
- (4) availability of space and resources for organisms

S4K7

ANSWER 3

Regents Date

Aug2019

6

Data Base File Number

1503

fossil fuels

784. Solar and wind power are options available to people interested in producing electricity while reducing their reliance on fossil fuels. A benefit of using these alternative energy sources is that they

- (1) preserve natural resources for future generations
- (2) increase the number of jobs required for mining coal
- (3) ensure that supplies of fossil fuels will never decrease
- (4) cost more to generate than all other sources of electricity

S4K7

ANSWER 1

Regents Date

Aug2023

14

Data Base File Number

1713

fossil fuels

785. Car manufacturers have begun to explore the use of biofuels, such as biodiesel, ethanol, and cooking oils made from plant material. The desired outcome of using these biofuels would be

- (1) a decrease in the use of fossil fuels
- (2) a decrease in the release of oxygen gas
- (3) an increase in abiotic resources
- (4) an increase in global warming

S4K7

ANSWER

1

Regents Date

Jan2015

30

Data Base File Number

1114

fossil fuels

786. The population of reindeer has been decreasing over the last 20 years in the Arctic because climate change has led to more rainfall there. The rain freezes on top of the snow, preventing the reindeer from getting through the snow to find food. Which action by humans has most likely contributed to climate change?

- (1) recycling materials
- (2) protecting wildlife
- (3) maintaining the ozone shield
- (4) burning fossil fuels

S4K7

ANSWER

4

Regents Date

Jan2023

13

Data Base File Number

1658

fossil fuels

787. Human society has become increasingly dependent on industry and technology. While this has had many benefits, it also has had the DISADVANTAGE of

- (1) reducing the amount of food that can be produced by one acre of farmland
- (2) lowering the level of carbon dioxide available for plants to use for photosynthesis
- (3) raising the number of producers worldwide to dangerous levels
- (4) increasing our reliance on energy sources such as fossil fuels

S4K7

ANSWER

4

Regents Date

Jan2023

25

Data Base File Number

1665

fossil fuels

		788. Although we rely on coal, oil, and natural gas to produce energy, some environmental scientists have proposed that we use less fossil fuel. One reason to support this proposal is to	Regents Date June2018
S4K7		(1) enable us to preserve rain forests in tropical areas	5
		(2) help us to reduce the production of carbon dioxide gas	Data Base File Number
ANSWER	2	(3) allow us to decrease the use of fertilizers on crops	
		(4) encourage us to end research on wind and water power sources	1388

fossil fuels

		789. Humans deplete the most resources when	Regents Date June2019
S4K7		(1) using wind energy as a power source	28
		(2) generating power by using fossil fuels	Data Base File Number
ANSWER	2	(3) using water power to generate electricity	
		(4) recycling glass and plastics	1487

functions / specialized

		790. The human heart and lungs contain cells that	Regents Date Aug2010
S4K2		(1) produce a hormone involved in respiration	6
		(2) have the same genetic information but perform different specialized functions	Data Base File Number
ANSWER	2	(3) use one part of the genetic code to synthesize all enzymes needed by the cell	
		(4) contain different numbers of DNA molecules	284

Galapagos Finches

		791. Beak structures differ between individuals of one species of bird. These differences most likely indicate	Regents Date Jan2005
LAB3		(1) the presence of a variety of food sources	71
		(2) a reduced rate of reproduction	Data Base File Number
ANSWER	1	(3) a large supply of one kind of food	
		(4) an abundance of predators	569

Galapagos Finches

		Regents Date
		Jan2018
		6
S4K3	792. Finches on the Galapagos Islands express a variety of traits. Variability in the offspring of these finches is a result of	Data Base File Number
	(1) mutation and cloning	1352
ANSWER	(2) meiosis and mutation	
2	(3) mitosis and asexual reproduction	
	(4) mitosis and genetic recombination	

Galapagos Finches

		Regents Date
		June2005
		74
LAB3	793. In members of a bird species living on a remote island, the greatest number of beak variations in the population would most likely be found when	Data Base File Number
	(1) there is a high level of competition for limited resources	592
ANSWER	(2) homeostasis is limited by a severe climate	
3	(3) they have a large and varied food supply	
	(4) they are prey for a large number of predators	

Galapagos finches

		Regents Date
		June2018
		81
LAB1	794. A factor that contributed to the evolution of finches on the Galapagos Islands was most likely the	Data Base File Number
	(1) lack of variation in beak structure of the finches	1410
ANSWER	(2) isolation of the finches on separate islands	
1	(3) relatively constant atmospheric temperature	
	(4) total lack of competition for food	

Galapagos Islands

		Regents Date
		June2014
		76
LAB3	795. The extremes of dry and wet weather of the Galapagos Islands cause the food supply to constantly change. During dry years, the food is mainly large, hard seeds, and finches with large beaks are found in greater numbers. Which statement best explains this observation?	Data Base File Number
	(1) Dry environments cause mutations in finches.	1063
ANSWER	(2) Finches grow larger when they have more water.	
4	(3) Small finches become smaller during dry seasons.	
	(4) Large beak size is an adaptation to dry conditions.	

gametes

796. A dogfish shark contains 24 chromosomes in each of its muscle cells. How many chromosomes are normally found in each of its gametes?

- (1) 6
- (2) 12
- (3) 24
- (4) 48

S4K4

ANSWER

2

Regents Date

Jan2010

18

Data Base File Number

240

gametes

797. Which statement describes a function of the human male reproductive system?

- (1) It produces gametes in testes.
- (2) It supplies a fluid that protects the fetus.
- (3) It provides support for the development of the embryo.
- (4) It provides nutrient materials through a placenta.

S4K4

ANSWER

1

Regents Date

Jan2012

13

Data Base File Number

401

gametes

798. Dioxin, a toxin associated with waste incineration and some plastics, has been found to directly disrupt normal gamete production in human females. Dioxin most likely affects the

- (1) testes and progesterone production
- (2) ovaries and estrogen production
- (3) DNA in the nuclei of sperm cells
- (4) pancreas and insulin production

S4K4

ANSWER

2

Regents Date

June2024

8

Data Base File Number

1762

gel electrophoresis

799. The differing rates of migration of DNA fragments in a gel electrophoresis procedure is mainly due to

- (1) the volume of the DNA sample used
- (2) the size of the DNA fragments produced
- (3) the number of DNA fragments in the gel
- (4) the size of the wells of the gel

LAB3

ANSWER

2

Regents Date

Aug2023

81

Data Base File Number

1727

gel electrophoresis

LAB1

ANSWER

1

800. Which chemicals are used to cut DNA into fragments for a gel electrophoresis procedure?

- (1) enzymes
- (2) molecular bases
- (3) hormones
- (4) ATP molecules

Regents Date

Jan2015

76

Data Base File Number

1122

gel electrophoresis

LAB1

ANSWER

1

801. Gel electrophoresis is used to separate DNA fragments on the basis of their

- (1) size
- (2) color
- (3) functions
- (4) chromosomes

Regents Date

June2004

63

Data Base File Number

694

gel electrophoresis

LAB1

ANSWER

3

802. Which lab procedure can be done to find molecular evidence for relationships between organisms?

- (1) Compare slides of cell organelles.
- (2) Examine fossils and ocean sediments.
- (3) Set up and perform gel electrophoresis.
- (4) Use a dichotomous key and test for pH.

Regents Date

June2021

74

Data Base File Number

1587

gene

S4K2

ANSWER

3

803. Viruses frequently infect bacteria and insert new genes into the genetic material of the bacteria. When these infected bacteria reproduce asexually, which genes would most likely be passed on?

- (1) only the new genes
- (2) only the original genes
- (3) both the original and the new genes
- (4) neither the original nor the new genes

Regents Date

Aug2007

12

Data Base File Number

9

gene

804. In all organisms, the coded instructions for specifying the characteristics of the organism are directly determined by the arrangement of the

- (1) twenty kinds of amino acids in each protein
- (2) twenty-three pairs of genes on each chromosome
- (3) strands of simple sugars in certain carbohydrate molecules
- (4) four types of molecular bases in the genes

S4K2

ANSWER

4

Regents Date

Aug2008

7

Data Base File Number

137

gene

805. Which statement is an accurate description of genes?

- (1) Proteins are made of genes and code for DNA.
- (2) Genes are made of proteins that code for nitrogen bases.
- (3) DNA is made of carbohydrates that code for genes.
- (4) Genes are made of DNA and code for proteins

S4K2

ANSWER

4

Regents Date

Aug2017

7

Data Base File Number

1330

gene

806. Which statement indicates one difference between the gene that codes for insulin and the gene that codes for testosterone in humans?

- (1) The gene for insulin is replicated in vacuoles, while the gene for testosterone is replicated in mitochondria.
- (2) The gene for insulin has a different sequence of molecular bases than the gene for testosterone.
- (3) The gene for insulin is turned on in liver cells, but the gene for testosterone is not.
- (4) The gene for insulin is a sequence of five different molecular bases while the gene for testosterone is a sequence of only four different molecular bases.

S4K2

ANSWER

2

Regents Date

Jan2008

12

Data Base File Number

82

gene

807. A human liver cell and a human skin cell in the same person have the same genetic sequences. However, these cells are different because the liver cell

- (1) has more dominant traits than the skin cell
- (2) can reproduce but the skin cell cannot
- (3) carries out respiration but the skin cell does not
- (4) uses different genes than the skin cell

S4K2

ANSWER

4

Regents Date

Jan2009

3

Data Base File Number

154

gene

808. Bacteria and humans are similar in that they both

- (1) contain genetic material
- (2) are single-celled
- (3) lack cell organelles
- (4) carry out autotrophic nutrition

S4K1

ANSWER

1

Regents Date

Jan2016

1

Data Base File Number

1178

gene

809. Traits are passed from parents to offspring. These traits are determined by

- (1) chromosomes, located on genes, found in the nucleus
- (2) genes, located on chromosomes, found in the nucleus
- (3) chromosomes, located on genes, found in the ribosomes
- (4) genes, located on chromosomes, found in the ribosomes

S4K2

ANSWER

2

Regents Date

Jan2020

6

Data Base File Number

1535

gene

810. Which phrase best describes a gene?

- (1) a segment of a DNA molecule found only in the body cells of an organism
- (2) a segment of a DNA molecule found only in the gametes of an organism
- (3) a segment of a DNA molecule that contains the instructions for producing a trait in an organism
- (4) a segment of a DNA molecule that contains the instructions for producing all the characteristics of an organism

S4K2

ANSWER

3

Regents Date

June2015

11

Data Base File Number

1130

gene

811. Recently, a type of genetically modified fish has been approved for sale for human consumption. The modified fish contain a growth hormone gene from a different fish species. As a result, the modified fish grow rapidly and are ready to sell in almost half the time it normally would take. The modified fish are able to produce the new growth hormone because

- (1) each of their cells contains the new gene to produce growth hormone
- (2) each gene contains the code to synthesize carbohydrates
- (3) the altered gene directs the mitochondria to synthesize the hormone
- (4) the modified body cells are able to reproduce by meiosis

Regents Date

June2019

6

Data Base File Number

1472

S4K2

ANSWER

1

gene

812. BRCA genes are human genes that normally work to help shut down cancer cells before they can harm the body. Scientists have learned that individuals inheriting a damaged form of a BRCA gene are at greater risk of developing breast or ovarian cancer. This discovery is an important first step in

- (1) preventing the uncontrolled meiotic division of cells in humans
- (2) identifying individuals at risk and recommending preventive treatment
- (3) being able to detect all the genes that regulate meiosis
- (4) helping to eliminate all BRCA genes

Regents Date

June2021

17

Data Base File Number

1573

S4K2

ANSWER

2

gene alteration

813. Some bacteria are unable to survive unless a certain nutrient is present in their food supply. After exposure to ultraviolet radiation, some of these bacteria are able to synthesize this nutrient. This change is most likely due to

- (1) increased respiration
- (2) exposure to an antigen
- (3) an alteration in a gene
- (4) gamete formation

Regents Date

Jan2012

29

Data Base File Number

413

S4K3

ANSWER

3

gene alteration

S4K3	814. Which process can produce new inheritable characteristics within a multicellular species? (1) cloning of the zygote (2) mitosis in muscle cells (3) gene alterations in gametes (4) differentiation in nerve cells	Regents Date June2006
		Data Base File Number 506
ANSWER	3	8

gene alteration

S4K3	815. Which event would most likely cause a change in a genetic sequence in an organism? (1) eating certain foods high in saturated fats (2) strenuous physical activity (3) exposure to radiation (4) a sudden exposure to cooler temperatures	Regents Date June2014
		Data Base File Number 1046
ANSWER	3	15

gene combinations

S4K2	816. Eye color, hair color, and skin color often vary from person to person and even within a family. One explanation is that (1) the glucose units in a DNA molecule are often rearranged (2) the genetic material of the female parent has the most influence on offspring (3) the inherited traits of individuals are determined by different gene combinations (4) some extra parts of genetic material are often gained during fertilization	Regents Date Jan2018
		Data Base File Number 1365
ANSWER	3	23

gene combinations

Regents Date
Jan2020

817. Base your answer to this question on the information given and on your knowledge of biology. A forensic scientist is trying to determine if the plant pieces found on a burglary suspect match the plants found outside a home that was robbed. The suspect had plant pieces in the hood of his jacket as well as green stains on the knees of his jeans. The evidence that would be most convincing in determining that the plant pieces found in the suspect's hood matched the plants outside the home that was robbed would be if they both had the same

LAB1

- (1) color flower petal
- (2) gene sequence
- (3) kind of pollen grains
- (4) type of leaf structure

76

Data Base File
Number

1560

ANSWER 2

gene combinations

Regents Date
Jan2024

818. Which three processes usually result in the greatest variety of possible gene combinations?

S4K3

- (1) mutation, meiosis, and fertilization
- (2) differentiation, mitosis, and fertilization
- (3) cloning, meiosis, and fertilization
- (4) differentiation, mutation, and fertilization

29

Data Base File
Number

1742

ANSWER 1

gene combinations

Regents Date
June2007

819. A single pair of goldfish in an aquarium produced a large number of offspring. These offspring showed variations in body shape and coloration. The most likely explanation for these variations is that the

S4K3

- (1) offspring were adapting to different environments
- (2) offspring were produced from different combinations of genes
- (3) parent fish had not been exposed to mutagenic agents
- (4) parent fish had not reproduced sexually

13

Data Base File
Number

33

ANSWER 2

gene combinations

		Regents Date June2022
	820. Some salmon have been genetically modified to grow bigger at a faster rate than wild salmon. They are kept in fish-farming facilities and are not released into the wild. Which statement regarding genetically modified salmon is most likely true?	
S4K2	(1) Wild salmon reproduce sexually, while genetically modified salmon reproduce asexually.	4
	(2) Wild salmon have an altered protein sequence, but genetically modified salmon do not.	Data Base File Number
ANSWER	(3) Genetically modified salmon and wild salmon would have different DNA sequences.	
3	(4) Genetically modified salmon and wild salmon would have identical DNA sequences.	1606

gene expression

		Regents Date Aug2001
	821. During the warm temperatures of summer, the arctic fox produces enzymes that cause its fur to become reddish brown. During the cold temperatures of winter, these enzymes do not function. As a result, the fox has a white coat that blends into the snowy background. This change in fur color shows that	
S4K2	(1) the genes of a fox are made of unstable DNA	10
	(2) mutations can be caused by temperature extremes	Data Base File Number
ANSWER	(3) random alteration of DNA can occur on certain chromosomes	
4	(4) the expression of certain genes is affected by temperature	920

gene expression

822. In Siamese cats, the fur on the ears, paws, tail, and face is usually black or brown, while the rest of the body fur is almost white. If a Siamese cat is kept indoors where it is warm, it may grow fur that is almost white on the ears, paws, tail, and face, while a Siamese cat that stays outside where it is cold, will grow fur that is quite dark on these areas. The best explanation for these changes in fur color is that

- (1) an environmental factor influences the expression of this inherited trait
- (2) the location of pigment-producing cells determines the DNA code of the genes
- (3) skin cells that produce pigments have a higher mutation rate than other cells
- (4) the gene for fur color is modified by interactions with the environment

S4K2

ANSWER 1

Regents Date

Aug2002

11

Data Base File Number

815

gene expression

823. In a particular variety of corn, the kernels turn red when exposed to sunlight. In the absence of sunlight, the kernels remain yellow. Based on this information, it can be concluded that the color of these corn kernels is due to

- (1) a different type of DNA that is produced when sunlight is present
- (2) a different species of corn that is produced in sunlight
- (3) the effect of sunlight on the number of chromosomes inherited
- (4) the effect of environment on gene expression

S4K2

ANSWER 4

Regents Date

Aug2003

8

Data Base File Number

785

gene expression

824. Some mammals have genes for fur color that produce pigment only when the outside temperature is above a certain level. This pigment production is an example of how the environment of an organism can

- (1) destroy certain genes
- (2) cause new mutations to occur
- (3) stop the process of evolution
- (4) influence the expression of certain genes

S4K2

ANSWER 4

Regents Date

Aug2004

7

Data Base File Number

699

gene expression

S4K2	825. In one variety of corn, the kernels turn red when exposed to sunlight. In the absence of sunlight, the kernels remain yellow. Based on this information, it can be concluded that the color of these corn kernels is due to the	Regents Date
		Aug2005
ANSWER	3	4
		Data Base File Number
	(1) process of selective breeding	596
	(2) rate of photosynthesis	
	(3) effect of environment on gene expression	
	(4) composition of the soil	

gene expression

S4K2	826. The enzyme pepsin is produced in the cells of the stomach but NOT in the cells of the small intestine. The small intestine produces a different enzyme, trypsin. The reason that the stomach and small intestine produce different enzymes is that the gene that codes for pepsin is	Regents Date
		Aug2005
ANSWER	2	8
		Data Base File Number
	(1) in the cells of the stomach, but not in the cells of the small intestine	598
	(2) expressed in the stomach but not expressed in the small intestine	
	(3) mutated in the small intestine	
	(4) digested by the trypsin in the small intestine	

gene expression

S4K2	827. Genes are inherited, but their expressions can be modified by the environment. This statement explains why	Regents Date
		Aug2006
ANSWER	1	2
		Data Base File Number
	(1) some animals have dark fur only when the temperature is within a certain range	522
	(2) offspring produced by means of sexual reproduction look exactly like their parents	
	(3) identical twins who grow up in different homes have the same characteristics	
	(4) animals can be cloned, but plants cannot	

gene expression

S4K1	828. The brown summer feathers of ptarmigans, small Arctic birds, are replaced by white feathers after winter arrives. Which statement best explains this observation?	Regents Date	Aug2007
			8
		Data Base File Number	
			6
ANSWER	1		
	(1) The expression of genes can be modified by the environment.		
	(2) Holes in the ozone layer vary in size depending on the season.		
	(3) Acids in rain bleach the brown feathers of the bird.		
	(4) Mutations occur only during certain seasons.		

gene expression

S4K2	829. A student notices that fruit flies with the curly wing trait develop straight wings if kept at a temperature of 16°C, but develop curly wings if kept at 25°C. The best explanation for this observation is that	Regents Date	Aug2008
			6
		Data Base File Number	
			136
ANSWER	3		
	(1) wing shape is controlled by behavior		
	(2) wing shape is influenced by light intensity		
	(3) gene expression can be modified by interactions with the environment		
	(4) gene mutations for wing shape can occur at high temperatures		

gene expression

S4K2	830. A towel placed on a lawn for a length of time can cause the grass beneath it to lose its green color. The most probable explanation for this is that darkness	Regents Date	Aug2012
			5
		Data Base File Number	
			447
ANSWER	1		
	(1) affects the expression of certain genes in the grass		
	(2) causes a mutation in the plants		
	(3) affects the structure of cell membranes in the grass		
	(4) causes plants to switch to heterotrophic nutrition		

gene expression

831. The colors and scents of plants attract helpful insects and repel insects that feed on them. The production of the proteins that provide these colors and scents is the direct result of the

- (1) behavior learned from parent plants
- (2) presence of specific genes
- (3) the genetic makeup of the surrounding vegetation
- (4) inability of plants to move as animals do

S4K2

ANSWER 2

Regents Date

Aug2012

17

Data Base File Number

458

gene expression

832. Corn seeds with identical genetic information were planted on two adjacent farms. The corn plants on one farm were well fertilized and grew large, while the plants on the other farm were not given fertilizer and did not grow as large. The best explanation for these observations is that

- (1) crops grow differently in different climates
- (2) the corn plants all contained mutated genes that made them grow
- (3) environmental conditions affect gene expression
- (4) the plants on one farm had different genes from the plants on the other farm

S4K2

ANSWER 3

Regents Date

Aug2014

11

Data Base File Number

1073

gene expression

833. Several companies now offer DNA "banking services," where DNA is extracted from a pet and is stored so that a "replacement pet" might be produced using cloning techniques when the original pet dies. Which statement best explains why the replacement pets that are produced in this way might NOT look or act like the original?

- (1) The new animal must get the DNA from two different parents, not just one cell.
- (2) Mutations could occur that change the cloned animal into a completely different species.
- (3) Recombination of the cells as they are cloned will make the resulting pet act differently.
- (4) The environment could influence how genes are expressed, changing how the animal looks and acts.

S4K2

ANSWER 4

Regents Date

Aug2017

25

Data Base File Number

1340

gene expression

834. There are over 200 different cell types in the human body. Each type of cell is specialized to carry out a particular function, but they all developed from the same single cell. This is because each type of cell

S4K2

ANSWER 3

- (1) contains different genes than the other types of cells
- (2) destroys the genes found in the other types of cells
- (3) expresses some genes not expressed in the other cell types
- (4) lacks the genes found in the other cell types

Regents Date

Aug2024

24

Data Base File Number

1803

gene expression

835. Fruit flies with the curly-wing trait will develop straight wings if kept at a temperature of 16°C during development and curly wings if kept at 25°C. The best explanation for this change in the shape of wings is that the

S4K2

ANSWER 3

- (1) genes for curly wings and genes for straight wings are found on different chromosomes
- (2) type of genes present in the fruit fly is dependent on environmental temperature
- (3) environment affects the expression of the genes for this trait
- (4) higher temperature produces a gene mutation

Regents Date

Jan2004

8

Data Base File Number

650

gene expression

836. The cells that make up the skin of an individual have some functions different from the cells that make up the liver because

S4K2

ANSWER 4

- (1) all cells have a common ancestor
- (2) different cells have different genetic material
- (3) environment and past history have no influence on cell function
- (4) different parts of genetic instructions are used in different types of cells

Regents Date

Jan2004

11

Data Base File Number

653

gene expression

837. Which statement best explains the fact that some identical twins appear different from one another?
- (1) Their DNA is essentially the same and the environment plays little or no role in the expression of their genes.
 - (2) Their DNA is very different and the environment plays a significant role in the expression of their genes.
 - (3) Their DNA is very different and the environment plays little or no role in the expression of their genes.
 - (4) Their DNA is essentially the same and the environment plays a significant role in the expression of their genes.

S4K2

ANSWER 4

Regents Date

Jan2006

6

Data Base File Number

478

gene expression

838. When "S. marcescens", a bacterium, is grown in a refrigerator, it produces red-colored colonies. However, if the bacterium is grown at room temperature, the colonies are white. The best explanation for this situation is that
- (1) refrigeration changes the structure of genes
 - (2) room temperature stimulates the synthesis of a red pigment
 - (3) temperature has an effect on the expression of genes
 - (4) only temperature is responsible for the expression of a trait

S4K2

ANSWER 3

Regents Date

Jan2011

7

Data Base File Number

310

gene expression

839. Although a liver cell and a muscle cell in a human developed from the same single cell, their appearance and functions are different. This is because the liver cell
- (1) contains different genes than the muscle cell
 - (2) expresses different genes than the muscle cell
 - (3) destroys the muscle cell genes it contains
 - (4) lacks the genes found in muscle cells

S4K2

ANSWER 2

Regents Date

Jan2012

15

Data Base File Number

403

gene expression

S4K2	840. In the summer, the arctic fox appears brown because its cells produce a dark pigment. However, in the winter, the arctic fox appears white because the dark pigment is not produced. The color change is most likely due to the effect of	Regents Date	Jan2013
			6
		Data Base File Number	
		ANSWER	3
	(1) different genes produced in the different seasons		
	(2) increased pollution on genetic mutations		
	(3) environmental conditions on gene expression		
	(4) poor nutrition on cell growth and development		622

gene expression

S4K2	841. Researchers recently discovered that when hammerhead sharks were moved to shallower water, resulting in exposure to increased light intensity, their backs turned a deep brownish black. Which statement best supports this observation?	Regents Date	Jan2014
			30
		Data Base File Number	
		ANSWER	1
	(1) Genes are inherited, but their expression can be modified by interactions with the environment.		
	(2) The cells of hammerhead sharks contain many thousands of different genes in their nuclei.		
	(3) An inherited trait of an individual can be determined by one or by many genes.		
	(4) Asexually produced offspring are normally genetically identical to the parent.		1022

gene expression

S4K2	842. A hydrangea plant has blue flowers when grown in acidic soil, but has pink flowers when grown in basic soil. A clone of the pink-flowered plant is grown in acidic soil and produces blue flowers. This change in flower color is most likely due to	Regents Date	Jan2015
			8
		Data Base File Number	
		ANSWER	3
	(1) sexual reproduction in the plants, resulting in variation		
	(2) asexual reproduction in the plants, resulting in variation		
	(3) genes being expressed in different ways due to environmental conditions		
	(4) a gene mutation that occurred after the clone was produced		1099

gene expression

S4K2	843. Although all of the cells of a plant contain the same genetic material, root cells and leaf cells are NOT identical because they	Regents Date
		Jan2018
		26
		Data Base File Number
ANSWER	2	1368

gene expression

S4K2	844. Identical twins were separated at birth and raised by two different families. Years later, one twin was a physically fit member of the cross-country team, and the other twin was overweight with slightly higher-than-normal blood pressure. The differences in these twins could be explained by the fact that	Regents Date
		Jan2020
		4
		Data Base File Number
ANSWER	4	1534

gene expression

S4K2	845. When exposed to ultraviolet (UV) light, human skin cells produce the protein melanin. This protein helps protect skin cells from damage caused by UV light. This is an example of	Regents Date
		Jan2024
		3
		Data Base File Number
ANSWER	4	1730

gene expression

846. The blood of newborn babies is tested to determine the presence of a certain substance. This substance indicates the genetic disorder PKU, which may result in mental retardation. Babies born with this disorder are put on a special diet so that mental retardation will not develop. In this situation, modification of the baby's diet is an example of how biological research can be used to
- (1) change faulty genes
 - (2) cure a disorder
 - (3) stimulate immunity
 - (4) control a disorder

S4K5

ANSWER 4

Regents Date

June2002

24

Data Base File Number

849

gene expression

847. Scientific studies show that identical twins who were separated at birth and raised in different homes may vary in height, weight, and intelligence. The most probable explanation for these differences is that
- (1) original genes of each twin increased in number as they developed
 - (2) one twin received genes only from the mother while the other twin received genes only from the father
 - (3) environments in which they were raised were different enough to affect the expression of their genes
 - (4) environments in which they were raised were different enough to change the genetic makeup of both individuals

S4K2

ANSWER 3

Regents Date

June2003

9

Data Base File Number

759

848. Base your answer to this question on the passage given and on your knowledge of biology.

. . . Some of the most common and deadly bacteria do their mischief by forming a sticky scum called biofilm. Individually, the microbes are easy to control, but when they organize themselves into biofilms they can become deadly, said Dr. Barbara Iglewski of the University of Rochester.

Biofilms are actually intricately organized colonies of billions of microbes, all working in a coordinated way to defend against attack and to pump out a toxin that can be deadly.

Once they are organized, the bacteria are highly resistant to antibiotics and even strong detergents often cannot wash them away or kill them.

Iglewski and colleagues from Montana State University and the University of Iowa report in "Science" that they discovered how the microbes in the colonies communicate and found that once this conversation is interrupted, the deadly bugs can be easily washed away. Using "Pseudomonas aeruginosa", a common bacteria that is a major infection hazard in hospitals and among cystic fibrosis patients, the researchers isolated a gene that the bacteria uses to make a communications molecule. The molecule helps the microbes organize themselves into a biofilm -- a complex structure that includes tubes to carry in nutrients and carry out wastes, including deadly toxins.

In their study, the researchers showed that if the gene that makes the communications molecule was blocked, the "Pseudomonas aeruginosa" could form only wimpy [weak], unorganized colonies that could be washed away with just a soap that has no effect on a healthy colony□...

Adapted from: Paul Recer, "Researchers find new means to disrupt attack by microbes," The Daily Gazette, April 26, 1998. --- Bacteria that form biofilms may be controlled most effectively by

- (1) antibiotics
- (2) detergents
- (3) cutting the tubes through which the bacteria communicate
- (4) blocking the expression of a gene that helps the colonies to organize

S1K1

34

**Data Base File
Number**

ANSWER

4

692

gene expression

S4K2	849. Plants inherit genes that enable them to produce chlorophyll, but this pigment is not produced unless the plants are exposed to light. This is an example of how the environment can	Regents Date
		June2005
ANSWER 2	(1) cause mutations to occur	4
	(2) influence the expression of a genetic trait	Data Base File Number
	(3) result in the appearance of a new species	576
	(4) affect one plant species, but not another	

gene expression

S4K2	850. A human liver cell is very different in structure and function from a nerve cell in the same person. This is best explained by the fact that	Regents Date
		June2006
ANSWER 1	(1) different genes function in each type of cell	5
	(2) liver cells can reproduce while the nerve cells cannot	Data Base File Number
	(3) liver cells contain fewer chromosomes than nerve cells	503
	(4) different DNA is present in each type of cell	

gene expression

S4K2	851. Even though each body cell in an individual contains the same DNA, the functions of muscle cells and liver cells are NOT the same because	Regents Date
		June2007
ANSWER 4	(1) mutations usually occur in genes when muscle cells divide	10
	(2) liver tissue develops before muscle tissue	Data Base File Number
	(3) liver cells produce more oxygen than muscle cells	31
	(4) liver cells use different genes than muscle cells	

gene expression

	852. At warm temperatures, a certain bread mold can often be seen growing on bread as a dark-colored mass. The same bread mold growing on bread in a cooler environment is red in color. Which statement most accurately describes why this change in the color of the bread mold occurs?	Regents Date June2008
S4K1	(1) Gene expression can be modified by interactions with the environment.	6
	(2) Every organism has a different set of coded instructions.	Data Base File Number
ANSWER 1	(3) The DNA was altered in response to an environmental condition.	
	(4) There is no replication of genetic material in the cooler environment.	108

gene expression

	853. Although identical twins inherit exact copies of the same genes, the twins may look and act differently from each other because	Regents Date June2009
S4K2	(1) a mutation took place in the gametes that produced the twins	5
	(2) the expression of genes may be modified by environmental factors	Data Base File Number
ANSWER 2	(3) the expression of genes may be different in males and females	
	(4) a mutation took place in the zygote that produced the twins	180

gene expression

	854. Even though identical twins have the same genetic material, they may develop slightly different characteristics because	Regents Date June2010
S4K2	(1) each twin receives different chromosomes from the egg	16
	(2) one twin may only have genes from the father	Data Base File Number
ANSWER 3	(3) gene expression may be influenced by factors that switch genes on and off	
	(4) a gene mutation may have occurred before the zygote divided	265

gene expression

855. As male children get older, some begin to closely resemble their fathers and have no resemblance to their mothers. Which statement best explains this observation?

S4K4

- (1) Several sperm fertilized the egg, so the fertilized egg contained more genes from their father.
- (2) More genes are inherited from the sperm cell of their father than from the egg cell of their mother, so most traits will be like those of their father.
- (3) More genes from their father are expressed in traits that can be seen, and more genes from their mother are expressed in traits that cannot be seen, such as blood type or enzyme function.
- (4) Genes from their father are stronger than genes from their mother, so the genes from their mother are not expressed.

Regents Date

June2011

8

Data Base File Number

336

ANSWER

3

gene expression

856. Chlorophyll gives plants their green color. Chlorophyll is produced only when plants are exposed to light, so plants kept in darkness have no chlorophyll and appear white. The best explanation for this is that

S4K2

- (1) chlorophyll is not needed by green plants at night
- (2) darkness mutates the chlorophyll genes, causing them to produce a white color
- (3) light is required for chlorophyll genes to be expressed
- (4) genetic information in cells is not influenced by the outside environment

Regents Date

June2013

12

Data Base File Number

951

ANSWER

3

gene expression

857. In an organism, a muscle cell has the same DNA as a nerve cell, yet the cells perform different functions. This is possible because

S4K2

- (1) different mutations occur in each cell type, changing the genetic instructions
- (2) temperature variations within the body alter DNA
- (3) proteins in each cell type change the structure of DNA
- (4) different parts of the genetic instructions are used in each type of cell

Regents Date

June2013

15

Data Base File Number

954

ANSWER

4

gene expression

		Regents Date June2015
	858. In the early 1900s, experiments were conducted on two caterpillar species. The members of the two species were each divided into two groups. One group of each species was placed under red light, while the other group of each species was kept in the dark. When the caterpillars developed into butterflies, their wings showed extreme color differences. Exposure to red light resulted in intensely colored wings, while those kept in the dark had paler wing colors. The color differences were most likely due to	
S4K2	(1) mutations in the color-producing genes	24
	(2) the caterpillars in the red light producing more DNA	Data Base File Number
ANSWER	(3) gene expression being affected by the environment	
3	(4) the caterpillars in the dark evolving less than those in the light	1138

gene expression

		Regents Date June2017
	859. Which statement is an example of how the external environment can influence gene expression	
S4K2	(1) Some flowering plants that inherit a gene for white flowers and a gene for red flowers will produce pink flowers.	34
	(2) Some animals that inherit genes for brown fur will grow white fur if the outside temperature falls below a certain level	Data Base File Number
ANSWER	(3) In some breeds of cat, certain fur-color genes are found only in females.	
2	(4) A pea plant is short-stemmed only if it inherits the genes for the trait from both parents.	1323

gene expression

		Regents Date June2018
	860. Which statement best explains why different body cells of the same individual look and function differently?	
S4K2	(1) Each cell contains different genes	15
	(2) Different genes are activated in different kinds of cells.	Data Base File Number
ANSWER	(3) Cells are able to change to adapt to their surroundings.	
2	(4) Half of the genes in the cells came from the mother and half from the father.	1392

gene expression

	861. Genetically identical yarrow plants were grown at different altitudes. Even though their genetic makeup was identical, the plants grew to different heights. One likely explanation for the different heights of the plants at each altitude is that	Regents Date June2021
S4K7	(1) gene expression was influenced by the environment	27
	(2) genes mutated when the plants were grown at higher elevations	Data Base File Number
ANSWER 1	(3) chromosomes increased in number with elevation change	
	(4) the sequence of DNA bases was altered at different altitudes	1583

gene expression

	862. The formation of the many kinds of body cells that make up an embryo begins with	Regents Date June2022
S4K2	(1) chemical changes in the cell membranes	3
	(2) the clumping together of proteins within the cells	Data Base File Number
ANSWER 3	(3) specific genes being activated	
	(4) the rapid metabolism of sugar molecules	1605

gene expression

	863. Scientists turned a specialized stomach cell from a mouse into a skin cell by activating a specific gene responsible for the production of skin cells. Which claim can be made, based on this evidence?	Regents Date June2023
S4K2	(1) Stomach cells have the genetic information to form other types of cells.	9
	(2) Skin and stomach cells produce identical proteins.	Data Base File Number
ANSWER 1	(3) Stomach cells receive half their genetic information from each parent.	
	(4) Skin and stomach cells have completely different genes.	1681

gene mutation

S4K2

ANSWER 1

864. A single gene mutation results from
- (1) a change in a base sequence in DNA
 - (2) recombination of traits
 - (3) the failure of chromosomes to separate
 - (4) blocked nerve messages

Regents Date

Aug2004
4

**Data Base File
Number**

697

gene mutation

S4K3

ANSWER 2

865. As a result of sexual reproduction, an organism can pass a gene mutation to its offspring if the mutation occurs in
- (1) a body cell
 - (2) a gamete
 - (3) liver tissue
 - (4) white blood cells

Regents Date

Jan2002

10

**Data Base File
Number**

862

gene mutation

S4K5

ANSWER 1

866. People have been warned about the dangers of excessive exposure to radiation during certain medical procedures. The most likely reason for this warning is that radiation exposure might
- (1) result in gene mutations and uncontrolled cell growth
 - (2) cause the rejection of transplanted organs
 - (3) increase body temperature by two to five degrees
 - (4) prevent the transport of materials into cells

Regents Date

Jan2013

23

**Data Base File
Number**

635

gene mutation

LAB1

ANSWER 4

867. A human gene contains the following DNA base sequence: ACGCCCACCTTA. The gene mutated. It then contained the following DNA base sequence: ACGCGCACCTTA. Which type of mutation is represented in the new gene?
- (1) addition
 - (2) deletion
 - (3) inversion
 - (4) substitution

Regents Date

Jan2018

81

**Data Base File
Number**

1382

gene mutation

	868. Gene mutations can be caused by many things. These mutations are biologically important because they	Regents Date Jan2020
S4K3	(1) occur at a regular rate and therefore can be controlled	19
	(2) can be passed to the offspring if they occur in any cell of the body	Data Base File Number
ANSWER	(3) are always harmful and therefore help to eliminate weak traits	1546
4	(4) can result in a new variety of gene combinations in the species.	

gene mutation

	869. A certain species of rough-skinned newt produces an extremely powerful toxin that helps prevent attacks by predators. However, one predator, the garter snake, can eat these newts without being affected by the toxin. Which statement best explains the resistance of garter snakes to the newt toxin?	Regents Date June2023
S4K3	(1) The snakes needed to become resistant to the toxin in order to survive, so they developed a toxin-resistance gene.	23
	(2) As the newts became more toxic, the snakes became increasingly resistant in order to survive.	Data Base File Number
ANSWER	(3) Exposure to newt toxin caused a mutation in the snakes, which increased resistance to the toxin in the snakes.	1691
4	(4) A random genetic mutation that resulted in toxin resistance increased the survival rates of the snakes that had it, and they passed it on to their offspring.	

gene recombination

	870. Variation in the offspring of sexually reproducing organisms is the direct result of	Regents Date Jan2007
S4K3	(1) sorting and recombining of genes	5
	(2) replication and cloning	Data Base File Number
ANSWER	(3) the need to adapt and maintain homeostasis	52
1	(4) overproduction of offspring and competition	

gene splicing

	871. If a gene is inserted into the DNA of a bacterial cell, every cell produced by that cell will have	Regents Date Jan2010
S4K2	(1) DNA that is different from that of the other cells produced	12
	(2) a 50% chance of having a copy of the inserted gene	Data Base File Number
ANSWER 3	(3) a copy of the inserted gene	235
	(4) a new type of DNA base	

genetic code

	872. Changes in the genetic code of a human can be transmitted to offspring if they occur in	Regents Date Aug2004
S4K3	(1) cancer cells	10
	(2) gametes	Data Base File Number
ANSWER 2	(3) cell membranes	701
	(4) antibodies	

genetic code

	873. Mustard gas removes guanine (G) from DNA. For developing embryos, exposure to mustard gas can cause serious deformities because guanine	Regents Date Jan2009
S4K2	(1) stores the building blocks of proteins	8
	(2) supports the structure of ribosomes	Data Base File Number
ANSWER 4	(3) produces energy for genetic transfer	158
	(4) is part of the genetic code	

genetic code

	874. A characteristic that an organism exhibits during its lifetime will only affect the evolution of its species if the characteristic	Regents Date June2010
S4K3	(1) results from isolation of the organism from the rest of the population	10
	(2) is due to a genetic code that is present in the gametes of the organism	Data Base File Number
ANSWER 2	(3) decreases the number of genes in the body cells of the organism	262
	(4) causes a change in the environment surrounding the organism	

genetic continuity

875. A variety of plant produces small white fruit. A stem was removed from this organism and planted in a garden. If this stem grows into a new plant, it would most likely produce

- (1) large red fruit, only
- (2) large pink fruit, only
- (3) small white fruit, only
- (4) small red and small white fruit on the same plant

S4K2

ANSWER

3

Regents Date

June2009

15

**Data Base File
Number**

187

genetic diversity

876. Base your answer to this question on the information given and on your knowledge of biology. ...Unless actions are taken to slow the decline of domesticated honeybees and augment [increase] their populations with wild bees, many fruits and vegetables may disappear from the food supply, said Claire Kremen, a conservation biologist at Princeton University in New Jersey... The honeybee decline, which is affecting domesticated and wild bee populations around the world, is mostly the result of diseases spread as a result of mites and other parasites as well as the spraying of crops with pesticides, scientists say...

Source: "Bee Declines May Spell End of Some Fruits, Vegetables," National Geographic News, October 5, 2005. Some honeybees have been able to survive the changes in their environment and reproduce. This is most likely due to

- (1) the aggressive behavior of wild bees
- (2) an abundance of food sources for the bees
- (3) genetic diversity in the bees
- (4) lack of mutations in the bees

S4K3

ANSWER

3

Regents Date

Aug2013

43

**Data Base File
Number**

996

genetic diversity

Regents Date

RBS2021

877. Base your answer to this question on the information given and your knowledge of biology. THE BANANA STORY -- Ancient banana fruits had dark hard seeds and were difficult to eat. In 1834, the Cavendish variety of the banana was discovered as a result of a genetic variation in nature. This Cavendish banana has no seeds and cannot reproduce. The Cavendish bananas have a very sweet taste and are easier to eat because of the lack of seeds. The plants are propagated by vegetative propagation using cuttings from the underground stem and producing new plants from the cuttings. By 2013 about 50 million pounds of Cavendish bananas were produced globally. Cavendish bananas are all genetically identical. Every banana is a clone of the original 1834 plant. The genetic diversity of the Cavendish banana is very low. Recently, a fungus disease called the Panama Disease, was shown to be able to kill the Cavendish strain of bananas. What important biological principle is illustrated by the story of the Cavendish banana?

RBS

(1) A lack of genetic diversity in Cavendish bananas gives them a superior taste and flavor.

1

(2) A lack of genetic diversity in Cavendish bananas indicates that a particular disease could kill all plants if the disease spreads globally.

Data Base File Number

(3) A lack of genetic diversity in Cavendish bananas indicates that the plant is able to resist plant diseases.

ANSWER

2

(4) A lack of genetic diversity in Cavendish bananas has no effect on disease resistance.

1590

genetic engineering

Regents Date

Aug2004

878. A gene that codes for resistance to glyphosate, a biodegradable weedkiller, has been inserted into certain plants. As a result, these plants will be more likely to

S4K2

(1) produce chemicals that kill weeds growing near them

12

(2) die when exposed to glyphosate

Data Base File Number

(3) convert glyphosate into fertilizer

ANSWER

4

(4) survive when glyphosate is applied to them

703

genetic engineering

S4K2	879. A biotechnology firm has produced tobacco plants that synthesize human antibodies that prevent bacterial diseases. One of the first steps in the production of these plants required	Regents Date	Aug2004
			13
		Data Base File Number	
			704
ANSWER	2		
	(1) using natural selection to increase the survival of antibody-producing tobacco plants		
	(2) inserting human DNA segments into the cells of tobacco plants		
	(3) using selective breeding to increase the number of antibody genes in tobacco plants		
	(4) growing tobacco plants in soil containing a specific fertilizer		

genetic engineering

S4K2	880. Researchers Cohn and Boyer transferred a gene from an African clawed frog into a bacterium. To accomplish this, these scientists had to use	Regents Date	Aug2005
			13
		Data Base File Number	
			603
ANSWER	1		
	(1) enzymes to cut out and insert the gene		
	(2) hereditary information located in amino acids		
	(3) radiation to increase the gene mutation rate of the bacterial cells		
	(4) cancer cells to promote rapid cell division		

genetic engineering

S4K2	881. Plants in species A cannot fight most fungal infections. Plants in species B make a protein that kills many fungi. One possible way for humans to produce species A plants with the ability to synthesize this protein would be to	Regents Date	Aug2010
			9
		Data Base File Number	
			286
ANSWER	3		
	(1) mutate fungal DNA and introduce the mutated DNA into species B using a virus		
	(2) add DNA from species B into the soil around species A		
	(3) insert the gene for the protein from species B into a chromosome in species A		
	(4) cross species A and a fungus to stimulate the synthesis of this protein		

genetic engineering

Regents Date

Aug2013

882. In 1996, scientists cloned the first mammal, a sheep. This technique involved the removal of the nucleus from an egg cell. The nucleus from a cell of another adult sheep was then inserted into this egg cell. Once this cell began to develop into an embryo, it was implanted into a third female sheep that later gave birth to a healthy lamb, Dolly. Which statement concerning Dolly is correct?

- (1) Her offspring would be genetically identical.
- (2) Dolly and her DNA donor are genetically identical.
- (3) Two different gametes were manipulated to produce Dolly.
- (4) Dolly was produced by the recombination of genetic material.

18

Data Base File
Number

983

S4K4

ANSWER

2

genetic engineering

Regents Date

Aug2015

883. Farmers in India have increased the harvest yield of food crops like eggplant by growing them from seeds that have been modified to produce a bacterial toxin that is harmful to pest insects. This is an example of

- (1) selective breeding of the insects
- (2) spraying an insecticide on plants
- (3) selective breeding of the eggplant
- (4) an application of biotechnology

25

Data Base File
Number

1171

S4K2

ANSWER

4

genetic engineering

Regents Date

Aug2017

884. Phosphorus is necessary for the growth of healthy plants. Scientists are developing plants that can grow in phosphorus-poor soil. Some of these new varieties, produced in a lab, make extra copies of a protein that helps them obtain more phosphorus from the soil. The process being used to develop these new varieties is most likely

- (1) paper chromatography
- (2) natural selection
- (3) direct harvesting
- (4) genetic engineering

4

Data Base File
Number

1328

S4K2

ANSWER

4

genetic engineering

885. In an effort to reduce the number of deaths due to malaria, scientists have successfully introduced a gene into mosquitoes. The gene makes the mosquitoes unable to support the development of the parasite that causes malaria. The technique used to produce this new variety of mosquito is most likely

- (1) chromatography
- (2) genetic engineering
- (3) electrophoresis of genes
- (4) selective breeding

S4K2

ANSWER 2

Regents Date

Aug2018

3

Data Base File Number

1413

genetic engineering

886. As a way to reduce the number of cases of malaria, a human tropical disease, a specific DNA sequence is inserted into the reproductive cells of Anopheles mosquitoes. Which process was most likely used to alter these mosquitoes?

- (1) cloning studies
- (2) genetic engineering
- (3) natural selection
- (4) random mutations

S4K2

ANSWER 2

Regents Date

Aug2019

14

Data Base File Number

1510

genetic engineering

887. The instructions for making an important protein in the blood-clotting process may be missing in some individuals. Scientists can now isolate these instructions and insert them into a yeast cell that will then produce the protein. Altering yeast cells in this way is known as

- (1) selective breeding
- (2) genetic engineering
- (3) homeostatic regulation
- (4) natural selection

S4K2

ANSWER 2

Regents Date

Aug2023

21

Data Base File Number

1719

genetic engineering

Regents Date
Aug2024

888. Researchers have identified a mutually beneficial relationship between some plant species and specific fungi. The fungi increase the nutrient uptake for these plants, and the plants provide nutrition to the fungi. In order for this relationship to occur, the plant must produce a particular protein. Scientists hope to enable plants that normally do not interact with these fungi to obtain the benefits that the plant-fungi relationship offers.

In order to make this possible, which process would scientists most likely use?

- (1) Treat the plants with chemical fertilizers to stimulate their growth.
- (2) Provide the fungi with the same molecular bases that are found in plant protein.
- (3) Identify the gene that codes for the protein and introduce it into plant cells by genetic engineering.
- (4) Selectively breed a new type of fungus that does not require the nutrients that the plants provide.

15

Data Base File
Number

1795

S4K6

ANSWER 3

genetic engineering

Regents Date
Jan2002

889. The gene for the production of human insulin is inserted into certain bacterial cells. The offspring of these bacterial cells will most likely be able to

- (1) destroy pathogens
- (2) reproduce sexually
- (3) synthesize this hormone
- (4) form human tissue

27

Data Base File
Number

874

S4K2

ANSWER 3

genetic engineering

Regents Date
Jan2002

890. Which statement best describes the result of some of the processes involved in genetic engineering?

- (1) They alter the arrangement of hereditary material.
- (2) They provide energy for mitosis and meiosis
- (3) They are necessary for normal gamete formation.
- (4) They reduce variation in organisms that reproduce asexually.

15

Data Base File
Number

863

S4K2

ANSWER 1

genetic engineering

S4K2	891. The production of certain human hormones by genetically engineered bacteria results from	(1) inserting a specific group of amino acids into the bacteria	Regents Date
			Jan2004
			12
			Data Base File Number
ANSWER	2	(2) combining a portion of human DNA with bacterial DNA and inserting this into bacteria	
		(3) crossing two different species of bacteria	
		(4) deleting a specific amino acid from human DNA and inserting it into bacterial DNA	654

genetic engineering

S4K2	892. The headline "Improved Soybeans Produce Healthier Vegetable Oils" accompanies an article describing how a biotechnology company controls the types of lipids (fats) present in soybeans. The improved soybeans are most likely being developed by the process of	(1) natural selection	Regents Date
			Jan2008
			11
			Data Base File Number
ANSWER	3	(2) asexual reproduction	
		(3) genetic engineering	
		(4) habitat modification	81

genetic engineering

S4K2	893. Coded instructions that are passed from one generation to the next can be most directly changed by the processes of	(1) passive transport, natural selection, and synthesis	Regents Date
			Jan2011
			5
			Data Base File Number
ANSWER	3	(2) selective breeding, replication, and absorption	
		(3) recombination, mutation, and genetic engineering	
		(4) evolution, reproduction, and digestion	309

genetic engineering

Regents Date

Jan2012

894. Some goats have been genetically modified with a human gene that codes for a blood anticlotting factor. The anticlotting factor can then be extracted from the goat milk and used during surgery. To produce these genetically modified goats, scientists most likely

S4K2

- (1) injected the anticlotting factor into the milk-producing glands of the animals
- (2) added modified DNA into the milk of the animals
- (3) inserted the human gene into the egg cells of goats
- (4) altered the nutritional requirements of newborn goats

9

Data Base File Number

397

ANSWER

3

genetic engineering

Regents Date

Jan2012

895. Researchers use a variety of techniques to learn more about the function of a specific gene in an organism. In one type of experiment, called a loss-of-function experiment, the gene being investigated is eliminated. In a gain-of-function experiment, extra copies of the gene being investigated are inserted. The cell process most directly affected in both experiments is

S4K2

- (1) protein synthesis
- (2) waste disposal
- (3) transport of materials
- (4) breakdown of nutrients

11

Data Base File Number

399

ANSWER

1

genetic engineering

Regents Date

Jan2013

896. Base your answer to this question on the information given and on your knowledge of biology. Scientists have found a gene in the DNA of a certain plant that could be the key to increasing the amount of lycopene, a cancer fighting substance, in tomatoes. The process of inserting this gene into the DNA of a tomato plant is known as

S4K2

- (1) selective breeding
- (2) genetic engineering
- (3) cloning
- (4) replication

32

Data Base File Number

640

ANSWER

2

genetic engineering

Regents Date

Jan2013

897. For those individuals who have an allergic reaction to cats, a company in Los Angeles promises relief. They offer a new line of cats genetically modified to eliminate or reduce their allergy-causing properties. The development of this new line of cats most likely involved

S4K4

- (1) using natural selection to produce a new variety of cat
- (2) altering the reproductive rate of cats
- (3) changing the behavior of cats
- (4) manipulating the DNA of cats

15

Data Base File Number

627

ANSWER

4

genetic engineering

Regents Date

Jan2014

898. Base your answer to this question on the information given and on your knowledge of biology. For many years, scientists hypothesized the existence of a single tomato gene that increases the sweetness and production of tomatoes. After years of research, a team of scientists identified the gene and observed greater sweetness and tomato production in plants that contain this gene. Which process could be used to insert this gene into other plant species to increase fruit production

S4K2

- (1) electrolysis
- (2) genetic engineering
- (3) paper chromatography
- (4) gel electrophoresis

52

Data Base File Number

1028

ANSWER

2

genetic engineering

Regents Date

Jan2015

899. Information in segments of human DNA can be expressed by a bacterial cell as a result of

S4K2

- (1) sexual reproduction
- (2) random mutation
- (3) genetic variability
- (4) genetic engineering

13

Data Base File Number

1103

ANSWER

4

genetic engineering

900. A tomato gene, known as the SIKLUH gene, has recently been discovered. The gene leads to the production of larger tomatoes. The gene affects fruit size by increasing cell layers and promoting extra cell divisions. In order to produce large fruit in other commercial plant species, scientists might

S4K2

- (1) clone the genes of other types of plants until they develop larger fruits
- (2) breed the tomatoes with other fruits such as apples
- (3) insert the gene into other types of plants
- (4) stimulate the process of meiosis in the other plants

ANSWER

3

Regents Date

Jan2017

25

Data Base File Number

1286

genetic engineering

901. Scientists have developed the ability to manufacture hormones, such as human growth hormone, using bacteria. One benefit of this new technology is that

S4K2

- (1) scientists can use only one type of bacteria
- (2) bacteria are relatively inexpensive and reproduce quickly
- (3) patients can spend more money on their medications
- (4) scientists produce drugs that cause more immune reactions

ANSWER

2

Regents Date

Jan2018

25

Data Base File Number

1367

genetic engineering

Regents Date

Jan2020

902. Base your answer to this question on the information given and on your knowledge of biology.
 Barley Gene Lowers Emissions From Rice ----
 Over half the people on the planet eat rice as a staple food. Growing rice emits methane, a potent greenhouse gas—to the tune of 25 million to 100 million tons of methane every year, a notable contribution to human-caused greenhouse gas emissions. When rice paddies are flooded, methane-producing bacteria thrive on the carbohydrates secreted by rice roots in the oxygen-free soils. The rice plant itself acts as a conduit [pathway], transmitting methane from the soil into the atmosphere...
 Source: Times Tribune 7/23/15 ---
 Scientists have incorporated a barley gene into a type of rice and produced rice plants that have much lower methane emissions. It is most likely that the scientists incorporated the barley gene into the rice, producing a new variety, using the process of

S4K2

- (1) selective breeding
- (2) meiosis, followed by recombination
- (3) genetic engineering
- (4) sexual reproduction, followed by mitosis

50

Data Base File Number

1557

ANSWER

3

genetic engineering

Regents Date

June2001

903. Many diabetics are now using insulin that was made by certain bacteria. The ability of these bacteria to produce insulin was most likely the result of

S4K2

- (1) deleting many DNA segments from bacterial DNA
- (2) genetic mapping of bacterial DNA to activate the gene for insulin production
- (3) inserting a portion of human DNA into the ring-shaped DNA of bacteria
- (4) using radiation to trigger mutations

13

Data Base File Number

895

ANSWER

3

genetic engineering

904. Which statement best describes human insulin that is produced by genetically engineered bacteria?

- (1) This insulin will not function normally in humans because it is produced by bacteria.
- (2) This insulin is produced as a result of human insulin being inserted into bacteria cells.
- (3) This insulin is produced as a result of exposing bacteria cells to radiation, which produces a mutation.
- (4) This insulin may have fewer side effects than the insulin previously extracted from the pancreas of other animals.

S4K2

ANSWER 4

Regents Date

June2003

19

Data Base File Number

764

genetic engineering

905. Enzymes are used in moving sections of DNA that code for insulin from the pancreas cells of humans into a certain type of bacterial cell. This bacterial cell will reproduce, giving rise to offspring that are able to form

- (1) human insulin
- (2) antibodies against insulin
- (3) enzymes that digest insulin
- (4) a new type of insulin

S4K2

ANSWER 1

Regents Date

June2004

39

Data Base File Number

693

genetic engineering

906. Some farmers currently grow genetically engineered crops. An argument against the use of this technology is that

- (1) it increases crop production
- (2) it produces insect-resistant plants
- (3) its long-term effects on humans are still being investigated
- (4) it always results in crops that do not taste good

S4K7

ANSWER 3

Regents Date

June2006

29

Data Base File Number

516

genetic engineering

Regents Date

June2007

907. The flounder is a species of fish that can live in very cold water. The fish produces an "antifreeze" protein that prevents ice crystals from forming in its blood. The DNA for this protein has been identified, An enzyme is used to cut and remove this section of flounder DNA that is then spliced into the DNA of a strawberry plant. As a result, the plant can now produce a protein that makes it more resistant to the damaging effects of frost. This process is known as

S4K2

- (1) sorting of genes
- (2) genetic engineering
- (3) recombination of chromosomes
- (4) mutation by deletion of genetic material

11

Data Base File Number

32

ANSWER

2

genetic engineering

Regents Date

June2011

908. Cotton plants produce seeds that contain high-quality protein. This protein could be used as a food source except that the seeds are poisonous to humans. Recently, scientists have inserted a section of DNA into the cotton plants that makes the cotton seeds nonpoisonous. The technique for this procedure is known as

S4K2

- (1) gene manipulation
- (2) cloning
- (3) reproduction
- (4) direct harvesting

17

Data Base File Number

340

ANSWER

1

genetic engineering

Regents Date

June2012

909. Which situation results in a characteristic that is inheritable?

S4K3

- (1) A limb is lost when two marine organisms fight.
- (2) A puppy learns to beg for food by watching an older dog perform tricks.
- (3) A gene is inserted into a bacterium, allowing the organism to produce insulin.
- (4) A random mutation causes the immediate death of a microbe.

15

Data Base File Number

426

ANSWER

3

genetic engineering

Regents Date

June2013

910. Goats have been genetically modified to produce an anticlotting protein in their milk. The protein is extracted from the milk and given to people who have inherited a disorder that causes their bodies to produce blood clots, which can be fatal. A benefit of the technology used to produce this protein is that it

S4K2

- (1) can be used to overcome the effects of a harmful mutation
- (2) can provide people with a new kind of nutrient-rich milk
- (3) will result in healthier goats with more nutritious milk for their offspring
- (4) will reduce blood clots in other farm animals that are modified in this way

3

Data Base File Number

945

ANSWER

1

genetic engineering

Regents Date

June2015

911. Genetic engineering has the potential to correct human genetic disorders. In gene therapy, a defective gene is replaced by using a virus to insert a normal gene into the cells of an individual. This treatment will be most successful if the virus is inserted into cells that

S4K2

- (1) lack a nucleus
- (2) are recycled after death, rather than removed from the body
- (3) carry out one specific function, rather than multiple functions
- (4) continue to divide during the life of the patient

18

Data Base File Number

1136

ANSWER

4

genetic engineering

Regents Date

June2019

912. Adults of the "Aedes" mosquito genus are responsible for transmitting the viral diseases Zika and Dengue. Scientists have produced a modified form of male "Aedes" mosquitoes. The offspring of these male mosquitoes die before reaching adulthood. This method of reducing the spread of disease is dependent on

S4K2

- (1) vaccines stimulating the immune system of infected people
- (2) providing medication to reduce the symptoms of disease
- (3) the use of natural selection to modify the viruses so they are no longer pathogenic
- (4) the use of genetic engineering to reduce the population of mosquitoes that carry the virus

27

Data Base File Number

1486

ANSWER

4

genetic engineering

913. One likely reason bacteria would be grown commercially in laboratory cultures would be to

S4K2

- (1) increase the number of antibiotics produced by human cell
- (2) eliminate the cloning of cells that can fight disease
- (3) increase the production of specialized proteins by using genetic engineering
- (4) decrease the amount of bacteria naturally present in organisms

Regents Date

June2019

47

Data Base File Number

1492

ANSWER

3

genetic engineering

914. CRISPR/Cas9 is a powerful system that bacteria use to cut and remove DNA from invading viruses. Using CRISPR/Cas9, researchers have successfully corrected a disease-causing mutation for muscular dystrophy in laboratory mice. Correcting the harmful mutation using CRISPR/Cas9 is an example of

S4K2

- (1) biological evolution
- (2) cloning techniques
- (3) genetic engineering
- (4) selective breeding

Regents Date

June2023

5

Data Base File Number

1678

ANSWER

3

genetic engineering

915. A gene present only in a single plant species was found to regulate protein content. This gene could increase the protein content of other food crops in the developing world. The most likely method that scientists would use to incorporate this gene into a variety of food crops is

S4K2

- (1) genetic engineering
- (2) selective breeding
- (3) sexual reproduction between the plants with this gene and those without it
- (4) deletion of the genes that limit protein production from each individual food crop plant

Regents Date

June2024

9

Data Base File Number

1763

ANSWER

1

genetic engineering

Regents Date
RBS2021

916. There is a genetic engineering technique called "CRISPR" which was developed in the year 2007. This technique permits removing a section of DNA from a chromosome and replacing it with a different section. This technique could, for example, remove a DEFECTIVE gene from a chromosome and replace it with a NORMAL gene. There are many possibilities using CRISPR for curing genetic defects such as SICKLE CELL DISEASE of red blood cells. What might be some HARMFUL or UNDESIRABLE end results of the CRISPR technique?

RBS

- (1) Unintended consequences might result in a harmful or fatal mutation.
- (2) Changing the coding of DNA might result in a genetic defect unknown to human medicine.
- (3) Unethical use of this technique might be used for cosmetic changes, for example, to change the eye or haircolor of a baby.
- (4) All of the choices shown could be UNDESIRABLE or HARMFUL.

1

Data Base File Number

ANSWER 4

1599

genetic inheritance

Regents Date
Aug2004

917. Most of the hereditary information that determines the traits of an organism is located in

S4K2

- (1) only those cells of an individual produced by meiosis
- (2) the nuclei of body cells of an individual
- (3) certain genes in the vacuoles of body cells
- (4) the numerous ribosomes in certain cells

8

Data Base File Number

ANSWER 2

700

genetic inheritance

Regents Date
Jan2024

918. The human pancreas contains cells that secrete insulin. Only these cells produce insulin because

S4K2

- (1) cells eliminate the parts of the genetic code they do not use
- (2) all other cells lack the genes for insulin production
- (3) different cells use different parts of the genetic information that they contain
- (4) they are the only cells associated with the digestion of sugar

4

Data Base File Number

ANSWER 3

1731

genetic inheritance

		Regents Date
		Jan2024
	919.	
	In an experiment using a particular frog species, nuclei were removed from the intestinal cells of tadpoles and transplanted into eggs whose nuclei had been removed. A small number of these eggs developed into normal frogs. This suggests that the nuclei of tadpole intestinal cells	
S4K2	(1) can undergo meiosis and form gametes	32
	(2) contain all of the genetic information needed for frog development	Data Base File Number
ANSWER	(3) will undergo mitosis and form a new zygote	
2	(4) fused with the frog genes already present in the zygotes	1744

genetic inheritance

		Regents Date
		June2010
	920.	
	Young birds that have been raised in isolation from members of their species build nests characteristic of their species. This suggests that the nest-building behavior is	
S4K3	(1) genetically inherited from parents	21
	(2) learned by watching members of their species	Data Base File Number
ANSWER	(3) a disadvantage to the survival of the species	
1	(4) a direct result of the type of food the bird eats	269

genetic inheritance

		Regents Date
		RBS2021
	921.	
	The chromosomes in a human cell were photographed and counted. A chromosomal photograph is called a karyotype. It was determined that the 2n (diploid) chromosome number for this individual is 47. That is, $2n=47$ for this individual. This individual is most likely	
RBS	(1) normal	1
	(2) abnormal	Data Base File Number
ANSWER	(3) female	
2	(4) male	1591

genetic inheritance

Regents Date

RBS2021

922. Base your answer to this question on the information given and your knowledge of biology. In a genetically stable population of a certain animal there is a dominant trait, "B". The recessive allele for this trait is "b". The population of animals was scientifically sampled and the genotype "bb" was found to be 16%. Assume that the population is large; there are no mutations; mating is random and there is no natural selection. There is no migration into or out of this population. What would be the expected percentage of animals in this population with the genotype "Bb"?

RBS

- (1) 36%
- (2) 48%
- (3) 56%
- (4) 26%

1

Data Base File
Number

1596

ANSWER

2

genetic modification

Regents Date

Aug2019

923. Some salmon have been genetically modified to grow bigger and mature faster than wild salmon. They are kept in fish-farming facilities. Which statement regarding genetically modified salmon is correct?

S4K2

- (1) Genetically modified salmon produce more of some proteins than wild salmon.
- (2) Genetically modified salmon and wild salmon would have identical DNA.
- (3) Wild salmon reproduce asexually while genetically modified salmon reproduce sexually.
- (4) Wild salmon have an altered protein sequence, but genetically modified salmon do not.

19

Data Base File
Number

1511

ANSWER

1

genetic modification

Regents Date

Jan2018

924. Base your answer to this question on the information given and on your knowledge of biology. In China, farmers switched from growing conventional cotton, which required spraying with insecticides 15 times each year, to a genetically modified cotton variety called Bt cotton. The Bt cotton produces a protein toxic to the insects that destroy the cotton crop. Since the switch to Bt cotton, the use of chemical insecticides has decreased by 60%. An advantage of growing the genetically modified Bt cotton instead of conventional cotton is that growing Bt cotton could

S4K7

- (1) result in an increase in populations of insects that are beneficial
- (2) result in an increase in the size of insect populations that are resistant to the Bt protein
- (3) lead to an increase in the survival rates of insects that eat cotton
- (4) lead to an increase in the use of insecticides that protect cotton from insects

41

Data Base File Number

1377

ANSWER

1

genetic modification

Regents Date

June2019

925. Some salmon have been genetically modified to grow bigger and faster than wild salmon. They are grown in fish-farming facilities. These genetically modified fish should NOT be introduced into a natural habitat because

S4K6

- (1) the salmon would recycle nutrients at a rapid rate
- (2) their rapid growth rate could cause them to outcompete native salmon
- (3) they would not have enough oxygen for survival
- (4) they would reproduce asexually once they were released

21

Data Base File Number

1482

ANSWER

2

genetic modification

		Regents Date
		June2024
	926.	Scientists have modified papayas to be resistant to the papaya ringspot virus and to decrease the time that it takes for them to ripen. These modifications
S4K2	(1)	may cause papayas to ripen too slowly, causing loss of revenue
	(2)	are passed to any organism that eats them, making the organism resistant to the virus
ANSWER	3	(3) are an example of using agricultural technologies to increase farm yields
	(4)	could spread ringspot virus throughout the entire ecosystem
		Data Base File Number
		1774

genetic resistance

		Regents Date
		Aug2011
	927.	"Bacillus thuringiensis", a bacterium commonly known as Bt, produces a protein that can kill certain insects that feed on corn crops. Scientists have been successful in transferring the gene that codes for this protein from the bacterium to the corn, so the corn can now make the Bt protein. Corn borers, insects that eat corn, die when they feed on corn containing the Bt protein. A potential problem associated with increased production of Bt corn is
S4K2	(1)	corn borers may stop feeding on corn plants
	(2)	corn borers may develop resistance to the Bt protein
ANSWER	2	(3) farmers may need to use less pesticide to control corn borers
	(4)	corn borers may compete with other insects that feed on corn plants
		Data Base File Number
		383

genetic variation

		Regents Date
		Aug2002
	928.	Which ecosystem has a better chance of surviving when environmental conditions change over a long period of time?
S4K6	(1)	one with a great deal of genetic diversity
	(2)	one with plants and animals but no bacteria
ANSWER	1	(3) one with animals and bacteria but no plants
	(4)	one with little or no genetic diversity
		Data Base File Number
		827

genetic variation

S4K3
ANSWER 3

929. Meiosis and fertilization are important processes because they may most immediately result in
- (1) many body cells
 - (2) immune responses
 - (3) genetic variation
 - (4) natural selection

Regents Date
Aug2002
9
Data Base File Number
814

genetic variation

S4K3
ANSWER 3

930. In an environment that undergoes frequent change, species that reproduce sexually may have an advantage over species that reproduce asexually because the sexually reproducing species produce
- (1) more offspring in each generation
 - (2) identical offspring
 - (3) offspring with more variety
 - (4) new species of offspring in each generation

Regents Date
Aug2006
11
Data Base File Number
528

genetic variation

S4K2
ANSWER 1

931. Lobsters are crustaceans related to crayfish, crabs, and shrimp. Most lobsters are a reddish-brown color, but on rare occasions, they can be orange, blue, or even multicolored. These color differences can be caused by
- (1) genetic variations
 - (2) different numbers of offspring
 - (3) overpopulation and excessive resources
 - (4) the instability of the ecosystem

Regents Date
Aug2018
9
Data Base File Number
1417

genetic variation

S4K3
ANSWER 1

932. A new chemical was discovered and introduced into a culture containing one species of bacteria. Within a day, most of the bacteria were dead, but a few remained alive. Which statement best explains why some of the bacteria survived?
- (1) They had a genetic variation that gave them resistance to the chemical.
 - (2) They were exposed to the chemical long enough to develop a resistance to it.
 - (3) They mutated and became a different species after exposure to the chemical.
 - (4) They absorbed the chemical and broke it down in their digestive systems.

Regents Date
Jan2006
12
Data Base File Number
481

genetic variation

933. In 1993 there were only 30 panthers in Florida. They were all closely related and many had reproductive problems. To avoid extinction and restore health to the population, biologists introduced 8 female panthers from Texas. Today, there are more than 80 panthers in Florida and most individuals have healthy reproductive systems. The success of this program was most likely due to the fact that the introduced females

Regents Date

Jan2007

S4K3

(1) produced more reproductive cells than the male panthers in Texas

12

(2) solved the reproductive problems of the species by asexual methods

Data Base File Number

(3) increased the genetic variability of the panther population in Florida

ANSWER

3

(4) mated only with panthers from Texas

55

genetic variation

934. In 1970, a deadly disease spread through corn crops in the United States. Scientists discovered that 80 percent of the corn contained the gene that made the plants more likely to be infected with the disease. This problem might have been avoided if the cornfields across the country had had more

Regents Date

Jan2013

S4K3

(1) large predators to control parasite populations

17

(2) selective mutations

Data Base File Number

(3) genetic diversity

ANSWER

3

(4) breeding of infected plants

629

genetic variation

935. Potato farmers in Ireland during the mid 1800's all grew the same type of potato. The potato plants were all produced as clones of one another. When a fungus infected the crop, all of the potatoes were destroyed. This occurred because these potato plants

Regents Date

Jan2016

S4K4

(1) had little genetic variability

12

(2) had increased biodiversity

Data Base File Number

(3) were the product of fertilization

ANSWER

1

(4) were the result of biotechnology

1188

genetic variation

S4K3	936. Within the fish population of a lake, variations exist in color, size, gamete production, and swimming speed. A favorable variation that would most likely be passed on to future generations of the species is	(1) a swimming speed that is less than that of its predators	Regents Date
			Jan2018
			33
			Data Base File Number
ANSWER	3	(2) the presence of bright, colorful markings that contrast with the lake bottom	
		(3) being of a size that enables them to hide among the rocks in the lake	
		(4) the production of a small number of gametes during the peak of the breeding season	1371

genetic variation

S4K5	937. Once implanted into a recipient, bioengineered blood vessels made from a plastic-like material become covered with the recipient's own cells. An advantage of using these bioengineered vessels is that	(1) they contain antibodies that will block an immune response	Regents Date
			Jan2024
			13
			Data Base File Number
ANSWER	3	(2) viruses and bacteria will not infect the cells on these blood vessels	
		(3) they do not trigger an immune response	
		(4) the engineered blood vessels can be inherited by future generations	1750

genetic variation

S4K3	938. In order for new species to develop, there MUST be a change in the	(1) temperature of the environment	Regents Date
			June2004
			12
			Data Base File Number
ANSWER	3	(2) migration patterns within a population	
		(3) genetic makeup of a population	
		(4) rate of succession in the environment	681

genetic variation

S4K2	939. Sexually produced offspring often resemble, but are not identical to, either of their parents. Why do the offspring resemble their parents but are not identical to either parent?	Regents Date
		June2005
ANSWER 2	(1) The offspring are a result of mitosis.	39
	(2) The offspring receive only half of their genetic information from each parent.	Data Base File Number
	(3) The offspring receive one-fourth of their genetic information from each parent.	
	(4) Environmental factors always change the appearance of offspring.	591

genetic variation

S4K3	940. Which factor could be the cause of the other three in an animal species?	Regents Date
		June2005
ANSWER 2	(1) the inability of the species to adapt to changes	9
	(2) a lack of genetic variability in the species	Data Base File Number
	(3) extinction of the species	
	(4) a decrease in the survival rate of the species	580

genetic variation

S4K3	941. Meiosis and fertilization are important for the survival of many species because these two processes result in	Regents Date
		June2005
ANSWER 4	(1) large numbers of gametes	12
	(2) increasingly complex multicellular organisms	Data Base File Number
	(3) cloning of superior offspring	
	(4) genetic variability of offspring	571

genetic variation

S4K6	942. If an ecosystem is changed through a natural disaster, organisms will have the best chance of survival if	Regents Date
		June2009
ANSWER 4	(1) their environment has few abiotic factors	
	(2) the organisms are large	Data Base File Number
	(3) the population size is small	
	(4) their species exhibits genetic variation	219

genetic variation

S4K3	943. When a species includes organisms with a wide variety of traits, it is most likely that this species will have	(1) a high proportion of individuals immune to genetic diseases	Regents Date
			June2011
			4
			Data Base File Number
ANSWER	2	(2) a greater chance to survive if environmental conditions suddenly change	333
		(3) less success competing for resources	
		(4) limitless supplies of important resources, such as food and water	

genetic variation

S4K7	944. If only one type of tree is planted in an abandoned field, the ecosystem will	(1) evolve quickly and become extinct	Regents Date
			June2011
			26
			Data Base File Number
ANSWER	3	(2) be unable to reach dynamic equilibrium	349
		(3) contain little genetic variability	
		(4) be unable to cycle materials	

genetic variation

S4K3	945. Buffalo grass is a species of plant found on the grazing prairies of Wyoming. It is a tough grass that has silicates (compounds containing oxygen and silicon) that reinforce its leaves. For hundreds of years, this grass has survived in an adverse environment. Which statement best explains the presence of this grass today?	(1) There are no variations in this grass species that help it to survive in an adverse environment.	Regents Date
			June2011
			20
			Data Base File Number
ANSWER	4	(2) Silicates are necessary for photosynthesis.	343
		(3) The current species has no mutations.	
		(4) The silicates in the grass have given the species an advantage in its environment.	

genetic variation

		Regents Date June2017
	946. As a result of habitat destruction, the size of the Florida panther population has been drastically reduced. It is estimated that there are only 100 to 160 Florida panthers in the wild. Which statement best explains why the Florida panther population may not continue to evolve?	
S4K3	(1) There is no longer a chance of mutations occurring in the population.	9
	(2) There is a lack of competition for limited environmental resources.	Data Base File Number
ANSWER	(3) There is no longer a chance of a trait providing a reproductive advantage to the population.	
4	(4) There is a lack of genetic variation for selection to act upon.	1308

genetic variation

		Regents Date June2023
	947. Usually, snakes reproduce sexually. However, some female copperhead snakes sometimes produce offspring asexually without sperm from a male. Compared with snakes formed by sexual reproduction, the offspring of these asexually reproducing snakes	
S4K4	(1) have more genetic variation	16
	(2) have limited genetic variation	Data Base File Number
ANSWER	(3) contain more DNA than the parent	
2	(4) contain more DNA than the parent	1685

genetics

		Regents Date Aug2007
	948. A child has brown hair and brown eyes. His father has brown hair and blue eyes. His mother has red hair and brown eyes. The best explanation for the child having brown hair and brown eyes is that	
S4K1	(1) a gene mutation occurred that resulted in brown hair and brown eyes.	9
	(2) gene expressions must change in each generation so evolution can occur	Data Base File Number
ANSWER	(3) the child received genetic information from each parent	
3	(4) cells from his mother's eyes were present in the fertilized egg	7

geographic isolation

		Regents Date Aug2011
	949. A population of animals is permanently split by a natural barrier into two separate populations in different environments. What will likely result after a long period of time?	
S4K3	(1) The evolution of the two populations will be identical.	23
	(2) The production of variations will stop in the two populations.	Data Base File Number
ANSWER	(3) The two populations will evolve into separate species.	
3	(4) Autotrophic nutrition will replace heterotrophic nutrition in the two populations.	373

global warming

		Regents Date Aug2005
	950. Base your answer to this question on the information given and on your knowledge of biology. The ice fields off Canada's Hudson Bay are melting an average of three weeks earlier than 25 years ago. The polar bears are therefore unable to feed on the seals on these ice fields during the last three weeks in spring. Polar bears have lost an average of 10% of their weight and have 10% fewer cubs when compared to a similar population studied just 20 years ago. Scientists have associated the early melting of the ice fields with the fact that the average world temperature is about 0.6°C higher than it was a century ago and this trend is expected to continue. What ecological problem most likely caused the earlier melting of the ice fields in the Hudson Bay area of Canada?	
S4K7	(1) warming of the Arctic waters due to pollution	53
	(2) changes in water currents due to wind variations	Data Base File Number
ANSWER	(3) global warming	
3	(4) polar bear migration	617

global warming

		Regents Date Aug2008
	951. One possible reason for the rise in the average air temperature at Earth's surface is that	
S4K7	(1) decomposers are being destroyed	25
	(2) deforestation has increased the levels of oxygen in the atmosphere	Data Base File Number
ANSWER	(3) industrialization has increased the amount of carbon dioxide in the air	
3	(4) growing crops is depleting the ozone shield	146

global warming

952. Most scientists recommend reducing carbon dioxide emissions. Less carbon dioxide in the atmosphere would be expected to

- (1) reduce the rate of global warming
- (2) increase damage caused by acid rain
- (3) decrease the number of biotic factors in ecosystems
- (4) reduce destruction of the ozone layer

S4K7

ANSWER 1

Regents Date

Aug2011

30

Data Base File Number

380

global warming

953. Some data suggest that the average global temperature will increase by 1°C-2°C by the year 2050. If this occurs, a major concern for humans would most likely be that

- (1) sea levels might rise enough to flood some coastal areas
- (2) long-term stability of the climate will benefit ecosystems
- (3) the availability of salt water for agricultural use will increase
- (4) the threat of extinction of land organisms will decrease

S4K7

ANSWER 1

Regents Date

Aug2012

27

Data Base File Number

467

global warming

954. Which action could humans take to slow the rate of global warming?

- (1) Cut down trees for more efficient land use.
- (2) Increase the consumption of petroleum products.
- (3) Use alternate sources of energy such as wind.
- (4) Reduce the use of fuel-efficient automobiles.

S4K7

ANSWER 3

Regents Date

Aug2019

29

Data Base File Number

1519

global warming

955. Which statement best explains how deforestation that is the result of forest fires can contribute to global warming?

- (1) Burning the trees adds smoke to the atmosphere and blocks sunlight.
- (2) Burning the trees adds carbon dioxide to the atmosphere.
- (3) Deforestation removes trees that produce carbon dioxide through the process of photosynthesis.
- (4) Deforestation immediately increases ecosystem stability needed in the burned area.

Regents Date

Aug2024

3

Data Base File Number

1786

S4K7

ANSWER

2

global warming

956. Car exhaust has been blamed for increasing the amount of carbon dioxide in the air. Some scientists believe this additional carbon dioxide in the air may cause

- (1) global warming
- (2) increased biodiversity
- (3) habitat preservation
- (4) ozone destruction

Regents Date

Jan2002

32

Data Base File Number

878

S4K7

ANSWER

1

global warming

957. Which process helps reduce global warming?

- (1) decay
- (2) industrialization
- (3) photosynthesis
- (4) burning

Regents Date

Jan2007

28

Data Base File Number

69

S4K7

ANSWER

3

global warming

958. In New York State, cars are inspected to be sure they are not releasing excessive amounts of several gases into the atmosphere. This is done in an effort to

- (1) recycle more nutrients
- (2) reduce biodiversity
- (3) reduce global warming
- (4) increase the growth rates of forests

Regents Date

Jan2014

28

Data Base File Number

1020

S4K7

ANSWER

3

global warming

Regents Date

Jan2020

959. Base your answers to this question on the information given and on your knowledge of biology.
Global Warming ---
Throughout its long history, Earth has warmed and cooled time and again. Climate has changed when the planet received more or less sunlight due to subtle shifts in its orbit, as the atmosphere or surface changed, or when the Sun's energy varied. But in the past century, another force has started to influence Earth's climate: humanity. ...
...What has scientists concerned now is that over the past 250 years, humans have been artificially raising the concentration of greenhouse gases in the atmosphere at an ever increasing rate, mostly by burning fossil fuels, but also from cutting down carbon-absorbing forests. Since the Industrial Revolution began in about 1750, carbon dioxide levels have increased nearly 38 percent as of 2009 and methane levels have increased 148 percent. ...
Source: <http://earthobservatory.nasa.gov> ---
What is one action that humans could take to slow down the rate of global warming?

- (1) Burn fossil fuels.
- (2) Cut down trees.
- (3) Use wind or solar power.
- (4) Increase methane levels.

S4K7

56

Data Base File
Number

ANSWER

3

1558

global warming

Regents Date
June2003

960. Base your answer to this question on the information given and on your knowledge of biology. -- Amphibians have long been considered an indicator of the health of life on Earth. Scientists are concerned because amphibian populations have been declining worldwide since the 1980s. In fact, in the past decade, twenty species of amphibians have become extinct and many others are endangered. Scientists have linked this decline in amphibians to global climatic changes. Warmer weather during the last three decades has resulted in the destruction of many of the eggs produced by the Western toad. Warmer weather has also led to a decrease in rain and snow in the Cascade Mountain Range in Oregon, reducing the water level in lakes and ponds that serve as the reproductive sites for the Western toad. As a result, the eggs are exposed to more ultraviolet light. This makes the eggs more susceptible to water mold that kills the embryos by the hundreds of thousands. -- The term used to identify the worldwide climatic changes referred to in the passage is

- (1) global warming
- (2) deforestation
- (3) mineral depletion
- (4) iindustrialization

S4K7

50

Data Base File
Number

782

ANSWER 1

global warming

Regents Date
June2004
27

961. Which factor is a major cause of global warming?

- (1) increased burning of fuels
- (2) increased number of green plants
- (3) decreased mineral availability
- (4) decreased carbon dioxide in the atmosphere

S4K7

Data Base File
Number

689

ANSWER 1

global warming

Regents Date
June2010
8

962. Global warming has been linked to a DECREASE in the

- (1) size of the polar ice caps
- (2) temperature of Earth
- (3) rate of species extinction
- (4) rate of carbon dioxide production

S4K1

Data Base File
Number

261

ANSWER 1

global warming

S4K7	963. In some parts of the world, forests are being cut down and burned to clear land for new homes and new farmland. A NEGATIVE effect of these activities might be	Regents Date
		June2013
ANSWER	1	27
		Data Base File Number
	(1) an increase in global warming	965
	(2) destruction of the ozone shield	
	(3) a decrease in the average temperature of the atmosphere	
	(4) an increase in biodiversity of the deforested areas	

global warming

S4K7	964. Global warming is most closely associated with	Regents Date
		June2019
ANSWER	2	24
		Data Base File Number
	(1) increased use of solar panels	1484
	(2) increased industrialization	
	(3) reducing the rate of species extinction	
	(4) removal of environmental wastes	

glucose

S4K5	965. An energy-rich organic compound needed by organisms is	Regents Date
		Aug2016
ANSWER	4	23
		Data Base File Number
	(1) water	1255
	(2) salt	
	(3) oxygen	
	(4) glucose	

glucose

S4K1	966. Which two human systems work together to provide glucose for the cells of the body?	Regents Date
		June2024
ANSWER	3	6
		Data Base File Number
	(1) nervous and reproductive systems	1761
	(2) nervous and respiratory systems	
	(3) circulatory and digestive systems	
	(4) circulatory and respiratory systems	

greenhouse gases

		Regents Date
		Jan2019
	967.	More than 100 years ago, Earth's atmosphere contained about 280 parts per million (ppm) of carbon dioxide. It is predicted that by the year 2050, the level of carbon dioxide in the atmosphere could reach 700 ppm, greatly increasing Earth's temperature. It has been suggested that growing more green plants would help to slow this increase. The best explanation for why increased numbers of plants would help is that plants
S4K7	(1)	serve as food for herbivores
	(2)	serve as a nonrenewable energy resource
ANSWER	(3)	remove carbon dioxide from the atmosphere during respiration
4	(4)	remove carbon dioxide from the atmosphere during photosynthesis
		29
		Data Base File Number
		1458

habitat destruction

		Regents Date
		Jan2010
	968.	The Audubon Society recently released a study that showed that the populations of some bird species have decreased in number by as much as 50% since 1966. The study eliminated food and water shortages and natural cycles as causes for the decrease. Which factor might have contributed to this decline?
S4K7	(1)	overproduction of bird offspring
	(2)	destruction of natural habitats
ANSWER	(3)	fewer predators
2	(4)	an energy-rich diet
		29
		Data Base File Number
		249

habitat destruction

		Regents Date
		Jan2014
	969.	In 2003, the city of Rochester, New York, began killing weeds with steam. A machine heats water to 280°F then sprays it on the weeds with great pressure. The extreme heat destroys the cellular structure of the plants. What is a possible DISADVANTAGE of this method of weed control?
S4K7	(1)	It can be used safely in areas where children play.
	(2)	It reduces the number of mutations in the ecosystem.
ANSWER	(3)	It destroys weeds without chemicals.
4	(4)	It alters the habitats of some beneficial insects.
		22
		Data Base File Number
		1016

habitat destruction

S4K7

ANSWER 1

970. Many oak trees are cut down and removed from an oak-hickory forest. A likely result of the direct harvesting of the oak species would be the
- (1) disruption of natural cycles
 - (2) conservation of these natural forest resources
 - (3) recycling of all the nutrients in the forest
 - (4) prevention of the extinction of animals native to the area

Regents Date
Jan2018

10

Data Base File Number
1355

habitat destruction

S4K7

ANSWER 3

971. An increased demand for soybeans has led to an increase in converting native forests and grasslands to fields for growing soybeans. One negative consequence of this environmental change has been
- (1) an increase in natural resources for the future
 - (2) an increase in the kinds of foods that can be produced
 - (3) a decrease in suitable habitats for wildlife
 - (4) a decrease in the need to set aside land for conservation

Regents Date
Jan2020

40

Data Base File Number
1555

habitat destruction

S4K7

ANSWER 1

972. As a result of human activity, a significant percentage of the coral reefs in the oceans have been damaged. One-third of marine fish species depend on coral reefs for survival. Many of these fish might die. The most direct cause of the death of these fish would be
- (1) habitat destruction
 - (2) direct harvesting
 - (3) recycling of nutrients
 - (4) use of nuclear fuels

Regents Date
June2014

25

Data Base File Number
1056

habitat destruction

S4K1

ANSWER 4

973. The hemlock wooly adelgid is an invasive insect species that is destroying native hemlock trees in New York State. These insects can upset natural ecosystems because they
- (1) provide food for native bird species
 - (2) can carry diseases that can be spread to pets
 - (3) increase biodiversity in New York State forests
 - (4) disrupt habitats that native species depend upon

Regents Date
June2017

24

Data Base File Number
1319

habitat destruction

		Regents Date
		June2024
		21
S4K7	974. The World Wildlife Federation's recent report indicated that there has been a 60% decline in the size of monitored wildlife populations in just over 40 years. The most likely factor contributing to this decline was	Data Base File Number
ANSWER	(1) animals reproducing successfully	1770
2	(2) the destruction of many natural habitats	
	(3) passing environmental protection laws	
	(4) introduction of native the species into habitats	

habitat stability

		Regents Date
		Jan2018
		5
S4K7	975. Monarch butterflies migrate from the U.S. and Canada to Mexico every winter. Over the past 10 years, there has been a drastic decrease in the number of monarch butterflies. Scientists have estimated that the population may have decreased from about 1 billion to 35 million. Which action would not be considered a reason for the decline in monarch butterfly populations?	Data Base File Number
ANSWER	(1) illegal deforestation	1351
4	(2) extreme temperature changes	
	(3) decreasing food supplies	
	(4) habitat preservation	

habitat stability

		Regents Date
		June2010
		26
S4K7	976. Which action will result in the greatest DECREASE in rain forest stability?	Data Base File Number
ANSWER	(1) removing one species of plant for medicine	274
3	(2) harvesting nuts from some trees	
	(3) cutting down all the trees for lumber	
	(4) powering all homes with wind energy	

heart rate

		Regents Date
		Jan2005
		69
LAB2	977. An increase in heart rate will most likely result in	Data Base File Number
ANSWER	(1) a decrease in metabolic rate	568
2	(2) an increase in pulse rate	
	(3) an increase in cell division	
	(4) a decrease in body temperature	

heart rate

		978. A student was jumping rope and noticed that her heart was beating faster. The student's heart rate probably increased as a result of	Regents Date Jan2023
LAB2		(1) a decrease in the need to provide waste materials to muscle cells	74
		(2) an increase in the number of red blood cells circulating through her leg muscles	Data Base File Number
ANSWER	3	(3) an increase in carbon dioxide in her blood	1674
		(4) a decrease in respiration in her blood cells	

heart rate

		979. A biology teacher asked students to brainstorm variables other than exercise that would affect heart rate. The students hypothesized that eating a lunch high in protein would decrease heart rates. They recorded resting heart rates of 20 students, had them eat high-protein meals, and then recorded their heart rates again. The heart rates of 15 students were lower while the heart rates for 5 students were higher after lunch. The best explanation for the observation that the heart rates of 5 students were higher after lunch is	Regents Date June2021
LAB2		(1) the heart rates of female students are not affected by a high-protein meal	75
		(2) the students all participated in physical education class immediately before lunch	Data Base File Number
ANSWER	3	(3) the students all had varying physical fitness levels and consumed different amounts of protein	1589
		(4) the students were all the same gender and age	

herbivores

		980. In most habitats, the removal of predators will have the most immediate impact on a population of	Regents Date Jan2004
S4K1		(1) producers	3
		(2) decomposers	Data Base File Number
ANSWER	3	(3) herbivores	646
		(4) microbes	

herbivores

	981. The carrying capacity for herbivores in a habitat is most directly affected by the availability of	Regents Date Jan2010
S4K5	(1) heat energy released by carnivores	23
	(2) carbon dioxide in the atmosphere	Data Base File Number
ANSWER 3	(3) photosynthetic organisms	245
	(4) decomposers in the soil	

herbivores

	982. Tissues of oleander plants contain chemicals that are poisonous to many mammals. The production of these poisonous chemicals most likely benefits oleanders by preventing leaf loss caused by	Regents Date Jan2014
S4K6	(1) lack of rain	17
	(2) scavengers	Data Base File Number
ANSWER 4	(3) mineral absorption	1011
	(4) herbivores	

heredity

	983. The hair colors of the members of a family are listed below. Mother - brown hair father - blond hair older son - brown hair younger son - blond hair The hair colors of the sons are most likely a direct result of	Regents Date Aug2019
S4K2	(1) natural selection in males	11
	(2) heredity	Data Base File Number
ANSWER 2	(3) evolution	1508
	(4) environmental influences	

heredity

	984. The transfer of genes from parents to their offspring is known as	Regents Date Jan2008
S4K1	(1) differentiation	1
	(2) heredity	Data Base File Number
ANSWER 2	(3) immunity	74
	(4) evolution	

heredity

		985. Many years ago, a scientist grew pea plants that produced wrinkled peas. The peas from these plants produced new plants that also produced wrinkled peas. The scientist concluded that something in the parent plants was being transmitted to the next generation. This discovery is now known as	Regents Date Jan2013
S4K2		(1) genetic engineering	7
		(2) biological evolution	Data Base File Number
ANSWER	3	(3) heredity	623
		(4) natural selection	

heredity

		986. The human liver contains many specialized cells that secrete bile. Only these cells produce bile because	Regents Date June2009
S4K2		(1) different cells use different parts of the genetic information they contain	4
		(2) cells can eliminate the genetic codes that they do not need	Data Base File Number
ANSWER	1	(3) all other cells in the body lack the genes needed for the production of bile	179
		(4) these cells mutated during embryonic development	

heterotroph

		987. Which change in a sample of pond water could indicate that heterotrophic microbes were active?	Regents Date Aug2006
S4K5		(1) increase in ozone level	20
		(2) increase in glucose level	Data Base File Number
ANSWER	3	(3) decrease in oxygen level	537
		(4) decrease in carbon dioxide level	

heterotroph

		988. Some bloodsucking insects insert their mouth parts directly into a blood vessel and withdraw blood. Other bloodsucking insects have mouth parts that cut through the skin and blood vessels and produce a small pool of blood from which they feed. Both mouthpart types are specialized for	Regents Date Jan2010
S4K1		(1) autotrophic nutrition	2
		(2) heterotrophic nutrition	Data Base File Number
ANSWER	2	(3) regulation	231
		(4) excretion	

heterotroph

		Regents Date
		Jan2019
		8
S4K1	989. An ameba is a single-celled, heterotrophic organism. In order to meet its energy needs, it relies directly on the interaction of which cell structures?	Data Base File Number
ANSWER 2	(1) chloroplasts and the cell membrane	1441
	(2) the cell membrane and mitochondria	
	(3) nucleus and ribosomes	
	(4) vacuoles and the nucleus	

heterotroph

		Regents Date
		June2010
		1
S4K1	990. Why is a mushroom considered a heterotroph?	Data Base File Number
ANSWER 4	(1) It manufactures its own food.	255
	(2) It divides by mitosis.	
	(3) It transforms light energy into chemical energy.	
	(4) It obtains nutrients from its environment.	

homeostasis

		Regents Date
		Aug2001
		5
S4K1	991. The normal sodium level in human blood is 135 mEq/L. If a blood test taken immediately after a meal reveals a sodium level of 150 mEq/L, what will most likely result?	Data Base File Number
ANSWER 4	(1) Antibody production will increase.	918
	(2) The person will move to an ecosystem with a lower sodium level.	
	(3) The nutritional relationships between humans and other organisms will change.	
	(4) An adjustment within the human body will be made to restore homeostasis.	

homeostasis

		Regents Date
		Aug2001
		23
S4K5	992. What usually results when an organism fails to maintain homeostasis?	Data Base File Number
ANSWER 2	(1) Growth rates within organs become equal.	931
	(2) The organism becomes ill or may die.	
	(3) A constant sugar supply for the cells is produced.	
	(4) The water balance in the tissues of the organism stabilizes.	

homeostasis

993. Organisms undergo constant chemical changes as they maintain an internal balance known as
- (1) interdependence
 - (2) homeostasis
 - (3) synthesis
 - (4) recombination

S4K1

ANSWER 2

Regents Date
Aug2002
23
Data Base File Number
823

homeostasis

994. The pancreas produces one hormone that lowers blood sugar level and another that increases blood sugar level. The interaction of these two hormones most directly helps humans to
- (1) maintain a balanced internal environment
 - (2) digest needed substances for other body organs
 - (3) dispose of wastes formed in other body organs
 - (4) increase the rate of cellular communication

S4K1

ANSWER 1

Regents Date
Aug2003
1
Data Base File Number
783

homeostasis

995. The ability of the human body to keep bloodsugar levels within a fairly narrow range, despite the intake of meals high in carbohydrates, is an example of
- (1) active transport
 - (2) genetic recombination
 - (3) homeostasis
 - (4) digestion

S4K5

ANSWER 3

Regents Date
Aug2009
15
Data Base File Number
210

homeostasis

996. Which situation indicates a serious organ system malfunction?
- (1) The ovary releases estrogen, which quickly binds to cell receptors.
 - (2) Blood flow throughout the entire body is suddenly reduced.
 - (3) White blood cells release enzymes in response to the proteins on inhaled pollen.
 - (4) Mitochondria stop functioning in a unicellular organism exposed to pollutants.

S4K5

ANSWER 2

Regents Date
Aug2010
25
Data Base File Number
297

homeostasis

997. The disease known as malaria may result in a fever, a decrease in red blood cells, and an enlarged liver and spleen. These symptoms are evidence of
- (1) a disruption of homeostasis
 - (2) a decrease in allergic reactions
 - (3) an increased number of cell organelles
 - (4) hormone destruction

S4K5

ANSWER 1

Regents Date

Aug2011

20

Data Base File Number

371

homeostasis

998. Breathing rate is constantly being monitored and adjusted in the human body, which results in
- (1) the differentiation of mature body cells
 - (2) feedback mechanisms removing damaged cells
 - (3) modification of gene activity in cells
 - (4) the internal environment being kept within certain limits

S4K5

ANSWER 4

Regents Date

Aug2012

15

Data Base File Number

456

homeostasis

999. In humans, the maintenance of a stable internal temperature is a direct result of
- (1) detection of and reaction to stimuli in the environment
 - (2) digestion of starches and absorption of protein from the internal environment
 - (3) diffusion of water and excretion of glucose to the external environment
 - (4) transport of ATP and locomotion through the environment

S4K5

ANSWER 1

Regents Date

Aug2016

7

Data Base File Number

1243

homeostasis

1000. Increased concern over the number of heat-related illnesses among football players has led to a possible change in uniform design. Shoulder pads were designed that constantly blew cool, dry air underneath the shoulder pads. Tests showed that the use of the device during rest and recovery periods resulted in a reduction of body temperature and heart rate. This new device would help the athlete to

- (1) control the rate of muscle activity
- (2) increase muscle strength
- (3) maintain homeostasis
- (4) eliminate the release of heat from the body

S4K5

ANSWER 3

Regents Date

Aug2017

35

Data Base File Number

1347

homeostasis

1001. Single-celled organisms are able to maintain homeostasis, even though they lack higher levels of organization such as organs and organ systems, because

- (1) single-celled organisms do not carry out the same life processes as multicellular organisms
- (2) multicellular organisms do not rely on tissues or organs to carry out life processes
- (3) cell structures work together to maintain homeostasis in single-celled organisms
- (4) single-celled organisms are able to coordinate organ functions to maintain homeostasis

S4K1

ANSWER 3

Regents Date

Aug2018

21

Data Base File Number

1427

homeostasis

1002. Anhidrosis is the inability to sweat normally. If the human body cannot sweat properly, it cannot cool itself, which is potentially harmful. Anhidrosis most directly interferes with

- (1) a feedback mechanism that maintains homeostasis
- (2) an immune system response to harmless antigens
- (3) the synthesis of hormones in the circulatory system
- (4) the enzymatic breakdown of water in cells

S4K5

ANSWER 1

Regents Date

Aug2019

10

Data Base File Number

1507

homeostasis

1003. Which statement best describes the interactions between the structures found within a single-celled organism?

- (1) They allow the organism to maintain homeostasis.
- (2) They prevent homeostasis from damaging the cell.
- (3) They must act independently of each other and prevent homeostasis.
- (4) They carry out the same life process in order to maintain homeostasis.

S4K1

ANSWER 1

Regents Date

Aug2022

2

Data Base File Number

1628

homeostasis

1004. An example of how a plant maintains homeostasis includes

- (1) producing many seeds for reproduction
- (2) controlling the amount of available solar energy
- (3) recycling energy from the Sun
- (4) regulating the action of guard cells

S4K5

ANSWER 4

Regents Date

Aug2023

6

Data Base File Number

1708

homeostasis

1005. Both a deer and a tree react to changes in their external surroundings, helping them to maintain a constant internal environment. This statement describes

- (1) predation
- (2) homeostasis
- (3) antibiotic resistance
- (4) autotrophic nutrition

S4K1

ANSWER 2

Regents Date

Jan2002

29

Data Base File Number

876

homeostasis

1006. Homeostasis in unicellular organisms depends on the proper functioning of

- (1) organelles
- (2) insulin
- (3) guard cells
- (4) antibodies

S4K1

ANSWER 1

Regents Date

Jan2007

5

Data Base File Number

50

homeostasis

1007. When humans perspire, water, urea, and salts containing sodium are removed from the blood. Drinking water during extended periods of physical exercise replenishes the water but not the sodium. This increase in water dilutes the blood and may result in the concentration of sodium dropping low enough to cause a condition known as hyponatremia. Symptoms of hyponatremia include headache, nausea, and lack of coordination. Left untreated, it can lead to coma and even death. The body has a variety of feedback mechanisms that assist in regulating water and sodium concentrations in the blood. The kidneys play a major role in these mechanisms, as they filter the blood and produce urine. The best way to reduce the symptoms of hyponatremia would be to

- (1) drink more water
- (2) eat chocolate
- (3) eat salty foods
- (4) drink cranberry juice

S4K5

ANSWER

3

Regents Date

Jan2008

46

Data Base File Number

99

homeostasis

1008. The maintenance of homeostasis in the body is most directly related to

- (1) cellular communication
- (2) cycling of energy
- (3) aging of the organism
- (4) recombination of chromosomes

S4K5

ANSWER

1

Regents Date

Jan2010

20

Data Base File Number

242

homeostasis

1009. Homeostasis is maintained in a single-celled organism by the interaction of

- (1) organs
- (2) systems
- (3) tissues
- (4) organelles

S4K1

ANSWER

4

Regents Date

Jan2012

3

Data Base File Number

391

homeostasis

1010. Bumblebees show some ability to control their own body temperature. During cold weather, bumblebees have been observed warming their flight muscles by shivering. The bees are able to maintain a body temperature several degrees above that of the surrounding air. Regulation of their internal body temperature is an example of
- (1) diffusion
 - (2) synthesis
 - (3) respiration
 - (4) homeostasis

S4K1

ANSWER

4

Regents Date

Jan2015

34

Data Base File Number

1117

homeostasis

1011. Base your answer to this question on the information given and on your knowledge of biology.
- The Bionic Pancreas
- Until recently, diabetics could rely only on regular blood sugar checks, medications, and low-carbohydrate diets in order to maintain their health. Bioengineers at Boston University are working to create a bionic pancreas. The device includes a sensor implanted just beneath the skin that monitors blood sugar levels. It sends a wireless signal to a smartphone every five minutes. If the phone receives a signal that blood sugar is too low or too high, it then sends a different signal to a separate device also attached to the body. This device releases the appropriate hormone into the bloodstream to return blood sugar levels back to normal. According to the passage, the bionic pancreas makes corrective actions that return blood sugar levels back to normal. This artificial device helps
- (1) produce more sugar
 - (2) break down blood cells
 - (3) maintain homeostasis
 - (4) cure their diabetes

S4K1

ANSWER

3

Regents Date

Jan2018

49

Data Base File Number

1379

homeostasis

1012. A small lizard spends the morning hours lying in the sunlight until its body temperature rises. Later on in the day, the lizard rests in a shady area until its body temperature cools. This type of behavior is important to
- (1) maintain homeostasis
 - (2) detect variations
 - (3) attract mates
 - (4) obtain nutrients

S4K5

ANSWER

1

Regents Date

Jan2020

16

Data Base File Number

1543

homeostasis

1013. Homeostasis in single-celled organisms is maintained through the proper functioning of

- (1) organelles
- (2) estrogen
- (3) guard cells
- (4) antibodies

S4K1

ANSWER 1

Regents Date

Jan2024

1

Data Base File Number

1728

homeostasis

1014. If a human system fails to function properly, what is the most likely result?

- (1) a stable rate of metabolism
- (2) a disturbance in homeostasis
- (3) a change in the method of cellular respiration
- (4) a change in the function of DNA

S4K1

ANSWER 2

Regents Date

June2001

5

Data Base File Number

889

homeostasis

1015. When a person does strenuous exercise, small blood vessels (capillaries) near the surface of the skin increase in diameter. This change allows the body to be cooled. These statements best illustrate

- (1) synthesis
- (2) homeostasis
- (3) excretion
- (4) locomotion

S4K1

ANSWER 2

Regents Date

June2003

6

Data Base File Number

757

homeostasis

1016. Which situation indicates that a disruption of homeostasis has taken place?

- (1) the presence of hormones that keep the blood sugar level steady
- (2) the maintenance of a constant body temperature
- (3) cell division that is involved in normal growth
- (4) a rapid rise in the number of red blood cells

S4K1

ANSWER 4

Regents Date

June2007

3

Data Base File Number

25

homeostasis

	1017. Contractile vacuoles maintain water balance by pumping excess water out of some single-celled pond organisms. In humans, the kidney is chiefly involved in maintaining water balance. These facts best illustrate that	Regents Date June2007
S4K1	(1) tissues, organs, and organ-systems work together to maintain homeostasis in all living things	5
	(2) interference with nerve signals disrupts cellular communication and homeostasis within organisms	Data Base File Number
ANSWER	(3) a disruption in a body system may disrupt the homeostasis of a single-celled organism	27
4	(4) structures found in single-celled organisms can act in a manner similar to tissues and organs in multicellular organisms	

homeostasis

	1018. On hot, dry days, guard cells often close microscopic openings in plant leaves, conserving water. This is an example of	Regents Date June2011
S4K5	(1) environmental factors causing gene mutation in plants	15
	(2) finite resources acting as selecting agents for evolution	Data Base File Number
ANSWER	(3) a feedback mechanism for maintaining homeostasis	339
3	(4) differentiation in plants as a result of stimuli	

homeostasis

	1019. One characteristic of all living things is that they	Regents Date June2012
S4K1	(1) develop organ systems	1
	(2) produce identical offspring	Data Base File Number
ANSWER	(3) maintain internal stability	420
3	(4) synthesize only inorganic matter	

homeostasis

- 1020.** In order for the human body to maintain homeostasis, the breakdown of glucose to release energy must be followed by the
- (1) production of oxygen
 - (2) division of the cell
 - (3) removal of wastes
 - (4) production of receptor molecules

S4K1

ANSWER 3

Regents Date

June2013

13

Data Base File Number

952

homeostasis

- 1021.** Which statement explains the importance of maintaining a constant internal environment to ensure proper enzyme functioning?
- (1) Changes in pH and temperature will cause the enzyme reaction rate to be too fast.
 - (2) Temperature and pH determine amino acid sequences in enzymes.
 - (3) Changes in pH will change the genetic instructions of enzymes.
 - (4) Increasing the temperature and pH can alter the specific shape of enzymes.

S4K5

ANSWER 4

Regents Date

June2013

37

Data Base File Number

968

homeostasis

- 1022.** Hospital patients are often given intravenous fluids (IVs) to maintain proper levels of water and salts in the body. Great care is used in preparing these solutions. If a manufacturer accidentally prepared a batch of IV fluid that contained much more than the usual amount of salt, harm to the patient could result. The most likely effect on a patient if this incorrectly prepared IV fluid was used is that
- (1) water would move into body cells and cause them to burst
 - (2) water would move out of body cells and cause them to dehydrate
 - (3) salt and water would both move out of body cells and disrupt homeostasis
 - (4) salt and water would both move into body cells and preserve homeostasis

LAB5

ANSWER 2

Regents Date

June2013

75

Data Base File Number

970

homeostasis

1023. Single-celled organisms are able to maintain internal stability because they
- (1) have multiple organ systems
 - (2) work with other cells
 - (3) contain structures that perform life functions
 - (4) carry out photosynthesis to produce food

S4K1

ANSWER

3

Regents Date

June2014

2

Data Base File Number

1035

homeostasis

1024. An individual walks out of his air-conditioned (75°F) home into the hot outside environment (85°F). His ability to adjust to this changing environment involves a mechanism similar to
- (1) the regulation of water loss by guard cells in plant leaves
 - (2) the digestion of carbohydrates by enzymes
 - (3) using ATP for the diffusion of water
 - (4) glucose production in the pancreas

S4K5

ANSWER

1

Regents Date

June2016

23

Data Base File Number

1226

homeostasis

1025. Energy drinks have become increasingly popular. Some of these drinks contain large amounts of caffeine, which is known to increase heart rates in most individuals. This effect on the heart rate can be dangerous because it can lead to
- (1) a disruption in the absorption of starch
 - (2) an increase in blood volume
 - (3) a decrease in oxygen levels
 - (4) an imbalance in homeostasis

S4K1

ANSWER

4

Regents Date

June2017

28

Data Base File Number

1321

homeostasis

	1026. Which statement describes a failure of homeostasis in humans?	Regents Date June2021
S4K5	(1) When activity in an individual increases, the body temperature rises and the individual sweats.	22
	(2) As the concentration of carbon dioxide increases in the human body, the lungs begin to expel more carbon dioxide.	Data Base File Number
ANSWER	(3) A viral infection leads to a decrease in the number of white blood cells being produced in the body.	1578
3	(4) After an individual gets a cut, certain chemical changes begin the healing process.	

homeostasis

	1027. Experiments in mice show that a guardian gene that protects against type 1 diabetes can be altered by exposure to antibiotics during development. The exposure alters the gut bacteria, leading to a loss of the guardian gene's protection. The loss of this protection most directly interferes with	Regents Date June2022
S4K5	(1) homeostasis	15
	(2) excretion	Data Base File Number
ANSWER	(3) reproduction	1613
1	(4) respiration	

homeostasis

	1028. An example of an activity that best contributes to maintaining homeostasis in an organism is a	Regents Date June2023
S4K1	(1) bear eating fish from a polluted stream	2
	(2) deer losing its fur at the start of winter	Data Base File Number
ANSWER	(3) person not sweating on a 100°F day	1676
4	(4) response to a chickenpox vaccination	

homeostasis / feedback

	1029. Which process is most directly responsible for maintaining internal stability in an organism when its environment is constantly changing?	Regents Date Aug2009
S4K1	(1) digestion	4
	(2) feedback	Data Base File Number
ANSWER	(3) reproduction	201
2	(4) evolution	

homeostasis / feedback

S4K1	1030. The human body maintains a balanced internal environment. In order to accomplish this	(1) organelles work independently (2) all cells have the same shape and function (3) insulin is produced when protein levels are low (4) stimuli are detected, and actions are taken	Regents Date
			Aug2024
			1
			Data Base File Number
ANSWER	4		1784

homeostasis / feedback

S4K5	1031. As blood glucose levels increase, hormones are released to return glucose levels to normal. This is an example of	(1) a nervous system disorder (2) the synthesis of antibodies (3) a stimulus and a response (4) an antigen and antibody reaction	Regents Date
			June2021
			16
			Data Base File Number
ANSWER	3		1572

hormone

S4K4	1032. The reproductive cycle of a human is usually regulated by	(1) gametes (2) hormones (3) natural selection (4) immune responses	Regents Date
			Aug2005
			16
			Data Base File Number
ANSWER	2		605

hormone

S4K5	1033. A substance directly involved in cellular communication within the human body is	(1) an antibody (2) an antibiotic (3) a hormone (4) a starch	Regents Date
			Aug2014
			5
			Data Base File Number
ANSWER	3		1069

hormone

S4K1	1034. Which substances play an important role in communication between cells in a multicellular organism by acting as chemical messengers?	(1) fats (2) antibiotics (3) minerals (4) hormones	Regents Date
			Jan2010
			8
			Data Base File Number
ANSWER	4		233

hormone

1035. Which hormone does not directly regulate human reproductive cycles?

- (1) testosterone
- (2) estrogen
- (3) insulin
- (4) progesterone

S4K4

ANSWER

3

Regents Date

June2009

6

Data Base File Number

181

hormone

1036. Which statement best explains why some cells in the reproductive system only respond to certain hormones?

- (1) These cells have different DNA than the cells in other body systems.
- (2) These cells have specific types of receptors on their membranes.
- (3) Reproductive system cells could be harmed if they made contact with hormones from other body systems.
- (4) Cells associated with the female reproductive system only respond to the hormone testosterone.

S4K1

ANSWER

2

Regents Date

June2010

4

Data Base File Number

258

hormone / human female

1037. Which statement describes a function of the hormone estrogen?

- (1) It regulates the secretion of digestive enzymes.
- (2) It promotes sperm production in males.
- (3) It influences the development of adult sex characteristics.
- (4) It maintains blood sugar levels.

S4K4

ANSWER

3

Regents Date

Aug2015

18

Data Base File Number

1164

hormone / human female

		Regents Date Aug2019
	1038. Scientists monitoring frog populations have noticed that the ratio of male frogs to female frogs varies when certain chemicals are present in the environment. The influence of estrogen, for example, has a noticeable effect. In the presence of a higher amount of estrogen, it would be most likely that	
S4K4	(1) fewer males would be found because they are much larger and fewer are produced	28
	(2) fewer females would be found because they are more sensitive to pesticides	Data Base File Number
ANSWER 4	(3) more males would be found because estrogen promotes the development of male characteristics	
	(4) more females would be found because estrogen promotes the development of female characteristics	1518

hormones / human

		Regents Date Jan2017
	1039. Which factor is a major cause of the changes that occur during puberty, the years when the rate of human physical growth	
S4K4	(1) changes in some hormone levels	10
	(2) an increase in meiosis in body cells	Data Base File Number
ANSWER 1	(3) a decrease in the rate of metabolism	
	(4) change in the gene sequences in reproductive cells	1275

hormones / human

		Regents Date June2005
	1040. The human reproductive system is regulated by	14
S4K4	(1) restriction enzymes	Data Base File Number
	(2) antigens	
ANSWER 4	(3) complex carbohydrates	573
	(4) hormones	

hormones / human

		Regents Date June2016
	1041. Three human hormones most directly involved in sexual reproduction are	
S4K4	(1) estrogen, insulin, and progesterone	26
	(2) testosterone, estrogen, and insulin	Data Base File Number
ANSWER 4	(3) progesterone, ATP, and testosterone	
	(4) estrogen, progesterone, and testosterone	1229

hormones / human female

		Regents Date
		Jan2019
		2
S4K4	1042. The human female reproductive cycle is regulated primarily by the	Data Base File Number
	(1) white blood cells of the circulatory system	1437
ANSWER	(2) muscle cells of the skeletal system	
4	(3) enzymes of the digestive system	
	(4) hormones of the endocrine system	

hormones pregnancy

		Regents Date
		Jan2008
		19
S4K4	1043. Which hormones most directly influence the uterus during pregnancy?	Data Base File Number
	(1) testosterone and insulin	86
ANSWER	(2) progesterone and testosterone	
4	(3) estrogen and insulin	
	(4) progesterone and insulin	

human activities

		Regents Date
		Aug2002
		32
S4K7	1044. By causing atmospheric changes through activities such as polluting and careless harvesting, humans have	Data Base File Number
	(1) caused the destruction of habitats	829
ANSWER	(2) affected global stability in a positive way	
1	(3) established equilibrium in ecosystems	
	(4) replaced nonrenewable resources	

human activities

		Regents Date
		Aug2006
		30
S4K7	1045. Which human activity would have the LEAST negative impact on the quality of the environment?	Data Base File Number
	(1) adding animal wastes to rivers	540
ANSWER	(2) cutting down tropical rain forests for plywood	
3	(3) using species-specific sex attractants to trap and kill insect pests	
	(4) releasing chemicals into the groundwater	

human activities

1046. Which human activity creates the least threat to global stability?

- (1) overuse of resources
- (2) pollution of water with heavy metals
- (3) pollution of air with sulfur gases
- (4) reuse of plastic bags

S4K7

ANSWER

4

Regents Date

Aug2009

26

Data Base File Number

221

human activities

1047. In state forests and parks containing varieties of flowering trees and shrubs, there are signs that say "Take nothing but pictures, leave nothing but footprints." These signs are necessary because

- (1) humans can destroy habitats by removing flowering trees and shrubs
- (2) all animals feed directly on flowering shrubs that may be removed by people
- (3) removal of flowering trees and shrubs will increase biodiversity
- (4) flowering shrubs grow best in state forests and parks

S4K7

ANSWER

1

Regents Date

Aug2009

25

Data Base File Number

220

human activities

1048. Which human activity would preserve finite resources?

- (1) deforestation
- (2) removing carnivores from a forest
- (3) recycling aluminum
- (4) heating homes with fossil fuels

S4K7

ANSWER

3

Regents Date

Aug2010
28

Data Base File Number

300

human activities

Regents Date
Aug2015

1049. Base your answer to this question on the information given and on your knowledge of biology.
---- Head Start for Hellbenders ----
The hellbenders (a species of large salamander) at the Bronx Zoo are now approximately seven inches in length and will grow to full size in about five years. Once they are about two-and-a-half years old, they will be returned to the wild in western New York State. Hellbender populations are declining due to several factors including over-collection for the pet trade, disease, pollution, and habitat destruction. Juvenile hellbenders in the wild currently face great difficulties in reaching adulthood, so the "head start" provided by the reintroduction of the 41 animals will help boost local populations.
---- Source: Wildlife Conservation Society, Members News
May/June 2011---- Which statement best explains the hellbender population decline in western New York State?

S4K7

50

- (1) Human activities had the unexpected consequence of decreasing the hellbender population to a dangerous level.
- (2) Humans have purposefully removed the hellbender from its habitat due to its aggressive behavior.
- (3) The decline of the hellbender population is due mainly to natural causes that humans cannot control.
- (4) The hellbender population decreased because salamanders are very resistant to climate change.

Data Base File
Number

ANSWER 1

1176

human activities

Regents Date
Aug2024

1050. Breathing vapors produced by e-cigarettes has caused respiratory problems, including coughing, shortness of breath, difficulty breathing, and even some deaths. Medical experts are warning the public and discouraging the use of these devices. The medical issues associated with vaping are an example of

S4K5

34

- (1) organ malfunctions caused by personal behaviors
- (2) feedback response maintaining homeostasis
- (3) inherited disorders resulting from inhaling vapors
- (4) the effects of infectious parasites carried by the vapors

Data Base File
Number

ANSWER 1

1807

human activities

1051. Which statement illustrates how human activities can most directly change the dynamic equilibrium of an ecosystem?

S4K7

ANSWER 3

- (1) A hurricane causes a stream to overflow its banks.
- (2) Increased wind increases water evaporation from a plant.
- (3) Water pollution causes a decrease in fish populations in a river.
- (4) The ozone shield helps prevent harmful radiation from reaching the surface of Earth.

Regents Date

Jan2002

33

Data Base File Number

879

human activities

1052. Which human activity would be LEAST likely to disrupt the stability of an ecosystem?

S4K7

ANSWER 4

- (1) disposing of wastes in the ocean
- (2) using fossil fuels
- (3) increasing the human population
- (4) recycling bottles and cans

Regents Date

Jan2004

35

Data Base File Number

668

human activities

Regents Date
Jan2005

1053. Base your answer to this question on the information given and on your knowledge of biology. The dodo bird inhabited the island of Mauritius in the Indian Ocean, where it lived undisturbed for years. It lost its ability to fly and it lived and nested on the ground where it ate fruits that had fallen from trees. There were no mammals living on the island. In 1505, the first humans set foot on Mauritius. The island quickly became a stopover for ships engaged in the spice trade. The dodo was a welcome source of fresh meat for the sailors and large numbers of dodos were killed for food. In time, pigs, monkeys, and rats brought to the island ate the dodo eggs in the ground nests. Which statement describes what most likely happened to the dodo bird within 100 years of the arrival of humans on Mauritius?

S4K7

- (1) Dodo birds developed the ability to fly in order to escape predation and their population increased.
- (2) The dodo bird population increased after the birds learned to build their nests in trees.
- (3) Human exploitation and introduced species significantly reduced dodo bird populations.
- (4) The dodo bird population became smaller because they preyed upon the introduced species.

33

Data Base File
Number

565

ANSWER 3

human activities

Regents Date
Jan2009

1054. The ivory-billed woodpecker, long thought to be extinct, was recently reported to be living in a southern swamp area. The most ecologically appropriate way to ensure the natural survival of this population of birds is to

S4K6

- (1) feed them daily with corn and other types of grain
- (2) destroy their natural enemies and predators
- (3) move the population of birds to a zoo
- (4) limit human activities in the habitat of the bird

24

Data Base File
Number

169

ANSWER 4

human activities

Regents Date
Jan2010

1055. Which human activity would most likely deplete finite resources?

S4K7

- (1) use of natural enemies to eliminate insect pests
- (2) development of wildlife refuges
- (3) governmental restriction of industrial pollution
- (4) uncontrolled population growth

28

Data Base File
Number

248

ANSWER 4

human activities

1056. Which human activity would interfere most directly with the production of oxygen in the environment?

- (1) using fertilizer for agriculture
- (2) using nuclear fuels
- (3) accelerating deforestation
- (4) preserving wetlands

S4K6

ANSWER

3

Regents Date

Jan2014

16

Data Base File Number

1010

human activities

1057. Overfishing has depleted the rich harvests of fish from the oceans. As a solution, a large industry that cultivates shrimp and fish in warm coastal ponds has been developed. To make way for these ponds, mangrove forests are cut down. Local organisms are displaced. In order for people to decide if this new fish farming technology is a good long-term solution, they must consider

- (1) the risks and costs as well as the benefits
- (2) that the mangrove forests would probably die off someday anyway
- (3) that food production is always more important than any other concern
- (4) the number of fish produced in the first year as compared with ocean fishing

S4K7

ANSWER

1

Regents Date

Jan2016

30

Data Base File Number

1201

human activities

1058. The passenger pigeon in the U.S. became extinct as a result of overhunting. The extinction of the passenger pigeon illustrates that

- (1) humans are the only cause of species extinctions
- (2) it takes hundreds of years for a species extinction
- (3) the benefits of technology always outweigh the ecological risks
- (4) human activities can irreversibly affect ecosystems

S4K7

ANSWER

4

Regents Date

Jan2019

33

Data Base File Number

1461

human activities

	1059. Current evidence has indicated that with an increase in global temperature, there will be more infectious and respiratory diseases. Worldwide efforts to slow down or halt the rise in temperature are being developed to	Regents Date Jan2024
S4K7	(1) increase the strain on the biosphere, resulting in the destruction of ecosystems	37
	(2) introduce proposals that will limit the improvement of air, soil, and water quality	Data Base File Number
ANSWER 3	(3) protect resources for future generations	1745
	(4) increase the release of greenhouse gases into the atmosphere	

human activities

	1060. Which factor is NOT considered by ecologists when they evaluate the impact of human activities on an ecosystem?	Regents Date June2001
S4K7	(1) amount of energy released from the Sun	32
	(2) quality of the atmosphere	Data Base File Number
ANSWER 1	(3) degree of biodiversity	910
	(4) location of power plants	

human activities

	1061. Which human activity would have the most positive effect on the environment of an area?	Regents Date June2006
S4K7	(1) using fire to eliminate most plants in the area	22
	(2) clearing the area to eliminate weed species	Data Base File Number
ANSWER 3	(3) protecting native flowers and grasses in the area	512
	(4) introducing a foreign plant species to the area	

human activities

	1062. By studying the chemicals in rare plants that grow only in rain forests, scientists hope to discover new life-saving medicines. Chances of finding such new medicines are reduced by	Regents Date June2011
S4K6	(1) predation by carnivores	3
	(2) homeostasis in organisms	Data Base File Number
ANSWER 4	(3) recycling of materials in food webs	332
	(4) loss of species due to human activities	

human activities

	1063.	A recent study found high levels of the toxic industrial pollutant mercury in the feathers of some songbirds. Those birds sang shorter, simpler versions of the songs they use to attract mates. Which statement regarding this finding is supported by the study?	Regents Date June2022
S4K7		(1) Mercury pollution will result in the extinction of all songbirds.	25
		(2) Mercury prevents songbirds from obtaining required nutrients.	Data Base File Number
ANSWER	4	(3) Human activities usually affect the smallest animals in ecosystems.	
		(4) Human activities can have negative effects on a species.	1621

human activities

	1064.	One human activity that most directly contributes to the decrease in the amount of oxygen present in ocean water is	Regents Date June2023
S4K7		(1) overfishing, causing a lack of biodiversity	32
		(2) planting more trees, causing more soil erosion	Data Base File Number
ANSWER	4	(3) introducing foreign species, causing more competition	
		(4) industrialization, which releases large amounts of carbon dioxide into the atmosphere	1696

human activity

	1065.	The importation of organisms such as the Japanese beetle and gypsy moth to areas where they have no natural enemies best illustrates	Regents Date Aug2004
S4K7		(1) the use of abiotic factors to reduce pest species	29
		(2) the selection of species to mate with each other to produce a new variety	Data Base File Number
ANSWER	4	(3) attempts by humans to protect extinct species	
		(4) a human activity that disrupts existing ecosystems	719

human activity

1066. Which human activity most directly causes a significant increase in the amount of carbon dioxide in the atmosphere?

- (1) growing corn for food
- (2) not using products containing plastics
- (3) driving cars long distances
- (4) planting large numbers of trees

S4K1

ANSWER 3

Regents Date

Aug2018

1

Data Base File Number

1411

human activity

1067. Base your answer to this question on the information given and on your knowledge of biology. New York State relies on natural gas for 24% of its energy supply. It is estimated that large deposits of natural gas are located in New York State. It is possible to extract the gas via high-volume hydraulic fracturing (hydrofracking). Hydrofracking involves freeing the natural gas by using a large amount of water treated with chemicals, which produces large quantities of waste products. Some people are in favor of hydrofracking, while others are against it. One side is concerned about the negative effect it will have on the environment. The other side points out the potential benefits it might provide. What is a "trade-off" that must be considered in the decision whether to move forward with hydrofracking?

- (1) Fracking is 100% safe and will not hurt the environment.
- (2) Fracking will provide more natural gas but might damage the environment.
- (3) Fracking improves the quality of the water in surrounding water wells.
- (4) Fracking is 100% harmful to the environment.

S4K7

ANSWER 2

Regents Date

Jan2014

71

Data Base File Number

1031

human activity

1068. Scientists have studied oceanic plastic garbage "patches" around the world. These are areas that accumulate plastic garbage from coastal regions. Their environmental effect ranges from killing sea life to blocking sunlight from reaching photosynthetic organisms. Without a change in human plastic usage, new garbage patches will continue to form. Which human activity would most directly reduce the amount of plastic garbage that enters the ocean?

S4K7

ANSWER 2

- (1) Ban the production and usage of all bags made from recycled plastic.
- (2) Clean up plastic trash from shorelines, rivers, and other waterways that flow into the oceans.
- (3) Manufacture fewer reusable water bottles, so that people will be more likely to use disposable ones.
- (4) Implement a glass bottle deposit system to discourage people from recycling plastic bottles.

Regents Date

Jan2018

4

Data Base File Number

1350

human activity

1069. When rain forests are cut down, there is a

S4K6

ANSWER 4

- (1) loss of fossil fuels that could be used by industry
- (2) release of excess oxygen to the atmosphere
- (3) release of chemicals which cause helpful mutations
- (4) loss of genetic material available for research

Regents Date

Jan2018
19

Data Base File Number

1361

human activity

1070. Microbeads are tiny, smooth, plastic spheres found in common household products such as facial soap. These beads, measuring from 0.0004 to 1.24 mm, roughly the size of some fish eggs, are too small to be removed by water treatment systems. Thus, they end up in rivers, lakes, and other bodies of water. The accumulation of these microbeads is an environmental concern for aquatic biologists because microbeads

S4K7

ANSWER 3

- (1) make the lakes and rivers cloudy and dirty, affecting their appearance
- (2) may stick to some household water pipes, preventing drainage problems
- (3) could be mistaken for food by some species, working their way up the food chain
- (4) could clog fishing nets, affecting the ability of fishermen to catch fish

Regents Date

Jan2018

38

Data Base File Number

1375

human activity

1071. Traditional lightbulbs are only 10% efficient. Ninety percent of the energy they use is converted to heat. Modern lightbulbs are much more efficient, but may cost three times as much as traditional lightbulbs. Consumers who switch to modern lightbulbs are most likely

S4K7

ANSWER 3

- (1) spending more money for no good reason
- (2) trying to stop pollution of the oceans
- (3) trading a short-term cost for long-term savings
- (4) helping traditional lightbulb factories employ people

Regents Date

Jan2018

9

Data Base File Number

1354

human activity

1072. Sustainable development occurs when people use their resources without depleting them. Which human activity is the best example of sustainable development?

S4K7

ANSWER 2

- (1) draining a wetland to build houses
- (2) loggers planting a tree for each one cut down
- (3) using nets to quickly capture large numbers of fish
- (4) building coal-burning power plants to provide electricity

Regents Date

June2021

25

Data Base File Number

1581

human activity

		1073.	Dead zones are areas found in the oceans and some large lakes where there is not enough oxygen to support life. Algae blooms occur when excess nutrients are introduced as pollutants from fertilizers, sewage-treatment plants, and the burning of fossil fuels. When the algae die and undergo decay, bacteria rapidly use up the oxygen in the area. Which human activity would most likely result in a DECREASE in the size and number of dead zones?	Regents Date June2022
S4K7		(1)	irrigating fields and lawns to increase runoff into the ocean and rivers	24
		(2)	building more coal-fired electrical generating plants	Data Base File Number
ANSWER	3	(3)	reducing the use of chemicals on farm fields and golf courses	
		(4)	constructing more sewage-treatment plants on the shores of lakes and rivers	1620

human growth

		1074.	Which factor is primarily responsible for the destruction of the greatest number of habitats?	Regents Date Aug2004
S4K7		(1)	human population growth	23
		(2)	decreased use of renewable resources	Data Base File Number
ANSWER	1	(3)	spread of predatory insects	
		(4)	epidemic diseases	713

human growth

		1075.	Increased human population growth usually results in	Regents Date Jan2013
S4K7		(1)	a decrease in the need for farming	25
		(2)	a need for stronger environmental protection laws	Data Base File Number
ANSWER	2	(3)	lower levels of air and water pollution	
		(4)	an increase in natural wildlife habitats	637

human growth

		1076.	Depletion of nonrenewable resources is often a result of	Regents Date June2011
S4K7		(1)	environmental laws	30
		(2)	human population growth	Data Base File Number
ANSWER	2	(3)	reforestation	
		(4)	recycling	353

human impact

S4K7	1077. To minimize negative environmental impact, a community should	Regents Date	Aug2001
			32
		Data Base File Number	
			938
ANSWER	4		
	(1) approve the weekly spraying of pesticides on the plants in a local park		
	(2) grant a permit to a chemical manufacturing company to build a factory by one of its lakes, with no restrictions on waste disposal		
	(3) make a decision about building a new road in a hiking area based only on the economic advantages		
	(4) set policy after considering both the risks and benefits involved in building a toxic waste site within its boundaries		

human impact

S4K6	1078. Soil in a certain area was contaminated with gasoline, diesel fuel, home heating oil, and grease from the operation of the previous facility. A technique known as BIOREMEDIATION has been used to destroy such organic pollutants using special bacteria. Although this method is effective for cleaning up some forms of pollution, BIOREMEDIATION is NOT effective for inorganic materials. BIOREMEDIATION is not an effective method for breaking down which of the following	Regents Date	Aug2001
			47
		Data Base File Number	
			942
ANSWER	4		
	(1) grease		
	(2) gasoline		
	(3) fuel for diesel engines and furnaces		
	(4) heavy metals such as lead		

human impact

S4K7	1079. Toxic chemicals called PCBs, produced as a result of manufacturing processes, were dumped into the Hudson River. What was most likely a result of this action on fish in the Hudson River?	Regents Date	Aug2001
			35
		Data Base File Number	
			941
ANSWER	1		
	(1) Some fish became unfit to eat.		
	(2) The fish populations increased.		
	(3) Thermal pollution of the river increased, decreasing the fish population.		
	(4) The carrying capacity for fish increased in the river.		

human impact

S4K7	1080. Deforestation would most immediately result in	(1) the disappearance of native species	(2) industrialization of an area	(3) the depletion of the ozone shield	(4) global warming	Regents Date
						Aug2001 33
ANSWER	1					Data Base File Number
						939

human impact

S4K7	1081. Dumping raw sewage into a river will lead to a reduction in dissolved oxygen in the water. This reduction will most likely cause	(1) an increase in all fish populations	(2) a decrease in most aquatic animal populations	(3) an increase in depth of the water	(4) a decrease in water temperature	Regents Date
						Aug2002
ANSWER	2					Data Base File Number
						830

human impact

S4K7	1082. Which factor is often responsible for the other three?	(1) increase in levels of toxins in both water and air	(2) increase in human population	(3) increased poverty and malnutrition	(4) increased depletion of finite resources	Regents Date
						Aug2002 31
ANSWER	2					Data Base File Number
						828

human impact

S4K7	1083. A major reason that humans have negatively affected the environment in the past is that humans have	(1) frequently lacked an understanding of how their activities affect the environment	(2) passed laws to protect certain wetlands	(3) attempted to control their population growth	(4) discontinued the use of certain chemicals used to control insects	Regents Date
						Aug2003
ANSWER	1					Data Base File Number
						804

human impact

1084. A new automobile manufacturing plant is opening in a certain town. It will have some negative environmental impacts. This is a trade-off that the town officials had to consider carefully before giving final approval. They most likely gave their approval because the negative impacts would be offset by the

- (1) release of pollutants into the environment
- (2) creation of new employment opportunities
- (3) decrease of property values in the area around the plant
- (4) increase of automobile traffic in the area around the plant

S4K7

ANSWER

2

Regents Date

Aug2004

26

Data Base File Number

716

human impact

1085. In most states, automobiles must be inspected every year to make sure that the exhaust fumes they emit do not contain high levels of pollutants such as carbon monoxide. This process is a way humans attempt to

- (1) control the water cycle
- (2) recycle nutrients from one ecosystem to another
- (3) control energy flow in natural ecosystems
- (4) maintain the quality of the atmosphere

S4K7

ANSWER

4

Regents Date

Aug2004

27

Data Base File Number

717

1086. Base your answer to this question on the passage given and on your knowledge of biology. --- Fighting Pollution with Bacteria. You may think that all bacteria are harmful. Think again! Some bacteria are working to clean up the damage humans have caused to the environment. In 1989, the oil tanker Exxon Valdez hit ground and a hole was ripped in its hull. Millions of gallons of crude oil spread along the coast of Alaska. In some places, the oil soaked 2 feet deep into the beaches. There seemed to be no way to clean up the spill. Then scientists decided to enlist the help of bacteria that are found naturally on Alaskan beaches. Some of these bacteria break down hydrocarbons (molecules found in oil) into simpler, less harmful substances such as carbon dioxide and water. The problem was that there were not enough of these bacteria to handle the huge amount of oil. To make the bacteria multiply faster, the scientists sprayed a chemical that acted as a fertilizer along 70 miles of coastline. Within 15 days, the number of bacteria had tripled. The beaches that had been treated with the chemical were much cleaner than those that had not. Without this bacterial activity, Alaska's beaches might still be covered with oil. This process of using organisms to eliminate toxic materials is called bioremediation. Bioremediation is being used to clean up gasoline that leaks into the soil under gas stations. At factories that process wood pulp, scientists are using microorganisms to break down phenols (a poisonous by-product of the process) into harmless salts. Bacteria also can break down acid drainage that seeps out of abandoned coal mines, and explosives, such as TNT. Bacteria are used in sewage treatment plants to clean water. Bacteria also reduce acid rain by removing sulfur from coal before it is burned. Because Americans produce more than 600 million tons of toxic waste a year, bioremediation may soon become a big business. If scientists can identify microorganisms that attack all the kinds of waste we produce, expensive treatment plants and dangerous toxic dumps might be put out of business. The chemical was sprayed along the Alaskan coastline in order to

- (1) introduce new bacteria to the beaches
- (2) dissolve oil that was spilled on the shore
- (3) increase the population of bacteria
- (4) wash away oil that had been spilled

S1K3

44

Data Base File Number

ANSWER

3

721

human impact

1087. The process of using organisms to eliminate toxic materials is called bioremediation. Which statement does NOT represent an example of bioremediation?

- (1) Duckweed removes heavy metals from ponds and lakes.
- (2) Ladybugs eliminate insect pests from plants.
- (3) Bacteria break down hydrocarbons in oil.
- (4) Ragweed plants remove lead from the ground around factory sites.

Regents Date
Aug2004

45

Data Base File
Number

722

S4K7

ANSWER 2

human impact

1088. Humans have altered ecosystems in many ways. The most positive impact on an ecosystem would result from

- (1) planting a single economically valuable crop in a 25-acre area
- (2) seeding an area with valuable plants that are from another ecosystem
- (3) planting many different plants that are native to the area in a vacant lot
- (4) filling in a swamp and planting grass and trees for a community park

Regents Date
Aug2005

30

Data Base File
Number

615

S4K7

ANSWER 3

human impact

1089. DDT and other pesticides used over 50 years ago are still affecting the environment today. Scientists have found these substances in recent glacier runoff. Glacier runoff occurs during the summer, when precipitation that has fallen on glaciers during the winter is released. Ice layers from existing glaciers have been analyzed. The results of this analysis show that the concentrations of DDT and other pesticides were highest about 10 years after the use of these substances was banned. This information shows that

- (1) DDT and other pesticides cause glacier runoff during the summer
- (2) it takes humans over 50 years to analyze a glacier
- (3) precipitation helps to break down pesticides
- (4) the decision of one human generation may have an impact on future generations

Regents Date
Aug2011

36

Data Base File
Number

385

S4K7

ANSWER 4

human impact

1090. Base your answer to this question on the information given and on your knowledge of biology. Invasion of the Giant Rodents Large, 20-pound rodents [nutria] that were originally from South America are spreading northward from the southern United States. The nutria were brought in and raised in the southern United States for their fur. Nutria escaped and started a wild population. They have since moved up the east coast, damaging plant life in Delaware and Maryland. Currently, they have reached New Jersey. These rodents are damaging New Jersey's marshland ecosystems. A nutria can eat up to 5 pounds of marshland plants a day. This loss of plant life is harming the marshland ecosystems. A wildlife manager in New Jersey wants to use poisons to destroy the nutria. What is a harmful end result that might result from this action.

- (1) Other animals might be poisoned.
- (2) Beneficial organisms might be destroyed.
- (3) The poison might be harmful to people.
- (4) All of the above could be correct.

S4K7

ANSWER 4

Regents Date

Aug2012

61

Data Base File Number

473

human impact

1091. A wetland provides a variety of services for an ecosystem, such as filtering pollutants from the water, allowing animals to lay eggs and reproduce, and producing fertile soils for plants. When humans build houses on wetland areas, they always

- (1) change this area so these processes can still take place
- (2) create new habitats for the wetland species
- (3) transport the wetland species to a new area
- (4) make changes that might not be reversible

S4K7

ANSWER 4

Regents Date

Aug2012

28

Data Base File Number

468

human impact

1092. A community is trying to decide on the location for a new shopping center. Two possible locations have been proposed, with each location having some benefits and some problems. The proper approach to deciding the best location would be to

- (1) select the site that could hold the most stores
- (2) select the site that would be the least expensive to develop
- (3) compare the problems, but not the benefits
- (4) compare the trade-offs of building at either location

S4K7

ANSWER 4

Regents Date

Aug2012

30

Data Base File Number

470

human impact

1093. Which occurrence most likely led to the other three?

- (1) Human population growth reached 6.8 billion in 2010 and it continues to increase.
- (2) The number of African elephants has declined from 1.2 million in 1979 to about 20,000 today.
- (3) Approximately 6,500 gallons of oil were spilled into a river in Illinois after a pipeline broke.
- (4) At one time, rain forests covered 14 percent of Earth and today they cover only 6 percent.

Regents Date
Aug2012
29

Data Base File
Number

469

S4K7

ANSWER 1

human impact

1094. Base your answer to this question on the information given and on your knowledge of biology. Keystone Species. A keystone species is one whose presence contributes to the diversity of life and whose extinction would lead to the extinction of other forms of life. A keystone species helps to support the ecosystem of which it is a part. An example of what can happen when a keystone species is removed occurred when fur hunters eliminated sea otters from some Pacific Ocean kelp beds. Otters eat sea urchins, which eat kelp. With its major predator gone, sea urchin populations exploded and consumed most of the kelp. Fish, snails, and other animals associated with the kelp beds disappeared. One action humans can take that might ensure that these sea otters will continue their function as a keystone species in their environment is to

- (1) establish a sea otter wildlife refuge in the Atlantic Ocean
- (2) pass laws to regulate the hunting of sea otters
- (3) plant kelp in the Pacific Ocean
- (4) destroy sea urchins found living in the kelp beds

Regents Date
Aug2012

47

Data Base File
Number

472

S4K7

ANSWER 2

human impact

1095. A variety of pear tree, known as Bradford, was originally introduced into the eastern United States in the 1960s. Today, this tree is crowding out other plants in these states. This situation best illustrates

- (1) an unintentional negative effect of altering an ecosystem
- (2) how a foreign species is controlled in the eastern United States
- (3) that the introduction of a foreign species does not affect food webs
- (4) that serious environmental consequences can be avoided by importing a foreign species

Regents Date

Aug2014

28

Data Base File Number

1088

S4K7

ANSWER

1

human impact

1096. A growing mass of plastic garbage is collecting in an area of the Pacific Ocean. This is caused by plastic garbage that is discarded by people, and it ends up in rivers that carry it to the ocean. Over time, ocean currents cause it to accumulate in this area of the Pacific. Currently, the mass is estimated to cover an area of ocean twice the size of Texas. As these plastics slowly break down, chemicals enter the water, and can enter ocean organisms that we might eventually use for food. This sequence of events illustrates that

- (1) humans modify ecosystems as a result of population growth, consumption, and technology
- (2) human activities that degrade ecosystems result in an increase in diversity of ecosystems
- (3) when humans alter ecosystems by adding specific organisms, serious consequences could result
- (4) industrialization brings a reduced demand for fossil and nuclear fuels

Regents Date

Aug2014

30

Data Base File Number

1089

S4K7

ANSWER

1

human impact

1097. The bottom of Onondaga Lake in upstate New York contains large amounts of pollutants. One proposal to clean the lake bottom requires that the pollutants be removed and stored nearby. People who live near the proposed storage sites are opposed to this plan. The officials who must decide on the proposal will examine both the benefits and risks of the plan. The decision made by the officials will most likely involve

- (1) increased industrialization
- (2) direct harvesting
- (3) an increase in finite resources
- (4) consideration of trade-offs

S4K7

ANSWER

4

Regents Date

Aug2014

24

Data Base File Number

1084

human impact

1098. Some time ago, there were thousands of California condors in North America. Large numbers were poisoned from lead in bullets that were used to kill the animals the condors fed on. An effort was made to help save this large scavenger. There are now more than 350 California condors in North America. The condors most likely increased in number because humans decided to

- (1) produce lead-resistant condors through asexual reproduction
- (2) pass laws against using lead bullets to kill animals used by condors for food
- (3) introduce plants that didn't absorb the lead from discharged bullets
- (4) produce lead-resistant prey for the condors through genetic engineering

S4K7

ANSWER

2

Regents Date

Aug2016

6

Data Base File Number

1242

human impact

1099. Three human actions that have been made possible in recent times are:
(1) - Doctors are able to diagnose and treat some fetal problems prior to the birth of a child.
(2) - Cloning can produce large numbers of plants that are resistant to drought.
(3) - Male insects can be sterilized with radiation to prevent them from mating successfully.
Which statement summarizes these three actions?

S4K4

ANSWER 1

- (1) Reproductive technology has medical, agricultural, and ecological applications.
- (2) Development is a highly regulated process involving mitosis and differentiation.
- (3) Reproduction and development are subject to environmental effects.
- (4) Human development, birth, and aging should be viewed as a predictable pattern of events.

Regents Date

Aug2016

12

Data Base File Number

1246

human impact

1100. In 2011 and 2012, scientists working on the Banana River in Florida recorded a dramatic increase in the number of manatee deaths. Over the past 50 years, this area has also seen the human population increase by more than 500,000 people. It is believed that pollution from numerous sewage tanks leaked into the water, eliminating the manatees' food source, replacing it with an alga that is toxic to the manatee. This is an example of

S4K7

ANSWER 4

- (1) a natural cycle in an ecosystem
- (2) the effect of increased biodiversity on an ecosystem
- (3) direct harvesting in an ecosystem
- (4) human actions altering ecosystems with serious consequences

Regents Date

Aug2017

30

Data Base File Number

1344

human impact

1101. Which human activity can have a NEGATIVE IMPACT on the stability of a mature ecosystem?

S4K7

ANSWER 2

- (1) replanting trees in areas where forests have been cut down for lumber
- (2) building dams to control the flow of water in rivers, in order to produce electricity
- (3) preserving natural wetlands, such as swamps, to reduce flooding after heavy rainfalls
- (4) passing laws that limit the dumping of pollutants in forests

Regents Date

Aug2019

40

Data Base File Number

1522

human impact

1102. Humans are able to positively or negatively affect their environment in many ways. Which statement accurately describes ONE of these possible effects?

S4K7

- (1) A positive environmental effect is that burning fossil fuels to generate electricity reduces carbon dioxide levels in the atmosphere.
- (2) A positive environmental effect is the cutting of trees in rain forests to provide large quantities of lumber to build homes for the increasing world population.
- (3) A negative environmental effect is that industrialization provides many jobs and helps the economy grow.
- (4) A negative environmental effect is that unregulated fishing in the ocean can disrupt the interactions between organisms in existing food webs.

Regents Date

Aug2022

22

Data Base File Number

1642

ANSWER

4

human impact

1103. For centuries, humans have built dams along rivers to redirect water for power, irrigation, and transportation. Dams can prevent migrating fish from swimming upstream to reproduce and can also disrupt the flow of sediments and nutrients. Communities are starting to eliminate some dams, and the health of the river ecosystems is being restored. This best illustrates that

S4K7

- (1) technological advances often involve environmental trade-offs
- (2) when humans modify their environment it always has effects that cannot be reversed
- (3) industrialization has had a positive effect on the health of river ecosystems
- (4) the construction of dams affected abiotic factors in the river but not biotic factors

Regents Date

Aug2024

4

Data Base File Number

1787

ANSWER

1

human impact

1104. Some factories have a negative impact on Earth's ecosystems because they

S4K7

- (1) have high energy demands that require the use of fossil fuels and nuclear fuels
- (2) utilize agricultural technology that decreases soil erosion
- (3) decrease the need for finite resources
- (4) limit the amount of emissions produced each year

Regents Date

Jan2002

34

Data Base File Number

880

ANSWER

1

human impact

S4K7	1105. One way to help provide suitable environments for future generations is to urge individuals to		Regents Date
			Jan2003
		(1) apply ecological principles when making decisions that will have an environmental impact	35
		(2) control all aspects of natural environments	Data Base File Number
		(3) agree that population controls have no impact on environmental matters	
ANSWER 1	(4) work toward increasing global warming	748	

human impact

S4K6	1106. The rapid destruction of tropical rain forests may be harmful because		Regents Date
			Jan2005
		(1) removing trees will prevent scientists from studying ecological succession	25
		(2) genetic material that may be useful for future medical discoveries will be lost	Data Base File Number
		(3) energy cycling in the environment will stop	
ANSWER 3	(4) the removal of trees will limit the construction of factories that will pollute the environment	561	

human impact

S4K7	1107. Many farmers plant corn, and then harvest the entire plant at the end of the growing season. One negative effect of this action is that		Regents Date
			Jan2009
		(1) soil minerals used by corn plants are not recycled	29
		(2) corn plants remove acidic compounds from the air all season long	Data Base File Number
		(3) corn plants may replace renewable sources of energy	
ANSWER 1	(4) large quantities of water are produced by corn plants	173	

human impact

1108. The Susquehanna River, which runs through the states of New York, Pennsylvania, and Maryland, received the designation "America's Most Endangered River" in 2005. One of the river's problems results from the large number of sewage overflow sites that are found along the course of the river. These sewage overflow sites are a direct result of an increase in
- (1) global warming
 - (2) human population
 - (3) recycling programs
 - (4) atmospheric changes

S4K7

ANSWER 2

Regents Date
Jan2009

28

Data Base File Number

172

human impact

1109. Which method of protecting members of an endangered species is most ecologically sound?
- (1) protecting the habitats where these animals live from human development
 - (2) capturing these animals and putting them in wildlife parks
 - (3) feeding and constructing shelters for these organisms
 - (4) passing laws that encourage hunting of the predators of these species

S4K7

ANSWER 1

Regents Date
Jan2011

24

Data Base File Number

321

human impact

1110. Scientists have been concerned about the reduction of shark populations due to overfishing off the east coast of the United States. Sharks feed on rays, which feed on scallops. Scallops feed on microscopic algae, which they filter from seawater. Without sharks, the rays consume and eliminate scallop beds, harming the scallop fishing industry. This situation demonstrates that
- (1) sharks are not important for the stability of this ecosystem
 - (2) reducing the shark population increases the quantity of scallops that can be harvested
 - (3) humans can upset ecosystem stability by removing species
 - (4) humans improve ecosystem diversity by removing predators

S4K7

ANSWER 3

Regents Date
Jan2013

28

Data Base File Number

639

human impact

1111. The graduating class of a high school would like to give the school a gift that would have a positive impact on the environment. Which plan would be the best choice?

S4K7

ANSWER 2

- (1) making wooden benches by harvesting trees from school property
- (2) planting native trees along the border of the school property
- (3) introducing a new population of foxes, the school mascot, to school grounds
- (4) clearing an area to make room for additional student parking

Regents Date

Jan2014

24

Data Base File Number

1017

human impact

1112. Scientists in Brazil have developed specific fertilizers and special breeds of soybeans and corn so crops can grow on large areas of tropical lands. This is valuable because farmers can help to feed the growing human population and strengthen the economy. However, trade-offs must be considered because farming on tropical lands can also

S4K7

ANSWER 3

- (1) add helpful microorganisms to the soil
- (2) remove oxygen from the atmosphere
- (3) reduce populations of native species
- (4) reduce mutations and disease in wildlife populations

Regents Date

Jan2017

15

Data Base File Number

1280

human impact

1113. During the last century, human impacts on our planet have led to an increasing and alarming loss of biodiversity in rainforest ecosystems. Scientists estimate that current extinction rates exceed those of some prehistoric mass extinctions. This loss of biodiversity also means loss of genetic diversity and loss of ecosystems. What could be done to minimize this loss of biodiversity?

S4K7

ANSWER 2

- (1) Introduce new species to rainforest ecosystems.
- (2) Write and pass new environmental protection laws specific to rainforest ecosystems.
- (3) Build barriers around rainforest ecosystems to keep animals and plants contained.
- (4) Move all rainforest animals to new ecosystems where they will be safe.

Regents Date

Jan2017

26

Data Base File Number

1287

human impact

1114. A company that produces paint is planning to build a small factory in a rural community. The factory would provide many needed jobs. Before the community agrees to allow the factory to be built, the community should

S4K7

ANSWER 3

- (1) investigate the use of paint as a method of biological control
- (2) consider just the economic advantages of building the new factory
- (3) assess the risks of the new factory and compare these to the benefits
- (4) insist the factory use finite resources located in the community

Regents Date

Jan2018

43

Data Base File Number

1378

human impact

1115. A Christmas tree farmer cuts down a native forest to plant Fraser fir trees. Compared to the original forest, the newly planted Christmas tree farm will most likely be

S4K6

ANSWER 4

- (1) more stable and more diverse
- (2) more stable and less diverse
- (3) less stable and more diverse
- (4) less stable and less diverse

Regents Date

Jan2023

15

Data Base File Number

1660

human impact

1116. Human impact on the environment is often more dramatic than the impact of most other living things because humans have a greater

S4K7

ANSWER 4

- (1) need for water
- (2) need for food
- (3) ability to adapt to change
- (4) ability to alter the environment

Regents Date

June2001

31

Data Base File Number

909

human impact

1117. Fertilizers used to improve lawns and gardens may interfere with the equilibrium of an ecosystem because they

S4K7

ANSWER 3

- (1) cause mutations in all plants
- (2) cannot be absorbed by roots
- (3) can be carried into local water supplies
- (4) cause atmospheric pollution

Regents Date

June2002

34

Data Base File Number

854

human impact

1118. Which animal has modified ecosystems more than any other animal and has had the greatest negative impact on world ecosystems?

- (1) gypsy moth
- (2) zebra mussel
- (3) human
- (4) shark

S4K7

ANSWER 3

Regents Date

June2003

35

Data Base File Number

777

human impact

1119. A major reason that humans can have such a significant impact on an ecological community is that humans

- (1) can modify their environment through technology
- (2) reproduce faster than most other species
- (3) are able to increase the amount of finite resources available
- (4) remove large amounts of carbon dioxide from the air

S4K7

ANSWER 1

Regents Date

June2008

29

Data Base File Number

123

human impact

1120. One reason why people should be aware of the impact of their actions on the environment is that

- (1) ecosystems are never able to recover once they have been adversely affected
- (2) the depletion of finite resources cannot be reversed
- (3) there is a decreased need for new technology
- (4) there is a decreased need for substances produced by natural processes

S4K7

ANSWER 2

Regents Date

June2009

30

Data Base File Number

197

human impact

1121. Base your answers to this question on the information given and on your knowledge of biology. After the Aswan High Dam was built on the Nile River, the rate of parasitic blood-fluke infection doubled in the human population near the dam. As a result of building the dam, the flow of the Nile changed. This changed the habitat, which resulted in an increase in its population of a certain aquatic snail. The snails, which were infected, released larvae of the fluke. These larvae then infected humans. This situation best illustrates that

- (1) the influence of humans on a natural system is always negative in the long term
- (2) the influence of humans on a natural system can have unpredictable negative impacts
- (3) human alteration of an ecosystem does not need to be studied to avoid ecological disaster
- (4) human alteration of an ecosystem will cause pollution and loss of finite resources

Regents Date
June2010

42

Data Base File
Number

279

S4K4

ANSWER 2

human impact

1122. Due to overfishing, the number of fish in the ocean could drastically decrease. This will cause

- (1) an increase in the stability of the oceans
- (2) an increase in the salt content of the oceans
- (3) a decrease in the stability of the oceans
- (4) a decrease in the oxygen available in the oceans

Regents Date
June2012

3

Data Base File
Number

421

S4K1

ANSWER 3

human impact

1123. A Native American saying states that, "We do not inherit the land we live on from our grandparents, we borrow it from our grandchildren." This saying is an attempt to make us understand that

- (1) the impact we have on the environment lasts for many generations
- (2) we must pay a lot of money to buy land from our parents
- (3) what we do today to the environment has little impact on our children
- (4) human actions only affect other humans

Regents Date
June2014

20

Data Base File
Number

1051

S4K7

ANSWER 1

human impact

1124. In the spring of 2010, there was a catastrophic explosion on an ocean oil drilling rig, causing millions of gallons of oil to be released into the Gulf of Mexico. Many organisms died due to the thick sludge in their habitat. However, in some organisms, such as shellfish, the oil stuck to tissues inside their shells. Which statement expresses a major concern of environmentalists about the accumulation of the oil in certain organisms in the Gulf of Mexico ecosystem?

S4K1

ANSWER 1

- (1) Larger organisms eat the shellfish and more chemicals will build up in their tissues.
- (2) The shellfish will prevent other organisms from obtaining oil.
- (3) Smaller organisms will be unaffected by the chemicals.
- (4) Larger organisms will be less affected by the oil, because they can eat other organisms.

Regents Date
June2014

37

Data Base File Number

1062

human impact

1125. In the California Mojave Desert, an energy company is building a large solar-power facility. It is expected to produce enough power for 140,000 homes and also cut carbon dioxide emissions by 500,000 tons a year. The facility will be built on 4,050 acres of wildlife habitat, which is near a protected refuge for a species of desert tortoise. The decision to build this power plant is most likely based on

S4K7

ANSWER 2

- (1) proving that positive atmospheric changes are less important than preserving wildlife
- (2) a trade-off, weighing the need for a cleaner energy source versus the protection of a natural resource
- (3) the fact that building these solar-power energy plants disrupts wildlife habitats
- (4) providing evidence that technological advances always produce positive environmental impacts

Regents Date
June2014

24

Data Base File Number

1055

human impact

1126. Residents of a town are concerned that a recently built factory could pose health risks. Scientists were asked to investigate the effects of the factory on the health of local residents. The most relevant information they reported was that

S4K7

ANSWER 4

- (1) in a survey, residents felt that the air in town looks dirtier now
- (2) there have been reports that other types of factories have been linked with health issues
- (3) residents have occasionally seen smoke coming from the factory
- (4) local medical facilities have recently reported a 15% increase in the number of patients treated for asthma

Regents Date

June2016

2

Data Base File Number

1210

human impact

1127. For several years now, there has been discussion of constructing a large oil pipeline across the United States. Which statement expresses a major concern many people are likely to have about the proposed pipeline?

S4K7

ANSWER 3

- (1) The pipeline will bring a large number of jobs to the area where it is being constructed.
- (2) The oil pipeline will increase the amount of finite resources.
- (3) If this pipeline were to leak, the oil could contaminate soil, water, and wildlife.
- (4) The pipeline is a technological fix for ozone depletion.

Regents Date

June2018

36

Data Base File Number

1404

human impact

Regents Date
June2018

1128. In the 1920s, over 25 million acres of the American southern plains were stripped of prairie grasses to provide more land for farmers to grow wheat. The prairie grasses had served to hold the soil in place and prevent erosion. In the early 1930s, a series of severe dust storms eroded topsoil from more than 13 million acres of the southern plains and dumped it as tons of dust particles over many cities in the Northeast. Farmland was destroyed and people were sickened from "dust pneumonia." This occurrence illustrates that

S4K7

- (1) farmers should never clear land to grow crops as it always creates problems
- (2) once an ecosystem has been altered, it can not be restored to normal
- (3) the farmers deliberately altered the equilibrium of the cities in the Northeast
- (4) when humans alter ecosystems, serious consequences may result

19

Data Base File
Number

1395

ANSWER 4

human impact

Regents Date
June2022

1129. In 2003, biologists encouraged nations to decrease the number of fish caught in order to help global fish populations recover. This seems to be helping some fish populations to increase. This increase in the size of some fish populations is a result of human

S4K7

- (1) actions that killed many of the predators of these fish populations
- (2) decisions that weighed the need for food with the need to maintain fish populations
- (3) activities that are increasing the use of nonrenewable resources of the oceans
- (4) decisions that are increasing the use of renewable ocean resources
decisions that are increasing the use of renewable ocean resources
decisions that are increasing the use of renewable ocean resources
decisions that are increasing the use of renewable ocean resources

49

Data Base File
Number

1626

ANSWER 2

human population / reducing

S4K7	1130. Which action would be LEAST likely to harm endangered species? (1) releasing more carbon dioxide into the atmosphere (2) reducing the human population (3) decreasing the amount of dissolved oxygen in the oceans (4) reducing the thickness of the ozone layer	Regents Date Aug2010 30
		Data Base File Number 302
		ANSWER 2

human reproduction

S4K4	1131. Heavy cigarette smoking and the use of alcohol throughout pregnancy usually increase the likelihood of (1) the birth of twins (2) the birth of a male baby (3) a baby being born with a viral infection (4) a baby being born with medical problems	Regents Date Jan2002 25
		Data Base File Number 872
		ANSWER 4

human reproduction

S4K4	1132. Human reproduction usually involves (1) internal fertilization and internal development (2) external fertilization and external development (3) internal fertilization and external development (4) external fertilization and internal development	Regents Date Jan2016 9
		Data Base File Number 1186
		ANSWER 1

human reproduction

S4K4	1133. Reproduction in humans usually requires (1) the process of cloning (2) mitotic cell division of gametes (3) gametes with chromosomes that are not paired (4) the external fertilization of sex cells	Regents Date June2005 13
		Data Base File Number 572
		ANSWER 3

human systems

		1134. Although the digestive system is primarily responsible for the breakdown of food, this process can be disrupted if the circulatory system malfunctions. The best explanation for this disruption is that	Regents Date Aug2015
S4K1		(1) human body systems interact with each other to perform life functions	2
		(2) the circulatory system is the control center of the body	Data Base File Number
ANSWER	1	(3) the digestive system and the circulatory system have many organs in common	
		(4) the circulatory system is responsible for the coordination of life functions, including the breakdown of food	1150

human systems

		1135. Four examples of systems in the human body are: muscles, nervous, circulatory, and digestive. A similarity between these systems is that they all	Regents Date Jan2018
S4K1		(1) are made of cells that are identical in structure and function	40
		(2) contain organs that work independently from other organs in that system	Data Base File Number
ANSWER	3	(3) work together to maintain a stable internal environment	
		(4) are separate and do not interact with other body systems	1376

hypothesis

		1136. A student formulated a hypothesis that cotton will grow larger bolls (pods) if magnesium is added to the soil. The student has two experimental fields of cotton, one with magnesium and one without. Which data should be collected to support this hypothesis?	Regents Date Aug2002
S1K2		(1) height of the cotton plants in both fields	1
		(2) diameter of the cotton bolls in both fields	Data Base File Number
ANSWER	2	(3) length of the growing season in both fields	
		(4) color of the cotton bolls in both fields	807

hypothesis

1137. Which statement best describes a hypothesis?
- (1) A hypothesis is the process of making careful observations.
 - (2) The conclusion drawn from the results of an experiment is part of a hypothesis.
 - (3) A hypothesis serves as a basis for determining what data to collect when designing an experiment.
 - (4) The facts collected from an experiment are written in the form of a hypothesis.

S1K2

ANSWER 3

Regents Date

Aug2009
32

**Data Base File
Number**

225

hypothesis

1138. Reasons for conducting peer review include all of the following EXCEPT
- (1) analyzing the experimental design
 - (2) pointing out possible bias
 - (3) identifying an illogical conclusion
 - (4) changing data to support the hypothesis

S1K3

ANSWER 4

Regents Date

Aug2011

41

**Data Base File
Number**

387

hypothesis

1139. A student hypothesized that watching sports on television would cause viewers' pulse rates to increase. She designed an experiment to determine the effect of watching sports on pulse rate. A group of 200 volunteers took their pulse rates and then watched their favorite sports on television. After the games, they immediately took their pulse rates again. The data collected showed that the pulse rates of some people increased, but the pulse rates of an equal number of people did not change. Although the hypothesis was not supported by the data, the hypothesis is still valuable because it
- (1) may lead to further investigation
 - (2) can be changed to fit the data
 - (3) is the opinion of the experimenter
 - (4) is based on beliefs of the volunteers

LAB2

ANSWER 1

Regents Date

Aug2013

76

**Data Base File
Number**

997

hypothesis

1140. A student wants to test the hypothesis that an acidic environment will decrease enzyme activity. In the experiment, the student used an enzyme that breaks down hydrogen peroxide into water and bubbles of oxygen. To test the hypothesis, the student should collect data on the number of oxygen bubbles produced at different

- (1) temperatures
- (2) pH levels
- (3) enzyme concentrations
- (4) concentrations of hydrogen peroxide

S4K5

ANSWER 2

Regents Date
Aug2014

39

Data Base File Number

1091

hypothesis

1141. Tomato plants in a garden are not growing well. The gardener hypothesizes that the soil is too acidic. To test this hypothesis accurately, the gardener could

- (1) plant seeds of a different kind of plant
- (2) move the tomato plants to an area with less sunlight
- (3) change the pH of the soil
- (4) reduce the amount of water available to the plant

S1K2

ANSWER 3

Regents Date
Jan2002

5

Data Base File Number

860

hypothesis

1142. Base your answers to this question on the information given and on your knowledge of biology. An experiment was carried out to answer the question "Does the pH of water affect the growth of radish plants?" Two groups of ten radish plants were set up. One group was watered with water having a pH of 3.0, and the other group was watered with water having a pH of 7.0. Both groups of plants received the same amount and intensity of light, the same amount of water, and they were grown in the same type of soil. The heights of the radish plants were measured every 2 days for a period of 2 weeks. Which sentence is a possible hypothesis that was tested in this experiment?

- (1) Does the pH of water affect the growth of radish plants?
- (2) Will the amount of water alter the heights of the radish plants?
- (3) The temperature of the water will affect the heights of the radish plants.
- (4) The pH of the water will affect the heights of the radish plants.

S1K2

ANSWER 4

Regents Date
Jan2014

31

Data Base File Number

1023

hypothesis

		Regents Date June2001
	1143. A scientist tested a hypothesis that white-tailed deer would prefer apples over corn as a primary food source. The findings of the test, in which the scientist claimed that the deer preferred apples, were published. Which research technique, if used by the scientist, might result in this claim being questioned?	
S1K3	(1) The scientist observed four deer in different locations at various times of the day.	2
	(2) The scientist observed a total of 500 deer in 20 different locations at various times of the day.	Data Base File Number
ANSWER	(3) The scientist observed 200 deer in various natural settings, but none in captivity.	
1	(4) The scientist observed 300 deer in various locations in captivity, but none in natural settings.	886

hypothesis

		Regents Date June2003
	1144. Why do scientists consider any hypothesis valuable?	
S1K3	(1) A hypothesis requires no further investigation.	2
	(2) A hypothesis may lead to further investigation even if it is disproved by the experiment.	Data Base File Number
ANSWER	(3) A hypothesis requires no further investigation if it is proved by the experiment.	
2	(4) A hypothesis can be used to explain a conclusion even if it is disproved by the experiment.	755

hypothesis

		Regents Date June2011
	1145. A biologist formulates a hypothesis, performs experiments to test his hypothesis, makes careful observations, and keeps accurate records of his findings. In order to complete this process, the biologist should	
S1K3	(1) adjust the data to support the hypothesis	33
	(2) eliminate data that do not support the hypothesis	Data Base File Number
ANSWER	(3) write a research paper explaining his theories before performing his experiments, in order to gain funding sources	
4	(4) evaluate the findings and, if necessary, alter the hypothesis based on his findings, and test the new hypothesis	354

hypothesis

1146. An experiment was designed to test whether students could squeeze a clothespin more times in 1 minute after resting or after exercising. What would be a hypothesis for the experiment?

LAB2

ANSWER

4

- (1) Do students squeeze clothespins more often in 1 minute after exercising?
- (2) Can most students squeeze a clothespin more times after they rest?
- (3) Ten students who exercise before squeezing a clothespin squeezed it more times in 1 minute than ten students who rested first.
- (4) Students who rest before squeezing a clothespin will squeeze it fewer times in 1 minute than students who exercise beforehand.

Regents Date

June2012

81

Data Base File Number

443

hypothesis

1147. Base your answer to this question on the information given and on your knowledge of biology.
Ulcers: Mystery Solved ---
Stomach ulcers are painful sores that develop in the stomach. Doctors once thought that ulcers were caused by stress. In the 1980s, a pair of physicians, Barry J. Marshall and J.Robin Warren, questioned the cause of ulcers. They found the bacterium "Helicobacter pylori " in the ulcer tissue of their patients. Even though they repeatedly presented their findings to colleagues, they were ignored until Marshall performed an astonishing experiment: He drank broth containing the bacteria and made himself sick with an ulcer! He then cured himself by taking an antibiotic.
The results were published in 1985, but it took another 10 years for doctors to regularly use antibiotics to treat ulcers. Marshall and Warren received a Nobel Prize in 2005 for this discovery. Which choice represents a possible hypothesis for Marshall's experiment?

S1K2

ANSWER

4

- (1) Does "Helicobacter pylori" cause stomach ulcers in people?
- (2) If a person takes an antibody, then they will not develop an ulcer.
- (3) Does exposure to infectious bacterial cells make people sick?
- (4) If a patient is infected by "Helicobacter pylori", then they will get an ulcer.

Regents Date

June2021

38

Data Base File Number

1584

hypothesis

		1148. Which statement is an example of a hypothesis that can be tested through experimentation?	Regents Date June2023
S1K2		(1) The number of times a dog wags its tail is a direct measure of how happy the dog is.	42
		(2) Is the ability of a fish to taste food affected by how clear the water is where it lives?	Data Base File Number
ANSWER	4	(3) A plant's fear of herbivores increases as the plant grows older.	
		(4) Bacterial growth will rapidly increase as the temperature increases.	1700

immune system

		1149. The purpose of introducing weakened microbes into the body of an organism is to stimulate the	Regents Date Aug2005
S4K5		(1) production of living microbes that will protect the organism from future attacks	24
		(2) production of antigens that will prevent infections from occurring	Data Base File Number
ANSWER	3	(3) immune system to react and prepare the organism to fight future invasions by these microbes	
		(4) replication of genes that direct the synthesis of hormones that regulate the number of microbes	611

immune system

		1150. People who have AIDS are more likely than others to become ill with multiple infections because the pathogen that causes AIDS	Regents Date Aug2012
S4K5		(1) targets many body systems	22
		(2) mutates, releasing toxins directly into the bloodstream	Data Base File Number
ANSWER	4	(3) increases the rate of enzyme activity in different types of body cells	
		(4) damages the immune system	462

immune system

1151. An individual recovers from the common cold, which is caused by rhinovirus A. The person then becomes infected with the avian influenza virus, which causes the bird flu. Which statement best describes what will most likely happen to this person?

S4K5

- (1) He will have the symptoms of the bird flu because he is not immune to the avian influenza virus.
- (2) He will have the symptoms of the common cold because he is not immune to the avian influenza virus.
- (3) He will not have the symptoms of the bird flu because he is immune to rhinovirus A.
- (4) He will not have the symptoms of the common cold because the avian influenza virus causes it.

Regents Date

Aug2013

23

Data Base File Number

988

ANSWER

1

immune system

1152. An organ, such as a kidney, used for transplant needs to be tested for compatibility with the person who is to receive the organ. If this is not done, the

S4K5

- (1) donated organ might attack the body
- (2) donated organ might attack the immune system
- (3) immune system might attack its own body cells
- (4) immune system might attack the donated organ

Regents Date

Aug2016

25

Data Base File Number

1257

ANSWER

4

immune system

1153. SCIDS (Severe Combined Immunodeficiency Syndrome) is a disorder where a genetic mutation inhibits the production and functioning of T-cells. T-cells are special types of white blood cells that play a role in the body's immune response. A possible symptom of SCIDS would be an increase in the

S4K5

- (1) number of antigens produced
- (2) red blood cell count
- (3) number of infections by pathogens
- (4) ability to maintain homeostasis

Regents Date

Aug2016

25

Data Base File Number

1256

ANSWER

3

immune system

Regents Date

Aug2022

1154. Scientists have discovered that pathogenic organisms and the chemicals they produce can cause foodborne illnesses. These illnesses harm the body as a result of interactions between the digestive and immune systems. Which statement most correctly describes how these two systems interact when an individual comes down with a foodborne illness?

S4K1

- (1) Chemicals produced by pathogens enter the immune system through a cut in the skin. The circulatory system carries the chemical to the digestive system, resulting in foodborne illness.
- (2) When specific chemicals produced by pathogens enter the digestive system in contaminated foods, the ability of the immune system to fight off foodborne illness is reduced.
- (3) When foods contaminated with pathogens are eaten, the immune system prevents the pathogens from entering the digestive system.
- (4) The digestive system breaks down the pathogens in the contaminated foods so that they are harmless. These harmless pathogens are then transferred to the immune system.

40

Data Base File
Number

ANSWER

2

1647

immune system

Regents Date

Aug2024

1155. The Tdap vaccine can protect adolescents and adults from the serious bacterial diseases tetanus, diphtheria, and pertussis. Another vaccine, called Td, protects against tetanus and diphtheria, but not pertussis. Td does NOT protect against pertussis because the

S4K5

- (1) Tdap vaccine is given to treat pertussis
- (2) Td vaccine does not contain the antibodies from pertussis to fight the bacteria
- (3) Tdap vaccine contains a small amount of the bacteria that causes pertussis
- (4) Td vaccine does not stimulate the immune system of people to recognize pertussis antigens

6

Data Base File
Number

ANSWER

4

1789

immune system

1156. The immune system of humans may respond to chemicals on the surface of an invading organism by
- (1) releasing hormones that break down these chemicals
 - (2) synthesizing antibodies that mark these organisms to be destroyed
 - (3) secreting antibiotics that attach to these organisms
 - (4) altering a DNA sequence in these organisms

S4K5

ANSWER 2

Regents Date

Jan2006

18

Data Base File Number

486

immune system

1157. In some people, substances such as peanuts, eggs, and milk cause an immune response. This response to usually harmless substances is most similar to the
- (1) action of the heart as the intensity of exercise increases
 - (2) mechanism that regulates the activity of guard cells
 - (3) action of white blood cells when certain bacteria enter the body
 - (4) mechanism that maintains the proper level of antibiotics in the blood

S4K5

ANSWER 3

Regents Date

Jan2009

23

Data Base File Number

168

immune system

1158. Doctors often use certain medications to treat infections. A few people have a reaction to some of these medications, such as itching, swelling, or trouble breathing. This is an example of
- (1) using antibodies to cure a medical problem
 - (2) the body's immune system overreacting to a usually harmless substance
 - (3) the body creating a mutation to fight unknown pathogens
 - (4) a vaccine causing the body to produce antigens against the infection

S4K5

ANSWER 2

Regents Date

Jan2020

13

Data Base File Number

1541

immune system

1159. A person refuses to get a measles vaccine because they claim that the vaccination will cause them to develop the measles. This claim is unsupported because the measles vaccination contains only

S4K5

ANSWER

4

- (1) antibodies to fight the flu, not the actual flu virus
- (2) the chicken pox virus, not the measles virus
- (3) the active measles virus that stimulates the immune system to make measles antigens
- (4) parts of the measles virus that triggers the immune system parts of the measles virus that triggers the immune system to fight the measles

to fight the measles

Regents Date

Jan2024

49

Data Base File Number

1747

immune system

1160. Base your answer to this question on the passage given and on your knowledge of biology. ---- In Search of a Low-Allergy Peanut ---- Many people are allergic to substances in the environment. Of the many foods that contain allergens (allergy-inducing substances), peanuts cause some of the most severe reactions. Mildly allergic people may only get hives. Highly allergic people can go into a form of shock. Some people die each year from reactions to peanuts. A group of scientists is attempting to produce peanuts that lack the allergy-inducing proteins by using traditional selective breeding methods. They are searching for varieties of peanuts that are free of the allergens. By crossing those varieties with popular commercial types, they hope to produce peanuts that will be less likely to cause allergic reactions and still taste good. So far, they have found one variety that has 80 percent less of one of three complex proteins linked to allergic reactions. Removing all three of these allergens may be impossible, but even removing one could help. Other researchers are attempting to alter the genes that code for the three major allergens in peanuts. All of this research is seen as a possible long-term solution to peanut allergies. Allergic reactions usually occur when the immune system produces

S4K5

ANSWER

3

- (1) antibiotics against usually harmless antigens
- (2) antigens against usually harmless antibodies
- (3) antibodies against usually harmless antigens
- (4) enzymes against usually harmless antibodies

Regents Date

June2006

49

Data Base File Number

519

immune system

1161. A student infected by a common cold virus ran a low-grade fever. After a few days, the student's temperature returned to normal and the student was free of cold symptoms. The fever served as

- (1) an antigen in the circulatory system
- (2) an immune response to a pathogen
- (3) a biological catalyst
- (4) a weakened pathogen

S4K5

ANSWER 2

Regents Date

June2016

13

Data Base File Number

1217

immune system

1162. The fact that the H7N9 virus, referred to as bird flu, has only recently infected humans helps explain why

- (1) it is highly transmissible through both the air and water
- (2) it is found only in the U.S.
- (3) humans have little or no immunity to the virus
- (4) the human population has formed antibodies against the virus

S4K5

ANSWER 3

Regents Date

June2019

43

Data Base File Number

1491

immune system

1163. Recently, a human trachea (a respiratory organ) was produced by using a patient's own stem cells. The benefit of using the patient's own cells to produce a trachea instead of receiving one from a donor is that

- (1) there will be more enzymes produced to help maintain homeostasis in the trachea
- (2) there will be an increase in the quantity of antibodies that the patient produces in response to the new trachea
- (3) there is less of a chance that the patient's immune system will attack the trachea
- (4) there will be a greater response to any infectious agent that may enter the body

S4K5

ANSWER 3

Regents Date

June2019

10

Data Base File Number

1476

immune system

S4K5	1164. Rejection of a newly transplanted organ is caused by	(1) the immune system reacting to the presence of the organ	Regents Date
			June2021
			12
			Data Base File Number
			1569
ANSWER	1		

immune system

S4K5	1165. Kidney-transplant surgery places a healthy kidney from one person into the body of another. The body will often produce substances that work against this transplanted organ. The system most directly involved in attacking the transplanted kidney is the	(1) excretory system	Regents Date
			June2024
			18
			Data Base File Number
			1769
ANSWER	4		

independent variable

LABA	1166. Base your answer to this question on the information given and on your knowledge of biology. A student designed an experiment to determine if air temperature had an effect on the rate of photosynthesis in corn plants. The independent variable in this experiment is the	(1) air temperature at which the corn plants were grown	Regents Date
			Aug2018
			32
			Data Base File Number
			1434
ANSWER	1		

independent variable

		Regents Date
		Jan2009
		36
S1K2	1167. Which statement about the use of independent variables in controlled experiments is correct?	Data Base File Number
	(1) A different independent variable must be used each time an experiment is repeated.	
	(2) The independent variables must involve time.	
ANSWER	(3) Only one independent variable is used for each experiment.	175
3	(4) The independent variables state the problem being tested	

independent variable

		Regents Date
		Jan2024
		73
LAB2	1168. Five students measured their pulse rates, then exercised by running up and down the stairs five times, then measured their pulse rates again. In the investigation, the independent variable is the	Data Base File Number
	(1) time to run up and down the stairs	
	(2) pulse rate	
ANSWER	(3) five students who participated	1754
4	(4) exercise that was done	

industrialization

		Regents Date
		Aug2009
		26
S4K7	1169. Which change is a cause of the other three?	Data Base File Number
	(1) increased fossil fuel consumption	
	(2) destruction of the ozone shield	
ANSWER	(3) increased industrialization	222
3	(4) destruction of natural habitats	

industrialization

		Regents Date
		Aug2018
		13
S4K7	1170. Nuclear power plants, which produce electrical energy, use large quantities of water for cooling. Often, small fish, larvae, and fish eggs are sucked in along with the cooling water and destroyed. This example illustrates how	Data Base File Number
	(1) industrialization can have positive and negative effects	
	(2) removal of these organisms has no effect on an ecosystem	
ANSWER	(3) direct harvesting increases the natural fish population	1421
1	(4) energy is generated without producing wastes	

industrialization

S4K7	1171. Increased industrialization will most likely	Regents Date Jan2008 27
ANSWER	(1) decrease available habitats	
1	(2) increase environmental carrying capacity for native species	
	(3) increase the stability of ecosystems	
	(4) decrease global warming	

industrialization

S4K7	1172. One positive impact that industrialization has had is that	Regents Date June2015 14
ANSWER	(1) industrialization produces waste gases that pollute the air	
3	(2) fossil fuels used by industries help reduce finite resources	
	(3) industrialization has been a source of many jobs for people	
	(4) new technologies have increased acid rain	

inference

S1K3	1173. Male stickleback fish with red undersides attack other male sticklebacks with red undersides and also attack models of fish with red undersides. Sticklebacks and fish models without red undersides are not attacked. Which is the best inference that can be drawn regarding this behavior?	Regents Date Aug2011
ANSWER	(1) A male stickleback will defend its territory against all other fish.	32
3	(2) The stimulus for an attack is a model with red fins or a male stickleback.	
	(3) The stimulus for an attack is a red underside.	
	(4) Male sticklebacks turn red to attract females.	

inheritance

1174. In several species of birds, the males show off their bright colors and long feathers. The dull colored females usually pick the brightest colored males for mates. Male offspring inherit their father's bright colors and long feathers. Compared to earlier generations, future generations of these birds will be expected to have a greater proportion of

- (1) bright-colored females
- (2) dull-colored females
- (3) dull-colored males
- (4) bright-colored males

S4K3

ANSWER

4

Regents Date

Aug2008

15

Data Base File Number

143

inheritance

1175. A woman changes her hair color to red; however, her children will not inherit this red hair color because the woman does not have

- (1) genes for red hair in her skin
- (2) genes for red hair in her sex cells
- (3) proteins for red hair in the placenta
- (4) proteins for red hair in her egg cells

S4K3

ANSWER

2

Regents Date

Aug2016

15

Data Base File Number

1249

inheritance

1176. A lion cub resembles its parents because it inherits genes that produce

- (1) DNA identical to all of the DNA found in both parents
- (2) proteins identical to all of the proteins found in both parents
- (3) ATP identical to some of the ATP found in each parent
- (4) enzymes identical to some of the enzymes found in each parent

S4K2

ANSWER

4

Regents Date

June2018

2

Data Base File Number

1385

inorganic

1177. Which substance is an inorganic molecule?

- (1) starch
- (2) DNA
- (3) water
- (4) fat

S4K5

ANSWER

3

Regents Date

Aug2011
18

Data Base File Number

369

insulin

1178. An increase in the level of insulin in the blood would most directly result in

- (1) a decrease in the amount of glucose in the blood
- (2) a decrease in the amount of protein in the blood
- (3) an increase in the amount of fat in cells
- (4) an increase in the amount of carbon dioxide in cells

S4K5

ANSWER 1

Regents Date

June2001

29

Data Base File Number

907

insulin

1179. The most immediate response to a high level of blood sugar in a human is an increase in the

- (1) muscle activity in the arms
- (2) blood flow to the digestive tract
- (3) activity of all cell organelles
- (4) release of insulin

S4K6

ANSWER 4

Regents Date

June2003

29

Data Base File Number

771

insulin

1180. The first successful transplant of insulin-producing cells from a living donor pancreas was completed in April 2000 in Japan. This enabled the body of the recipient to

- (1) regulate fat concentration by a feedback mechanism
- (2) provide protection against an infectious disease
- (3) slow down the heart rate after a period of activity ends
- (4) maintain blood sugar levels throughout the day

S4K5

ANSWER 4

Regents Date

June2013

22

Data Base File Number

961

insulin

1181. In response to an increasing blood glucose level, the human body will normally

- (1) store the glucose in cell nuclei
- (2) release a hormone that lowers the blood glucose
- (3) produce a hormone that destroys the glucose
- (4) use the excess glucose to make proteins

S4K1

ANSWER 2

Regents Date

June2017

18

Data Base File Number

1315

insulin

1182. After digesting the nutrients from a meal high in carbohydrates, the body
- (1) releases insulin to return the blood sugar levels to normal
 - (2) secretes enzymes to absorb starch into the intestines
 - (3) produces water to maintain dynamic equilibrium in the blood
 - (4) maintains homeostasis by increasing wastes produced in muscle cells

Regents Date
June2022

13

S4K5

Data Base File
Number

1612

ANSWER 1

insulin

1183. A chemical produced by the pancreas functions to decrease glucose levels in the blood. The chemical described is
- (1) progesterone
 - (2) insulin
 - (3) testosterone
 - (4) ATP

Regents Date
June2023

39

S4K5

Data Base File
Number

1699

ANSWER 2

insulin

1184. Diabetes is a condition in which the hormone insulin is not being produced by the pancreas at adequate levels. In diabetes, the glucose sugar is not properly regulated and the condition may become fatal. In 1922, Dr. Frederick Banting injected a 14 year old boy, who was dying of diabetes, with insulin which was extracted from a dog pancreas. The boy survived. For many years insulin was extracted from the pancreases of pigs and cattle to treat diabetics. In 1982, an EXACT copy of the human insulin molecule was produced by bacteria and used to treat diabetes. How can bacteria produce human insulin when they are one-celled organisms with no relationship to humans?
- (1) Natural selection produced bacteria capable of producing insulin.
 - (2) Bacteria mutated by chance and produced the human insulin.
 - (3) Genetic engineering permitted the insertion of the human insulin gene into bacteria.
 - (4) How bacteria can produce human insulin is not known.

Regents Date
RBS2021

1

RBS

Data Base File
Number

1598

ANSWER 3

interdependence

1185. One of the best ways to represent the interdependence of all of the organisms in an ecosystem is

- (1) an evolutionary tree
- (2) a food chain
- (3) an electrophoresis gel
- (4) a food web

S4K1

ANSWER

4

Regents Date

Jan2018

32

Data Base File Number

1370

interdependence

1186. Which statement is an example of the interdependence of organisms?

- (1) Owls hunt at night.
- (2) Ants get food from insects and protect insects from predators.
- (3) Ticks feed on the blood of animals and the ticks grow larger.
- (4) Crows feed on dead mice.

S4K1

ANSWER

2

Regents Date

June2016

1

Data Base File Number

1209

interdependence

1187. Base your answer to this question on the passage given and on your knowledge of biology.

Medical Mystery

Recently, an elderly man went to a hospital. He felt tired and was coughing and dehydrated. At first, the doctor thought he had pneumonia, but an x-ray showed a spot on his lung. Because the man was a smoker, the doctor expected to find a tumor. Instead, the surgeon discovered a pea seed growing inside the man's lung. When the pea seedling was removed, the patient quickly regained his health. Which environmental factors inside a human lung would help the pea begin to germinate?

- (1) water and oxygen
- (2) carbon dioxide and water
- (3) darkness and moisture
- (4) light and oxygen

S4K6

ANSWER

1

Regents Date

June2019

67

Data Base File Number

1498

interrelationships

S4K5	1188. Worms that had been invaded by bacteria were eaten by a species of bird. Many of these birds died as a result. The most likely explanation for this is that the	Regents Date	Aug2007
			26
		Data Base File Number	
			18
ANSWER	1		
	(1) bacteria interfered with normal life functions of the birds		
	(2) disease that killed the birds was inherited		
	(3) gene alterations in the bacterial cells killed the birds		
	(4) birds produced antigens in response to the bacteria		

interrelationships

S4K7	1189. Which action illustrates an increased understanding and concern by humans for ecological interrelationships	Regents Date	Aug2007
			27
		Data Base File Number	
			19
ANSWER	4		
	(1) importing organisms in order to stabilize existing ecosystems		
	(2) eliminating pollution standards for industries that promote technology		
	(3) removing natural resources at a rate equal to the needs of the population		
	(4) implementing laws to regulate the number of animals hunted and killed each year		

interrelationships

S4K6	1190. Even before a flower bud opens, certain plant chemicals have colored the flower in patterns particularly attractive to specific insects. At the same time, these chemicals protect the plant's reproductive structures by killing or inhibiting pathogens and insects that may feed on the plant. Which statement about the plant and the other organisms mentioned is correct?	Regents Date	Jan2006
			26
		Data Base File Number	
			492
ANSWER	4		
	(1) Chemicals affect plants but not animals.		
	(2) Organisms of every niche may be preyed on by herbivores.		
	(3) Any chemical produced in a plant can protect against insects.		
	(4) Organisms may interact with other organisms in both positive and negative ways.		

lab

1191. Which piece of laboratory equipment would normally be used to accurately measure 5 milliliters of glucose solution for an experiment?

- (1) a beaker
- (2) a flask
- (3) a graduated cylinder
- (4) a test tube

LABA

ANSWER 3

Regents Date

Aug2003

43

Data Base File Number

806

lab technique

1192. Base your answer to this question on the information given and on your knowledge of biology. A student designed an experiment to determine if air temperature had an effect on the rate of photosynthesis in corn plants. Which tool is correctly paired with a procedure that could be used during this experiment?

- (1) an electronic balance to measure the volume of soil in which each corn plant is grown
- (2) a graduated cylinder to measure 30 mL of water for each plant daily
- (3) a metric ruler to determine the mass of each plant each week
- (4) a Celsius thermometer to determine the pH of the soil

LABA

ANSWER 2

Regents Date

Aug2018

31

Data Base File Number

1433

lab technique

1193. During an investigation, a student measures out 15 grams of salt. Then, he measures 15 milliliters of water and adds the salt to it. Next, he measures a 1 centimeter wide by 4 centimeters long section of plant leaf. Which list of tools is arranged in the order that the student used them?

- (1) graduated cylinder, ruler, balance
- (2) balance, ruler, graduated cylinder
- (3) graduated cylinder, balance, ruler
- (4) balance, graduated cylinder, ruler

LABA

ANSWER 4

Regents Date

June2016

33

Data Base File Number

1232

laboratory procedure

LABS

ANSWER

2

1194. A laboratory procedure calls for heating 50 milliliters of a sugar solution to 60°C. Which piece of laboratory equipment will NOT be needed?

- (1) protective eyewear
- (2) ruler
- (3) thermometer
- (4) graduated cylinder

Regents Date

Aug2009

31

Data Base File Number

224

leaf / guard cells

S4K5

ANSWER

3

1195. Which process is most closely associated with the regulation of water loss from the leaves of trees?

- (1) digestion of water within the cytoplasm in the leaf cells of the trees
- (2) synthesis of protein by the chloroplasts in the leaf cells of the trees
- (3) movement of water through leaf openings controlled by the guard cells
- (4) absorption of nitrogen through leaf openings controlled by the guard cells

Regents Date

Aug2015

7

Data Base File Number

1154

leaf / guard cells

S4K5

ANSWER

3

1196. Which structures regulate water loss and gas exchange in the leaves of plants?

- (1) vacuoles
- (2) chloroplasts
- (3) guard cells
- (4) mitochondria

Regents Date

June2017

14

Data Base File Number

1312

limiting factors

S4K7

ANSWER

3

1197. Which information concerning a desert is provided by the following quotation? "The desert is arid, with less than 25 cm of rain per year. The plants are spaced far apart, or are grouped around water sources. Most of the animals are active at night."

- (1) daily temperature range and types of autotrophs
- (2) time of rainy season and type of food used by heterotrophs
- (3) identity of a limiting factor and behavior of heterotrophs
- (4) type of nutrition in animals and distribution of autotrophs

Regents Date

June2005

34

Data Base File Number

590

limiting factors

Regents Date

June2011

1198. Base your answers to this question on the passage included and on your knowledge of biology. - Corals come in about 1,500 known species - from soft swaying fans to stony varieties with hard skeletons that form reef bases. They are made up of polyps, tiny animals that live in colonies and feed at night on microscopic plants and creatures. The coral's surface is the living part, with color infused by single-celled algae called zooxanthellae that live in polyp tissue. The algae act like solar panels, passing energy to the coral as they photosynthesize while feeding on the coral's waste. Extremely sensitive, corals survive in a narrow range of temperature, sunlight and salinity. An uncommonly severe El Niño in 1998 raised ocean temperatures and changed currents, causing bleaching that devastated reefs worldwide. Scientists say parts of the Indian Ocean lost up to 90 percent of corals. The bleaching struck reefs around the Persian Gulf, East Africa, Southeast Asia and the Caribbean. Some recovered. Many died. - Source: Associated Press, December 2001 -- The passage contains information concerning

S4K6

ANSWER

1

- (1) limiting factors
- (2) reproductive methods
- (3) bacteria
- (4) competition

43

Data Base File
Number

356

limiting factors

Regents Date

June2024

1199. Which event would most likely be the immediate result of significantly lowering the oxygen concentration in a freshwater lake?

S4K5

ANSWER

1

- (1) a decrease in the number of fish
- (2) an increase in the number of plants
- (3) an increase in biodiversity
- (4) a decrease in water temperature

27

Data Base File
Number

1773

male reproduction

Regents Date

Aug2015

1200. The primary function of the human male reproductive system is to

S4K4

ANSWER

2

- (1) provide a site for fertilization
- (2) produce and transport gametes
- (3) protect and nourish the embryo
- (4) prevent urine from leaving the body

19

Data Base File
Number

1165

male reproduction

		Regents Date
		Jan2018
		7
S4K4	1201. Exposure to certain environmental toxins, such as pesticides, may reduce fertility in males by interfering with their ability to produce gametes. These toxins are most likely having an effect on the	Data Base File Number
ANSWER 4	(1) testes and progesterone	1353
	(2) ovaries and testosterone	
	(3) ovaries and estrogen	
	(4) testes and testosterone	

marsupials

		Regents Date
		June2008
		18
S4K4	1202. Kangaroos are mammals that lack a placenta. Therefore, they must have an alternate way of supplying the developing embryo with	Data Base File Number
ANSWER 1	(1) nutrients	116
	(2) carbon dioxide	
	(3) enzymes	
	(4) genetic information	

meiosis

		Regents Date
		Aug2003
		17
S4K3	1203. The great variety of possible gene combinations in a sexually reproducing species is due in part to the	Data Base File Number
ANSWER 4	(1) sorting of genes as a result of gene replication	791
	(2) pairing of genes as a result of mitosis	
	(3) pairing of genes as a result of differentiation	
	(4) sorting of genes as a result of meiosis	

meiosis

		Regents Date
		Aug2005
		11
S4K4	1204. Which cell process occurs only in organisms that reproduce sexually?	Data Base File Number
ANSWER 3	(1) mutation	601
	(2) replication	
	(3) meiosis	
	(4) mitosis	

meiosis

1205. Which cell is normally produced as a direct result of meiosis?

- (1) a uterine cell having half the normal species number of chromosomes
- (2) an egg having the full species number of chromosomes
- (3) a zygote having the full species number of chromosomes
- (4) a sperm having half the normal species number of chromosomes

Regents Date

Aug2007

19

Data Base File Number

15

S4K4

ANSWER

4

meiosis

1206. Within a sexually reproducing species, the correct chromosome number is maintained by

- (1) halving the chromosome number in gamete production, followed by fertilization
- (2) doubling the chromosome number in gamete production, followed by fertilization
- (3) halving the chromosome number during mitosis, followed by differentiation
- (4) doubling the chromosome number during mitosis, followed by differentiation

Regents Date

Aug2024

29

Data Base File Number

1806

S4K4

ANSWER

1

meiosis

1207. Most cells in the body of a fruit fly contain eight chromosomes. In some cells, only four chromosomes are present, a condition which is a direct result of

- (1) mitotic cell division
- (2) meiotic cell division
- (3) embryonic differentiation
- (4) internal fertilization

Regents Date

Jan2002

19

Data Base File Number

867

S4K4

ANSWER

2

meiosis

1208. Down syndrome is a genetic disorder caused by the presence of an extra chromosome in the body cells of humans. This extra chromosome occurs in a gamete as a result of

- (1) an error in the process of cloning
- (2) an error in meiotic cell division
- (3) a gene mutation
- (4) replication of a single chromosome during mitosis

Regents Date

Jan2005

16

Data Base File Number

555

S4K4

ANSWER

2

meiosis

1209. Which statement best explains the significance of meiosis in the process of evolution within a species?

- (1) The gametes produced by meiosis ensure the continuation of any particular species by asexual reproduction.
- (2) Equal numbers of eggs and sperm are produced by meiosis.
- (3) Meiosis produces eggs and sperm that are alike.
- (4) Meiosis provides for variation in the gametes produced by an organism.

S4K3

ANSWER

4

Regents Date

June2001

19

Data Base File Number

901

meiosis

1210. Offspring that result from meiosis and fertilization each have

- (1) twice as many chromosomes as their parents
- (2) one-half as many chromosomes as their parents
- (3) gene combinations different from those of either parent
- (4) gene combinations identical to those of each parent

S4K4

ANSWER

3

Regents Date

June2006

16

Data Base File Number

510

metabolism

1211. Which observation could lead to the conclusion that an object is nonliving?

- (1) It passes on hereditary information only through asexual reproduction.
- (2) It carries out synthesis.
- (3) It cannot perform metabolic processes.
- (4) It is composed of a cell, but does not have tissues.

S4K1

ANSWER

3

Regents Date

Jan2015

1

Data Base File Number

1094

metabolism

1212. Scientists who study rock formations in caves describe some of the formations as "living rock" because, under certain conditions, they increase in size. Which statement would best dispute the claim that these rock formations are living?

S4K1

ANSWER 1

- (1) Rocks are not composed of cells, while living organisms are.
- (2) Rocks perform complex metabolic processes, but cannot grow.
- (3) Rocks cannot reproduce sexually.
- (4) Rocks remain stable in a wide range of physical conditions.

Regents Date

Jan2018

20

Data Base File Number

1362

metabolism

1213. Every single-celled organism is able to survive because it carries out

S4K1

ANSWER 1

- (1) metabolic activities
- (2) autotrophic nutrition
- (3) heterotrophic nutrition
- (4) sexual reproduction

Regents Date

June2001

1

Data Base File Number

892

metabolism

1214. What is an advantage of a change in pulse rate after exercising?

LAB2

ANSWER 2

- (1) The heart needs to produce more energy to supply the active muscle cells and maintain homeostasis.
- (2) An increased blood flow carries excess waste products away from the active muscle cells.
- (3) The blood is removing oxygen from muscle cells that were not active and carrying it to muscle cells that are active.
- (4) The blood is supplying the active muscle cells with carbon dioxide to neutralize wastes in those cells.

Regents Date

June2014

82

Data Base File Number

1065

metabolism

LAB2

ANSWER 3

1215. The buildup of waste products in muscle cells that are active might cause
- (1) digestion
 - (2) cellular respiration
 - (3) increased fatigue
 - (4) decreased heart rate

Regents Date
June2015
73
Data Base File Number
1148

metabolism

S4K1

ANSWER 4

1216. The breathing rate, heart rate, and blood hormone levels of an individual would directly provide information about that individual's
- (1) cellular organization
 - (2) nutrition
 - (3) inheritance
 - (4) metabolic activity

Regents Date
June2018
29
Data Base File Number
1401

metabolism

S4K1

ANSWER 3

1217. In an animal cell, all of the organelles work together to carry out
- (1) photosynthesis
 - (2) diffusion
 - (3) metabolic processes
 - (4) information storage

Regents Date
June2024
1
Data Base File Number
1757

microscope

S1K2

ANSWER 4

1218. A slide of human blood cells was observed in focus under the low-power objective of a compound light microscope that had clean lenses. When the microscope was switched to high power, the image was dark and fuzzy. Which parts of the microscope should be used to correct this situation?
- (1) nosepiece and coarse adjustment
 - (2) diaphragm and ocular
 - (3) objective and fine adjustment
 - (4) diaphragm and fine adjustment

Regents Date
Aug2003
39
Data Base File Number
805

microscope

1219. A student prepared a slide of pollen grains from a flower. First the pollen was viewed through the low-power objective lens and then, without moving the slide, viewed through the high-power objective lens of a compound light microscope. Which statement best describes the relative number and appearance of the pollen grains observed using these two objectives?

- (1) low power: 25 small pollen grains, high power: 100 large pollen grains
- (2) low power: 100 small pollen grains, high power: 25 large pollen grains
- (3) low power: 25 large pollen grains, high power: 100 small pollen grains
- (4) low power: 100 large pollen grains, high power: 25 small pollen grains

Regents Date

Aug2007

36

Data Base File Number

22

LABS

ANSWER

2

microscope

1220. After switching from the high-power to the low-power objective lens of a compound light microscope, the area of the low-power field will appear

- (1) larger and brighter
- (2) smaller and brighter
- (3) larger and darker
- (4) smaller and darker

Regents Date

Jan2004

36

Data Base File Number

669

LABA

ANSWER

1

microscope

1221. While viewing a specimen under high power of a compound light microscope, a student noticed that the specimen was out of focus. Which part of the microscope should the student turn to obtain a clearer image under high power?

- (1) eyepiece
- (2) coarse adjustment
- (3) fine adjustment
- (4) nosepiece

Regents Date

Jan2007

31

Data Base File Number

72

LABS

ANSWER

3

microscope technique

		1222. Which structure is best observed using a compound light microscope?	Regents Date Jan2003
		(1) a cell	37
LABA		(2) a virus	Data Base File Number
		(3) a DNA sequence	749
ANSWER	1	(4) the inner surface of a mitochondrion	

microscope technique

		1223. A coverslip should be slowly lowered from a 45° angle onto a slide in order to	Regents Date Jan2012
		(1) prevent the slide from being scratched	74
LAB5		(2) stop the loss of water from under the coverslip	Data Base File Number
		(3) ensure that the specimen being viewed will stay alive	418
ANSWER	4	(4) reduce the formation of air bubbles	

microscope technique

		1224. A microscope slide viewed with high power can most likely be damaged by	Regents Date Jan2016
		(1) adding distilled water	76
LAB5		(2) adding salt water	Data Base File Number
		(3) rotating the coarse adjustment knob	1208
ANSWER	3	(4) rotating the fine adjustment knob	

mitochondria

		1225. While viewing a slide of rapidly moving sperm cells, a student concludes that these cells require a large amount of energy to maintain their activity. The organelles that most directly provide this energy are known as	Regents Date Aug2002
		(1) vacuoles	8
S4K1		(2) ribosomes	Data Base File Number
		(3) chloroplasts	813
ANSWER	4	(4) mitochondria	

mitochondria

1226. Muscle cells in athletes often have more mitochondria than muscle cells in nonathletes. Based on this observation, it can be inferred that the muscle cells in athletes

- (1) have a smaller demand for cell proteins than the muscle cells of nonathletes
- (2) reproduce less frequently than the muscle cells of nonathletes
- (3) have nuclei containing more DNA than nuclei in the muscle cells of nonathletes
- (4) have a greater demand for energy than the muscle cells of nonathletes

S4K1

ANSWER 4

Regents Date

Aug2004

6

Data Base File Number

698

mitochondria

1227. An organelle that releases energy for metabolic activity in a nerve cell is the

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

S4K1

ANSWER 3

Regents Date

Aug2008

5

Data Base File Number

135

mitochondria

1228. Certain seaweeds contain a greater concentration of iodine inside their cells than there is in the seawater surrounding them. The energy required to maintain this concentration difference is most closely associated with the action of

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

S4K7

ANSWER 2

Regents Date

Aug2019

4

Data Base File Number

1501

mitochondria

1229. Creatine, a popular nutritional supplement, is used to decrease fatigue by increasing ATP in muscle cells. The cell structure directly responsible for the increased production of ATP in human muscle cells is the

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

S4K1

ANSWER 2

Regents Date

Aug2023

11

Data Base File Number

1711

mitochondria

1230. The swordfish contains a heat generating organ that warms its brain and eyes up to 14°C above the surrounding ocean water temperature. Which structures are most likely to be found at relatively high concentrations within the cells of this heat generating organ?

- (1) nuclei
- (2) chloroplasts
- (3) chromosomes
- (4) mitochondria

S4K1

ANSWER

4

Regents Date

Jan2011

26

Data Base File Number

323

mitochondria

1231. Which cell structure is mainly responsible for releasing energy from food molecules in some single-celled organisms?

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

S4K1

ANSWER

4

Regents Date

Jan2016

2

Data Base File Number

1179

mitochondria

1232. Which statement best describes a function of glucose in plant cells?

- (1) It is converted into solar energy in the chloroplasts.
- (2) It can be used directly as a building block in protein synthesis.
- (3) It can be used during the digestion of fats.
- (4) It is used during cellular respiration in the mitochondria.

S4K1

ANSWER

4

Regents Date

Jan2017

38

Data Base File Number

1294

mitochondria

1233. In which cell structure is energy extracted from nutrients?

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

S4K2

ANSWER

3

Regents Date

Jan2020

7

Data Base File Number

1536

mitochondria

- 1234.** Which statement concerning the functioning of cells is correct?
- (1) Mitochondria transfer energy from organic compounds to form ATP molecules.
 - (2) Vacuoles are the sites of DNA synthesis.
 - (3) The nucleus stores genes that will later be removed from the cell.
 - (4) The cell membrane prevents the diffusion of all poisons into a cell from its environment.

S4K1

ANSWER 1

Regents Date

Jan2024

19

Data Base File Number

1753

mitochondria

- 1235.** Studies of fat cells and thyroid cells show that fat cells have fewer mitochondria than thyroid cells. A biologist would most likely infer that fat tissue
- (1) does not require energy
 - (2) has energy requirements equal to those of thyroid tissue
 - (3) requires less energy than thyroid tissue
 - (4) requires more energy than thyroid tissue

S4K5

ANSWER 3

Regents Date

June2003

42

Data Base File Number

781

mitochondria

- 1236.** Certain poisons are toxic to organisms because they interfere with the function of enzymes in mitochondria. This results directly in the inability of the cell to
- (1) store information
 - (2) build proteins
 - (3) release energy from nutrients
 - (4) dispose of metabolic wastes

S4K1

ANSWER 3

Regents Date

June2008

5

Data Base File Number

107

mitochondria

- 1237.** Mitochondria provide ribosomes with
- (1) ATP for protein synthesis
 - (2) amino acids for protein synthesis
 - (3) oxygen for respiration
 - (4) carbon dioxide for the production of sugars

S4K1

ANSWER 1

Regents Date

June2019

17

Data Base File Number

1478

mitochondria

1238. Most of the reactions by which energy from carbohydrates is released for use by the cell take place within the

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

S4K1

ANSWER 1

Regents Date

June2021

6

Data Base File Number

1565

mitochondria

1239. Cells possess structures that perform specific jobs. Which statement correctly pairs a cell structure with a function it performs in the cells?

- (1) The cell membrane synthesizes proteins for cell processes.
- (2) The mitochondria provide energy for cell processes.
- (3) Ribosomes regulate which materials enter and leave the cell.
- (4) Vacuoles transfer genetic information from one cell to another.

S4K1

ANSWER 2

Regents Date

June2023

7

Data Base File Number

1680

mitochondria

1240. Some children inherit mutated mitochondria and suffer fatigue and muscle pain. The most likely explanation for this condition is that their mitochondria fail to

- (1) provide the antigens needed to fight the mutated DNA
- (2) regulate the transport of nutrients to the muscle cells
- (3) synthesize the starch needed by the muscles
- (4) release enough energy for cells to function properly

S4K1

ANSWER 4

Regents Date

June2024

39

Data Base File Number

1779

mitosis

1241. Genetic researchers have discovered a number of different gene mutations that have led to the development of cancer. These mutations affect how frequently a cell reproduces. Which process would be directly influenced by these mutations?

- (1) differentiation of cells in an embryo
- (2) meiotic cell division
- (3) division of sperm and egg cells
- (4) mitotic cell division

S4K2

ANSWER 4

Regents Date

Aug2018

8

Data Base File Number

1416

mitosis

1242. Recently, scientists noted that stained chromosomes from rapidly dividing cells, such as human cancer cells, contain numerous dark, dotlike structures. Chromosomes from older human cells that have stopped dividing have very few, if any, dotlike structures. The best generalization regarding these dotlike structures is that they
- (1) will always be present in cells that are dividing
 - (2) may increase the rate of mitosis in human cells
 - (3) definitely affect the rate of division in all cells
 - (4) can cure all genetic disorders

S1K3

ANSWER

2

Regents Date

Jan2004

39

Data Base File Number

671

mitosis

1243. A cell resulting from the fertilization of an egg begins to divide. Two cells are formed that normally remain attached and could develop into a new individual. If the two cells become separated, which statement describes what would most likely occur?
- (1) The cells would each have all of the needed genetic information, and both could survive
 - (2) The cells would each have only one-half of the needed genetic information, so both would die.
 - (3) One cell would have all of the needed genetic information and would survive, but the other would have none of the needed genetic information and would die.
 - (4) Each cell would have some of the needed genetic information, but would be unable to share it, so both would die.

S4K4

ANSWER

1

Regents Date

Jan2005

15

Data Base File Number

554

mitosis

1244. Marine sponges contain a biological catalyst that blocks a certain step in the separation of chromosomes. Which cellular process would be directly affected by this catalyst?
- (1) mitosis
 - (2) diffusion
 - (3) respiration
 - (4) photosynthesis

S4K5

ANSWER

1

Regents Date

Jan2007

15

Data Base File Number

58

mitosis

1245. The sequence of events occurring in the life cycle of a bacterium is listed: [A] The bacterium copies its single chromosome. [B] The copies of the chromosome attach to the cell membrane of the bacterium. [C] As the cell grows, the two copies of the chromosome separate. [D] The cell is separated by a wall into equal halves. [E] Each new cell has one copy of the chromosome. This sequence as described above most closely resembles the process of

- (1) recombination
- (2) zygote formation
- (3) mitotic cell division
- (4) meiotic cell division

S4K4

ANSWER

3

Regents Date

Jan2008

16

Data Base File Number

85

mitosis

1246. If a chemical that interrupts cell division is added to a culture of human liver tissue, which process would stop?

- (1) meiosis
- (2) mitosis
- (3) breakdown of glucose
- (4) diffusion of nutrients

S4K4

ANSWER

2

Regents Date

Jan2010

16

Data Base File Number

239

mitosis

1247. Base your answer to this question on the information given and on your knowledge of biology. Scientists have found a gene in the DNA of a certain plant that could be the key to increasing the amount of lycopene, a cancer fighting substance, in tomatoes. The ability to produce increased amounts of lycopene will be passed on to new tomato cells as a direct result of

- (1) recycling
- (2) mitosis
- (3) enzyme action
- (4) gene expression

S4K2

ANSWER

2

Regents Date

Jan2013

33

Data Base File Number

641

mitosis

1248. Which process allows a mammal to continue to grow in size?

- (1) mitosis of sex cells
- (2) mitosis of body cells
- (3) meiosis of sex cells
- (4) meiosis of body cells

S4K4

ANSWER

2

Regents Date

Jan2013

16

Data Base File Number

628

mitosis

1249. The processes of deletion, insertion, and substitution can alter genes in a skin cell. The altered genes will most likely be passed on to
- (1) sperm cells
 - (2) egg cells
 - (3) every cell that develops from that skin cell
 - (4) only a few of the cells that develop from that skin cell

S4K2

ANSWER

3

Regents Date

June2013

8

Data Base File Number

947

mitosis

1250. Melanoma is a type of cancer in which abnormal skin cells divide uncontrollably. Some chemotherapy drugs, which stop the growth of the cancer, directly interfere with the process of
- (1) meiosis
 - (2) coordination
 - (3) mitosis
 - (4) recombination

S4K5

ANSWER

3

Regents Date

June2013

20

Data Base File Number

959

mitosis

1251. Gene editing can be used to swap out an unwanted gene for a desirable one from the same species. Which statement best explains why the desired gene will be found in all cells that come from the genetically edited cell?
- (1) The original cell will reproduce by meiosis and a mutation will occur.
 - (2) The altered DNA in the edited cell will be replicated and passed on to each new cell during mitosis.
 - (3) DNA replication in body cells will result in sperm and egg cells with the edited gene.
 - (4) The desired gene will be inserted into each new cell by using restriction enzymes.

S4K2

ANSWER

2

Regents Date

June2021

19

Data Base File Number

1575

mitosis / differentiation

		Regents Date
		Jan2006
		14
S4K4	1252. After the union of sperm and egg, the single celled zygote develops into a multicellular organism with specialized cells by the processes of	Data Base File Number
ANSWER	2	482
	(1) meiosis and replication	
	(2) mitosis and differentiation	
	(3) cloning and growth	
	(4) fertilization and gamete production	

mitosis / differentiation

		Regents Date
		Jan2015
		21
S4K4	1253. A zygote develops into a multicellular organism through	Data Base File Number
ANSWER	1	1108
	(1) mitosis and specialization	
	(2) mitosis and meiosis	
	(3) recombination and communication	
	(4) genetic engineering and natural selection	

muscle cramps

		Regents Date
		June2008
		70
LABS	1254. A marathon runner frequently experiences muscle cramps while running. If he stops running and rests, the cramps eventually go away. The cramping in the muscles most likely results from	Data Base File Number
ANSWER	1	130
	(1) lack of adequate oxygen supply to the muscle	
	(2) the runner running too slowly	
	(3) the runner warming up before running	
	(4) increased glucose production in the muscle	

muscle fatigue

		Regents Date
		Jan2011
		70
LABS	1255. Base your answer to this question on the information given and on your knowledge of biology. An investigation is carried out to determine the effect of exercise on the rate at which a person can squeeze a clothespin. Muscle fatigue occurs during this activity when	Data Base File Number
ANSWER	4	329
	(1) carbon dioxide is used up in the muscle cells	
	(2) simple sugar is converted to starch in the muscle cells	
	(3) proteins accumulate in mitochondria in the muscle cells	
	(4) certain waste products collect in the muscle cells	

muscles / oxygen

Regents Date
Jan2016

1256. Base your answer to this question on the passage given and on your knowledge of biology.
-----Blood Doping -----
Some athletes who compete in endurance events, such as marathon runners or cyclists, believe that they will be more competitive if they can increase the number of red blood cells in their bloodstreams. One way of increasing the number of red blood cells in an athlete is to engage in blood doping. Blood doping is an illegal practice in which athletes harvest their own blood months before a competition, isolate the red blood cells, and freeze them. Just before the date of the competition, the blood cells are returned to the athlete's bloodstream. Another type of blood doping involves using donated blood from another person (blood transfusions). In either case, the athlete will have more red blood cells available than competitors who do not engage in blood doping. Athletes who use their own blood cells to blood dope often become anemic as a result. Anemia is a condition caused by a lack of red blood cells and/or iron in the blood. Iron is a necessary part of the pigment used to carry oxygen to the cells. Athletes who use donated blood to blood dope also run the risk of contracting a blood-borne disease. An athlete might believe that there is a benefit to blood doping with red blood cells because it

S4K5

- (1) could improve the delivery of oxygen to the muscles
- (2) could increase the amount of training necessary
- (3) would help to deliver necessary nutrient molecules to the cells
- (4) would help an athlete to fight disease

39

Data Base File
Number

ANSWER 1

1205

mutagenic chemical

Regents Date
Aug2010

1257. A chemical known as 5-bromouracil causes a mutation that results in the mismatching of molecular bases in DNA. The offspring of organisms exposed to 5-bromouracil can have mismatched DNA if the mutation occurs in

S4K3

- (1) the skin cells of the mother
- (2) the gametes of either parent
- (3) all the body cells of both parents
- (4) only the nerve cells of the father

15

Data Base File
Number

ANSWER 2

289

mutation

S4K3	ANSWER 1	1258. New inheritable characteristics would be LEAST likely to result from	Regents Date Aug2001
		(1) mutations which occur in muscle cells and skin cells	16
		(2) mutations which occur in male gametes	Data Base File Number
		(3) mutations which occur in female gametes	926
		(4) the sorting and recombination of existing genes during meiosis and fertilization	

mutation

S4K5	ANSWER 3	1259. The ozone layer of Earth's atmosphere helps to filter ultraviolet radiation. As the ozone layer is depleted, more ultraviolet radiation reaches Earth's surface. This increase in ultraviolet radiation may be harmful because it can directly cause	Regents Date Aug2003
		(1) photosynthesis to stop in all marine organisms	27
		(2) abnormal migration patterns in waterfowl	Data Base File Number
		(3) mutations in the DNA of organisms	799
		(4) sterility in most species of mammals and birds	

mutation

S4K3	ANSWER 3	1260. A mutation occurs in the liver cells of a certain field mouse. Which statement concerning the spread of this mutation through the mouse population is correct?	Regents Date Aug2005
		(1) It will spread because it is beneficial.	10
		(2) It will spread because it is a dominant gene.	Data Base File Number
		(3) It will not spread because it is not in a gamete.	600
		(4) It will not spread because it is a recessive gene.	

mutation

S4K3	ANSWER 2	1261. Mutations that occur in skin or lung cells have little effect on the evolution of a species because mutations in these cells	Regents Date Aug2006
		(1) usually lead to the death of the organism	12
		(2) cannot be passed on to offspring	Data Base File Number
		(3) are usually beneficial to the organism	529
		(4) lead to more serious mutations in offspring	

mutation

1262. In a group of mushrooms exposed to a poisonous chemical, only a few of the mushrooms survived. The best explanation for the resistance of the surviving mushrooms is that the resistance

S4K3

- (1) was transmitted to the mushrooms from the poisonous chemical
- (2) resulted from the presence of mutations in the mushrooms
- (3) was transferred through the food web to the mushrooms
- (4) developed in response to the poisonous chemical

Regents Date

Aug2006

9

Data Base File Number

526

ANSWER

2

mutation

1263. A mutation changes a gene in a cell in the stomach of an organism. This mutation could cause a change in

S4K3

- (1) both the organism and its offspring
- (2) the organism, but not its offspring
- (3) its offspring, but not the organism itself
- (4) neither the organism nor its offspring

Regents Date

Aug2007

13

Data Base File Number

10

ANSWER

2

mutation

1264. One disadvantage of a genetic mutation in a human skin cell is that it

S4K2

- (1) may result in the production of a defective protein
- (2) may alter the sequence of simple sugars in insulin molecules
- (3) can lead to a lower mutation rate in the offspring of the human
- (4) can alter the rate of all the metabolic processes in the human

Regents Date

Aug2008

12

Data Base File Number

139

ANSWER

1

mutation

1265. Which situation would most likely produce a gene mutation in a squirrel?

S4K3

- (1) The squirrel stops using its claws for digging.
- (2) The squirrel is exposed to radiation for several days.
- (3) Oak trees gradually become less common.
- (4) The weather becomes wetter for a short period of time.

Regents Date

Aug2009

10

Data Base File Number

207

ANSWER

2

mutation

1266. Which activity would most likely increase the mutation rate in a culture of bacteria being grown in a laboratory experiment?
- (1) adding more distilled water to the culture
 - (2) adding excess nutrients to the culture
 - (3) exposing the culture to a higher concentration of carbon dioxide
 - (4) exposing the culture to ultraviolet radiation

S4K3

ANSWER

4

Regents Date

Aug2013

19

Data Base File Number

984

mutation

1267. A mutation occurring in a human can be passed from parent to offspring when it occurs in a
- (1) lung cell, due to exposure to a toxic gas
 - (2) gamete formed in the ovary
 - (3) body cell undergoing mitosis
 - (4) heart cell with chromosome damage

S4K2

ANSWER

2

Regents Date

Aug2015

8

Data Base File Number

1155

mutation

1268. It is recommended that people avoid excessive use of tanning beds. Exposure to the radiation emitted by tanning beds can cause skin cancer. This cancer is the direct result of a
- (1) change in a starch molecule
 - (2) mutation in the genetic material
 - (3) mutation in a protein
 - (4) change in a fat molecule

S4K3

ANSWER

2

Regents Date

Aug2017

26

Data Base File Number

1341

mutation

1269. A characteristic of mutations is that they usually
- (1) are caused only by the events of mitosis
 - (2) do not occur at random
 - (3) result in different genetic sequences
 - (4) occur to meet the needs of a species

S4K3

ANSWER

3

Regents Date

Jan2002

16

Data Base File Number

864

mutation

1270. A mutation occurs in a cell. Which sequence best represents the correct order of their events involved for this mutation to affect the traits expressed by this cell?

S4K2

- (1) a change in the sequence of DNA bases → joining amino acids in sequence → appearance of characteristic
- (2) joining amino acids in sequence → a change in the sequence of DNA bases → appearance of characteristic
- (3) appearance of characteristic → joining amino acids in sequence → a change in the sequence of DNA bases
- (4) a change in the sequence of DNA bases → appearance of characteristic → joining amino acids in sequence

Regents Date

Jan2004

38

Data Base File Number

670

ANSWER

1

mutation

1271. Base your answer to this question on the information given and on your knowledge of biology. Mutations are often referred to as the "raw materials" of evolution. Why are mutations often referred to as the "raw materials" of evolution?

S4K2

- (1) mutations cause variations
- (2) mutations always cause damage to the organism
- (3) mutations cause meiosis to occur
- (4) mutations are never beneficial to the organism

Regents Date

Jan2005

56

Data Base File Number

567

ANSWER

1

mutation

1272. Thousands of years ago, giraffes with short necks were common within giraffe populations. Nearly all giraffe populations today have long necks. This difference could be due to

S4K3

- (1) giraffes stretching their necks to keep their heads out of reach of predators
- (2) giraffes stretching their necks so they could reach food higher in the trees
- (3) a mutation in genetic material controlling neck size occurring in some skin cells of a giraffe
- (4) a mutation in genetic material controlling neck size occurring in the reproductive cells of a giraffe

Regents Date

Jan2006

10

Data Base File Number

479

ANSWER

4

mutation

1273. An error in genetic information present in a body cell of a mammal would most likely produce
- (1) rapid evolution of the organism in which the cell is found
 - (2) a mutation that will affect the synthesis of a certain protein in the cell
 - (3) an adaptation that will be passed on to other types of cells
 - (4) increased variation in the type of organelles present in the cell

S4K2

ANSWER 2

Regents Date

Jan2007

9

Data Base File Number

53

mutation

1274. A species in a changing environment would have the best chance of survival as a result of a mutation that has a
- (1) high adaptive value and occurs in its skin cells
 - (2) low adaptive value and occurs in its skin cells
 - (3) high adaptive value and occurs in its gametes
 - (4) low adaptive value and occurs in its gametes

S4K3

ANSWER 3

Regents Date

Jan2009

12

Data Base File Number

160

mutation

1275. Researchers have found that formaldehyde and asbestos can alter DNA base sequences. Based on this research, the use of these chemicals has been greatly reduced because they
- (1) may act as fertilizers, increasing the growth of algae in ponds
 - (2) have been replaced by more toxic compounds
 - (3) are capable of causing mutations in humans
 - (4) interfere with the production of antibiotics by white blood cells

S4K3

ANSWER 3

Regents Date

Jan2010

14

Data Base File Number

237

mutation

1276. In sexually reproducing organisms, mutations can be inherited if they occur in
- (1) the egg, only
 - (2) the sperm, only
 - (3) any body cell of either the mother or the father
 - (4) either the egg or the sperm

S4K3

ANSWER 4

Regents Date

Jan2011

8

Data Base File Number

311

mutation

1277. A deletion of a DNA segment alters a gene in a single skin cell of an individual. Which statement best describes a result of this mutation?

- (1) Any cell produced from this skin cell will have the same mutation.
- (2) All offspring of the individual will have a skin cell mutation.
- (3) The mutation will spread into other types of cells.
- (4) The gametes of this individual will have the same mutation.

Regents Date

Jan2012

8

Data Base File Number

396

S4K2

ANSWER

1

mutation

1278. Which factor has the greatest influence on the development of new, inheritable characteristics?

- (1) combinations of genes resulting from mitosis
- (2) mutations of genes in reproductive cells
- (3) sorting of genes during asexual reproduction
- (4) recombining of genes during differentiation

Regents Date

Jan2013

12

Data Base File Number

625

S4K3

ANSWER

2

mutation

1279. Base your answer to this question on the information given and on your knowledge of biology. Mutations cause many disorders in humans. Cystic fibrosis (CF) is a disorder that can be passed on from generation to generation. Skin cancer is a disorder that sometimes originates in skin cells as a result of overexposure to the Sun. Which statement best explains the formation of the mutations that cause both cystic fibrosis and skin cancer?

- (1) These mutations are a direct result of a change in the amino acid molecule that controls the formation of genetic codes in gametes.
- (2) These mutations are caused by a change in the sugars that make up the genetic codes in all cells.
- (3) Both of these mutations involve a change in the makeup of genes.
- (4) Both of these mutations are a result of the incorrect synthesis of the proteins that make up DNA.

Regents Date

Jan2017

49

Data Base File Number

1296

S4K2

ANSWER

3

mutation

1280. Which statement best describes how a new human trait develops and can be passed on to future generations?

S4K3

- (1) A mutation in a stomach cell results in the inability of a woman to produce a certain digestive enzyme.
- (2) A mother consumes alcohol during pregnancy, causing the fetus to have a low birth weight.
- (3) During meiosis, a new combination of DNA subunits is formed.
- (4) During mitosis, DNA does not divide correctly and the cells die.

Regents Date

Jan2017

11

Data Base File Number

1276

ANSWER

3

mutation

1281. Studies have shown that children are especially vulnerable to the effects of ultraviolet (UV) radiation. Tanning beds expose the skin to nearly ten times as much UV radiation as natural sunlight. With that knowledge, a law was passed in New York State to prevent individuals under the age of 18 from using tanning beds. Which statement best explains why UV radiation is so harmful?

S4K5

- (1) Certain environmental factors can increase the occurrence of harmful gene mutations.
- (2) Diseases are all caused by exposure to environmental factors.
- (3) Homeostasis in an organism is increased by the presence of radiation.
- (4) Radiation decreases the likelihood that infectious agents cause mutations

Regents Date

Jan2019

41

Data Base File Number

1464

ANSWER

1

mutation

1282. Butterflies exposed to radiation leaking from a damaged nuclear power plant in Japan have been observed to have malformed legs, antennae, and wings. For future butterfly generations to have these similar structural abnormalities, gene mutations must be present in the affected butterflies'

S4K3

- (1) wing cells
- (2) body cells
- (3) antenna cells
- (4) sex cells

Regents Date

Jan2019

14

Data Base File Number

1447

ANSWER

4

mutation

1283. Which statement is true regarding an alteration or change in DNA?

- (1) It is always known as a mutation.
- (2) It is always advantageous to an individual.
- (3) It is always passed on to offspring.
- (4) It is always detected by the process of chromatography

S4K2

ANSWER

1

Regents Date

June2003

12

Data Base File Number

762

mutation

1284. A mutation that can be inherited by offspring would result from

- (1) random breakage of chromosomes in the nucleus of liver cells
- (2) a base substitution in gametes during meiosis
- (3) abnormal lung cells produced by toxins in smoke
- (4) ultraviolet radiation damage to skin cells

S4K3

ANSWER

2

Regents Date

June2009

16

Data Base File Number

188

mutation

1285. Which mutation in a fruit fly could be passed on to its offspring?

- (1) a mutation in a cell of an eye that changes the color of the eye
- (2) a mutation in a leg cell that causes the leg to be shorter
- (3) a mutation in a sperm cell that changes the shape of the wing
- (4) a mutation in a cell of the digestive tract that produces a different enzyme

S4K3

ANSWER

3

Regents Date

June2011

18

Data Base File Number

341

mutation

1286. Changing one base in a gene could have the most direct effect on the

- (1) function of the membrane of a cell
- (2) sequence of building blocks of a protein found in a cell
- (3) number of mitochondria in a cell
- (4) type of carbohydrates synthesized by a cell

S4K2

ANSWER

2

Regents Date

June2012

7

Data Base File Number

424

mutation

1287. An increase in the amount of ultraviolet light entering the atmosphere through holes in the ozone layer will most likely
- (1) reduce the rate of photosynthesis in fungi
 - (2) result in rapid recycling of finite resources
 - (3) prevent animal migration
 - (4) cause an increase in the rate of certain mutations

S4K7

ANSWER

4

Regents Date

June2012

29

Data Base File Number

437

mutation

1288. Base your answer to this question on the information given and on your knowledge of biology. Female mosquitoes need a meal of blood from a person or other animal in order to produce eggs. It has been discovered that mosquitoes have cells on their antennae that can detect the insect repellent known as DEET. The repellent is not harmful to mosquitoes, but when mosquitoes detect DEET, they will not land on the surface where the DEET has been applied. This protects people from being bitten by mosquitoes. Recently, scientists found some mosquitoes that are resistant to DEET because they do not detect its presence. They bred these mosquitoes and eventually produced a population consisting of about 50% DEET-resistant insects. Identify the process most likely responsible for a mosquito initially becoming resistant to DEET.

S4K3

ANSWER

2

- (1) succession
- (2) mutation
- (3) cell division
- (4) metabolism

Regents Date

June2015

61

Data Base File Number

1146

mutation

1289. When receiving x rays, individuals wear a lead shield over major organs in order to limit the body's exposure to radiation. One reason for this procedure is to
- (1) protect the patient against broken bones
 - (2) prevent mutations in gametes
 - (3) improve circulation in the patient
 - (4) increase the chance of a change in DNA

S4K3

ANSWER

2

Regents Date

June2015

15

Data Base File Number

1133

mutation

1290. A chemical was added to hand sanitizers and dish detergents to kill bacteria. Certain species of bacteria are no longer killed by this chemical. One likely reason for the decreased effectiveness of this chemical is that these bacteria have

- (1) slower metabolic rates
- (2) a mutation for resistance
- (3) been selectively bred for survival
- (4) an adaptation to a different niche

S4K3

ANSWER

2

Regents Date

June2017

23

Data Base File Number

1318

mutation

1291. The ameba, a single-celled organism, reproduces asexually. Variations in an ameba would most commonly occur through

- (1) differentiation during development
- (2) the fusion of gametes
- (3) random mutations
- (4) recombination during fertilization

S4K2

ANSWER

3

Regents Date

June2018

17

Data Base File Number

1393

mutation

1292. Mutations are most directly caused by changes in the

- (1) cell organelles of tissues
- (2) genes of chromosomes
- (3) ribosomes in gametes
- (4) receptors on membranes

S4K2

ANSWER

2

Regents Date

June2019

18

Data Base File Number

1479

mutation

1293. Base your answer to this question on the information given and on your knowledge of biology.
Bird Flu
Researchers are not sure when the H7N9 virus, referred to as bird flu, hit the China poultry markets. In February of 2012, the virus was found to have spread from birds to humans. All cases resulted from direct contact with infected poultry. The bird flu can cause severe respiratory illness in humans. Since flu viruses constantly mutate, it would be difficult to develop a vaccine ahead of time. Scientists are worried that the virus could spread easily among people, causing a worldwide outbreak of the disease. Based on the information, one danger of the new Bird Flu H7N9 strain is that it
- (1) causes death in over 75% of the individuals who become infected
 - (2) is transferred to humans through consuming cooked poultry
 - (3) can spread from humans to birds, such as crows and pigeons
 - (4) mutates rapidly, making it hard to produce an effective vaccine

S4K5

ANSWER 4

Regents Date

June2019

42

Data Base File Number

1490

mutation

1294. Down syndrome occurs when an individual has an extra copy of chromosome 21. This additional genetic material alters development and results in Down syndrome. This genetic abnormality is an example of
- (1) a mutation
 - (2) fertilization
 - (3) a substitution
 - (4) differentiation

S4K3

ANSWER 1

Regents Date

June2021

5

Data Base File Number

1564

mutation / recombination

1295. Which two processes result in variations that commonly influence the evolution of sexually reproducing species?
- (1) mutation and genetic recombination
 - (2) mitosis and natural selection
 - (3) extinction and gene replacement
 - (4) environmental selection and selective breeding

S4K3

ANSWER 1

Regents Date

June2006

9

Data Base File Number

507

natural predators

1296. Which farming practice causes the LEAST harm to the environment?

S4K7

- (1) using natural predators to reduce insect numbers
- (2) adding chemical fertilizers to all the crops in the area
- (3) planting the same crop for 1 year on all the fields in the area
- (4) planting the same crop in the same field each year for 10 years

Regents Date

Jan2012

28

Data Base File Number

412

ANSWER

1

natural predators

1297. Base your answer to this question on the information given and on your knowledge of biology. The emerald ash borer is an insect that was introduced into North America sometime in the 1990s. It probably arrived in the United States in wooden packing material carried in cargo ships or on airplanes coming from Asia. The ash borer was first reported killing ash trees in Michigan in 2002. Since then, it has spread to Pennsylvania and New York. Since its arrival, the insect has destroyed tens of millions of trees. One of the ways the ash borer has been able to spread so quickly is through the transport of wood that is infested with their larvae. The USDA has proposed the introduction of Asian wasps to control the ash borer population. One action that individuals can take to control the spread of the emerald ash borer is to

S4K7

- (1) spray all the oak trees at one time with a variety of pesticides
- (2) plant only trees from Asia in yards and parks
- (3) plant more ash trees to replace those that are infected
- (4) use wood from only local sources for heating and for campfires

Regents Date

Jan2016

34

Data Base File Number

1203

ANSWER

4

natural predators

Regents Date
Jan2016

1298. Base your answer to this question on the information given and on your knowledge of biology. The emerald ash borer is an insect that was introduced into North America sometime in the 1990s. It probably arrived in the United States in wooden packing material carried in cargo ships or on airplanes coming from Asia. The ash borer was first reported killing ash trees in Michigan in 2002. Since then, it has spread to Pennsylvania and New York. Since its arrival, the insect has destroyed tens of millions of trees. One of the ways the ash borer has been able to spread so quickly is through the transport of wood that is infested with their larvae. The USDA has proposed the introduction of Asian wasps to control the ash borer population. The best explanation for the fact the emerald ash borer is not as great a problem in Asia as it is in the United States is that

S4K7

- (1) there are few natural predators of the ash borer in the United States, while there are many in Asia
- (2) the same pesticides that work in Asia do not work on controlling the ash borer in the United States
- (3) only healthy ash borers arrived in the United States, while many unhealthy ash borers are present in the population in Asia
- (4) the ash borers are not as adapted to the climate in the United States as they are to the one in Asia

33

Data Base File
Number

ANSWER 1

1202

natural selection

Regents Date
Aug2002

1299. In an area in Africa, temporary pools form where rivers flow during the rainy months. Some fish have developed the ability to use their ventral fins as FEET to travel on land from one of these temporary pools to another. Other fish in these pools die when the pools dry up. What can be expected to happen in this area after many years?

S4K3

- (1) The fish using ventral fins as FEET will be present in increasing numbers.
- (2) FEET in the form of ventral fins will develop on all fish.
- (3) The fish using ventral fins as FEET will develop real FEET.
- (4) All of the varieties of fish will survive and produce many offspring.

15

Data Base File
Number

ANSWER 1

817

natural selection

1300. The teeth of carnivores are pointed and are good for puncturing and ripping flesh. The teeth of herbivores are flat and are good for grinding and chewing. Which statement best explains these observations?

- (1) Herbivores have evolved from carnivores.
- (2) Carnivores have evolved from herbivores.
- (3) The two types of teeth most likely evolved as a result of natural selection.
- (4) The two types of teeth most likely evolved as a result of the needs of an organism.

S4K3

ANSWER 3

Regents Date

Aug2006

13

Data Base File Number

530

natural selection

1301. The diversity of organisms present on Earth is the result of

- (1) ecosystem stability
- (2) homeostasis
- (3) natural selection
- (4) direct harvesting

S4K3

ANSWER 3

Regents Date

Aug2010

7

Data Base File Number

285

natural selection

1302. A population of white moths lives in a forest near a factory. This factory burns coal and pollutes the air with black dust. Over time, this dust has settled on the trees in the area, making them darker in color. This could result in

- (1) an increase in the white moth population
- (2) a decrease in the white moth population
- (3) an increase in the number of trees in the area
- (4) a decrease in the air pollution affecting the area

S4K3

ANSWER 2

Regents Date

Aug2012

12

Data Base File Number

453

natural selection

1303. Domestic horses have a greater diversity of coat colors than that of wild horses. The process that led to a greater diversity of coat colors in domestic horses is

- (1) selective breeding
- (2) random mutation
- (3) gene alteration
- (4) natural selection

S4K3

ANSWER 4

Regents Date

Aug2012

11

Data Base File Number

452

natural selection

- 1304.** Natural selection is best described as
- (1) a change in an organism in response to a need of that organism
 - (2) a process of nearly constant improvement that leads to an organism that is nearly perfect
 - (3) differences in survival rates as a result of different inherited characteristics
 - (4) inheritance of characteristics acquired during the life of an organism

S4K3

ANSWER 4

Regents Date

Aug2016
13

Data Base File Number

1247

natural selection

- 1305.** A variety of species of Galapagos finches evolved from one original species long ago through the process of
- (1) asexual reproduction
 - (2) ecological succession
 - (3) natural selection
 - (4) selective breeding

LAB3

ANSWER 3

Regents Date

Aug2019

75

Data Base File Number

1529

natural selection

- 1306.** Farmers have been planting crops that express an insecticide gene, so that when pests consume these crops, the pests are poisoned. Unfortunately, since these plants were introduced in 1996, growing numbers of insect pests have developed resistance to the insecticide. The process that led to the insect resistance can best be explained by
- (1) ecological succession
 - (2) selective breeding
 - (3) asexual reproduction
 - (4) natural selection

S4K3

ANSWER 4

Regents Date

Aug2022

11

Data Base File Number

1634

natural selection

1307. Which statement best describes a current understanding of natural selection?

- (1) Natural selection influences the frequency of an adaptation in a population.
- (2) Natural selection has been discarded as an important concept in evolution.
- (3) Changes in gene frequencies due to natural selection have little effect on the evolution of species.
- (4) New mutations of genetic material are due to natural selection.

S4K3

ANSWER 1

Regents Date

Jan2004

13

Data Base File Number

655

natural selection

1308. In an area of Indonesia where the ocean floor is littered with empty coconut shells, a species of octopus has been filmed "walking" on two of its eight tentacles. The remaining six tentacles are wrapped around its body. Scientists suspect that, with its tentacles arranged this way, the octopus resembles a rolling coconut. Local predators, including sharks, seem not to notice the octopus as often when it behaves in this manner. This unique method of locomotion has lasted over many generations due to

- (1) competition between octopuses and their predators
- (2) ecological succession in marine habitats
- (3) the process of natural selection
- (4) selective breeding of this octopus species

S4K3

ANSWER 3

Regents Date

Jan2009

13

Data Base File Number

161

natural selection

1309. Ancestors of the giant panda had rounded paws with five very short toes. Today, the giant panda has a sixth toe, often referred to as a thumb, even though it develops from a wrist bone. This unique thumb is an adaptation that allows the panda to easily hold and eat bamboo shoots. The presence of the giant panda's thumb is most likely the result of

- (1) natural selection
- (2) selective breeding
- (3) asexual reproduction
- (4) ecological succession

S4K3

ANSWER 1

Regents Date

Jan2011

19

Data Base File Number

318

natural selection

- 1310.** Which characteristic is necessary for natural selection to occur in a species?
- (1) stability
 - (2) variation
 - (3) complex cellular organization
 - (4) a very low mutation rate

S4K3

ANSWER 3

Regents Date
Jan2012
10
Data Base File Number
398

natural selection

- 1311.** Natural selection and its evolutionary consequences provide a scientific explanation for
- (1) the fossil record of ancient life-forms
 - (2) predictions about the rate of global warming
 - (3) the amount of precipitation in a rain forest
 - (4) the amount of soil used to grow certain crops

S4K3

ANSWER 1

Regents Date
Jan2015
15
Data Base File Number
1104

natural selection

- 1312.** If a sudden genetic mutation in the birds that feed on brightly colored poisonous frogs made them able to consume any amount of the poison with no harm to them, it is most likely that
- (1) the frogs that are least poisonous and less conspicuous now would survive better than those that have more poison
 - (2) the frogs that are most poisonous would continue to survive and be protected by the poison they contain
 - (3) without the protection of the poison, all of the frogs would need to change color to become less conspicuous
 - (4) the birds would find another source of food that does not contain any poison

LAB1

ANSWER 1

Regents Date
Jan2017
76
Data Base File Number
1300

natural selection

- 1313.** Genetic recombination, production of more offspring than can survive, and struggling with the challenges of the environment are all concepts associated with
- (1) natural selection
 - (2) mitotic division
 - (3) selective breeding
 - (4) genetic engineering

S4K3

ANSWER 1

Regents Date
Jan2019
11
Data Base File Number
1444

natural selection

1314. Which situation would most likely result in the highest rate of natural selection?

- (1) reproduction of organisms by an asexual method in an unchanging environment
- (2) reproduction of a species having a very low mutation rate in a changing environment
- (3) reproduction of organisms in an unchanging environment with little competition and few predators
- (4) reproduction of organisms exhibiting genetic differences due to mutations and genetic recombinations in a changing environment

S4K3

ANSWER 4

Regents Date

June2002

16

Data Base File Number

843

natural selection

1315. Which statement is not part of the concept of natural selection?

- (1) Individuals that possess the most favorable variations will have the best chance of reproducing.
- (2) Variation occurs among individuals in a population.
- (3) More individuals are produced than will survive.
- (4) Genes of an individual adapt to a changing environment.

S4K3

ANSWER 4

Regents Date

June2004

13

Data Base File Number

682

natural selection

1316. Natural selection and its evolutionary consequences provide a scientific explanation for each of the following EXCEPT

- (1) the fossil record
- (2) protein and DNA similarities between different organisms
- (3) similar structures among different organisms
- (4) a stable physical environment

S4K3

ANSWER 4

Regents Date

June2005

10

Data Base File Number

581

natural selection

1317. Base your answer to this question on the passage given and on your knowledge of biology. -- When Charles Darwin traveled to the Galapagos Islands, he observed 14 distinct varieties of finches on the islands. Darwin also observed that each finch variety ate a different type of food and lived in a slightly different habitat from the other finches. Darwin concluded that the finches all shared a common ancestor but had developed different beak structures. -- The different beak structures mentioned in the last sentence were most likely influenced by

- (1) selection for favorable variations
- (2) environmental conditions identical to those of the common ancestor
- (3) abnormal mitotic cell division
- (4) characteristics that are acquired during the bird's lifetime

LAB3

ANSWER 1

Regents Date

June2006

71

Data Base File Number

521

natural selection

1318. Certain insects resemble the bark of the trees on which they live. Which statement provides a possible biological explanation for this resemblance?

- (1) The insects needed camouflage so they developed protective coloration.
- (2) Natural selection played a role in the development of this protective coloration.
- (3) The lack of mutations resulted in the protective coloration.
- (4) The trees caused mutations in the insects that resulted in protective coloration.

S4K3

ANSWER 2

Regents Date

June2008

13

Data Base File Number

112

natural selection

1319. Parrots are tropical birds. However, in some areas of New York City, some parrots have been able to survive outdoors year-round. These parrots survive, while most others cannot, due to

- (1) overproduction of offspring
- (2) extinction of previous species
- (3) asexual reproduction of parrots with a mutation
- (4) a variation that allows these parrots to live in colder climates

S4K3

ANSWER 4

Regents Date

June2012

6

Data Base File Number

423

natural selection

- 1320.** Characteristics that are harmful to a species tend to decrease in frequency from generation to generation because these characteristics usually
- (1) have a high survival value for the species
 - (2) have a low survival value for the species
 - (3) are inherited by more individuals
 - (4) affect only the older members of the population

S4K3

ANSWER 2

Regents Date

June2012

14

Data Base File Number

425

natural selection

- 1321.** Which statement describes an effect of natural selection on a species?
- (1) It favors the survival of certain members of the species and results in a change in the proportion of individuals with highly adaptive traits.
 - (2) It provides feedback mechanisms for members of a species and results in a change in the proportion of individuals with homeostatic controls.
 - (3) It leads to reproduction with other species, increasing the number of different adaptations.
 - (4) It increases competition between populations that occupy different niches, increasing the chance of extinction of the less-adapted species.

S4K3

ANSWER 1

Regents Date

June2014

13

Data Base File Number

1044

natural selection

- 1322.** Many animals have developed courtship behaviors. Males will often dance, swim, or sing in a particular way to attract a female. Males who are more successful at the courtship behavior will have a greater chance of having more offspring. This behavior is a result of
- (1) natural selection
 - (2) genetic engineering
 - (3) asexual reproduction
 - (4) gene manipulation

S4K3

ANSWER 1

Regents Date

June2016

14

Data Base File Number

1218

natural selection

S4K3

ANSWER 1

1323. Natural selection produces changes most quickly in
- (1) species with short reproductive cycles
 - (2) individual pathogens killed by antibiotics
 - (3) complex multicellular organisms
 - (4) individuals that produce a small number of offspring

Regents Date

June2017
8

Data Base File
Number

1307

natural selection

S4K3

ANSWER 4

1324. Burmese Pythons in their native habitat often eat a large animal and then do not feed again for weeks. In the Florida everglades, Burmese Pythons are an invasive snake. Food sources are often small mammals and birds. The current large python population in Florida can be described as a species that
- (1) will quickly die out because there are no appropriate food sources in their environment
 - (2) will develop new digestive organs as needed to succeed in the Florida Everglades
 - (3) has expanded only because small animals reproduce so quickly that they provide an unlimited food source
 - (4) has already successfully adapted to an unfamiliar environment through natural selection

Regents Date

June2024

41

Data Base File
Number

1780

niche

S4K6

ANSWER 1

1325. Which pair of organisms would most likely compete for the same ecological niche?
- (1) bacteria and fungi
 - (2) deer and wolf
 - (3) tree and fungi
 - (4) deer and bacteria

Regents Date

Aug2010

26

Data Base File
Number

298

niche

1326. In a pine forest, there are different species of birds known as warblers that are able to coexist on the same pine trees. The Cape May warblers feed on insects located on the tips of the highest pine branches. The yellow-rumped warblers feed on insects on lower branches of the same trees. The different feeding locations for these two species of warblers indicate that they have different

- (1) niches
- (2) ecosystems
- (3) methods of asexual reproduction
- (4) methods of selective breeding

S4K6

ANSWER

1

Regents Date

Aug2014

7

Data Base File Number

1070

niche

1327. Two closely related species of birds live in the same tree. Species A feeds on ants and termites, while species B feeds on caterpillars. The two species coexist successfully because

- (1) each occupies a different niche
- (2) they interbreed
- (3) they use different methods of reproduction
- (4) birds compete for food

S4K1

ANSWER

2

Regents Date

Jan2006

2

Data Base File Number

475

niche

1328. Members of a bird-watching club observed the activities of three species of birds for an entire spring and summer. They noticed that the different species fed at different heights in the same pine tree. Which ecological concept is supported by this observation?

- (1) Organisms that feed on different foods in the same area of an ecosystem fill the same niche.
- (2) Organisms that live in the same ecosystem can occupy different niches in the ecosystem.
- (3) Different species feeding in the same ecosystem will eventually compete with each other, eliminating all the species except one.
- (4) Different species living in the same area of an ecosystem usually have the same physical characteristics.

S4K6

ANSWER

2

Regents Date

Jan2016

27

Data Base File Number

1198

niche

	1329. In a forest community, a shelf fungus and a slug live on the side of a decaying tree trunk. The fungus digests and absorbs materials from the tree, while the slug eats algae growing on the outside of the trunk. These organisms do not compete with one another because they occupy	Regents Date June2003
S4K1	(1) the same habitat, but different niches	41
	(2) the same niche, but different habitats	Data Base File Number
ANSWER 1	(3) the same niche and the same habitat	780
	(4) different habitats and different niches	

niche

	1330. When habitats are destroyed, there are usually fewer niches for animals and plants. This action would most likely not lead to a change in the amount of	Regents Date June2006
S4K7	(1) biodiversity	26
	(2) competition	Data Base File Number
ANSWER 4	(3) interaction between species	515
	(4) solar radiation reaching the area	

niche

	1331. An earthworm lives and reproduces in the soil. It aerates the soil and adds organic material to it. The earthworm is a source of food for other organisms. All of these statements together best describe	Regents Date June2011
S4K6	(1) a habitat	29
	(2) autotrophic nutrition	Data Base File Number
ANSWER 3	(3) an ecological niche	352
	(4) competition	

niche

	1332. Which term refers to the ecological niche of many bacteria and fungi in an ecosystem?	Regents Date June2012
S4K6	(1) decomposer	36
	(2) herbivore	Data Base File Number
ANSWER 1	(3) producer	441
	(4) scavenger	

niche

1333. When two different bird species temporarily occupy the same niche, they would most likely
- (1) change their nesting behaviors
 - (2) not affect one another
 - (3) interbreed to form a new species
 - (4) compete with one another

S4K6

ANSWER

4

Regents Date

June2012

22

Data Base File Number

433

niche

1334. Base your answer to this question on the information given and on your knowledge of biology. A homeowner observed different types of birds feeding at bird feeders filled with an assortment of food. Competition arises most often when two birds have similar
- (1) enzymes
 - (2) niches
 - (3) habitats
 - (4) ecosystems

LAB3

ANSWER

2

Regents Date

June2024

75

Data Base File Number

1783

nonrenewable resource

1335. One likely reason some experimental automobiles have been developed to use electricity rather than gasoline is that
- (1) gasoline is made from petroleum, a nonrenewable resource
 - (2) Earth has an unlimited supply of fossil fuels
 - (3) the use of electricity will eliminate the need for all antipollution laws
 - (4) the use of electricity will increase the manufacture of antipollution devices for cars

S4K7

ANSWER

1

Regents Date

Aug2007

29

Data Base File Number

20

nonrenewable resource

1336. Which practice would most likely deplete a nonrenewable natural resource?
- (1) harvesting trees on a tree farm
 - (2) burning coal to generate electricity in a power plant
 - (3) restricting water usage during a period of water shortage
 - (4) building a dam and a power plant to use water to generate electricity

S4K7

ANSWER

2

Regents Date

Jan2003

33

Data Base File Number

746

nonrenewable resource

S4K7	1337. Many homeowners and businesses are installing solar electric systems. Greater use of solar electric systems benefits the environment because it	Regents Date	Jan2017
			2
		Data Base File Number	
			1267
		ANSWER	2
	(1) depends on the greater use of fossil fuels		
	(2) conserves nonrenewable resources		
	(3) produces gases that cause global warming		
	(4) reduces the need for the ozone shield		

nonrenewable resource

S4K7	1338. In order to reduce consumption of nonrenewable resources, humans could	Regents Date	June2007
			29
		Data Base File Number	
			43
		ANSWER	2
	(1) burn coal to heat houses instead of using oil		
	(2) heat household water with solar radiation		
	(3) increase industrialization		
	(4) use a natural-gas grill to barbecue instead of using charcoal		

nonrenewable resource

S4K7	1339. According to scientists, ocean waves could be a source of energy. Devices are being designed to capture the energy from waves and supply electricity to coastal areas. A direct benefit of utilizing this technology to produce energy would be the	Regents Date	June2017
			3
		Data Base File Number	
			1303
		ANSWER	2
	(1) destruction of habitats near the devices		
	(2) decreased use of nonrenewable resources		
	(3) release of gases needed for photosynthesis		
	(4) increased use of finite resources		

nuclear waste

S4K7	1340. One environmental problem caused by the use of nuclear power as an energy source is the	Regents Date	Jan2011
			23
		Data Base File Number	
			320
		ANSWER	2
	(1) destruction of the ozone shield		
	(2) disposal of wastes		
	(3) production of acid rain		
	(4) accumulation of CO2 in the atmosphere		

nucleus

1341. Within which structure of an animal cell does DNA replication take place?

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

S4K1

ANSWER

3

Regents Date

Jan2012

4

Data Base File Number

392

nucleus

1342. The nucleus of a cell coordinates processes and activities that take place in the cell. Which two systems perform a similar function in the human body?

- (1) nervous and endocrine
- (2) digestive and reproductive
- (3) circulatory and respiratory
- (4) skeletal and muscular

S4K1

ANSWER

1

Regents Date

Jan2013

4

Data Base File Number

621

nucleus

1343. Hereditary information is stored inside the

- (1) ribosomes, which have chromosomes that contain many genes
- (2) ribosomes, which have genes that contain many chromosomes
- (3) nucleus, which has chromosomes that contain many genes
- (4) nucleus, which has genes that contain many chromosomes

S4K2

ANSWER

3

Regents Date

June2006

4

Data Base File Number

502

nutrient recycling

1344. Many homeowners who used to collect, bag, and discard grass clippings are now using mulching lawnmowers, which cut up the clippings into very fine pieces and deposit them on the soil. The use of mulching lawnmowers contributes most directly to

- (1) increasing the diversity of life
- (2) recycling of nutrients
- (3) the control of pathogens
- (4) the production of new species

S4K6

ANSWER

2

Regents Date

Aug2008

29

Data Base File Number

150

nutrient recycling

		Regents Date
		Jan2019
	1345. The fast food industry in the United States buys many russet potatoes from farmers. Therefore, most potato farmers grow russet potatoes. If farmers continue to plant the same crop in the same fields year after year without putting additives into the soil, the end result could be	
S4K7	(1) smaller yields in future years due to the loss of nutrients	25
	(2) larger potatoes because they will adapt to the soil	Data Base File Number
ANSWER	(3) new varieties of potatoes because they will reproduce sexually	
1	(4) genetically engineered potatoes that are resistant to disease	1455

nutrient recycling

		Regents Date
		June2021
	1346. Some environmental engineering companies have recently designed “manufactured wetlands” to serve as natural sewage treatment plants. Utilizing the ability of wetland organisms to reduce human wastes makes use of naturally occurring	
S4K7	(1) nutrient cycles	23
	(2) energy cycles	Data Base File Number
ANSWER	(3) limiting factors	
1	(4) finite resources	1579

organ function

		Regents Date
		Aug2013
	1347. Which structure is correctly paired with its function?	12
S4K4	(1) ovary --- provides milk for newborns	Data Base File Number
	(2) testis --- development of sperm	
ANSWER	(3) placenta --- storage of released eggs	
2	(4) uterus --- produces estrogen	979

organ systems

1348. Which statement best compares a multicellular organism to a single-celled organism?

S4K1

- (1) A multicellular organism has organ systems that interact to carry out life functions, while a single-celled organism carries out life functions without using organ systems.
- (2) A single-celled organism carries out fewer life functions than each cell of a multicellular organism.
- (3) A multicellular organism always obtains energy through a process that is different from that used by a single-celled organism.
- (4) The cell of a single-celled organism is always much larger than an individual cell of a multicellular organism.

Regents Date

Aug2006

6

Data Base File Number

524

ANSWER 1

organ systems

1349. In humans, digestion depends on a variety of organs, such as the stomach, small intestine, and liver. The interactions of these organs provide evidence that

S4K1

- (1) each organ in the human body plays a role in only one life function
- (2) organs in humans work together, resulting in the survival of the individual
- (3) the most important life function in humans is the breaking down of food
- (4) each life function is carried out by at least four different systems in humans

Regents Date

Aug2023

5

Data Base File Number

1707

ANSWER 2

organ systems

1350. Which two organ systems provide materials required for the human body to produce ATP?

S4K1

- (1) reproductive and excretory
- (2) digestive and respiratory
- (3) respiratory and immune
- (4) digestive and reproductive

Regents Date

Jan2005

6

Data Base File Number

546

ANSWER 2

organ systems

		Regents Date June2008
	1351. Humans require organ systems to carry out life processes. Single-celled organisms do not have organ systems and yet they are able to carry out life processes. This is because	
S4K1	(1) human organ systems lack the organelles found in single-celled organisms	4
	(2) a human cell is more efficient than the cell of a single-celled organism	Data Base File Number
ANSWER	(3) it is not necessary for single-celled organisms to maintain homeostasis	
4	(4) organelles present in single-celled organisms act in a manner similar to organ systems	106

organ systems

		Regents Date June2014
	1352. A similarity between humans and many other multicellular animals is that they	
S4K1	(1) occupy the same niche in most food webs	3
	(2) are composed of organ systems	Data Base File Number
ANSWER	(3) have the same DNA sequences	
2	(4) carry out autotrophic nutrition	1036

organ transplant

		Regents Date Aug2022
	1353. A response of a normally functioning immune system that can be harmful is	
S4K5	(1) being infected by the flu virus	6
	(2) rejecting an organ transplant	Data Base File Number
ANSWER	(3) recognizing chemical signals	
2	(4) fighting off a bacterial infection	1630

organ transplant

		Regents Date Aug2023
	1354. Difficulties often occur when tissues or organs are transplanted from one person to another because the	
S4K5	(1) transplanted structures cannot produce new cells	4
	(2) rate of mitosis differs between the two people involved	Data Base File Number
ANSWER	(3) introduction of a foreign substance causes the formation of antibodies	
3	(4) two people often have the same blood type	1706

organ transplant

1355. When a person receives a transplanted organ, many medications are necessary to keep the organ from being rejected. The process of organ rejection is similar to the one involved in

- (1) the growth of cancerous tissue
- (2) an allergic reaction
- (3) a genetic mutation
- (4) the production of an antigen

S4K5

ANSWER 2

Regents Date

Jan2023

7

Data Base File Number

1654

organ transplant

1356. To increase chances for a successful organ transplant, the person receiving the organ should be given special medications. The purpose of these medications is to

- (1) increase the immune response in the person receiving the transplant
- (2) decrease the immune response in the person receiving the transplant
- (3) decrease mutations in the person receiving the transplant
- (4) increase mutations in the person receiving the transplant

S4K5

ANSWER 2

Regents Date

June2008

20

Data Base File Number

118

organ transplant

1357. Base your answer to this question on the information given and on your knowledge of biology. Fungi are interesting organisms that interact with humans in many ways. Yeasts are fungi used in the food industry to produce products such as bread and certain beverages. Some fungi are valuable in medicine. For example, the drug cyclosporine, which is capable of suppressing the response of the immune system to foreign antigens, and the antibiotic penicillin are both products from fungi. Other fungi are less welcomed by humans. The irritation of athlete's foot is caused by a fungus, and a number of allergies are caused by reproductive spores released by fungi. What is the role of a drug like cyclosporine when transplanting organs from one person to another person?

- (1) It stops rejection of the organ.
- (2) It stops the organ from getting an infection.
- (3) It causes an infection of the organ.
- (4) It acts as an allergen.

S4K5

ANSWER 1

Regents Date

June2015

59

Data Base File Number

1145

organ transplant

		Regents Date June2017
	1358. When people receive organ transplants, they often need to take medications that decrease immune responses because	13
S4K5	(1) transplanted organs contain antigens that can trigger white blood cell activity	Data Base File Number
	(2) hormones present in replacement organs prevent the synthesis of antibiotics	
ANSWER	(3) transplanted organs produce their own antibiotics	1311
1	(4) antigens present in these organs attack antibodies already present in the blood	

organelles

		Regents Date Aug2009
	1359. Which structures carry out life functions within cells?	3
S4K1	(1) tissues	Data Base File Number
	(2) organ systems	
ANSWER	(3) organelles	200
3	(4) organs	

organelles

		Regents Date Aug2014
	1360. Which statement best describes the organelles in a cell?	4
S4K1	(1) All organelles are involved directly with communication between cells.	Data Base File Number
	(2) Organelles must work together and their activities must be coordinated.	
ANSWER	(3) Organelles function only when there is a disruption in homeostasis.	1068
2	(4) Each organelle must function independently of the others in order to maintain homeostasis.	

organelles

1361. An ameba is a single-celled organism. It uses its cell membrane to obtain food from its environment, digests the food with the help of organelles called lysosomes, and uses other organelles to process the digested food. From this, we can best infer that

S4K1

- (1) all single-celled organisms have lysosomes to digest food
- (2) amebas are capable of digesting any type of food molecule
- (3) single-celled organisms are as complex as multicellular organisms
- (4) structures in amebas have functions similar to organs in multicellular organisms

Regents Date

Aug2019

7

Data Base File Number

1504

ANSWER

4

organelles

1362. Which sequence best represents the levels of organization in a paramecium, a single-celled organism?

S4K1

- (1) cells -> tissues -> organs -> organ systems -> organism
- (2) organelles -> organ systems -> organism
- (3) cells -> organs -> organ systems -> organism
- (4) organelles -> organism

Regents Date

Jan2019

28

Data Base File Number

1457

ANSWER

4

organelles

Regents Date
Jan2023

1363. Base your answer to this question on the information given and on your knowledge of biology.
--- Lysosomes-Not Just Garbage Disposals ---
Lysosomes are cellular organelles that have the ability to break down large organic compounds or old, worn-out cell organelles. Some of the products that are produced as a result of this breakdown process can be reused as building blocks, while other products are released as wastes from the cell. Recently, studies have shown that lysosomes are more than just garbage disposals. New research has shown that lysosomes have the ability to sense how well-nourished a cell is. If lysosomes detect that there is a lack of nutrients for energy, the organelle prompts the cell to produce more enzymes. These enzymes can break down fat reserves and other cellular materials that could be used as a source of energy. On the other hand, if the cell has an abundance of nutrients, signals are sent from the lysosome that prompt the cell to grow or divide, making more cells. Which of the following life functions can lysosomes carry out?

- (1) homeostasis
- (2) digestion
- (3) diffusion
- (4) ATP production

S4K1

62

Data Base File
Number

1673

ANSWER 2

organelles

Regents Date
June2002
6

1364. In a cell, all organelles work together to carry out

- (1) diffusion
- (2) active transport
- (3) information storage
- (4) metabolic processes

S4K1

Data Base File
Number

838

ANSWER 4

organelles

Regents Date
June2013

1365. In a multicellular organism, organs carry out a variety of life functions. In a single-celled organism, these functions are performed by

- (1) tissues
- (2) organelles
- (3) organ systems
- (4) organs

S4K1

11

Data Base File
Number

950

ANSWER 2

organelles

1366. An ameba, a one-celled organism, can move, ingest, and transport materials within the cell, because it has

- (1) organs
- (2) organelles
- (3) tissues
- (4) systems

S4K1

ANSWER

2

Regents Date

June2016

11

Data Base File Number

1215

organic chemistry

1367. Which molecules are normally found in single-celled organisms?

- (1) organic molecules, only
- (2) inorganic molecules, only
- (3) both organic and inorganic molecules
- (4) neither organic nor inorganic molecules

S4K1

ANSWER

3

Regents Date

Aug2022

7

Data Base File Number

1631

organic chemistry

1368. When organisms break the bonds of organic compounds, the organisms can

- (1) use the smaller molecules to plug the gaps in the cell membrane to slow diffusion
- (2) use the energy obtained to digest molecules produced by respiration that uses oxygen
- (3) obtain energy or reassemble the resulting materials to form different compounds
- (4) excrete smaller amounts of solid waste materials during vigorous exercise

S4K1

ANSWER

3

Regents Date

Jan2005

22

Data Base File Number

559

organic chemistry

1369. Which group consists entirely of organic molecules?

- (1) protein, oxygen, fat
- (2) protein, starch, fat
- (3) water, carbon dioxide, oxygen
- (4) water, starch, protein

S4K1

ANSWER

2

Regents Date

Jan2016

6

Data Base File Number

1183

organic chemistry

S4K5	1370. Organic compounds are used as building blocks for	(1) water, DNA, and starches	(2) water, proteins, and oxygen	(3) proteins, DNA, and carbon dioxide	(4) proteins, starches, and fats	Regents Date
						Jan2018 24
ANSWER	4					Data Base File Number
						1366

organic chemistry

S4K1	1371. Which set of substances are molecular building blocks that directly form some of the complex organic molecules present in humans?	(1) water and oxygen	(2) starch and nitrogen	(3) carbon dioxide and proteins	(4) glucose and amino acids	Regents Date
						Jan2024
ANSWER	4					Data Base File Number
						7
						Data Base File Number
						1733

organic chemistry

S4K5	1372. Proteins, starch, and DNA are similar in that they are all	(1) organic compounds	(2) parts of genes	(3) made of amino acids	(4) made of simple sugars	Regents Date
						June2017 17
ANSWER	1					Data Base File Number
						1314

organism / characteristics

S4K1	1373. Which organisms and set of characteristics are correctly paired?	(1) fungi----carry out photosynthesis and heterotrophic nutrition	(2) plants-----carry out respiration and autotrophic nutrition	(3) decomposers-----carry out photosynthesis and autotrophic nutrition	(4) animals-----carry out autotrophic nutrition and heterotrophic nutrition	Regents Date
						Jan2018
ANSWER	2					Data Base File Number
						1
						Data Base File Number
						1348

organization

1374. Which sequence of terms is in the correct order from simplest to most complex?

- (1) cells → tissues → organs → organ systems
- (2) tissues → organisms → cells → organ systems
- (3) cells → tissues → organ systems → organs
- (4) organs → organisms → organ systems → cells

S4K1

ANSWER 1

Regents Date

Aug2002

4

Data Base File Number

810

organization

1375. Which sequence illustrates the increasing complexity of levels of organization in multicellular organisms?

- (1) organelle → cell → tissue → organ → organ system → organism
- (2) cell → organelle → tissue → organ → organ system → organism
- (3) organelle → tissue → cell → organ → organ system → organism
- (4) cell → organism → organ system → organ → tissue → organelle

S4K1

ANSWER 1

Regents Date

Aug2005

2

Data Base File Number

594

organization

1376. Which sequence represents the correct order of organization in complex organisms?

- (1) tissues → organs → systems → cells
- (2) organs → tissues → systems → cells
- (3) systems → organs → cells → tissues
- (4) cells → tissues → organs → systems

S4K1

ANSWER 4

Regents Date

Jan2007

3

Data Base File Number

48

organization

1377. Which sequence represents the correct order of levels of organization found in a complex organism?

- (1) cells → organelles → organs → organ systems → tissues
- (2) tissues → organs → organ systems → organelles → cells
- (3) organelles → cells → tissues → organs → organ systems
- (4) organs → organ systems → cells → tissues → organelles

S4K1

ANSWER 3

Regents Date

June2003

8

Data Base File Number

758

osmosis

1378. If frog eggs taken from a freshwater pond are placed in a saltwater aquarium, what will most likely happen?

- (1) Water will leave the eggs.
- (2) Salt will leave the eggs.
- (3) Water will neither enter nor leave the eggs.
- (4) The eggs will burst.

Regents Date

Aug2007

68

Data Base File Number

23

LABS

ANSWER

1

osmosis

1379. Which activity can occur without the use of energy?

- (1) contraction of muscle tissue
- (2) protein synthesis in a cell
- (3) active transport of minerals
- (4) movement of water across a membrane

Regents Date

Aug2014

15

Data Base File Number

1077

S4K5

ANSWER

4

osmosis

1380. Which substance can enter a cell by diffusion without having to be digested?

- (1) water
- (2) protein
- (3) starch
- (4) fat

Regents Date

June2012

4

Data Base File Number

422

S4K1

ANSWER

1

ovary

1381. Removal of one ovary from a human female would most likely

- (1) affect the production of eggs
- (2) make fertilization impossible
- (3) make carrying a fetus impossible
- (4) decrease her ability to provide essential nutrients to an embryo

Regents Date

Aug2006

16

Data Base File Number

533

S4K4

ANSWER

1

ovary

1382. The reproductive structure in a female mammal that produces sex cells is the

- (1) ovary
- (2) testes
- (3) uterus
- (4) placenta

Regents Date

Aug2017

28

Data Base File Number

1342

S4K4

ANSWER

1

overpopulation

		Regents Date
		June2011
		27
S4K6	1383. Which organisms directly help to reduce overpopulation in a deer herd?	Data Base File Number
ANSWER	(1) parasites and predators	350
1	(2) parasites and scavengers	
	(3) decomposers and predators	
	(4) decomposers and consumers	

overpopulation

		Regents Date
		June2018
		26
S4K7	1384. Rabbits are not native to Australia. They were imported by European settlers. In 1936, the myxoma virus was introduced into Australia as a means of biological control to infect and reduce the rabbit population. This method of controlling the rabbit population was an attempt to	Data Base File Number
ANSWER	(1) stop the overpopulation of a native species	1398
2	(2) stop the overproduction of an introduced species	
	(3) limit the food sources of the rabbit	
	(4) limit the number of rabbits brought into the country	

oxygen concentration

		Regents Date
		Aug2013
		20
S4K5	1385. Which two processes are responsible for keeping the percentage of atmospheric oxygen at relatively constant levels?	Data Base File Number
ANSWER	(1) circulation and coordination	985
3	(2) respiration and coordination	
	(3) respiration and photosynthesis	
	(4) photosynthesis and circulation	

ozone

		Regents Date
		Aug2011
		25
S4K7	1386. The release of products of combustion into the air often causes the formation of ozone near the surface of Earth. This ground-level ozone damages plants and affects their ability to absorb carbon dioxide. The doubling of ground level ozone since 1850 is most likely due to	Data Base File Number
ANSWER	(1) the chemical composition of the upper atmosphere	375
2	(2) emissions from vehicles and industrial processes	
	(3) the extinction of certain animal species	
	(4) a greater use of nuclear fuel	

ozone

- 1387.** Continued depletion of the ozone layer will most likely result in
- (1) an increase in skin cancer among humans
 - (2) a decrease in atmospheric pollutants
 - (3) an increase in marine ecosystem stability
 - (4) a decrease in climatic changes

Regents Date
Jan2006
28
Data Base File Number
494

S4K7

ANSWER 1

ozone

- 1388.** Damage to the ozone shield over the United States is likely to cause
- (1) increased warming of local ecosystems
 - (2) increased exposure to ultraviolet light
 - (3) reduction in the pH of acid precipitation
 - (4) reduction in the frequency of floods and droughts

Regents Date
Jan2014
29
Data Base File Number
1021

S4K7

ANSWER 2

ozone

- 1389.** At one point, scientists observed that the ozone shield was getting thinner. They warned that the loss of the effectiveness of this shield may lead to an increase in
- (1) allergies to ozone
 - (2) mutations that lead to cancer
 - (3) viral diseases, such as AIDS
 - (4) ice formation at the poles

Regents Date
June2016
27
Data Base File Number
1230

S4K7

ANSWER 2

ozone

- 1390.** Melanoma is a type of skin cancer that can spread to vital organs in the body. Doctors believe that exposure to ultraviolet (UV) radiation from the Sun is a leading cause of melanoma. One practical way governments can help prevent the harmful effects of UV radiation is to
- (1) require everyone to remain indoors during daylight hours
 - (2) regulate the production and release of gases that damage the ozone shield
 - (3) encourage the building of a greater number of cancer treatment centers
 - (4) prohibit the use of solar panels on homes and businesses

Regents Date
June2019
7
Data Base File Number
1473

S4K7

ANSWER 2

paper chromatography

LAB1

ANSWER 3

1391. Which technique could be used to separate pigments from a mixture?
- (1) preparing a wet-mount slide
 - (2) staining
 - (3) paper chromatography
 - (4) dissection

Regents Date

Aug2014

75

Data Base File Number

1093

paper chromatography

LAB1

ANSWER 2

1392. Paper chromatography is a method used in
- (1) comparing the shapes of plant leaves
 - (2) separating mixtures of plant pigments
 - (3) comparing habitats of different plants
 - (4) separating individual DNA fragments of plants

Regents Date

Jan2017

74

Data Base File Number

1299

paper chromatography

LAB1

ANSWER 3

1393. Base your answer to this question on the information given and on your knowledge of biology. A forensic scientist is trying to determine if the plant pieces found on a burglary suspect match the plants found outside a home that was robbed. The suspect had plant pieces in the hood of his jacket as well as green stains on the knees of his jeans. In order to compare the composition of the pigments on the suspect's jeans to the pigments of the plants at the home, the forensic scientist should use
- (1) restriction enzymes
 - (2) genetic engineering
 - (3) paper chromatography
 - (4) receptor molecules

Regents Date

Jan2020

75

Data Base File Number

1559

paper chromatography

LABS

ANSWER 1

1394. Paper chromatography is a laboratory technique that is used to
- (1) separate different molecules from one another
 - (2) stain cell organelles
 - (3) indicate the pH of a substance
 - (4) compare relative cell sizes

Regents Date

June2008

69

Data Base File Number

129

paper chromatography

LAB1

ANSWER

1

1395. Which group of materials would be most useful to a student planning to separate a mixture of leaf pigments using paper chromatography?

- (1) filter paper, dropper, solvent, beaker
- (2) enzymes, beaker, goggles, compound microscope
- (3) compound microscope, filter paper, coverslip, glass slide
- (4) meterstick, thermometer, solvent, enzymes

Regents Date

June2019

73

Data Base File Number

1493

parasite / decomposer

S4K6

ANSWER

3

1396. A certain fungus can be harmful when it infects the outermost layers of the human foot, while another type of fungus can be beneficial when it recycles nutrients by breaking down dead organisms. Which terms identify these two roles of fungi?

- (1) producer, prey
- (2) host, autotroph
- (3) parasite, decomposer
- (4) herbivore, predator

Regents Date

Aug2012

24

Data Base File Number

464

parasite / host

S4K5

ANSWER

3

1397. The relationship that exists when athlete's foot fungus grows on a human is an example of

- (1) predator/prey
- (2) producer/consumer
- (3) parasite/host
- (4) decomposer/autotroph

Regents Date

Aug2009

23

Data Base File Number

218

parasite / host

S4K5

ANSWER

3

1398. Deer ticks are responsible for spreading Lyme disease. This organism, which feeds on the blood of warm-blooded organisms like mice, deer, and humans, is best described as a

- (1) predator
- (2) scavenger
- (3) parasite
- (4) host

Regents Date

Aug2013

25

Data Base File Number

990

parasite / host

1399. When handling cat litter, humans can potentially be exposed to a harmful single-celled protozoan. Its primary host is the common domestic cat, but it can also live in humans. This protozoan is an example of a

- (1) predator
- (2) producer
- (3) parasite
- (4) scavenger

S4K6

ANSWER 3

Regents Date

Aug2019

3

Data Base File Number

1500

parasite / host

1400. The presence of parasites in an animal will usually result in

- (1) an increase in meiotic activity within structures of the host
- (2) the inability of the host to maintain homeostasis
- (3) the death of the host organism within twenty-four hours
- (4) an increase in genetic mutation rate in the host organism

S4K5

ANSWER 2

Regents Date

Jan2003

25

Data Base File Number

739

parasite / host

1401. Puppies are often given medicine to eliminate roundworms from their intestines. These worms consume some of the food the puppies have digested. The worms and the puppies represent a relationship known as

- (1) predator-prey
- (2) consumer-producer
- (3) parasite-host
- (4) autotroph-heterotroph

S4K6

ANSWER 3

Regents Date

Jan2012

35

Data Base File Number

416

parasite / host

1402. "Rafflesia arnoldii" is a bright red and yellow flowering plant that has no leaves, roots, or stems. Rafflesia do not carry out photosynthesis. They take nutrients from the cells of grapevines. "Rafflesia arnoldii" is an example of a

- (1) producer
- (2) omnivore
- (3) carnivore
- (4) parasite

S4K6

ANSWER 4

Regents Date

Jan2017

23

Data Base File Number

1284

parasite / host

1403. Mistletoe is a plant that lives on the branches of trees. The mistletoe plant sends its roots in through the bark of trees and takes away water and minerals that the tree needs. In this situation, the mistletoe plant is

- (1) a parasite
- (2) a predator
- (3) a decomposer
- (4) an autotroph

S4K6

ANSWER 1

Regents Date

Jan2019

12

Data Base File Number

1445

parasite / host

1404. Dodder plants consist of tangled masses of yellow, leafless vines and contain few chloroplasts. The vines twist around and grow into the stems of other plants and absorb water and nutrients from them. Which statement best describes this relationship?

- (1) Dodder plants are parasitic, relying on host organisms for resources.
- (2) Dodder plants are decomposers, returning organic material back to the environment.
- (3) Dodder plants are producers, while the other plants that they attach to are consumers.
- (4) Dodder plants are consumers, transferring energy to other plants in the ecosystem.

S4K6

ANSWER 1

Regents Date

Jan2020

9

Data Base File Number

1537

parasite / host

1405. Dodder is a creeping vine that is parasitic on other plants. Which characteristic does dodder share with all other heterotrophs?

- (1) It produces nutrients by photosynthesis.
- (2) It must grow in bright locations.
- (3) It consumes preformed organic molecules.
- (4) It remains in one place for its entire life.

S4K1

ANSWER 3

Regents Date

June2003

40

Data Base File Number

779

parasite / host

1406. Dodder, a plant with no chlorophyll, grows on a living plant of a different species from which it obtains nutrients. Which pair of terms describes this relationship?

- (1) parasite and host
- (2) predator and prey
- (3) producer and decomposer
- (4) consumer and scavenger

S4K6

ANSWER 1

Regents Date

June2016

25

Data Base File Number

1228

parasite / host

1407. Ringworm is a skin infection common among school-aged children. Although the name suggests that a worm causes the disease, it is actually caused by a fungus that lives and feeds on the dead outer layer of the skin. The relationship between ringworm and humans can be described as

- (1) predator/prey
- (2) predator/host
- (3) parasite/prey
- (4) parasite/host

S4K6

ANSWER

4

Regents Date

June2021

26

Data Base File Number

1582

pathogens

1408. Which statement best describes why pathogens are harmful?

- (1) All of the cells of an organism infected by pathogens become pathogens.
- (2) Pathogens cannot be controlled once they enter the cells of an organism.
- (3) Pathogens produce antibodies that will kill the host organism.
- (4) Pathogens can interfere with normal life functions.

S4K5

ANSWER

4

Regents Date

Aug2013

17

Data Base File Number

982

pathogens

1409. Microbes that enter the body, causing disease, are known as

- (1) pathogens
- (2) antibodies
- (3) enzymes
- (4) hosts

S4K5

ANSWER

1

Regents Date

June2002

23

Data Base File Number

848

pathogens

1410. "Salmonella" bacteria can cause humans to have stomach cramps, vomiting, diarrhea, and fever. The effect these bacteria have on humans indicates that Salmonella bacteria are

- (1) predators
- (2) pathogenic organisms
- (3) parasitic fungi
- (4) decomposers

S4K5

ANSWER

2

Regents Date

June2009

19

Data Base File Number

189

pH / blood

1411. The body's inability to regulate blood pH could affect

- (1) enzymes that function within the circulatory system
- (2) red blood cells' ability to fight infections
- (3) white blood cells' ability to carry oxygen to the body
- (4) DNA that controls starch digestion in the circulatory system

S4K5

ANSWER

1

Regents Date

**Jan2024
23**

**Data Base File
Number**

1737

pH / blood

1412. The failure to regulate the pH of the blood can affect the activity of

- (1) enzymes that clot blood
- (2) red blood cells that make antibodies
- (3) chlorophyll that carries oxygen in the blood
- (4) DNA that controls starch digestion in the blood

S4K5

ANSWER

1

Regents Date

June2010

20

**Data Base File
Number**

268

pH / blood

1413. One effect of uncontrolled diabetes is that the blood might develop an acidic pH. As a result, cells may not be able to regulate their internal pH. Within these cells, this could cause a disruption of the function of biological catalysts known as

- (1) enzymes
- (2) toxins
- (3) antibodies
- (4) antigens

S4K5

ANSWER

1

Regents Date

June2014

19

**Data Base File
Number**

1050

phages

Regents Date

June2018

1414. Base your answer to this question on the information given and on your knowledge of biology.
Harmless Skin Virus Fights Acne
"Acne is caused when hair follicles become blocked with an oily substance called sebum, which the body makes to stop the hair and skin from drying out. Normally harmless bacteria, such as "Propionibacterium acnes", that live on the skin can then contaminate and infect the plugged follicles.
Phages [a type of virus] appear to help counteract this. When the scientists sequenced the DNA coding of the phages, they discovered that, as well as sharing most of their genetic material, the viruses all had some key features in common. All carry a gene that makes a protein called endolysin - an enzyme thought to destroy bacteria by breaking down their cell walls. And unlike antibiotics, which kill many types of bacteria, including "good" ones that live in our gut, phages are programmed to target only specific bacteria...
Source: BBC News ---- September 25, 2012.----- This treatment for acne, using phages, is effective because phages

S4K5

- (1) produce antibodies to clean out clogged pores and hair follicles
- (2) eliminate bacteria by attacking specific cell structures
- (3) carry genes and infect follicles
- (4) attack every known type of bacteria

38

Data Base File
Number

1405

ANSWER

2

photosynthesis

Regents Date

Aug2003

1415. Which process is directly used by autotrophs to store energy in glucose?
- (1) diffusion
 - (2) photosynthesis
 - (3) respiration
 - (4) active transport

S4K5

26

Data Base File
Number

798

ANSWER

2

photosynthesis

1416. Base your answer to this question on the information given and on your knowledge of biology. "Carbon exists in a simple organic molecule in a leaf and in an inorganic molecule in the air humans exhale." What is the simple organic molecule formed in the leaf and the process that produces it?

- (1) glucose produced by photosynthesis
- (2) glucose produced by respiration
- (3) glucose produced by mitochondria
- (4) glucose produced by digestion

S4K5

ANSWER

1

Regents Date

Aug2004

57

Data Base File Number

724

photosynthesis

1417. An enzyme known as rubisco enables plants to use large amounts of carbon dioxide. This enzyme is most likely active in the

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

S4K5

ANSWER

4

Regents Date

Aug2006

18

Data Base File Number

535

photosynthesis

1418. Much of the carbon dioxide produced by green plants is NOT excreted as a metabolic waste because it

- (1) can be used for photosynthesis
- (2) is too large to pass through cell membranes
- (3) is needed for cellular respiration
- (4) can be used for the synthesis of proteins

S4K6

ANSWER

1

Regents Date

Aug2008

14

Data Base File Number

142

photosynthesis

1419. Some green plants secrete acids that dissolve rock, which makes it possible for the plants to absorb phosphorus needed for healthy plant growth. In addition to phosphorus, plants require many other substances. Which substances are required for the production of carbohydrates in green plants?

- (1) oxygen and nitrogen
- (2) carbon and glucose
- (3) carbon dioxide and water
- (4) hydrogen and starch

S4K5

ANSWER

3

Regents Date

Aug2024

10

Data Base File Number

1792

photosynthesis

1420. The mass of some corn plants at the end of their growth period was 6 tons per acre. Most of this mass was produced from

- (1) water and organic compounds absorbed from the soil
- (2) minerals from the soil and oxygen from the air
- (3) minerals and organic materials absorbed from the soil
- (4) water from the soil and carbon dioxide from the air

S4K5

ANSWER

4

Regents Date

Jan2002

26

Data Base File Number

873

photosynthesis

1421. An iodine test of a tomato plant leaf revealed that starch was present at 5:00 p.m. on a sunny afternoon in July. When a similar leaf from the same tomato plant was tested with iodine at 6:00 a.m. the next morning, the test indicated that less starch was present. This reduction in starch content most likely occurred because starch was

- (1) changed directly into proteins
- (2) transported out of the leaves through the guard cells
- (3) transported downward toward the roots through tubes
- (4) changed into simple sugars

S4K1

ANSWER

4

Regents Date

Jan2002

2

Data Base File Number

857

photosynthesis

1422. Leaves of green plants contain openings known as stomates, which are opened and closed by specialized cells allowing for gas exchange between the leaf and the outside environment. Which phrase best represents the net flow of gases involved in photosynthesis into and out of the leaf through these openings on a sunny day?

- (1) carbon dioxide moves in; oxygen moves out
- (2) carbon dioxide and oxygen move in; ozone moves out
- (3) oxygen moves in; nitrogen moves out
- (4) water and ozone move in; carbon dioxide moves out

S4K5

ANSWER

1

Regents Date

Jan2004

24

Data Base File Number

661

photosynthesis

1423. Plants in areas with short growing seasons often have more chloroplasts in their cells than plants in areas with longer growing seasons. Compared to plants in areas with longer growing seasons, plants in areas with shorter growing seasons most likely

- (1) make and store food more quickly
- (2) have a higher rate of protein metabolism
- (3) grow taller
- (4) have a different method of respiration

S4K5

ANSWER 1

Regents Date

Jan2005

18

Data Base File Number

556

photosynthesis

1424. A five-year study was carried out on a population of algae in a lake. The study found that the algae population was steadily decreasing in size. Over the five-year period this decrease most likely led to

- (1) a decrease in the amount of nitrogen released into the atmosphere
- (2) an increase in the amount of oxygen present in the lake
- (3) an increase in the amount of water vapor present in the atmosphere
- (4) a decrease in the amount of oxygen released into the lake

S4K5

ANSWER 4

Regents Date

Jan2008

28

Data Base File Number

93

photosynthesis

1425. Millions of acres of tropical rain forest are being destroyed each year. Which change would most likely occur over time if the burning and clearing of these forests were stopped?

- (1) an increase in the amount of atmospheric pollution produced
- (2) a decrease in the source of new medicines
- (3) an increase in the amount of oxygen released into the atmosphere
- (4) a decrease in the number of species

S4K5

ANSWER 3

Regents Date

Jan2009

25

Data Base File Number

170

photosynthesis

S4K5

ANSWER

3

1426. Certain organisms are able to store energy from the Sun in energy-rich compounds. Which event best illustrates this activity?

- (1) A fox captures and eats a young rabbit.
- (2) A caterpillar is eaten by a blackbird.
- (3) Lettuce produces organic substances.
- (4) Bacteria change organic material into simple nutrients.

Regents Date

Jan2011

3

Data Base File Number

308

photosynthesis

S4K1

ANSWER

3

1427. Plant cells can synthesize energy-rich organic molecules, and later break them down to extract that energy for performing life processes. These activities require direct interaction between the

- (1) chloroplasts and vacuoles
- (2) cell walls and ribosomes
- (3) chloroplasts and mitochondria
- (4) ribosomes and mitochondria

Regents Date

Jan2012

6

Data Base File Number

394

photosynthesis

S4K5

ANSWER

1

1428. Which process will result in a gain of energy in an ecosystem?

- (1) photosynthesis in algae cells
- (2) digestion in hummingbirds
- (3) ATP synthesis in fungi
- (4) respiration in maple tree cells

Regents Date

Jan2014

10

Data Base File Number

1006

photosynthesis

S4K5

ANSWER

3

1429. Which process uses energy to combine inorganic molecules to synthesize organic molecules?

- (1) respiration
- (2) digestion
- (3) photosynthesis
- (4) decomposition

Regents Date

Jan2015

27

Data Base File Number

1111

photosynthesis

1430. A cell in the leaf of a corn plant contains more chloroplasts than a cell in the stem of a corn plant. Based on this observation, it can be inferred that, when compared to the cell in the stem, the cell in the leaf

- (1) synthesizes more sugar
- (2) has a higher chromosome count
- (3) produces fewer proteins
- (4) uses less carbon dioxide

S4K5

ANSWER 1

Regents Date

Jan2017

3

Data Base File Number

1268

photosynthesis

1431. In the 1660s, Flemish physician Jan van Helmont grew a small willow tree in a pot of soil. He added only water to the pot. At the end of five years, he found that the tree had gained 75 kilograms, but there was very little change in the mass of the soil. Van Helmont concluded that the plant gained weight directly from the water. We now know that this conclusion is only partially correct because, in addition to water, photosynthesis also requires

- (1) oxygen from the atmosphere
- (2) carbon dioxide from the atmosphere
- (3) proteins from animal prey
- (4) carbohydrates from the soil

S4K5

ANSWER 2

Regents Date

Jan2020

41

Data Base File Number

1556

photosynthesis

1432. Eating a sweet potato provides energy for human metabolic processes. The original source of this energy is the energy

- (1) in protein molecules stored within the potato
- (2) from starch molecules absorbed by the potato plant
- (3) made available by photosynthesis
- (4) in vitamins and minerals found in the soil

S4K5

ANSWER 3

Regents Date

June2001

25

Data Base File Number

904

photosynthesis

Regents Date

June2008

1433. A student performed an experiment to demonstrate that a plant needs chlorophyll for photosynthesis. He used plants that had green leaves with white areas. After exposing the plants to sunlight, he removed a leaf from each plant and processed the leaves to remove the chlorophyll. He then tested each leaf for the presence of starch. Starch was found in the area of the leaf that was green, and no starch was found in the area of the leaf that was white. He concluded that chlorophyll is necessary for photosynthesis. Which statement represents an assumption the student had to make in order to draw this conclusion?

S1K2

- (1) Starch is synthesized from the glucose produced in the green areas of the leaf.
- (2) Starch is converted to chlorophyll in the green areas of the leaf.
- (3) The white areas of the leaf do not have cells
- (4) The green areas of the leaf are heterotrophic

34

Data Base File Number

127

ANSWER

1

photosynthesis

Regents Date

June2009
21

1434. In the leaf of a plant, guard cells help to

- (1) destroy atmospheric pollutants when they enter the plant
- (2) regulate oxygen and carbon dioxide levels
- (3) transport excess glucose to the roots
- (4) block harmful ultraviolet rays that can disrupt chlorophyll production

S4K5

Data Base File Number

191

ANSWER

2

photosynthesis

Regents Date

June2012

1435. During the process of photosynthesis, energy from the Sun is converted into

- (1) chemical energy in the bonds of inorganic molecules
- (2) chemical energy in the bonds of organic molecules
- (3) enzymes used to produce inorganic molecules
- (4) enzymes used to produce organic molecules

S4K5

Data Base File Number

431

ANSWER

2

photosynthesis

1436. The cells of some organisms contain both chloroplasts and mitochondria. Which statement describes what would happen in these cells if they were moved from a light environment to a dark one?

S4K5

- (1) The amount of oxygen present would decrease and the amount of carbon dioxide would increase
- (2) The amount of glucose present would increase and ATP would no longer be available.
- (3) The amount of carbon dioxide present would decrease and ATP would continue to be synthesized.
- (4) The amount of oxygen present would increase and the amount of glucose available would decrease.

Regents Date
June2014

36

Data Base File
Number

1061

ANSWER

1

placenta

1437. The structure that makes nutrients most directly available to a human embryo is the

S4K4

- (1) gamete
- (2) ovary
- (3) stomach
- (4) placenta

Regents Date
Aug2003

15

Data Base File
Number

790

ANSWER

4

placenta

1438. Toxins can harm a developing fetus. They usually enter the fetus by the process of

S4K4

- (1) blood flow from the mother to the fetus
- (2) active transport from the ovary
- (3) diffusion across placental membranes
- (4) recombination of genes from the fetus and mother

Regents Date
Aug2005

18

Data Base File
Number

607

ANSWER

3

placenta

1439. Which substance usually passes in the greatest amount through the placenta from the blood of the fetus to the blood of the mother?

S4K4

- (1) oxygen
- (2) carbon dioxide
- (3) amino acids
- (4) glucose

Regents Date
Aug2006

17

Data Base File
Number

534

ANSWER

2

placenta

1440. Which statement describes one function of the placenta in mammals?

- (1) It allows blood of the mother to mix with the blood of the fetus.
- (2) It contains fluid that protects the embryo from harm.
- (3) It removes waste products that are produced in the cells of the fetus,
- (4) It synthesizes food for the embryo.

Regents Date

Aug2007

6

Data Base File Number

5

S4K4

ANSWER

3

placenta

1441. Hammerhead sharks are unlike most other shark species. Nearly all shark species either lay eggs or give birth to live young after their eggs hatch internally. Hammerhead sharks form a placenta, a structure more commonly found in mammals, such as humans. One role of the placenta in the development of offspring is normally to

- (1) produce blood cells
- (2) provide milk
- (3) produce gametes
- (4) transfer nutrients

Regents Date

Aug2022

8

Data Base File Number

1632

S4K4

ANSWER

4

placenta

1442. German measles is a disease that can harm an embryo if the mother is infected in the early stages of pregnancy because the virus that causes German measles is able to

- (1) be absorbed by the embryo from the mother's milk
- (2) be transported to the embryo in red blood cells
- (3) pass across the placenta
- (4) infect the eggs

Regents Date

Jan2009

17

Data Base File Number

164

S4K4

ANSWER

3

placenta

1443. Which structure is correctly paired with its function?

- (1) testis -- produces nutrients for the offspring
- (2) placenta -- allows nutrients to diffuse from the mother to the embryo
- (3) uterus -- produces testosterone used in egg production
- (4) ovary -- provides a place for the internal development of the embryo

Regents Date

Jan2010

19

Data Base File Number

241

S4K4

ANSWER

2

placenta

1444. A pathogen passing from a mother to her fetus could cause
- (1) a decrease in the chromosome number of the fetus
 - (2) an increase in milk production in the mother
 - (3) gamete production to increase
 - (4) an infection in the fetus

Regents Date

Jan2011

21

Data Base File Number

319

S4K4

ANSWER

4

placenta

1445. In most mammals, the placenta is essential to the embryo for the processes of
- (1) meiosis and excretion
 - (2) nutrition and excretion
 - (3) milk production and digestion
 - (4) blood exchange and digestion

Regents Date

Jan2011

18

Data Base File Number

317

S4K4

ANSWER

2

placenta

1446. Base your answer to this question on the information given and on your knowledge of biology.
- The Critical Role of the Placenta
- The proper functioning of the placenta is critical to the growth and development of a healthy fetus. For example, the placenta appears to act as a nutrient sensor. It regulates the amounts and types of nutrients that are transported from the mother to the fetus. Improper functioning of the placenta can alter the structure and function of specific cells and organ systems in the developing fetus, putting it at risk for health problems as an adult. For example, in some pregnancies, the placenta develops a resistance to blood flow. This resistance appears to force the heart of the fetus to work harder. This could result in an increased chance of the individual developing heart disease as an adult. A group of hormones known as glucocorticoids affects the development of all the tissues and organ systems. One of the things this group of hormones does is to alter cell function by changing the structure of cell membrane receptors. What controls the passage of chemicals through the placenta?
- (1) concentration of chemicals, only
 - (2) presence of ATP, only
 - (3) permeability of the placenta
 - (4) passage of red blood cells through membranes

Regents Date

Jan2014

64

Data Base File Number

1029

S4K4

ANSWER

3

placenta

S4K4	1447. Damage to which structure would directly interfere with the nutritional needs of a developing embryo?	<ul style="list-style-type: none">(1) ovary(2) testes(3) lungs(4) placenta	Regents Date
			Jan2024
ANSWER	4		Data Base File Number
			1736

placenta

S4K4	1448. Which process normally occurs at the placenta?	<ul style="list-style-type: none">(1) Oxygen diffuses from fetal blood to maternal blood.(2) Materials are exchanged between fetal and maternal blood.(3) Maternal blood is converted into fetal blood.(4) Digestive enzymes pass from maternal blood to fetal blood.	Regents Date
			June2003 23
ANSWER	2		Data Base File Number
			767

placenta

S4K4	1449. One function of the placenta in a human is to	<ul style="list-style-type: none">(1) surround the embryo and protect it from shock(2) allow for mixing of maternal blood with fetal blood(3) act as the heart of the fetus, pumping blood until the fetus is born(4) permit passage of nutrients and oxygen from the mother to the fetus	Regents Date
			June2004 16
ANSWER	4		Data Base File Number
			684

placenta

S4K4	1450. The human female reproductive system is adapted for	<ul style="list-style-type: none">(1) production of zygotes in ovaries(2) external fertilization of gametes(3) production of milk for a developing embryo(4) transport of oxygen through a placenta to a fetus	Regents Date
			June2007 17
ANSWER	4		Data Base File Number
			37

placenta

1451. Essential materials needed for development are transported to a human fetus through the

- (1) reproductive hormones
- (2) egg cell
- (3) placenta
- (4) ovaries

S4K4

ANSWER

3

Regents Date

June2010

19

Data Base File Number

267

placenta

1452. The major function of the placenta is to

- (1) cushion the fetus so it won't be hurt when the mother moves
- (2) exchange food, oxygen, and waste between mother and fetus
- (3) store food for the fetus
- (4) support the egg for the process of fertilization

S4K4

ANSWER

2

Regents Date

June2012

19

Data Base File Number

430

placenta

1453. Occasionally, during pregnancy, the placenta can separate from the uterus. This causes a disruption in development and sometimes death of the fetus. Harm to the developing fetus might occur because the placenta

- (1) transfers oxygen and nutrients to the fetal blood
- (2) sends maternal blood into the fetus
- (3) supplies milk for the fetus
- (4) breaks down wastes of the fetus

S4K4

ANSWER

1

Regents Date

June2015

4

Data Base File Number

1125

placenta

1454. In humans, the placenta is essential to the embryo for

- (1) nutrition, excretion, and reproduction
- (2) respiration, nutrition, and excretion
- (3) movement, reproduction, and nutrition
- (4) coordination, movement, and growth

S4K4

ANSWER

2

Regents Date

June2016

12

Data Base File Number

1216

placenta

1455. Placenta previa is a medical condition that occurs in some pregnant women. Women with this condition are often placed on bed rest, which prohibits them from any strenuous activity that may cause the blood vessels in the placenta to rupture. If not diagnosed, placenta previa can be a very dangerous condition because the placenta is
- (1) the primary source of oxygen for the mother
 - (2) where the fetus obtains milk from the mother
 - (3) where nutrients and wastes are exchanged
 - (4) the primary source of estrogen and progesterone in the mother

S4K4

ANSWER

3

Regents Date

June2019

4

Data Base File Number

1470

placenta

1456. Which statement best describes a critical function of the placenta?
- (1) Meiosis occurs in the placenta, allowing for the development and release of eggs.
 - (2) Blood from the mother and fetus mixes at the placenta, providing nutrients and oxygen.
 - (3) The placenta filters out all harmful toxins and chemicals from the mother's blood, so that they cannot reach the fetus.
 - (4) The exchange of oxygen and carbon dioxide occurs between the mother and developing fetus across the placenta.

S4K4

ANSWER

4

Regents Date

June2024

12

Data Base File Number

1765

plasmolysis

1457. Base your answer to this question on the information given and on your knowledge of biology. One of the effects of Hurricane Katrina, which devastated New Orleans in 2005, was the death of almost all of the plants in flooded areas. Initially, toxic chemicals and bacteria were suspected as a possible cause. Scientists later determined that the salt concentration in the floodwater caused the plants to die. The death of the plants was most likely due to
- (1) water moving into plant cells from the surrounding environment
 - (2) water moving out of plant cells into the surrounding environment
 - (3) both water and salt moving from plant cells into the surrounding environment
 - (4) both water and salt moving into plant cells from the surrounding environment

LAB5

ANSWER

2

Regents Date

Jan2014

76

Data Base File Number

1033

pollination

	1458.	A farmer planted two corn varieties, one of which was very tasty but had small ears, and the other one had large ears but did not taste nearly as good. The pollen from one variety was used to fertilize the other variety of corn. State one biological advantage this method of reproduction has over cloning.	Regents Date Jan2014
S4K4	(1)	This method can create identical species.	67
	(2)	This method can create mutations.	Data Base File Number
ANSWER	(3)	This method can create new varieties.	1030
3	(4)	This method can help bees pollinate the corn	

pollution / air

	1459.	Windmills that generate electricity are being built in coastal areas. The main benefit of these windmills is that they	Regents Date Aug2013
S4K7	(1)	produce finite resources	30
	(2)	reduce dependency on fuels that cause air pollution	Data Base File Number
ANSWER	(3)	absorb the noise of passing boats	995
2	(4)	maintain the salt concentration in the ocean	

pollution / air

	1460.	Increased production of goods makes our lives more comfortable, but causes an increase in the demand for energy and other resources. One NEGATIVE impact of this situation on ecosystems is an increase in	Regents Date Jan2005
S4K7	(1)	living space for wildlife	29
	(2)	renewable resources	Data Base File Number
ANSWER	(3)	the diversity of plant species	562
4	(4)	pollution levels in the atmosphere	

pollution / air

	1461.	A change in the acidity of mountain lakes would most likely be a result of	Regents Date Jan2006
S4K7	(1)	ecological succession of the area at the top of the mountain	29
	(2)	the introduction of new species into the lakes	Data Base File Number
ANSWER	(3)	air pollution from smoke stacks miles away	495
3	(4)	planting grasses and shrubs around the lakes	

pollution / air

S4K7	1462. A new type of fuel gives off excessive amounts of smoke. Before this type of fuel is widely used, an ecologist would most likely want to know	Regents Date	June2001
			35
		Data Base File Number	
			912
ANSWER	1		

pollution / water

S4K7	1463. Water pollution as a result of fertilizer runoff from farms is harmful because it initially	Regents Date	Jan2016
			29
		Data Base File Number	
			1200
ANSWER	1		

pollution / water

S4K7	1464. A major environmental concern in urban areas is pollution produced by automobiles. Fluids, such as oil and gasoline, may leak out of vehicles and end up in lakes, streams, and rivers. One reason why scientists are concerned about this type of pollution is that	Regents Date	Jan2023
			16
		Data Base File Number	
			1661
ANSWER	1		

population

S4K2	1465. After a rabbit population reaches the carrying capacity of its habitat, the population of rabbits will most likely	Regents Date
		Jan2007
ANSWER	3	7
		Data Base File Number
		51

- (1) decrease, only
- (2) increase, only
- (3) alternately increase and decrease
- (4) remain unchanged

population

S4K7	1466. In one town, some people support a proposal to build a shopping mall on a large, undeveloped lot, because it would increase business and create new jobs. As a trade-off, the shopping mall would cause a decrease in the	Regents Date
		June2015
ANSWER	4	19
		Data Base File Number
		1137

- (1) amount of air pollution
- (2) volume of garbage and litter
- (3) amount of wastewater entering the local sewage system
- (4) variety of wildlife populations in the area

population / carrying capacity

S4K6	1467. Powassan is a rare, tick-borne virus that is found in areas near the Great Lakes and the northeastern United States. The tick is not affected by the virus, but humans bitten by a tick carrying the virus will develop a serious illness. The risk of getting the Powassan virus is greatest in June and July. This information supports the concept that	Regents Date
		Aug2023
ANSWER	3	17
		Data Base File Number
		1715

- (1) all viruses around the Great Lakes are spread by infected ticks
- (2) this virus is harmful to all living organisms that it infects
- (3) relationships between organisms may be negative, neutral, or positive
- (4) time of year, alone, determines if infection with the Powassan virus is possible

population / carrying capacity

		1468.	Which statement most accurately describes the expected effect on the carrying capacity of a population if a change in a factor occurs?	Regents Date Aug2023
S4K6		(1)	The number of snowshoe hares would increase if the population of Canadian lynx, a predator, also increased.	16
		(2)	The population of green algae would increase if chemical weed killers used on lawns entered the lake.	Data Base File Number
ANSWER	4	(3)	The grass population would decrease if the foxes ate many rabbits.	1714
		(4)	The population of Kaibab deer in Arizona would decrease if they overgrazed the plants.	

population / carrying capacity

		1469.	As a population of organisms within a forest ecosystem increases, the size of the population is eventually limited by	Regents Date Aug2023
S4K1		(1)	the overproduction of their food supply	13
		(2)	the size of similar populations in a nearby ecosystem	Data Base File Number
ANSWER	3	(3)	a finite supply of water and nutrients	1712
		(4)	a lack of competition	

population / environment

		1470.	Duckweed is a small plant that grows on the surface of still bodies of water. Over a nine-week period, scientists monitored the growth of duckweed in three ditches located on the same farm. The number of duckweed plants increased rapidly during weeks one and two. After two weeks, each ditch was completely covered with a layer of duckweed and remained covered for the remaining seven weeks. A valid conclusion based on the data collected over this nine-week study is that	Regents Date Aug2024
S4K2		(1)	animals that eat duckweed have the greatest effect on duckweed population size	8
		(2)	duckweed populations die off after completing a two-week life cycle in the ditch	Data Base File Number
ANSWER	4	(3)	only changes in temperature affect duckweed population size	1790
		(4)	the size of the duckweed population is kept stable by limited resources in the ditch	

population / environment

S4K6	ANSWER 4	1471. The size of plant populations can be influenced by the	Regents Date
		(1) molecular structure of available oxygen	June2009
		(2) size of the cells of decomposers	23
		(3) number of chemical bonds in a glucose molecule	Data Base File Number
		(4) type of minerals present in the soil	192

population / environment

S4K6	ANSWER 2	1472. Many animal populations living in a particular area would most likely	Regents Date
		(1) occupy the same niche	June2023
		(2) have similar physical requirements	6
		(3) eat the same food	Data Base File Number
		(4) require an input of solar energy	1679

population growth

S4K7	ANSWER 2	1473. Which long-term change could directly cause the other three?	Regents Date
		(1) pollution of air and water	Aug2005
		(2) increasing human population	27
		(3) scarcity of suitable animal habitats	Data Base File Number
		(4) depletion of resources	613

population growth

Regents Date

Aug2006

1474. Base your answer to this question on the passage given and on your knowledge of biology. -- Better Rice -- The production of new types of food crops will help raise the quantity of food grown by farmers. Research papers released by the National Academy of Sciences announced the development of two new superior varieties of rice -- one produced by selective breeding and the other by biotechnology. One variety of rice, called Nerica (New Rice for Africa), is already helping farmers in Africa. Nerica combines the hardiness and weed resistance of rare African rice varieties with the productivity and faster maturity of common Asian varieties. Another variety, called Stress-Tolerant Rice, was produced by inserting a pair of bacterial genes into rice plants for the production of trehalose (a sugar). Trehalose helps plants maintain healthy cell membranes, proteins, and enzymes during environmental stress. The resulting plants survive drought, low temperatures, salty soils, and other stresses better than standard rice varieties. Why is the production of new varieties of food crops necessary?

S4K7

- (1) Essential food crops are rapidly becoming extinct.
- (2) Technology for producing fresh water for agriculture has improved.
- (3) Burning fossil fuels has decreased agricultural areas.
- (4) World population continues to increase.

41

Data Base File Number

ANSWER

4

542

population growth

Regents Date

Jan2007

1475. Which human activity will most likely have a NEGATIVE effect on global stability?

S4K7

- (1) decreasing water pollution levels
- (2) increasing recycling programs
- (3) decreasing habitat destruction
- (4) increasing world population growth

27

Data Base File Number

ANSWER

4

68

population growth

Regents Date

June2004

1476. Which situation has had the most NEGATIVE effect on the ecosystems of Earth?

S4K7

- (1) use of air pollution controls
- (2) use of natural predators to control insect pests
- (3) recycling glass, plastic, and metals
- (4) increasing human population

29

Data Base File Number

ANSWER

4

691

population growth

S4K7	1477. The NEGATIVE effect humans have on the stability of the environment is most directly linked to an increase in	Regents Date
		June2005
		27
		Data Base File Number
ANSWER	4	589

population growth

S4K1	1478. Zebra mussels are aquatic animals found in many bodies of fresh water in New York State. These organisms are not native to North America. When these mussels first appeared, their populations increased rapidly, which led scientists to fear their potential impact on native species. Lately, it has been observed that the rate of population growth of the zebra mussels has decreased. A reason for this decrease may be	Regents Date
		June2023
		11
		Data Base File Number
ANSWER	1	1682

population growth

S4K7	1479. Which human activity would most likely deplete finite resources?	Regents Date
		June2024
		25
		Data Base File Number
ANSWER	3	1772

population interaction

		Regents Date
		Aug2016
	1480.	Burmese pythons are large snakes that have been introduced into the Florida Everglades ecosystem. Burmese pythons and alligators hunt the same prey. One likely effect of the introduction of the pythons is that
S4K7	(1)	alligators will have more prey available
	(2)	pythons will become native to the Everglades
	(3)	alligator populations will decline
ANSWER	3	
	(4)	pythons will become an endangered species
		Data Base File Number
		1239

population interaction

		Regents Date
		Jan2012
	1481.	One way humans can promote the survival of organisms in an ecosystem is to
S4K6	(1)	One way humans can promote the survival of organisms in an ecosystem is to
	(2)	introduce new consumers to control autotrophs
	(3)	release extra CO ₂ into the atmosphere to help autotrophs
ANSWER	4	
	(4)	learn about the interactions of populations
		Data Base File Number
		410

positive impact

		Regents Date
		June2010
	1482.	One way that humans could have a positive impact on local environments is to
S4K7	(1)	generate waste products as a result of technological advances
	(2)	use resources that are renewable
	(3)	increase planting large areas of one crop
ANSWER	2	
	(4)	increase the use of pesticides
		Data Base File Number
		275

predator / prey

		Regents Date
		Jan2011
	1483.	During its annual migration, the red knot, a medium-size shorebird, flies the entire length of North and South America. During one critical stop to feed on the eggs of horseshoe crabs, the birds nearly double their body mass. The relationship between the red knot and the horse-shoe crab is that of
S4K6	(1)	parasite - host
	(2)	consumer - producer
	(3)	scavenger - producer
ANSWER	4	
	(4)	predator - prey
		Data Base File Number
		325

predators

1484. Rabbits introduced into Australia over one hundred years ago have become a serious pest. Rabbit populations have increased so much that they have displaced many native species of herbivores. Which statement best explains the reason for their increased numbers?

- (1) Rabbits have a high metabolic rate.
- (2) There are few native predators of rabbits.
- (3) Additional rabbit species have been introduced.
- (4) There is an increase in rabbit competitors.

S4K7

ANSWER

2

Regents Date

Aug2010

27

Data Base File Number

299

predators

1485. Human population growth has led to a reduction in the populations of predators throughout natural ecosystems across the United States. Scientists consider the loss of these predators to have a

- (1) positive effect, because an increase in their prey helps to maintain stability in the ecosystem
- (2) positive effect, because predators usually eliminate the species they prey on
- (3) negative effect, since predators have always made up a large portion of our food supply
- (4) negative effect, because predators have an important role in maintaining stable ecosystems

S4K1

ANSWER

4

Regents Date

Aug2014

21

Data Base File Number

1082

predators

1486. The governments of many countries have regulations that are designed to prevent the accidental introduction of nonnative insects into their countries. This is because, in these new habitats, the nonnative insects might

- (1) become food for birds
- (2) not survive a cold winter
- (3) not have natural predators
- (4) add to the biodiversity

S4K7

ANSWER

3

Regents Date

Aug2019

24

Data Base File Number

1515

predators

			Regents Date Jan2017
	1487.	The number of white-tailed deer in certain areas of Long Island, NY has increased significantly. Homeowners and farmers have put up tall fencing to protect their gardens and crops from the deer. One reason why the white tailed-deer might have increased significantly in certain areas of Long Island is	
S4K6	(1)	the lack of natural predators	31
	(2)	an increase in deer pathogens	Data Base File Number
ANSWER	(3)	a shortage of biotic resources needed by the deer	
1	(4)	that carrying capacity has no effect on deer populations	1289

predators

			Regents Date June2021
	1488.	Rabbit populations vary in size over time. An increase in which factor would likely prevent the rabbit population from steadily increasing?	
S4K1	(1)	food	8
	(2)	mates	Data Base File Number
ANSWER	(3)	predators	
3	(4)	prey	1567

prions

			Regents Date Jan2013
	1489.	Prions are proteins that act as an infectious agent. They cause a variety of diseases, including "Mad Cow" disease. Prions cannot produce more prions on their own, but cause the host organism to replicate more prions. Most scientists do not consider prions to be alive. A valid reason for accepting that prions are nonliving things is that	
S4K1	(1)	no living thing can cause a disease	2
	(2)	proteins are inorganic molecules	Data Base File Number
ANSWER	(3)	prions contain all of the material needed to reproduce	
4	(4)	prions cannot carry out reproduction independently	619

producer

1490. Lichens are composed of two organisms, a fungus that cannot make its own food and algae that contain chlorophyll. Lichens may live on the bark of trees or even on bare rock. They secrete acids that tend to break up the rock they live on, helping to produce soil. As soil accumulates from the broken rock and dead lichens, other organisms, such as plants, may begin to grow. Lichens can alter their environment, enabling other organisms to grow and take their places in that environment. What is the role of the algae component of a lichen in an ecosystem?

- (1) decomposer
- (2) parasite
- (3) herbivore
- (4) producer

S4K6

ANSWER

4

Regents Date

Jan2006

37

Data Base File Number

498

producer

1491. The dense needles of Douglas fir trees can prevent most light from reaching the forest floor. This situation would have the most immediate effect on

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

S4K5

ANSWER

1

Regents Date

June2002

4

Data Base File Number

836

producer

1492. Which relationship best describes the interactions between lettuce and a rabbit?

- (1) predator -- prey
- (2) producer -- consumer
- (3) parasite -- host
- (4) decomposer -- scavenger

S4K6

ANSWER

2

Regents Date

June2002

26

Data Base File Number

851

producer

1493. Which type of organism helps to reduce atmospheric carbon dioxide?

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

S4K6

ANSWER

2

Regents Date

June2013

25

Data Base File Number

963

producer

1494. Producers are generally found at the beginning of a food chain. Which statement best explains why this is true?

- (1) Producers are usually smaller in size than consumers.
- (2) Producers do not rely on other organisms for food.
- (3) There are always more consumers than producers in food chains.
- (4) Consumers are always more complex organisms than producers.

S4K6

ANSWER 2

Regents Date

June2018

1

Data Base File Number

1384

protein

1495. Which organic compounds would be the best to analyze in order to determine if two species are closely related?

- (1) fats
- (2) starches
- (3) sugars
- (4) proteins

S4K2

ANSWER 4

Regents Date

Aug2014

31

Data Base File Number

1090

protein

1496. Which compounds are composed of amino acids?

- (1) proteins
- (2) sugars
- (3) carbohydrates
- (4) fats

S4K5

ANSWER 1

Regents Date

Jan2010

38

Data Base File Number

254

protein

1497. Which two cell structures work together in the process of protein synthesis?

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

S4K1

ANSWER 3

Regents Date

Jan2013

1

Data Base File Number

618

protein

1498. Brothers and sisters often have similar facial characteristics, such as nose shape or eye color, because they

- (1) are raised in similar environments
- (2) eat similar types of foods
- (3) have similar types of proteins
- (4) use similar types of facial care products

S4K2

ANSWER 3

Regents Date

Jan2014

3

Data Base File Number

999

protein

1499. The inability of an organism to produce certain proteins can occur when an organism is lacking an enzyme needed to combine

- (1) oxygen molecules
- (2) simple sugars
- (3) amino acids
- (4) biological catalysts

S4K1

ANSWER 3

Regents Date

Jan2015

33

Data Base File Number

1116

protein

1500. Amino acids bond together to form which type of complex molecule?

- (1) protein
- (2) starch
- (3) fat
- (4) sugar

LAB1

ANSWER 1

Regents Date

Jan2018

82

Data Base File Number

1383

protein

1501. Which statement concerning proteins is NOT correct?

- (1) Proteins are long, usually folded, chains.
- (2) The shape of a protein molecule determines its function.
- (3) Proteins can be broken down and used for energy.
- (4) Proteins are bonded together, resulting in simple sugars.

S4K2

ANSWER 4

Regents Date

June2006

12

Data Base File Number

508

protein

1502. Two proteins in the same cell perform different functions. This is because the two proteins are composed of

- (1) chains folded the same way and the same sequence of simple sugars
- (2) chains folded the same way and the same sequence of amino acids
- (3) chains folded differently and a different sequence of simple sugars
- (4) chains folded differently and a different sequence of amino acids

S4K2

ANSWER

4

Regents Date

June2007

9

Data Base File Number

30

protein

1503. Three days after an organism eats some meat, many of the organic molecules originally contained in the meat would be found in newly formed molecules of

- (1) glucose
- (2) protein
- (3) starch
- (4) oxygen

S4K1

ANSWER

2

Regents Date

June2010

2

Data Base File Number

256

protein function

1504. The way a protein molecule is folded determines the shape of the molecule, which determines the

- (1) function of that protein
- (2) structure of ATP containing that protein
- (3) type of simple sugars in that protein
- (4) amino acids in that protein

S4K2

ANSWER

1

Regents Date

Aug2012

9

Data Base File Number

450

protein function

1505. Scientists have found a gene that makes a protein called PKG that controls certain behaviors in many types of ants. The soldier ant will help collect food when it has a low level of PKG. When it has a high level of PKG, the soldier ant will protect and defend its colony. Soldier ants that are given PKG are more likely to ignore food sources and attack intruders. Which conclusion can best be made from this information?

- (1) PKG protein is synthesized only by the soldier ants.
- (2) Genes control which type of amino acids a cell can make.
- (3) Eating too much protein makes some organisms very aggressive
- (4) The behavior of soldier ants is controlled in part by the PKG protein.

S4K2

ANSWER

4

Regents Date

Aug2018

7

Data Base File Number

1415

protein function

1506. The function of most proteins depends primarily on the

- (1) type and order of amino acids
- (2) environment of the organism
- (3) availability of starch molecules
- (4) nutritional habits of the organism

S4K2

ANSWER

1

Regents Date

Jan2008

4

Data Base File Number

77

protein shape

1507. Mad cow disease is a fatal disease that destroys brain tissue. Researchers have found that a prion protein, which is an abnormally constructed molecule, is responsible. Which statement best describes the characteristics a protein must have to function correctly?

- (1) A protein is a long chain of amino acids folded into a specific shape.
- (2) A protein is a long chain of simple sugars folded into a specific shape.
- (3) A protein is made of amino acids synthesized into a short, circular chain.
- (4) A protein is made of simple sugars synthesized into a short, circular chain.

S4K2

ANSWER

1

Regents Date

Aug2017

23

Data Base File Number

1339

protein shape

1508. A photograph of a father and his teenage son show definite facial similarities. Which conclusion can be drawn regarding these similarities?

S4K2

ANSWER 2

- (1) The DNA present in their body cells is identical.
- (2) The percentage of their proteins with the same molecular composition is high.
- (3) The base sequences of their genes are identical.
- (4) The mutation rate is the same in their body cells.

Regents Date

Jan2003

39

Data Base File Number

750

protein shape

1509. The shape of a protein is most directly determined by the

S4K2

ANSWER 2

- (1) amount of energy available for synthesis of the protein
- (2) kind and sequence of amino acids in the protein
- (3) type and number of DNA molecules in a cell
- (4) mistakes made when the DNA is copied

Regents Date

Jan2010

13

Data Base File Number

236

protein shape

1510. The shape of a protein is originally determined by the

S4K2

ANSWER 3

- (1) size of the protein molecule
- (2) location of the protein within the cell
- (3) arrangement of amino acids in the protein
- (4) function the protein must carry out

Regents Date

Jan2012

5

Data Base File Number

393

protein shape

1511. Which statement best describes some protein molecules in a cell?

S4K2

ANSWER 1

- (1) Proteins are long, folded chains that can form various cell parts.
- (2) Proteins are composed of four different starches that direct cell activity.
- (3) Proteins are long, twisted strands of glucose that regulate cells.
- (4) Proteins are genetically diverse substances that are synthesized in the nucleus.

Regents Date

Jan2017

22

Data Base File Number

1283

protein shape

1512. The shape of a protein molecule is influenced by
- (1) whether it is organic or inorganic
 - (2) the sequence of amino acids in it
 - (3) the number of genes found in the nucleus
 - (4) the number of chromosomes in the cell

S4K2

ANSWER

2

Regents Date

June2001
9

Data Base File
Number

893

protein shape

1513. The shape of a protein molecule directly determines its
- (1) movements through the cytoplasm
 - (2) functions inside and outside of cells
 - (3) roles in building water molecules
 - (4) circulation throughout the body

S4K2

ANSWER

2

Regents Date

June2016
7

Data Base File
Number

1214

protein shape

1514. The removal of a short sequence of bases from a gene would most directly affect the
- (1) diffusion of materials into a cell
 - (2) shape of a protein molecule
 - (3) pH of the cytoplasm
 - (4) size of a cell's nucleus

S4K2

ANSWER

2

Regents Date

June2023

19

Data Base File
Number

1687

receptor

1515. Antibody molecules and receptor molecules are similar in that they both
- (1) control transport through the cell membrane
 - (2) have a specific shape related to their specific function
 - (3) remove wastes from the body
 - (4) speed up chemical reactions in cells

S4K5

ANSWER

2

Regents Date

Aug2005

20

Data Base File
Number

609

receptor

1516. Botulinum toxin is a substance that can cause paralysis in humans. The effects of the toxin are due to the blocking of a signaling molecule that is necessary for communication between nerve cells. The toxin most likely interferes with the normal functioning of a

- (1) chromosome
- (2) DNA molecule
- (3) receptor
- (4) digestive hormone

S4K1

ANSWER

3

Regents Date

Jan2018

16

Data Base File Number

1360

receptor

1517. Anabolic Steroids ---
Anabolic steroids are hormones that affect muscle growth. Many athletes take synthetic anabolic steroids, in hopes of developing larger muscles so they can perform better at their sport. These hormones can act like the hormone testosterone. When men take an excess of anabolic steroids, they can have an increase in feminine features. This is due to the fact that the excess of these chemicals signals the male body to stop producing testosterone. One reason why anabolic steroids can imitate the hormone testosterone is because

- (1) anabolic steroids and testosterone both interact with the same cell receptors
- (2) testosterone acts only on muscle cells
- (3) females produce small amounts of the hormone testosterone
- (4) an increase in testosterone in males using anabolic steroids increases male features

S4K1

ANSWER

1

Regents Date

Jan2020

34

Data Base File Number

1553

receptor

1518. A protein on the surface of HIV can attach to proteins on the surface of healthy human cells. These attachment sites on the surface of the cells are known as

- (1) receptor molecules
- (2) genetic codes
- (3) molecular bases
- (4) inorganic catalysts

S4K1

ANSWER

1

Regents Date

June2007

4

Data Base File Number

26

receptor

1519. The ability of estrogen to affect certain cells depends directly on
- (1) amino acids
 - (2) receptor molecules
 - (3) gametes
 - (4) nerve cells

S4K1

ANSWER 2

Regents Date
June2011
2
Data Base File Number
331

receptor / hormone

1520. Base your answer to this question on the information given and on your knowledge of biology. "Cell communication involves a cell detecting and responding to signals from other cells. Receptor molecules play an important role in these reactions. Human cells have insulin receptors that are needed for the movement of glucose out of the blood". What is one way that the shape of the insulin receptor is related to its role in cell communication?
- (1) The shape of the receptor molecule is not specific for a specific molecule.
 - (2) The shape of the receptor molecule is specific for a specific molecule.
 - (3) The shape of the receptor molecule is exactly the same as the target molecule.
 - (4) The shape of the receptor molecule is not known.

S4K5

ANSWER 2

Regents Date
Aug2004
59
Data Base File Number
726

receptor / hormone

1521. After ingesting Vitamin D, the body converts it into a hormone that is transported throughout the body. This hormone affects cells in the intestines and bones. The reason that this hormone affects only certain cells in the body is because these cells have
- (1) specific receptors
 - (2) antibodies
 - (3) specific organelles
 - (4) genes

S4K1

ANSWER 1

Regents Date
Aug2023
1
Data Base File Number
1703

receptor molecules

S4K1	1522. Which substances are found on cell surfaces and respond to nerve and hormone signals? (1) starches and simple sugars (2) Which substances are found on cell surfaces and subunits of DNA (3) vitamins and minerals (4) receptor molecules	Regents Date Aug2005
		Data Base File Number 593
ANSWER	4	

receptor molecules

S4K5	1523. The virus that causes bird flu can attach to the cells of the lower part of the respiratory system in humans, but not to the cells of the upper part of the respiratory system. The most likely reason for this is that these two groups of cells have different (1) DNA codes in their nuclei (2) enzymes in their mitochondria (3) amounts of water in their cytoplasm (4) receptor molecules on their membranes	Regents Date Jan2010
		Data Base File Number 229
ANSWER	4	

receptor molecules

S4K1	1524. In multicellular organisms, cells must be able to communicate with each other. Structures that enable most cells to communicate with each other are known as (1) pathogenic agents (2) chloroplasts (3) antibiotics (4) receptor molecules	Regents Date June2001
		Data Base File Number 891
ANSWER	4	

receptor molecules

S4K1	1525. The ability of certain hormones to attach to a cell is primarily determined by the (1) receptor molecules in the cell membrane (2) proteins in the cytoplasm of the cell (3) amount of DNA in the cell (4) concentration of salts outside the cell	Regents Date June2002
		Data Base File Number 839
ANSWER	1	

receptor molecules

		Regents Date
		June2014
		1
S4K1		Data Base File Number
ANSWER	3	1034
	1526. How do cells in the ovary detect a hormone from the brain?	
	(1) The brain sends a nerve impulse to the ovary.	
	(2) White blood cells bring the hormone to the ovary.	
	(3) Receptor molecules on the cells of the ovary bind with the hormone.	
	(4) Vacuoles within the ovary bind with the hormone.	

receptor molecules

		Regents Date
		June2023
		18
S4K1		Data Base File Number
ANSWER	3	1686
	1527. "Myasthenia gravis" is an autoimmune disease characterized by weakness of the skeletal muscles. It occurs when normal communication between nerve and muscle cells is interrupted. The weakness is likely due to	
	(1) the lack of ATP in the muscle caused by a decrease of available carbon dioxide	
	(2) the brain failing to send the proper hormone signal to vacuoles within muscle cells	
	(3) the failure of receptor molecules on the muscle to receive the chemical produced by nerve cells	
	(4) the ribosomes in the muscle cells failing to produce enough sugar for muscle contraction	

receptor sites

		Regents Date
		Jan2002
		28
S4K5		Data Base File Number
ANSWER	1	875
	1528. A characteristic of hormones and enzymes that allows them to work effectively with other organic molecules is their	
	(1) specific shape	
	(2) small size	
	(3) concentration of carbon and hydrogen atoms	
	(4) high-energy bonds	

receptor sites

		Regents Date
		Jan2009
		5
S4K1		Data Base File Number
ANSWER	4	156
	1529. Many viruses infect only a certain type of cell because they bind to certain	
	(1) other viruses on the surface of the cell	
	(2) mitochondria in the cell	
	(3) hormones in the cell	
	(4) receptor sites on the surface of the cell	

receptor sites

S4K5

ANSWER

1

1530. The hormone adrenaline can affect only cells with
- (1) appropriately shaped receptors
 - (2) the appropriate antibodies
 - (3) ribosomes that produce adrenaline
 - (4) genes that break down adrenaline

Regents Date

Jan2016
19

**Data Base File
Number**

1193

receptors

S4K1

ANSWER

1

1531. Which statement concerning cell communication is correct?
- (1) DNA codes for certain molecules that become cell receptors involved in cell communication.
 - (2) Cells produce ATP molecules, which become cell receptors for communication.
 - (3) Cells build new cell parts, which function as communication genes.
 - (4) Certain proteins use cell communication to build new cell parts made of DNA.

Regents Date

Aug2012

4

**Data Base File
Number**

446

receptors

S4K1

ANSWER

1

1532. After a hormone enters the bloodstream, it is transported throughout the body, but the hormone affects only certain cells. The reason only certain cells are affected is that the membranes of these cells have specific
- (1) receptors
 - (2) tissues
 - (3) antibodies
 - (4) carbohydrates

Regents Date

Jan2006

3

**Data Base File
Number**

476

receptors

1533. Base your answer to this question on the information given and on your knowledge of biology. Diabetes is a condition characterized by elevated blood sugar levels. One form of diabetes occurs when insulin fails to properly regulate blood sugar levels. Complications from diabetes can include nerve cell damage and poor blood flow, especially in the feet and legs. In individuals with diabetes, wounds usually take longer than normal to heal. The failure of a cell to react in a normal manner to insulin is most likely the result of a problem with

- (1) vacuoles
- (2) receptors
- (3) mitochondria
- (4) sugars

S4K1

ANSWER

2

Regents Date

June2012

31

Data Base File Number

439

receptors

1534. Scientists have found that different tissues in the prostate gland, a male reproductive organ, respond to different hormones. The tissues in the center area of the gland respond to testosterone and the tissues in the outer area of the gland respond to estrogen. The cells that make up these two regions of the prostate are different in that

- (1) cells in the center area produce more estrogen than cells in the outer area
- (2) cells in the outer area have many testosterone receptors
- (3) they contain different receptors on their cell membranes
- (4) they contain different DNA sequences for the production of hormones

S4K5

ANSWER

3

Regents Date

June2024

3

Data Base File Number

1759

recombination

1535. The sorting and recombining of genes during meiosis and fertilization usually leads to the production of

- (1) gametes with many copies of the same chromosome
- (2) embryos with traits identical to those of all other members of the species
- (3) zygotes with the genetic information to produce only females
- (4) offspring with some traits that did not appear in their parents

S4K3

ANSWER

4

Regents Date

Aug2009

9

Data Base File Number

206

recombination

S4K2	1536. Sexual reproduction in a species usually results in	(1) an increase in the chromosome number in the offspring	Regents Date
			Jan2012
			16
			Data Base File Number
ANSWER	3	(2) offspring genetically identical to the parent	404
		(3) recombination of genes	
		(4) a decrease in biodiversity	

recombination

S4K3	1537. Which process will increase variations that could be inherited?	(1) mitotic cell division	Regents Date
			June2008
			16
			Data Base File Number
ANSWER	3	(2) active transport	115
		(3) recombination of genes	
		(4) synthesis of proteins	

recombination

S4K3	1538. Agriculturists have developed some varieties of vegetables from common wild mustard plants, which reproduce sexually. Which statement best explains the development of these different varieties of vegetables?	(1) Different varieties can develop from a single species as a result of the recombination of genetic information.	Regents Date
			June2010
			11
			Data Base File Number
ANSWER	1	(2) Different species can develop from a single species as a result of the effect of similar environmental conditions.	263
		(3) Mutations will occur in the genes of a species only if the environment changes.	
		(4) Variations in a species will increase when the rate of mitosis is decreased.	

recycling

S4K1	1539. In an ecosystem, what happens to the atoms of certain chemical elements such as carbon, oxygen, and nitrogen?	(1) They move into and out of living systems.	Regents Date
			Aug2001
			3
			Data Base File Number
ANSWER	1	(2) They are never found in living systems.	916
		(3) They move out of living systems and never return.	
		(4) They move into living systems and remain there.	

recycling

- 1540.** The soil on a farm can very quickly become depleted of the minerals essential to plants because harvesting of crops can interfere with the
- (1) reproductive cycles of animals
 - (2) recycling of inorganic compounds
 - (3) flow of energy
 - (4) transport of groundwater

S4K4

ANSWER

2

Regents Date

Aug2009

19

Data Base File Number

214

recycling

- 1541.** In the fall, some farmers plow the remains of corn plants into the ground. This activity contributes most directly to the
- (1) increase in the biodiversity of their fields
 - (2) depletion of nonrenewable resources
 - (3) destruction of natural habitats
 - (4) recycling of organic matter

S4K7

ANSWER

4

Regents Date

Aug2015

27

Data Base File Number

1172

recycling

- 1542.** The overuse of chemical fertilizers has resulted in the growth of some lawns in which decomposers cannot live. This would interfere most directly with the ability of the lawn ecosystem to
- (1) recycle energy
 - (2) recycle nutrients
 - (3) maintain atmospheric pH
 - (4) reduce biodiversity

S4K7

ANSWER

2

Regents Date

Aug2016

29

Data Base File Number

1261

recycling

- 1543.** Some states require shoppers to pay a deposit on certain beverage containers made of plastic and glass. When shoppers return the containers, their deposits are returned to them. How is this system intended to help the environment?
- (1) It encourages people to buy products that do not have a deposit.
 - (2) It reduces the amount of money shoppers actually spend.
 - (3) It reduces the amount of plastics and glass put into landfills.
 - (4) It forces manufacturers to reduce air pollution when they are making the containers

S4K7

ANSWER

3

Regents Date

Aug2017

21

Data Base File Number

1338

recycling

- 1544.** Vultures, which are classified as scavengers, are an important part of an ecosystem because they
- (1) hunt herbivores, limiting their populations in an ecosystem
 - (2) feed on dead animals, which aids in the recycling of environmental materials
 - (3) cause the decay of dead organisms, which releases usable energy to herbivores and carnivores
 - (4) are the first level in food webs and make energy available to all the other organisms in the web

Regents Date

Jan2003

29

Data Base File Number

742

S4K6

ANSWER

2

recycling

- 1545.** Researchers have discovered a chemical that sterilizes soil by killing all of the bacteria that are normally present. If this chemical were released in a forest ecosystem, the most likely result would be that
- (1) the food web would be disrupted because there would be little recycling of nutrients
 - (2) fewer animals would suffer from disease such as cancer
 - (3) there would be more energy available for insects and worms that live in the soil
 - (4) the diversity of plants and animals present would increase

Regents Date

Jan2017

32

Data Base File Number

1290

S4K6

ANSWER

1

recycling

- 1546.** When humans place grass clippings and other yard waste in landfills, they are most directly interfering with the natural process of
- (1) recycling energy
 - (2) the production of energy
 - (3) recycling organic compounds
 - (4) the production of organic compounds

Regents Date

Jan2019

19

Data Base File Number

1450

S4K7

ANSWER

3

recycling

1547. Many bacteria and fungi are important in the environment because they

- (1) return energy to the environment, making it available for plants
- (2) recycle nutrients, making them available for other organisms
- (3) produce glucose through the process of respiration
- (4) reverse the flow of energy in the ecosystem

Regents Date

Jan2020

21

Data Base File Number

1548

S4K6

ANSWER

2

recycling

1548. Some people make compost piles consisting of weeds and other plant materials. When the compost has decomposed, it can be used as fertilizer. The production and use of compost is an example of

- (1) the introduction of natural predators
- (2) the use of fossil fuels
- (3) the deforestation of an area
- (4) the recycling of nutrients

Regents Date

June2009

27

Data Base File Number

195

S4K7

ANSWER

4

recycling

1549. Many communities have started programs to dispose of evergreen trees after the holiday season. These programs allow individuals to bring these trees to be shredded, and the resulting chips are spread around parks and recreational areas as mulch. These programs benefit the environment by

- (1) increasing pollution in parks
- (2) taking up more space in landfills
- (3) returning materials to the environment
- (4) increasing carbon dioxide in the atmosphere

Regents Date

June2014

28

Data Base File Number

1059

S4K7

ANSWER

3

recycling

1550. An example of recycling is

- (1) using a paper cup instead of a mug
- (2) turning off the lights when leaving a room
- (3) using plastic from a soda bottle to make a certain type of clothing
- (4) using two paper towels rather than five to clean up a spill

Regents Date

June2017

1

Data Base File Number

1301

S4K7

ANSWER

3

recycling

1551. Which human activity best represents a method for recycling nutrients?
- (1) mixing lawn clippings with vegetable waste to produce compost used to fertilize gardens
 - (2) raking and bagging lawn clippings in plastic bags for disposal in landfills
 - (3) collecting lawn and garden wastes for burning
 - (4) clearing a forested area to provide open land for cattle

S4K2

ANSWER 1

Regents Date

June2021

7

Data Base File Number

1566

red cell

1552. As a human red blood cell matures, it loses its nucleus. As a result of this loss, a mature red blood cell lacks the ability to
- (1) take in material from the blood
 - (2) release hormones to the blood
 - (3) pass through artery walls
 - (4) carry out cell division

S4K1

ANSWER 4

Regents Date

Aug2007

3

Data Base File Number

3

red cell

1553. As human red blood cells mature, they lose their nuclei. As a result of this loss, which process would be impossible for mature red blood cells to carry out?
- (1) excretion
 - (2) respiration
 - (3) reproduction
 - (4) transport

S4K4

ANSWER 3

Regents Date

Aug2018

11

Data Base File Number

1419

renewable energy

1554. As water flows downhill, its energy can be used to generate electricity. Later, this water may evaporate, fall as rain, and be used again to generate electricity in the same way. This explains why electricity generated with water is considered
- (1) a source of water pollution
 - (2) a renewable form of energy
 - (3) more expensive than nuclear energy
 - (4) responsible for global warming

S4K7

ANSWER 2

Regents Date

Jan2012

17

Data Base File Number

405

renewable energy

		Regents Date
		Jan2019
	1555. Two new wind turbines have recently been built within the Eiffel Tower in Paris. The power that these turbines generate will be enough to power the entire first floor of the tower, including the restaurants, shops, and exhibits. A benefit of using wind power as an alternative source of energy is that it	
S4K7	(1) is nonrenewable, so additional resources will be depleted by tower businesses	23
	(2) is renewable, so it will decrease the environmental impact of the tower businesses	Data Base File Number
ANSWER	(3) increases the use of resources that cannot be renewed in the future	
2	(4) decreases the amount of fossil fuels available for future generations	1454

renewable resource

		Regents Date
		Aug2017
	1556. Before a new shopping center can be built on previously undeveloped land, the builders must submit a proposal to the local government for approval. Which statement identifies an environmental concern associated with the development of the shopping center?	
S4K7	(1) Building the center would decrease resources needed by local organisms.	13
	(2) The new shopping center would increase competition with already existing businesses.	Data Base File Number
ANSWER	(3) Building the center would decrease the amount of pollution in the area.	
1	(4) The new shopping center would increase the biodiversity of the area.	1334

renewable resource

		Regents Date
		June2014
	1557. Many scientists are worried about some of Earth's finite resources because humans are	
S4K7	(1) using carbon dioxide faster than it is being produced	27
	(2) placing industrial wastes in landfills	Data Base File Number
ANSWER	(3) interfering with energy flow from consumers to producers	
4	(4) using large amounts of some materials that cannot be renewed	1058

renewable resource

		Regents Date
		June2019
		16
S4K7	1558. An increase in human population puts a stress on resources that can be renewed, such as	Data Base File Number
	(1) trees and coal	1477
ANSWER	(2) water and gasoline	
4	(3) oil and natural gas	
	(4) water and trees	

replication

		Regents Date
		Aug2016
		5
S4K2	1559. Before a cell divides, an exact copy of each chromosome is made by the process of	Data Base File Number
	(1) genetic engineering	1241
ANSWER	(2) replication	
2	(3) mutation	
	(4) recombination	

replication

		Regents Date
		Jan2005
		14
S4K4	1560. Which statement is true of both mitosis and meiosis?	Data Base File Number
	(1) Both are involved in asexual reproduction.	553
ANSWER	(2) Both occur only in reproductive cells.	
4	(3) The number of chromosomes is reduced by half.	
	(4) DNA replication occurs before the division of the nucleus.	

reproduction

		Regents Date
		Aug2012
		18
S4K4	1561. Which situation would be part of the normal reproductive cycle of a human?	Data Base File Number
	(1) the presence of testosterone regulating gamete production in a male	459
ANSWER	(2) estrogen in concentrations that would produce sperm in a female	
1	(3) a high progesterone level in a male	
	(4) a low insulin level in either a male or a female	

reproduction

1562. Which life function is NOT necessary for an individual organism to stay alive?

- (1) nutrition
- (2) reproduction
- (3) regulation
- (4) excretion

S4K1

ANSWER 2

Regents Date

Aug2017

5

Data Base File Number

1329

reproduction

1563. Estrogen has a direct effect on the

- (1) formation of a zygote
- (2) changes within the uterus
- (3) movement of an egg toward the sperm
- (4) development of a placenta within the ovary

S4K4

ANSWER 2

Regents Date

Jan2006

11

Data Base File Number

480

reproduction

1564. Which statement describes the reproductive system of a human male?

- (1) It releases sperm that can be used only in external fertilization.
- (2) It synthesizes progesterone that regulates sperm formation.
- (3) It produces gametes that transport food for embryo formation.
- (4) It shares some structures with the excretory system.

S4K4

ANSWER 4

Regents Date

Jan2006

17

Data Base File Number

485

reproduction

1565. Which statement concerning production of offspring is correct?

- (1) Production of offspring is necessary for a species to survive, but it is not necessary for an individual to survive.
- (2) An organism can reproduce without performing any of the other life processes.
- (3) Production of offspring is necessary for an individual organism to survive, while the other life processes are important for a species to survive.
- (4) Reproduction is a process that requires gametes in all species.

S4K4

ANSWER 1

Regents Date

Jan2009

14

Data Base File Number

162

reproduction

1566. Which statement is characteristic of reproduction in humans?

- (1) The reproductive cells of males and females differ in chromosome number.
- (2) Males and females produce gametes in the ovaries.
- (3) Males and females produce the same number of gametes.
- (4) The reproductive cycles of males and females are regulated by hormones.

S4K4

ANSWER 4

Regents Date

June2018

9

Data Base File Number

1390

reproduction / female

1567. Which statement does not correctly describe an adaptation of the human female reproductive system?

- (1) It produces gametes in ovaries.
- (2) It provides for external fertilization of an egg.
- (3) It provides for internal development of the embryo.
- (4) It removes excretions produced by the fetus.

S4K4

ANSWER 2

Regents Date

Aug2002

19

Data Base File Number

818

reproduction / female

1568. The reproductive cycle in females is regulated primarily by

- (1) estrogen and testosterone
- (2) estrogen and progesterone
- (3) progesterone and insulin
- (4) progesterone and testosterone

S4K4

ANSWER 2

Regents Date

Jan2015

19

Data Base File Number

1106

reproduction / female

1569. During a woman's menstrual cycle, ovulation occurs and an egg is released. This process is important because it allows for

- (1) eggs to be produced by mitosis and be fertilized by a sperm
- (2) sperm to fertilize the egg in the uterus
- (3) multiple sperm to fertilize one egg, which then forms the placenta
- (4) the egg to leave the ovary and be fertilized by a sperm

S4K4

ANSWER 4

Regents Date

June2022

6

Data Base File Number

1608

reproduction / female

S4K4	ANSWER	4	1570. The primary function of estrogen and progesterone is to	(1) regulate growth	Regents Date
				(2) control heart rate	June2022
			(3) monitor blood sugar levels	(4) regulate reproductive cycles	Data Base File Number
					7
					1609

reproduction / male

S4K4	ANSWER	3	1571. Regulation of sexual reproductive cycles of human males is related most directly to the presence of the hormone	(1) estrogen	Regents Date
				(2) progesterone	Jan2002
			(3) testosterone	(4) insulin	Data Base File Number
					17
					865

reproduction / male

S4K4	ANSWER	1	1572. The reproductive system of the human male produces gametes and	(1) transfers gametes to the female for internal fertilization	Regents Date
				(2) produces enzymes that prevent fertilization	Jan2003
			(3) releases hormones involved in external fertilization	(4) provides an area for fertilization	Data Base File Number
					18
					736

reproduction / male

S4K4	ANSWER	3	1573. One function of the male reproductive system in mammals is to	(1) produce insulin necessary for sexual reproduction	Regents Date
				(2) transport eggs necessary for fertilization	Jan2015
			(3) allow for delivery of gametes needed for reproduction	(4) provide protection for the developing zygote	Data Base File Number
					20
					1107

reproduction / male

			Regents Date
			June2013
			17
S4K4	1574.	The reproductive system of a male mammal provides	
	(1)	support for the internal development of the embryo	
	(2)	materials through the placenta	
	(3)	a means for the delivery of gametes	Data Base File Number
ANSWER	3	(4)	the ovaries for gamete production
			956

reproduction / male

			Regents Date
			June2018
			21
S4K4	1575.	The human male reproductive system is adapted for the production of	
	(1)	sperm and the delivery of these cells for internal fertilization	
	(2)	gametes that transport food to the egg	
	(3)	zygotes and the development of these cells into a fetus	Data Base File Number
ANSWER	1	(4)	hormones that stimulate placenta formation in the male
			1397

reproductive success

			Regents Date
			Aug2001
			22
S4K4	1576.	Which characteristic of sexual reproduction has specifically favored the survival of animals that live on land?	
	(1)	fusion of gametes in the outside environment	
	(2)	male gametes that may be carried by the wind	
	(3)	fertilization within the body of the female	Data Base File Number
ANSWER	3	(4)	female gametes that develop within ovaries
			930

reproductive success

			Regents Date
			Aug2012
			10
S4K3	1577.	In order for a species to evolve, it must be able to	
	(1)	consume a large quantity of food	
	(2)	reproduce successfully	
	(3)	maintain a constant body temperature	Data Base File Number
ANSWER	2	(4)	be domesticated
			451

reproductive success

		Regents Date
		Aug2014
		12
S4K3	1578. The male red-winged blackbird defends its territory and uses loud vocalizations to attract a mate. Such behavior directly benefits these birds because it results in	Data Base File Number
ANSWER	(1) increased competition for food	1074
2	(2) greater reproductive success	
	(3) reduced biodiversity	
	(4) global stability	

reproductive success

		Regents Date
		Aug2016
		17
S4K3	1579. A male frigatebird displays to the female by inflating its large red throat sac, throwing its head back, vibrating its wings, and producing a "drumming" sound with its throat sac. For the frigatebird, this behavior has most likely resulted in	Data Base File Number
ANSWER	(1) hiding from predators	1251
2	(2) greater reproductive success	
	(3) locating new sources of food	
	(4) reduced population growth	

reproductive success

		Regents Date
		June2010
		13
S4K3	1580. A species of bird known as Bird of Paradise has been observed in the jungles of New Guinea. The males shake their bodies and sometimes hang upside down to show off their bright colors and long feathers to attract females. Females usually mate with the FLASHIEST males. These observations can be used to support the concept that	Data Base File Number
ANSWER	(1) unusual courtship behaviors lead to extinction	264
4	(2) some organisms are better adapted for asexual reproduction	
	(3) homeostasis in an organism is influenced by physical characteristics	
	(4) behaviors that lead to reproductive success have evolved	

respiration

		Regents Date
		Aug2004
		58
S4K5	1581. What is the carbon-containing molecule that humans exhale and the process that produces it?	Data Base File Number
ANSWER	(1) carbon dioxide produced by photosynthesis	725
2	(2) carbon dioxide produced by respiration	
	(3) carbon dioxide produced by ATP	
	(4) carbon dioxide produced by mitochondria	

respiration

1582. Which statement best describes cellular respiration?

- (1) It occurs in animal cells but not in plant cells.
- (2) It converts energy in food into a more usable form.
- (3) It uses carbon dioxide and produces oxygen.
- (4) It stores energy in food molecules.

S4K5

ANSWER

2

Regents Date

Aug2005
19

**Data Base File
Number**

608

respiration

1583. All life depends on the availability of usable energy. This energy is released when

- (1) organisms convert solar energy into the chemical energy found in food molecules
- (2) respiration occurs in the cells of producers and high-energy molecules enter the atmosphere
- (3) cells carry out the process of respiration
- (4) animal cells synthesize starch and carbon dioxide

S4K5

ANSWER

3

Regents Date

Jan2008

21

**Data Base File
Number**

87

respiration

1584. Base your answer to this question on the information given and on your knowledge of biology. 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. The fatigue is due to

- (1) an increase of metabolic waste products in the muscles
- (2) an increase in the pulse rate of the student
- (3) a decrease of metabolic waste products in the muscles
- (4) a decrease in the pulse rate of the student

LAB2

ANSWER

1

Regents Date

Jan2013

75

**Data Base File
Number**

642

respiration

1585. Base your answer to this question on the information given and on your knowledge of biology. 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. In order for the muscle fatigue to end, the muscle cells must be provided with
- (1) oxygen
 - (2) nitrogen
 - (3) carbon dioxide
 - (4) amino acids

LAB2

ANSWER 1

Regents Date

Jan2013

76

Data Base File Number

643

respiration

1586. Which dissolved substance do aquatic animals remove from their external environment for use in cellular respiration?
- (1) carbon dioxide
 - (2) ATP molecules
 - (3) oxygen molecules
 - (4) nitrogen gas

S4K5

ANSWER 3

Regents Date

Jan2018

28

Data Base File Number

1369

respiration

1587. Which phrase best describes cellular respiration, a process that occurs continuously in the cells of organisms?
- (1) removal of oxygen from the cells of an organism
 - (2) conversion of light energy into the chemical bond energy of organic molecules
 - (3) transport of materials within cells and throughout the bodies of multicellular organisms
 - (4) changing of stored chemical energy in food molecules to a form usable by organisms

S4K5

ANSWER 4

Regents Date

June2001

23

Data Base File Number

903

respiration

1588. What happens to certain nutrient molecules after they pass into muscle cells?

- (1) They are replicated in the nucleus.
- (2) They are acted on by enzymes and release the energy they contain.
- (3) They are changed into tissues and organs in the cytoplasm.
- (4) They enter chloroplasts, where they can absorb light energy.

S4K1

ANSWER 2

Regents Date

June2001

3

Data Base File Number

887

respiration

1589. In the cells of the human body, oxygen molecules are used directly in a process that

- (1) releases energy
- (2) digests fats
- (3) synthesizes carbohydrate molecules
- (4) alters the genetic traits of the cell

S4K1

ANSWER 1

Regents Date

June2013

36

Data Base File Number

967

respiration

1590. Fish absorb oxygen through the gills, earthworms absorb oxygen through the skin, amebas take in oxygen through the cell membranes, and cows inhale oxygen through the nasal passages into their lungs. This statement demonstrates that living things

- (1) rely on similar or the same processes, but accomplish them in different ways
- (2) rely on different processes and accomplish them in different ways
- (3) rely on different processes, but perform them in the same or related ways
- (4) have no relationship to one another, and are all independent individuals

S4K1

ANSWER 1

Regents Date

June2013

1

Data Base File Number

943

respiration

1591. During the process of cellular respiration, energy is released from

- (1) carbon dioxide
- (2) oxygen atoms
- (3) water molecules
- (4) chemical bonds

S4K5

ANSWER 4

Regents Date

June2014

16

Data Base File Number

1047

response / stimulus

	1592. Like humans, animals including dogs and cats get goose bumps. On a cold day, these goose bumps cause their coats to expand creating a layer of insulation. If the animal is scared, the coat will also expand making the animal look larger to predators. These responses serve as examples of	Regents Date Jan2017
S4K5	(1) allergic reactions	9
	(2) learned behaviors	Data Base File Number
ANSWER 3	(3) detection and response to stimuli	1274
	(4) reproductive and feeding success	

response / stimulus

	1593. Which change is an example of a response to a stimulus?	Regents Date Jan2018
S4K5	(1) The pupil of an eye decreases in size in bright light.	12
	(2) A leaf absorbs sunlight in the morning.	Data Base File Number
ANSWER 1	(3) The water level of a pond rises on a rainy day.	1356
	(4) A dead tree decays after many years.	

response / stimulus

	1594. On a hot day, dogs sweat through their paw pads and pant, which helps keep them cool. Both the sweating and panting are	Regents Date June2022
S4K5	(1) due to a loss of oxygen	2
	(2) a failure of cell communication	Data Base File Number
ANSWER 4	(3) due to a lack of adaptation to the environment	1604
	(4) a response to a stimulus	

ribosome

	1595. Which cell structure is correctly paired with its primary function?	Regents Date Aug2011
S4K1	(1) ribosome-protein synthesis	3
	(2) mitochondrion-movement	Data Base File Number
ANSWER 1	(3) vacuole-cell division	360
	(4) nucleus-storage of nutrients	

ribosome

1596. Which organelle is correctly paired with its specific function?

- (1) cell membrane--storage of hereditary information
- (2) chloroplast--transport of materials
- (3) ribosome--synthesis of proteins
- (4) vacuole--production of ATP

S4K1

ANSWER

3

Regents Date

Jan2007

4

Data Base File Number

49

ribosome

1597. If the ribosomes of a cell were destroyed, what effect would this most likely have on the cell?

- (1) It would stimulate mitotic cell division.
- (2) The cell would be unable to synthesize proteins.
- (3) Development of abnormal hereditary features would occur in the cell.
- (4) Increased protein absorption would occur through the cell membrane.

S4K2

ANSWER

2

Regents Date

Jan2010

7

Data Base File Number

232

ribosome

1598. The interaction of which two systems provides the molecules needed for the metabolic activity that takes place at ribosomes?

- (1) digestive and circulatory
- (2) reproductive and excretory
- (3) immune and nervous
- (4) respiratory and muscular

S4K1

ANSWER

1

Regents Date

Jan2011

25

Data Base File Number

322

ribosome

1599. Protein synthesis is accomplished primarily by the interaction of which two cell structures?

- (1) vacuoles and mitochondria
- (2) ribosomes and vacuoles
- (3) nuclei and ribosomes
- (4) nuclei and mitochondria

S4K1

ANSWER

3

Regents Date

Jan2020

3

Data Base File Number

1533

ribosome

- 1600.** In a cell, information that controls the production of proteins must pass from the nucleus to the
- (1) cell membrane
 - (2) chloroplasts
 - (3) mitochondria
 - (4) ribosomes

S4K1

ANSWER

4

Regents Date

June2004

6

Data Base File Number

678

ribosome

- 1601.** A pesticide that kills an insect by interfering with the production of proteins in the insect would most directly affect the activity of
- (1) ribosomes
 - (2) minerals
 - (3) chloroplasts
 - (4) mitochondria

S4K1

ANSWER

1

Regents Date

June2012

21

Data Base File Number

432

ribosome

- 1602.** In a cell, protein synthesis is the primary function of
- (1) ribosomes
 - (2) mitochondria
 - (3) chloroplasts
 - (4) vacuoles

S4K1

ANSWER

1

Regents Date

June2013

10

Data Base File Number

949

scavenger

Regents Date
Aug2009

1603. Base your answer to this question on the passage included in this question, and on your knowledge of biology.
To most people, using maggots (fly larvae) for a medical treatment is not a great idea. However, to many doctors, fly larvae do have a place in medicine, and that place is inside open wounds. In maggot debridement therapy, live fly larvae are mixed into a dressing for a wound and the area is covered with gauze. Maggots, which will only eat dead tissue, feed on damaged flesh and leave the healthy tissue behind. In the process, the maggots excrete an antimicrobial chemical that helps cleanse the wound of pathogens. When the dressing is cut away two or three days later, the maggots, now up to 10 times their original size, are easily removed. Question: What is the meaning of the term DEBRIDEMENT?

S1K1

- (1) excretions of pathogens
- (2) impaired wound healing
- (3) removal of dead tissue
- (4) destruction of antimicrobial chemicals

44

Data Base File
Number

226

ANSWER

3

scavenger

Regents Date
Aug2018

1604. Sharks are often followed by smaller fish that eat some of the scraps from the organisms eaten by the shark. These smaller fish are acting as

S4K6

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

22

Data Base File
Number

1428

ANSWER

2

scientific data

Regents Date
Aug2019

1605. Since the early 1990s, proton pump inhibitors (PPIs) have been widely used to treat acid reflux disease. Although clinical tests in the 1980s deemed PPIs to be safe for humans, in 2012 the FDA announced warnings that long-term use of PPIs could increase the risk of bone fractures, kidney disease, and some intestinal infections. Which statement best explains why the safety of PPIs is now in question when clinical experiments in the 1980s provided evidence that they were safe?

S1K1

- (1) Researchers have been able to collect more data than were available in the 1980s.
- (2) Fewer people had acid reflux in the 1980s compared to today.
- (3) The medication containing PPIs has changed since the 1980s when tests were done.
- (4) The original experiments in the 1980s used only test animals and did not use human subjects

33

Data Base File
Number

1521

ANSWER 1

scientific data

Regents Date
Jan2008

1606. A biologist used the internet to contact scientists around the world to obtain information about declining amphibian populations. He was able to gather data on 936 populations of amphibians, consistin of 157 species from 37 countries. Results showed that the overall numbers of amphibians dropped 15% a year from 1960 to 1966 and continued to decline about 2% a year through 1997. What is the importance of collecting an extensive amount of data such as this?

S1K1

- (1) Researchers will now be certain that the decline in the amphibian populations is due to pesticides.
- (2) The data collected will prove that all animal populations around the world are threatened.
- (3) Results from all parts of the world will be found to be identical.
- (4) The quantity of data will lead to a better understanding of the problem.

31

Data Base File
Number

95

ANSWER 4

scientific inquiry

1607. Which source would provide the most reliable information for use in a research project investigating the effects of antibiotics on diseasecausing bacteria?

S1K1

ANSWER 3

- (1) the local news section of a newspaper from 1993
- (2) a news program on national television about antigens produced by various plants.
- (3) a current professional science journal article on the control of pathogens
- (4) an article in a weekly news magazine about reproduction in pathogens

Regents Date
Aug2005

33

Data Base File Number

616

scientific inquiry

1608. In 1910, Thomas Morgan discovered a certain pattern of inheritance in fruit flies known as sex linkage. This discovery extended the ideas of inheritance that Gregor Mendel had discovered while working with garden peas in 1865. Which principle of scientific inquiry does this illustrate?

S1K1

ANSWER 2

- (1) A control group must be part of a valid experiment.
- (2) Scientific explanations can be modified as new evidence is found.
- (3) The same experiment must be repeated many times to validate the results.
- (4) Values can be used to make ethical decisions about a scientific discovery.

Regents Date
Aug2007

2

Data Base File Number

2

scientific inquiry

1609. Which statement most accurately describes scientific inquiry?

S1K1

ANSWER 4

- (1) It ignores information from other sources.
- (2) It does not allow scientists to judge the reliability of their sources.
- (3) It should never involve ethical decisions about the application of scientific knowledge.
- (4) It may lead to explanations that combine data with what people already know about their surroundings.

Regents Date
Jan2007

33

Data Base File Number

73

scientific inquiry

1610. A scientist was investigating why a particular tree species grows only in a specific environment. To determine physical conditions the tree species needs to survive, an appropriate study should include

S1K2

- (1) the identification of organisms in the food web in that environment
- (2) an analysis of the arrangement of the leaves on the trees
- (3) the identification of all tree species in the area
- (4) an analysis of the soil around the tree

Regents Date

Jan2009

37

Data Base File Number

176

ANSWER

4

scientific inquiry

1611. Base your answer to this question on the information given, and on your knowledge of biology. Before conducting an experiment, two students gathered information about the effect of greenhouse gases on global warming. Student A found information in a newspaper article. Student B found information in several peer-reviewed scientific journals and on three websites. Which statement most likely describes the reliability of the students' information?

S1K1

- (1) Information gathered by student A is more reliable because newspapers are always updated to reflect the most current research.
- (2) Information gathered by student B is more reliable because some of it was gathered from peer-reviewed sources.
- (3) Information gathered by student A is more reliable because it is from a single source without conflicting information.
- (4) Information gathered by student B is more reliable because some of it was found on the internet.

Regents Date

Jan2018

34

Data Base File Number

1372

ANSWER

2

scientific inquiry

Regents Date
June2001

1612. The blood of newborn babies is tested to determine whether a certain substance is present. This substance indicates the presence of the disorder known as PKU, which may result in mental retardation. Babies with this disorder are put on a special diet to prevent mental retardation. In this situation, which action is usually taken first?
- (1) treating the expression of the disorder
 - (2) preventing the expression of the disorder
 - (3) controlling the disorder
 - (4) diagnosing the disorder

S4K5

27

Data Base File
Number

ANSWER

4

906

scientific inquiry

Regents Date
June2002

1613. In his theory, Lamarck suggested that organisms will develop and pass on to offspring variations that they need in order to survive in a particular environment. In a later theory, Darwin proposed that changing environmental conditions favor certain variations that promote the survival of organisms. Which statement is best illustrated by this information?
- (1) Scientific theories that have been changed are the only ones supported by scientists.
 - (2) All scientific theories are subject to change and improvement.
 - (3) Most scientific theories are the outcome of a single hypothesis.
 - (4) Scientific theories are not subject to change.

S1K1

3

Data Base File
Number

ANSWER

2

835

scientific inquiry

Regents Date
June2003

1614. A great deal of information can now be obtained about the future health of people by examining the genetic makeup of their cells. There are concerns that this information could be used to deny an individual health insurance or employment. These concerns best illustrate that
- (1) scientific explanations depend upon evidence collected from a single source
 - (2) scientific inquiry involves the collection of information from a large number of sources
 - (3) acquiring too much knowledge in human genetics will discourage future research in that area
 - (4) while science provides knowledge, values are essential to making ethical decisions using this knowledge

S1K1

4

Data Base File
Number

ANSWER

4

756

scientific method

1615. A scientist is planning to carry out an experiment on the effect of heat on the function of a certain enzyme. Which would not be an appropriate first step?

- (1) doing research in a library
- (2) having discussions with other scientists
- (3) completing a data table of expected results
- (4) using what is already known about the enzyme

S1K1

ANSWER 3

Regents Date

Aug2004

1

Data Base File Number

695

scientific method

1616. Which statement best describes a scientific theory?

- (1) It is a collection of data designed to provide support for a prediction.
- (2) It is an educated guess that can be tested by experimentation.
- (3) It is a scientific fact that no longer requires any evidence to support it.
- (4) It is a general statement that is supported by many scientific observations.

S1K1

ANSWER 4

Regents Date

Aug2005

3

Data Base File Number

595

scientific method

1617. An investigation was carried out to determine which of three antibacterial soaps is most effective. Four petri dishes labeled A, B, C, and D were set up. The same amount and type of bacteria was added to each dish. Next, 2 mL of a different brand of soap were added to dishes B, C, and D. Then, 2 mL of water were added to dish A, instead of soap. The dishes were incubated at 37°C for 24 hours. At the end of the investigation, the amount of bacteria in each dish was determined. Dish D had the least bacteria. It was concluded that the soap in dish D was the most effective soap to use against bacteria. Which statement best describes the validity of this conclusion?

- (1) The conclusion is not valid since the same amount of bacteria was used in each dish.
- (2) The conclusion is valid since too small a sample of bacteria was used in this investigation.
- (3) The conclusion is valid since the amounts of bacteria were measured at the end of the investigation.
- (4) The conclusion might not be valid since the investigation was carried out only once.

S1K1

ANSWER 4

Regents Date

Aug2012

32

Data Base File Number

471

scientific method

Regents Date
Aug2014

1618. Students noticed that some of their classmates have a hard time concentrating during class. They thought it may have some connection with the fact that these students consume energy drinks just before class. An experiment was proposed to find out if there is a connection between energy drinks and the lack of ability to concentrate in class. A properly designed experiment to determine this would include having

LAB2

- (1) the whole class drink energy drinks and no water at all, for the entire time of the experiment
- (2) the whole class drink water and no energy drinks at all, for the entire time of the experiment
- (3) the students drink both water and an energy drink just before class
- (4) half the students drink water and the other half drink an energy drink just before class

74

Data Base File
Number

ANSWER 4

1092

scientific method

Regents Date
Aug2016

1619. Which statement best expresses a basic scientific assumption?

S1K3

- (1) Interpretation of experimental results has provided explanations for all natural phenomena.
- (2) If a conclusion is valid, similar investigations by other scientists should result in the same conclusion.
- (3) For any conclusion to be valid, the design of the experiment requires that only two groups be compared.
- (4) After a scientist formulates a conclusion based on an experiment, no further investigation is necessary

33

Data Base File
Number

ANSWER 2

1264

scientific method

1620. A student performed an experiment to see if water temperature affects the level of activity in aquatic snails. The student set up four tanks with five snails in each tank. All four of the setups were identical in every way, except for the temperature of the water. In order to make the conclusions more valid, the student could

- (1) alter the pH of the water
- (2) change the size of the tank
- (3) carry out the experiment for a shorter period of time
- (4) use a larger number of snail

S1K2

ANSWER

4

Regents Date

Aug2017

31

Data Base File Number

1345

scientific method

1621. A broad body of evidence, subject to revisions, supported by different kinds of scientific investigations and often involving the contributions of scientists from different disciplines is necessary to develop

- (1) an inference
- (2) a fact
- (3) a theory
- (4) a prediction

S1K1

ANSWER

3

Regents Date

Aug2017

33

Data Base File Number

1346

scientific method

1622. It has been widely accepted that humans inherit mitochondria from their mothers. DNA sequencing has recently provided evidence that children from several families with a history of mitochondrial disease have inherited mitochondria from their fathers. This discovery illustrates the concept that

- (1) scientists in the past did not ask questions about the reliability of the source of data
- (2) experiments without controls are valid if they obtain new information
- (3) scientific explanations are tentative and subject to change as new discoveries are made
- (4) claims should be questioned only when based on large samples of unbiased data

S1K1

ANSWER

3

Regents Date

Aug2023

35

Data Base File Number

1724

scientific method

1623. In an investigation to determine the change in heart rate with increased activity, a biology teacher asked students to take their pulses immediately before and immediately after exercising for 2 minutes. The data showed an average heart rate of 72 beats per minute before exercising and 90 beats per minute after exercising. If a valid conclusion is to be made from the results of this investigation, which assumption must be made?

- (1) In most students, the average heart rate is not affected by exercise.
- (2) Exercise causes the heart rate to slow down.
- (3) Each student exercised with the same intensity.
- (4) The heart rate of each student goes up 18 beats after jogging for 2 minutes.

S1K3

ANSWER

3

Regents Date

Jan2002

52

Data Base File Number

883

scientific method

1624. A biologist reported success in breeding a tiger with a lion, producing healthy offspring. Other biologists will accept this report as fact only if

- (1) research shows that other animals can be crossbred
- (2) the offspring are given a scientific name
- (3) the biologist included a control in the experiment
- (4) other researchers can replicate the experiment

S1K3

ANSWER

4

Regents Date

Jan2003

1

Data Base File Number

727

scientific method

Regents Date

Jan2003

1625. In Texas, researchers gave a cholesterol-reducing drug to 2,335 people and an inactive substitute (placebo) to 2,081. Most of the volunteers were men who had normal cholesterol levels and no history of heart disease. After 5 years, 97 people getting the placebo had suffered heart attacks compared to only 57 people who had received the actual drug. The researchers are recommending that to help prevent heart attacks, all people (even those without high cholesterol) take these cholesterol-reducing drugs. In addition to the information above, what is another piece of information that the researchers must have before support for the recommendation can be justified?

S1K3

- (1) Were the eating habits of the two groups similar?
- (2) How does a heart attack affect cholesterol levels?
- (3) Did the heart attacks result in deaths?
- (4) What chemical is in the placebo?

26

Data Base File Number

740

ANSWER

1

scientific method

Regents Date

Jan2004

1626. The analysis of data gathered during a particular experiment is necessary in order to

S1K3

- (1) formulate a hypothesis for that experiment
- (2) develop a research plan for that experiment
- (3) design a control for that experiment
- (4) draw a valid conclusion for that experiment

1

Data Base File Number

644

ANSWER

4

scientific method

Regents Date

Jan2010

1627. Conclusions based on an experiment are most likely to be accepted when

S1K1

- (1) they are consistent with experimental data and observations
- (2) they are derived from investigations having many experimental variables
- (3) scientists agree that only one hypothesis has been tested
- (4) hypotheses are based on one experimental design

31

Data Base File Number

251

ANSWER

1

scientific method

	1628.	In the 18th century, Carolus Linnaeus classified organisms based on their structural similarities. Modern classification determines relationships more accurately because it is based on genetic and other biochemical similarities. This change in classification method best illustrates that	Regents Date Jan2015
S1KA	(1)	multiple trials are required to increase the validity of a scientific explanation	31
	(2)	scientific explanations are subject to the ethical view of the scientist proposing them	Data Base File Number
ANSWER	(3)	peer review is required to validate the results of scientific investigations	1115
4	(4)	all scientific explanations are tentative and subject to change and improvement	

scientific method

	1629.	In order to be accepted, a scientific theory must be	Regents Date Jan2017
S1K1	(1)	widely tested and supported by extensive data	33
	(2)	based on the results of a single experiment	Data Base File Number
ANSWER	(3)	controversial and cause debate	1291
1	(4)	in line with all previous historical ideas	

scientific method

	1630.	Base your answer to this question on the information given, and on your knowledge of biology. Before conducting an experiment, two students gathered information about the effect of greenhouse gases on global warming. Student A found information in a newspaper article. Student B found information in several peer-reviewed scientific journals and on three websites. After gathering the information, the students presented the information to their class. The class gave the students suggestions about how to continue with their experiment. How does this step benefit the investigation?	Regents Date Jan2018
S1K2	(1)	Feedback from the class will help them design a better experiment.	35
	(2)	Feedback creates confusion, and will complicate the investigation.	Data Base File Number
ANSWER	(3)	The students' investigation will be unaffected because the class is not carrying out the experiment.	1373
1	(4)	The investigation will be unchanged because students can use information only from published sources to design the experiment.	

scientific method

1631. For years, scientists believed that flight evolved when ancestral birds climbed trees and then glided back to the ground. Recent fossil evidence suggests that flight may have evolved from the ground up, as early birds used to jump off the ground as a way to avoid predators. These discoveries suggest that

S1K1

- (1) scientists use only fossil evidence to study flight
- (2) scientific understandings can change as new information becomes available
- (3) most birds avoid predators by jumping off the ground into the air
- (4) ancestral birds always climbed trees

ANSWER 2

Regents Date

Jan2023

41

Data Base File Number

1671

scientific method

1632. Colombia is a country in South America that grows and exports a large portion of the coffee that is used by Americans. A group of scientists in Colombia conducted an experiment on the effects of coffee on the development of Alzheimer's disease in elderly people. Their conclusion was that drinking coffee every day will decrease the occurrence of Alzheimer's disease, and they recommended that Americans drink coffee several times a day. In order to evaluate this conclusion and before they encourage Americans to drink more coffee, scientists in the United States should

S1K3

- (1) conduct their own experiments to see if they arrive at the same conclusion
- (2) go to Colombia and see how the coffee is grown
- (3) provide coffee to people with Alzheimer's and see if it cures their disease
- (4) construct a data table to test the hypothesis

ANSWER 1

Regents Date

Jan2023

42

Data Base File Number

1672

scientific method

LAB2	ANSWER 3	1633. Students in a biology class wanted to determine the effect of exercise on heart rate. In order to reach a more reliable conclusion, the students should collect data from a	Regents Date Jan2024
		(1) small number of students, then multiply the heart rates together	75
		(2) small number of students, then average the heart rates	Data Base File Number
		(3) large number of students, then average the heart rates	1755
		(4) large number of students, then add the heart rates together	

scientific method

S1K3	ANSWER 3	1634. Diagrams, tables, and graphs are used by scientists mainly to	Regents Date June2001
		(1) design a research plan for an experiment	1
		(2) test a hypothesis	Data Base File Number
		(3) organize data	885
		(4) predict the independent variable	

scientific method

S1K1	ANSWER 3	1635. The current knowledge concerning cells is the result of the investigations and observations of many scientists. The work of these scientists forms a well-accepted body of knowledge about cells. This body of knowledge is an example of a	Regents Date June2002
		(1) hypothesis	1
		(2) controlled experiment	Data Base File Number
		(3) theory	833
		(4) research plan	

scientific method

S1K3	ANSWER 4	1636. A student observes that an organism is green. A valid conclusion that can be drawn from this observation is that	Regents Date June2003
		(1) the organism must be a plant	1
		(2) the organism cannot be single celled	Data Base File Number
		(3) the organism must be an animal	754
		(4) not enough information is given to determine whether the organism is a plant or an animal	

scientific method

1637. Which statement best describes the term THEORY as used in the gene-chromosome theory?

S1K1

ANSWER

3

- (1) A theory is never revised as new scientific evidence is presented.
- (2) A theory is an assumption made by scientists and implies a lack of certainty.
- (3) A theory refers to a scientific explanation that is strongly supported by a variety of experimental data.
- (4) A theory is a hypothesis that has been supported by one experiment performed by two or more scientists.

Regents Date

June2004

2

Data Base File Number

675

scientific method

1638. Researchers performing a well-designed experiment should base their conclusions on

S1K1

ANSWER

2

- (1) the hypothesis of the experiment
- (2) data from repeated trials of the experiment
- (3) a small sample size to insure a reliable outcome of the experiment
- (4) results predicted before performing the experiment

Regents Date

June2005

1

Data Base File Number

574

scientific method

1639. A student was comparing preserved specimens of three plant species, X, Y, and Z, in a classroom. Which statement is an example of an observation the student could have made and NOT an inference?

LAB1

ANSWER

1

- (1) The leaves produced by plant X are 4 cm across and 8 cm in length.
- (2) Plant Y has large purple flowers that open at night.
- (3) Plant X produces many seeds that are highly attractive to finches.
- (4) The flowers of plant Z are poisonous to household pets.

Regents Date

June2006

66

Data Base File Number

520

scientific method

1640. A science researcher is reviewing another scientist's experiment and conclusion. The reviewer would most likely consider the experiment INVALID if
- (1) the sample size produced a great deal of data
 - (2) other individuals are able to duplicate the results
 - (3) it contains conclusions not explained by the evidence given
 - (4) the hypothesis was not supported by the data obtained

S4K3

ANSWER

3

Regents Date

June2006

32

Data Base File Number

518

scientific method

1641. Base your answer to this question on the information given and on your knowledge of biology.
Ulcers: Mystery Solved ---
Stomach ulcers are painful sores that develop in the stomach. Doctors once thought that ulcers were caused by stress. In the 1980s, a pair of physicians, Barry J. Marshall and J.Robin Warren, questioned the cause of ulcers. They found the bacterium "Helicobacter pylori " in the ulcer tissue of their patients. Even though they repeatedly presented their findings to colleagues, they were ignored until Marshall performed an astonishing experiment: He drank broth containing the bacteria and made himself sick with an ulcer! He then cured himself by taking an antibiotic.
The results were published in 1985, but it took another 10 years for doctors to regularly use antibiotics to treat ulcers. Marshall and Warren received a Nobel Prize in 2005 for this discovery. The work of Marshall and Warren shows that
- (1) hypotheses made by physicians are always correct
 - (2) scientific explanations are revised based on new evidence
 - (3) peer review always leads to the immediate acceptance of results
 - (4) conclusions must always be consistent with those made by other scientists

S1K1

ANSWER

2

Regents Date

June2021

39

Data Base File Number

1585

scientific method

- 1642.** Scientific claims should be questioned if
- (1) peer review was used to examine the claims made by scientists
 - (2) the experimental results cannot be repeated by other scientists
 - (3) conclusions follow logically from the evidence
 - (4) the data are based on samples that are very large

S1K3

ANSWER

2

Regents Date

**June2022
35**

**Data Base File
Number**

1623

scientific method

- 1643.** Jean-Baptiste Lamarck was a French naturalist who proposed the idea that modern-day organisms developed new characteristics through a process known as the inheritance of acquired traits. As more evidence became available, this theory was eventually replaced by Charles Darwin's theory of evolution. This modification of scientific knowledge illustrates that
- (1) scientists do not communicate with each other and often make mistakes
 - (2) all scientific explanations are tentative and subject to change or improvement
 - (3) scientists often ignore evidence that does not help prove their theory
 - (4) hypotheses seldom change even when new discoveries are made

S4K1

ANSWER

2

Regents Date

June2023

36

**Data Base File
Number**

1697

scientific method

Regents Date

June2024

1644. Base your answers to this question on the information below and on your knowledge of biology.
- Mitochondria Inherited from Father
- It was widely accepted that humans inherit their mitochondria only from their mothers. In 2002, an individual suffering from fatigue and muscle pain was found to have a mutation in his mitochondrial DNA. DNA sequencing of family members revealed that he had inherited the mutated mitochondria from his father. Since 2002, evidence of additional cases of children inheriting mitochondrial mutations from their fathers has been found. The discovery that humans can inherit mitochondria from their fathers illustrates the concept that

- (1) inquiry does not judge the reliability of sources
- (2) experiments without controls are not valid
- (3) scientific explanations are tentative and subject to change
- (4) advancements in technology usually make scientific theories invalid

38

Data Base File
Number

1778

S1K1

ANSWER 3

scientific study

Regents Date

Aug2022

1645. Smoking increases the risk of certain cancers of the mouth, esophagus, pancreas, kidneys, and uterus. This finding would be most reliable if it were based on

- (1) data collected from patients in one cancer research hospital.
- (2) research done by scientists in many different countries
- (3) reading the information on cigarette cartons
- (4) cancer information published on social media sites.

34

Data Base File
Number

1646

S4K3

ANSWER 2

selective breeding

Regents Date

Aug2003

1646. Research applications of the basic principles of genetics have contributed greatly to the rapid production of new varieties of plants and animals. Which activity is an example of such an application?

- (1) testing new fertilizers on food crops
- (2) selective breeding of plants and animals that exhibit high resistance to disease
- (3) developing new irrigation methods to conserve water
- (4) using natural predators to control insect pests

11

Data Base File
Number

788

S4K2

ANSWER 2

selective breeding

1647. In some cases, humans have chosen to mate certain individual farm animals within a species. For example, by allowing only the largest cattle to reproduce over many generations, strains of very large cattle have been produced. This process is known as

- (1) natural selection
- (2) direct harvesting
- (3) selective breeding
- (4) dynamic equilibrium

S4K2

ANSWER 3

Regents Date

Aug2009

6

Data Base File Number

203

selective breeding

1648. The pedigree of Seattle Slew, a racehorse considered by some to be one of the fastest horses that ever lived, includes very fast horses on both his mother's side and his father's side. Seattle Slew most likely was a result of

- (1) environmental selection
- (2) alteration of DNA molecules
- (3) selective breeding
- (4) a sudden mutation

S4K2

ANSWER 3

Regents Date

Aug2010

23

Data Base File Number

296

selective breeding

1649. Over the past few thousand years, humans have helped to bring about changes in many plant and animal species in order to make them more useful. Examples include strong workhorses, hunting dogs, large-eared corn, and beautiful flower varieties. These changes were primarily brought about by humans, using the process of

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

S4K2

ANSWER 2

Regents Date

Aug2013

6

Data Base File Number

974

selective breeding

1650. The corn we eat today is larger and has more kernels than the corn people first grew thousands of years ago. Which process is most likely responsible for the changes that have occurred?

- (1) mitosis
- (2) succession
- (3) direct harvesting
- (4) selective breeding

S4K6

ANSWER 4

Regents Date

Aug2015

5

Data Base File Number

1152

selective breeding

1651. Which activity enables humans to produce new genetic combinations in other organisms?

S4K2

- (1) selecting and breeding the organisms for specific traits
- (2) increasing the number of enzymes available to the organisms
- (3) growing organisms that reproduce asexually
- (4) decreasing the amount of DNA in the diet of the organisms

ANSWER 1

Regents Date
Aug2016

4

Data Base File Number

1240

selective breeding

1652. When humans first domesticated dogs, there was relatively little diversity in the species. Today, there are many variations such as the German shepherd and the dalmation. This increase in diversity is most closely associated with

S4K2

- (1) cloning of selected body cells
- (2) selective breeding
- (3) mitotic cell division
- (4) environmental influences on inherited traits

ANSWER 2

Regents Date
Jan2002

9

Data Base File Number

861

selective breeding

1653. To produce large tomatoes that are resistant to cracking and splitting, some seed companies use the pollen from one variety of tomato plant to fertilize a different variety of tomato plant. This process is an example of

S4K2

- (1) selective breeding
- (2) DNA sequencing
- (3) direct harvesting
- (4) cloning

ANSWER 1

Regents Date
Jan2004

10

Data Base File Number

652

selective breeding

1654. In order to produce the first white marigold flowers, growers began with the lightest yellow-flowered marigold plants. After crossing them, these plants produced seeds, which were planted, and only the offspring with very light-yellow flowers were used to produce the next generation. Repeating this process over many years, growers finally produced a marigold flower that is considered the first white variety of its species. This procedure is known as

- (1) differentiation
- (2) cloning
- (3) gene insertion
- (4) selective breeding

S4K2

ANSWER 4

Regents Date
Jan2008

7

Data Base File Number
79

selective breeding

1655. Selective breeding has been used for thousands of years to

- (1) develop bacteria that produce human insulin
- (2) clone desirable plant varieties
- (3) develop viruses that protect against diseases
- (4) produce new varieties of domestic animals

S4K2

ANSWER 4

Regents Date
Jan2012

7

Data Base File Number
395

selective breeding

1656. The Old English Bulldog is extinct. To produce a new English Bulldog, dogs having the desired physical features, but not the aggressive nature of the old bulldogs, were mated. The result was a bulldog that was similar in appearance to the extinct bulldog, but without its fierce nature. Which technique was most likely used to develop this new variety of dog?

- (1) cloning
- (2) inducing mutations
- (3) genetic engineering
- (4) selective breeding

S4K2

ANSWER 4

Regents Date
Jan2013

9

Data Base File Number
624

selective breeding

Regents Date
Jan2016

1657. A news release about production of farm-raised salmon contains the following information:-----
*The program is mating targeted fish to concentrate key traits in Atlantic salmon stocks.
*The three-year process includes spawning, tagging, and choice of parent fish.
*The fish are weighed, measured, and monitored to identify those with the best growth rates.
*The project examines the performance of fish to determine which fish to use to produce the next generation.

These statements indicate that the producers are attempting to improve salmon through the use of

- (1) genetic engineering
- (2) homeostatic feedback
- (3) selective breeding
- (4) natural selection

35

Data Base File Number

1204

S4K2

ANSWER 3

selective breeding

Regents Date
June2002

1658. Which process is a common practice that has been used by farmers for hundreds of years to develop new plant and animal varieties?

- (1) cloning
- (2) genetic engineering
- (3) cutting DNA and removing segments
- (4) selective breeding for desirable traits

13

Data Base File Number

841

S4K2

ANSWER 4

selective breeding

Regents Date
June2005

1659. One variety of strawberry is resistant to a damaging fungus, but produces small fruit. Another strawberry variety produces large fruit, but is not resistant to the same fungus. The two desirable qualities may be combined in a new variety of strawberry plant by

- (1) cloning
- (2) asexual reproduction
- (3) direct harvesting
- (4) selective breeding

6

Data Base File Number

578

S4K2

ANSWER 4

selective breeding

			Regents Date June2008
	1660.	For centuries, certain animals have been crossed to produce offspring that have desirable qualities. Dogs have been mated to produce Labradors, beagles, and poodles. All of these dogs look and behave very differently from one another. This technique of producing organisms with specific qualities is known as	
S4K3	(1)	gene replication	12
	(2)	natural selection	Data Base File Number
ANSWER	(3)	random mutation	111
4	(4)	selective breeding	

selective breeding

			Regents Date June2011
	1661.	Selective breeding is a technique that is used to	14
S4K2	(1)	give all organisms a chance to reproduce	Data Base File Number
	(2)	produce organisms from extinct species	338
ANSWER	(3)	produce offspring with certain desirable traits	
3	(4)	keep farm crops free of all mutations	

selective breeding

			Regents Date June2013
	1662.	In the past, humans developed varieties of dogs, such as the German shepherd and the bearded collie, using	14
S4K2	(1)	selective breeding for particular traits	Data Base File Number
	(2)	recombination of genes during mitosis	953
ANSWER	(3)	mutations present only in body cells	
1	(4)	natural selection of favorable traits	

selective breeding

			Regents Date June2018
	1663.	A farmer grows beans that he sells to local markets. Over a period of 40 years, the farmer has identified the plants that produced the most beans and only used those beans to produce new plants. This procedure is part of the process of	
S4K2	(1)	selective breeding	4
	(2)	genetic engineering	Data Base File Number
ANSWER	(3)	replication	1387
1	(4)	cloning	

sex hormones

	1664. As women age, their reproductive cycles stop due to decreased	Regents Date Aug2007
S4K4	(1) digestive enzyme production	17
	(2) production of ATP	Data Base File Number
ANSWER	(3) levels of specific hormones	14
3	(4) heart rate	

sexual reproduction

	1665. Which organism would most likely have new gene combinations?	Regents Date Aug2012
S4K4	(1) a frog that was produced from a skin cell of a frog	23
	(2) a hamster resulting from sexual reproduction	Data Base File Number
ANSWER	(3) a bacterium resulting from asexual reproduction	463
2	(4) a starfish that grew from part of a starfish	

sexual reproduction

	1666. Sexually reproduced offspring have traits similar to their parents because they receive	Regents Date Aug2022
S4K2	(1) all of the proteins from each parent	3
	(2) some of the proteins from both parents	Data Base File Number
ANSWER	(3) all of the genes present in both parents	1629
4	(4) some of the genes present in each parent	

sexual reproduction

	1667. Which sequence best represents the correct order of events in the formation of a sexually reproduced individual?	Regents Date Aug2022
S4K4	(1) embryo → zygote → gamete → fetus	18
	(2) zygote → embryo → fetus → gamete	Data Base File Number
ANSWER	(3) gametes → embryo → fetus → zygote	1639
4	(4) gametes → zygote → embryo → fetus	

sexual reproduction

- 1668.** Two kittens in a litter are genetically different from each other and from their parents. These genetic differences are most directly due to
- (1) sexual reproduction
 - (2) asexual reproduction
 - (3) cloning
 - (4) evolution

S4K2

ANSWER 1

Regents Date

Jan2020

10

Data Base File Number

1538

sexual reproduction

- 1669.** Which sequence best represents sexual reproduction?
- (1) mitosis → gametes → zygote → fertilization
 - (2) gametes → meiosis → mitosis → fertilization
 - (3) fertilization → gametes → meiosis → zygote
 - (4) meiosis → gametes → fertilization → zygote

S4K4

ANSWER 4

Regents Date

June2013

16

Data Base File Number

955

sickle cell anemia

- 1670.** The sickle-cell trait is an inherited condition resulting from the presence of abnormal molecules of the protein hemoglobin in red blood cells. A person with the sickle-cell trait may have a child with the same condition because the child receives from the parent
- (1) abnormal red blood cells
 - (2) abnormal hemoglobin molecules
 - (3) a code for the production of abnormal hemoglobin
 - (4) a code for the production of abnormal amino acids

S4K2

ANSWER 3

Regents Date

Aug2009

8

Data Base File Number

205

sickle cell anemia

Regents Date

Jan2006

1671. Base your answer to this question on the information given and on your knowledge of biology. Sickle-cell anemia is an inherited disease that occurs mainly in people from parts of Africa where malaria is common. It is caused by a gene mutation that may be harmful or beneficial. A person with two mutant genes has sickle-cell disease. The hemoglobin of a person with sickle-cell disease twists red blood cells into a crescent shape. These blood cells cannot circulate normally. Symptoms of the disease include bleeding and pain in bones and muscles. People with sickle-cell disease suffer terribly in childhood and, until modern medicine offered treatment, most of them died before reproducing. An individual who has one mutant gene is protected from malaria because the gene changes the hemoglobin structure in a way that speeds removal of malaria-infected cells from circulation. A person with two normal genes has perfectly good red blood cells, but lacks resistance to malaria. Which statement about having one sickle-cell gene is correct?

S4K3

ANSWER

3

- (1) It is fatal to anyone who inherits the gene.
- (2) It is beneficial to anyone who inherits the gene.
- (3) It is beneficial in certain environments.
- (4) It is beneficial or harmful depending on whether it is common or rare.

48

Data Base File
Number

499

simple sugar

Regents Date

June2005

2

1672. In plants, simple sugars are least likely to be

- (1) linked together to form proteins
- (2) broken down into carbon dioxide and water
- (3) used as a source of energy
- (4) stored in the form of starch molecules

S4K1

ANSWER

1

Data Base File
Number

575

soil nutrients

Regents Date

June2010

41

1673. A limiting factor unique to a field planted with corn year after year is most likely

- (1) temperature
- (2) sunlight
- (3) water
- (4) soil nutrients

S4K6

ANSWER

4

Data Base File
Number

278

species relationships

		1674.	An invasive species, the spiny water flea, was recently found in a New York lake. These water fleas eat zooplankton, a food also consumed by native fishes. The fleas spread from lake to lake by attaching to fishing lines, anchor ropes, and boats. Which statement best describes the effect of the water flea on the lake?	Regents Date Aug2018
S4K7		(1)	It will not compete with animals in the local food chain.	25
		(2)	It will feed on organisms that are important to other species.	Data Base File Number
ANSWER	2	(3)	The number of water fleas will decrease due to a lack of food.	
		(4)	There will be no effect on native species in the lake.	1430

species relationships

		1675.	Which factor would be least likely to contribute to the development of a new species?	Regents Date Jan2016
S4K3		(1)	plentiful resources within the environment occupied by the species	28
		(2)	increased genetic variation within the species	Data Base File Number
ANSWER	1	(3)	changes in the environment of the species	
		(4)	the ability of the species to increase its numbers by sexual reproduction	1199

species relationships

		1676.	The tall wetland plant, purple loosestrife, was brought from Europe to the United States in the early 1800s as a garden plant. The plant's growth is now so widespread across the United States that it is crowding out a number of native plants. This situation is an example of	Regents Date June2002
S4K7		(1)	the results of the use of pesticides	35
		(2)	the recycling of nutrients	Data Base File Number
ANSWER	4	(3)	the flow of energy present in all ecosystems	
		(4)	an unintended effect of adding a species to an ecosystem	855

species relationships

			Regents Date June2004
	1677.	A particular species of unicellular organism inhabits the intestines of termites, where the unicellular organisms are protected from predators. Wood that is ingested by the termites is digested by the unicellular organisms, forming food for the termites. The relationship between these two species can be described as	
S4K6		(1) harmful to both species	25
		(2) parasite/host	Data Base File Number
ANSWER	3	(3) beneficial to both species	688
		(4) predator/prey	

species relationships

			Regents Date June2019
	1678.	Two organisms of different species are not likely to compete for the same	
S4K6		(1) food	20
		(2) mate	Data Base File Number
ANSWER	2	(3) space	1481
		(4) water	

sperm

			Regents Date Aug2005
	1679.	Which reproductive structure is correctly paired with its function?	
S4K4		(1) uterus -- usual site of fertilization	17
		(2) testis -- usual location for egg development	Data Base File Number
ANSWER	4	(3) ovary -- delivers nutrients to the embryo	606
		(4) sperm -- transports genetic material	

sperm

			Regents Date Aug2006
	1680.	Which statement correctly describes the genetic makeup of the sperm cells produced by a human male?	
S4K4		(1) Each cell has pairs of chromosomes and the cells are usually genetically identical.	10
		(2) Each cell has pairs of chromosomes and the cells are usually genetically different.	Data Base File Number
ANSWER	4	(3) Each cell has half the normal number of chromosomes and the cells are usually genetically identical.	527
		(4) Each cell has half the normal number of chromosomes and the cells are usually genetically different.	

sperm

	1681. A large number of sperm cells are produced by males every day. This large number of sperm cells increases the chance that	Regents Date Aug2009
S4K4	(1) at least one sperm cell will be reached when the eggs swim toward the sperm cells in the ovary	16
	(2) several sperm cells will unite with an egg so the fertilized egg will develop properly	Data Base File Number
ANSWER 3	(3) some of the sperm cells will survive to reach the egg	
	(4) enough sperm cells will be present to transport the egg from where it is produced to where it develops into a fetus	211

sperm

	1682. Testosterone directly affects the	Regents Date June2013
S4K4	(1) formation of a zygote	31
	(2) changes within an ovary	Data Base File Number
ANSWER 3	(3) production of sperm cells	
	(4) development of a placenta	966

staining

	1683. Which technique could be used to make the structures in cells more visible when using a compound light microscope?	Regents Date Jan2019
LABA	(1) paper chromatography	50
	(2) staining	Data Base File Number
ANSWER 2	(3) electrophoresis	
	(4) gene manipulation	1466

staining

	1684. When using a compound light microscope, the most common reason for staining a specimen being observed is to	Regents Date June2011
LABA	(1) keep the organism from moving around	36
	(2) make the view more colorful	Data Base File Number
ANSWER 4	(3) determine the effects of chemicals on the organism	
	(4) reveal details that are otherwise not easily seen	355

starch

1685. Starch molecules present in a maple tree are made from materials that originally entered the tree from the external environment as

- (1) enzymes
- (2) simple sugars
- (3) amino acids
- (4) inorganic compounds

S4K1

ANSWER 4

Regents Date

Aug2006

19

Data Base File Number

536

starch

1686. Most of the starch stored in the cells of a potato is composed of molecules that originally entered these cells as

- (1) enzymes
- (2) simple sugars
- (3) amino acids
- (4) minerals

S4K1

ANSWER 2

Regents Date

June2006

6

Data Base File Number

504

starch

1687. Before starch can enter a cell, it must be

- (1) absorbed by simple sugars
- (2) diffused into simple sugars
- (3) digested to form simple sugars
- (4) actively transported by simple sugars

S4K1

ANSWER 3

Regents Date

June2013

9

Data Base File Number

948

starch

1688. In order to enter cells and be useful to the body, starch must be

- (1) absorbed through the skin
- (2) broken down into fats and water
- (3) digested into simple sugars
- (4) converted to carbon dioxide and ATP

S4K1

ANSWER 3

Regents Date

June2014

4

Data Base File Number

1037

stomate

1689. The leaves of a plant are dotted with openings known as stomata. When open, stomata allow the plant to exchange gases and allow moisture to evaporate, helping to draw water from the roots up into the plant. These activities help the plant to

- (1) produce light energy
- (2) maintain homeostasis
- (3) decompose organic matter
- (4) synthesize minerals

S4K5

ANSWER

2

Regents Date

Aug2010

21

Data Base File Number

294

stomate

1690. While looking at the bottom surface of a leaf with a compound light microscope, a student notices pairs of cells with openings between them on the surface of the leaf. The main purpose of these openings and the cells that surround them is

- (1) removing excess sugars
- (2) synthesis of carbon dioxide
- (3) regulating gas exchange
- (4) purification of water

S4K5

ANSWER

3

Regents Date

Aug2018

18

Data Base File Number

1425

stomate

1691. When a plant is in a hot and dry environment, the guard cells may close the stomate openings in the leaves. This action will directly

- (1) maintain homeostasis by reducing the evaporation of water
- (2) harm the plant by cutting off its oxygen supply
- (3) maintain homeostasis by preventing carbon dioxide from entering
- (4) harm the plant by cutting off its energy supply

S4K5

ANSWER

1

Regents Date

Jan2023

17

Data Base File Number

1662

stomate

1692. The interaction between guard cells and a leaf opening would NOT be involved in

- (1) diffusion of carbon dioxide
- (2) maintaining homeostasis
- (3) heterotrophic nutrition
- (4) feedback mechanisms

S4K5

ANSWER

3

Regents Date

June2005

21

Data Base File Number

585

stomate

1693. Over time, a tree that once had a total mass of 300 g increased in mass to 3000 kg. This increase in mass comes mostly from

- (1) carbon dioxide that enters through the leaf openings
- (2) oxygen that enters through the leaf openings
- (3) soil that all plants need to grow
- (4) chloroplasts that enter the roots and move to the leaves

Regents Date
June2019

5

S4K5

Data Base File
Number

1471

ANSWER 1

succession

1694. As succession proceeds from a shrub community to a forest community, the shrub community modifies its environment, eventually making it

- (1) more favorable for itself and less favorable for the forest community
- (2) more favorable for itself and more favorable for the forest community
- (3) less favorable for itself and more favorable for the forest community
- (4) less favorable for itself and less favorable for the forest community

Regents Date
Aug2006

23

S4K6

Data Base File
Number

538

ANSWER 3

succession

1695. After a building was torn down and the area was cleared, grasses began to grow in the area. Several years later, small bushes replaced the grasses. This pattern of plant growth is known as ecological

- (1) stability
- (2) cultivation
- (3) succession
- (4) coordination

Regents Date
Aug2013

27

S4K6

Data Base File
Number

992

ANSWER 3

succession

1696. Years after the lava from an erupting volcano destroyed an area, grasses started to grow in that area. The grasses were gradually replaced by shrubs, evergreen trees, and finally, by a forest that remained for several hundred years. This entire process is an example of

- (1) feedback
- (2) ecological succession
- (3) plant preservation
- (4) deforestation

S4K6

ANSWER 2

Regents Date

Jan2008

26

Data Base File Number

91

succession

1697. Lichens and mosses are the first organisms to grow in an area. Over time, grasses and shrubs will grow where these organisms have been. The grasses and shrubs are able to grow in the area because the lichens and mosses

- (1) synthesize food needed by producers in the area
- (2) are at the beginning of every food chain in a community
- (3) make the environment suitable for complex plants
- (4) provide the enzymes needed for plant growth

S4K6

ANSWER 3

Regents Date

June2005

26

Data Base File Number

588

succession

1698. A volcanic eruption destroyed a forest, covering the soil with volcanic ash. For many years, only small plants could grow. Slowly, soil formed in which shrubs and trees could grow. These changes are an example of

- (1) manipulation of genes
- (2) evolution of a species
- (3) ecological succession
- (4) equilibrium

S4K6

ANSWER 3

Regents Date

June2008

28

Data Base File Number

122

succession / secondary

1699. After a fire destroys a forest, the area will most likely

- (1) remain bare land indefinitely
- (2) develop into a desert area
- (3) develop into an entirely different type of forest after hundreds of years
- (4) recover through gradual changes back to a point of long-term stability

S4K6

ANSWER 4

Regents Date

Aug2011

26

Data Base File Number

376

succession / secondary

- 1700.** What would most likely occur after an ecosystem is disrupted by fire?
- (1) The ecosystem would eventually return to its original state.
 - (2) The ecosystem would return to its previous state immediately.
 - (3) The ecosystem would evolve into a new ecosystem that is totally different from the original.
 - (4) The ecosystem would become an ever-changing environment with no stability.

S4K6

ANSWER 1

Regents Date

Jan2002

31

Data Base File Number

877

succession / secondary

- 1701.** A fire burns an oak forest down to bare ground. Over the next 150 years, if the climate remains constant, this area will most likely
- (1) remain bare ground
 - (2) return to an oak forest
 - (3) become a rain forest
 - (4) become a wetland

S4K6

ANSWER 2

Regents Date

Jan2006

27

Data Base File Number

493

succession / secondary

- 1702.** What will most likely result after a fire or other natural disaster damages an ecosystem in a certain area?
- (1) The area will remain uninhabited for an indefinite number of centuries.
 - (2) A stable ecosystem will be reestablished after one year.
 - (3) An ecosystem similar to the original one will eventually be reestablished if the climate is stable.
 - (4) The stable ecosystem that becomes reestablished in the area will be different from the original.

S4K6

ANSWER 3

Regents Date

June2001

33

Data Base File Number

911

survival

1703. Which statement concerning sexual reproduction is correct?

- (1) It is not necessary in order for the individual to survive.
- (2) The offspring are identical to the parent.
- (3) It is necessary in order for the individual to survive.
- (4) The offspring are identical to each other.

Regents Date

Aug2015

15

S4K4

Data Base File Number

1162

ANSWER

1

survival success

1704. The Florida panther, a member of the cat family, has a population of fewer than 100 individuals and has limited genetic variation. Which inference based on this information is valid?

- (1) These animals will begin to evolve rapidly.
- (2) Over time, these animals will become less likely to survive in a changing environment
- (3) These animals are easily able to adapt to the environment.
- (4) Over time, these animals will become more likely to be resistant to disease.

Regents Date

Aug2003

19

S4K3

Data Base File Number

792

ANSWER

2

survival success

1705. Which group would most likely have the greatest survival success during a long period of environmental changes?

- (1) a small population of rabbits living in a field of grass
- (2) a large population of red ants living in a forest
- (3) an endangered population of polar bears living near an iceberg
- (4) one species of bird that nests only in sugar maple trees

Regents Date

Aug2011

12

S4K6

Data Base File Number

365

ANSWER

2

survival success

1706. Plant species X lives in a hot, dry environment. Slowly, over hundreds of years, the climate becomes wetter. Fungi attack species X and cause the population of species X to decrease. However, plant species X could survive if the plants

S4K3

ANSWER

4

- (1) try to mutate quickly and synthesize new proteins
- (2) are watered often and fertilized with extra nutrients
- (3) can adapt to the new conditions by mating with the fungus
- (4) have a few members of the population that are fungus-resistant

Regents Date

Aug2016

18

Data Base File Number

1252

survival success

1707. For native human populations in tropical areas, the intensity of ultraviolet (UV) rays from the Sun is strong, and skin color is generally dark. Melanin pigments found in people with darker skin color help block the effects of the UV radiation on skin cells. In tropical areas, the best explanation for having increased melanin in human skin cells is that it

S4K3

ANSWER

2

- (1) increases the occurrence of mutations
- (2) provides a survival advantage
- (3) acts as a feedback mechanism to increase UV exposure
- (4) produces antibodies that destroy pathogens

Regents Date

Aug2022

33

Data Base File Number

1645

survival success

1708. Milkweeds are plants that produce toxic, bitter-tasting chemicals. Some insects have developed the ability to safely feed on milkweed. They accumulate some of the toxin in their bodies, causing them to taste bitter to other animals that may try to eat them. As a result, most animals avoid eating these insects. A possible explanation for this relationship is that

S4K3

ANSWER

1

- (1) eating a toxic plant increases the ability of these insects to survive and reproduce
- (2) milkweed populations are controlled by many insects
- (3) the milkweed benefits from the insects that can tolerate the toxin they produce
- (4) eventually the insects will become immune to the toxin

Regents Date

Aug2024

15

Data Base File Number

1796

survival success

1709. Which statement about competition in ecosystems is correct?
- (1) Organisms compete most when they occupy different niches and resources are plentiful.
 - (2) Individuals need not compete, because resources such as water and food are always plentiful in ecosystems.
 - (3) Organisms that compete successfully will survive, reproduce, and pass their traits on to their offspring.
 - (4) Competition usually results in the extinction of a species, ensuring the survival of other species.

S4K3

ANSWER 3

Regents Date

Aug2024

11

Data Base File Number

1793

survival success

1710. A native species is competing for resources with a nonnative species that was accidentally introduced into the area. The nonnative species is more likely to survive than the native species when
- (1) both species eat the same food
 - (2) predators prey on both species
 - (3) the native species is immune to a particular pathogen present in the ecosystem
 - (4) the nonnative species has no natural enemies present in the ecosystem

S4K7

ANSWER 4

Regents Date

Jan2023

3

Data Base File Number

1651

survival success

1711. Some behaviors such as mating and caring for young are genetically determined in certain species of birds. The presence of these behaviors is most likely due to the fact that
- (1) birds do not have the ability to learn
 - (2) individual birds need to learn to survive and reproduce
 - (3) these behaviors helped birds to survive in the past
 - (4) within their lifetimes, birds developed these behaviors

S4K3

ANSWER 3

Regents Date

June2002

17

Data Base File Number

844

survival success

LAB3

ANSWER 4

1712. The role that the environment plays in determining which species survive is referred to as
- (1) a trade-off
 - (2) a gene mutation
 - (3) an ecological niche
 - (4) a selecting agent

Regents Date
June2019
81
Data Base File Number
1496

survival success

S4K3

ANSWER 1

1713. As climate changes, which type of reproduction would most likely result in a greater chance of survival for a species?
- (1) sexual reproduction, with a short reproductive cycle
 - (2) sexual reproduction, with a long reproductive cycle
 - (3) asexual reproduction, with a short reproductive cycle
 - (4) asexual reproduction, with a long reproductive cycle

Regents Date
June2019
26
Data Base File Number
1485

survival success

S4K3

ANSWER 2

1714. A gene mutation resulting in insecticide resistance would most likely cause an increase in an insect population because
- (1) more insects will need to be resistant to the insecticide
 - (2) the insecticide-resistant insect will survive and reproduce
 - (3) the insect with the resistance gene will reproduce asexually
 - (4) spraying an insecticide will allow more insects without mutations to survive

Regents Date
June2022
42
Data Base File Number
1625

synthesis

	1715. A colony of bacteria growing on a culture medium is successfully synthesizing an organic compound. Which procedure would be LEAST likely to have an effect on this synthesis?	Regents Date Aug2003
S4K5	(1) adding more subunits of the organic compound to the medium	25
ANSWER	(2) lowering the pH of the medium	Data Base File Number
4	(3) raising the temperature of the colony from 20°C to 30°C	
	(4) increasing the number of hormone molecules in the colony	797

synthesis

	1716. Which two terms are considered to be opposite processes?	Regents Date Aug2012
S4K1	(1) photosynthesis and autotrophic nutrition	3
ANSWER	(2) cloning and mitosis	Data Base File Number
3	(3) digestion and synthesis	
	(4) dynamic equilibrium and homeostasis	445

synthesis

	1717. The structures most directly involved in the synthesis of cellular proteins are the	Regents Date Aug2023
S4K1	(1) nucleus and ribosomes	8
ANSWER	(2) cell membrane and nucleus	Data Base File Number
1	(3) chloroplasts and cell membrane	
	(4) mitochondria and chloroplasts	1709

synthesis

	1718. Which statement concerning simple sugars and amino acids is correct?	Regents Date Jan2004
S4K1	(1) They are both wastes resulting from protein synthesis.	5
ANSWER	(2) They are both building blocks of starch.	Data Base File Number
3	(3) They are both needed for the synthesis of larger molecules.	
	(4) They are both stored as fat molecules in the liver.	648

synthesis

S4K1	1719. Which sequence represents the correct order of events for the production of necessary complex molecules after food is taken in by a multicellular animal? (1) diffusion -> synthesis -> absorption -> digestion -> circulation (2) circulation -> diffusion -> synthesis -> absorption -> digestion (3) digestion -> absorption -> circulation -> diffusion -> synthesis (4) synthesis -> digestion -> absorption -> diffusion -> circulation	Regents Date Jan2011
		12
		Data Base File Number
		314
ANSWER	3	

synthesis

S4K5	1720. In living cells, chemical processes, such as synthesis, all require the action of (1) specialized antibiotics (2) hormones (3) salts (4) biological catalysts	Regents Date Jan2016
		21
		Data Base File Number
		1194
ANSWER	4	

synthesis

S4K2	1721. Which sequence represents the correct interaction of organelles and processes for the synthesis of proteins? (1) nucleus → amino acid bonding → ribosomes → gene codes (2) ribosomes → nucleus → gene codes → amino acid bonding (3) ribosomes → gene codes → amino acid bonding → nucleus (4) nucleus → gene codes → ribosomes → amino acid bonding	Regents Date Jan2024
		38
		Data Base File Number
		1746
ANSWER	4	

synthesis

S4K1	1722. Which two systems are most directly involved in providing molecules needed for the synthesis of fats in human cells? (1) digestive and circulatory (2) excretory and digestive (3) immune and muscular (4) reproductive and circulatory	Regents Date June2004
		3
		Data Base File Number
		676
ANSWER	1	

synthesis

		Regents Date
		June2005
		17
S4K5	1723. Which group contains only molecules that are each assembled from smaller organic compounds?	Data Base File Number
	(1) proteins, water, DNA, fats	583
ANSWER	(2) proteins, starch, carbon dioxide, water	
3	(3) proteins, DNA, fats, starch	
	(4) proteins, carbon dioxide, DNA, starch	

synthesis

		Regents Date
		June2024
		24
S4K1	1724. Which two terms are opposite processes?	Data Base File Number
	(1) autotrophic nutrition and photosynthesis	1771
ANSWER	(2) asexual reproduction and cloning	
3	(3) digestion and synthesis	
	(4) natural selection and evolution	

technological advancement

		Regents Date
		Jan2008
		29
S4K7	1725. Which result of technological advancement has a positive effect on the environment?	Data Base File Number
	(1) development of new models of computers each year, with disposal of the old computers in landfills	94
ANSWER	(2) development of new models of cars that travel fewer miles per gallon of gasoline	
3	(3) development of equipment that uses solar energy to charge batteries	
	(4) development of equipment to speed up the process of cutting down trees	

testes

		Regents Date
		Aug2002
		20
S4K4	1726. Testes are adapted to produce	Data Base File Number
	(1) body cells involved in embryo formation	819
ANSWER	(2) immature gametes that undergo mitosis	
3	(3) sperm cells that may be involved in fertilization	
	(4) gametes with large food supplies that nourish a developing embryo	

tissue

S4K1	1727. The respiratory system includes a layer of cells in the air passages that clean the air before it gets to the lungs. This layer of cells is best classified as	Regents Date
		Jan2009
		6
		Data Base File Number
ANSWER	1	159

tissue

S4K1	1728. Tissue engineering is being developed as a technology that would use laboratory-grown tissues to replace diseased or damaged human body parts, such as hearts and kidneys. In order to build these new body parts, scientists would start by	Regents Date
		June2024
		15
		Data Base File Number
ANSWER	4	1767

transport

S4K1	1729. The human body has many cells that are deep inside the body. For this reason, the human body requires	Regents Date
		June2019
		41
		Data Base File Number
ANSWER	1	1489

transport / oxygen

S4K1	1730. Which organ system in humans is most directly involved in the transport of oxygen?	Regents Date
		June2009
		2
		Data Base File Number
ANSWER	4	178

uterus

1731. To clone a mammal, a cloned embryo is often put into an adult female of the same species to continue internal development. The structure in which the embryo will develop is the

- (1) ovary
- (2) placenta
- (3) uterus
- (4) egg

S4K4

ANSWER

3

Regents Date

Aug2018

12

Data Base File Number

1420

uterus

1732. Which statement about the functioning of the human reproductive system is correct?

- (1) The zygote helps the mother provide milk to the fetus before it is born.
- (2) Testes produce unfertilized eggs and release them so that they can be fertilized by sperm.
- (3) Ovaries are where male gametes undergo meiosis to reduce their chromosome number.
- (4) The uterus is where the fetus develops internally until birth.

S4K4

ANSWER

4

Regents Date

Jan2023

14

Data Base File Number

1659

uterus

1733. Within which structure in the human body does specialization of parts of the developing baby take place?

- (1) ovary
- (2) uterus
- (3) testis
- (4) pancreas

S4K4

ANSWER

2

Regents Date

June2001

18

Data Base File Number

900

vaccination

1734. Which statement about the response of the body to pathogens is correct?

- (1) Red blood cells engulf invaders and produce antibodies that attack invaders.
- (2) Vaccinations may contain weakened microbes that stimulate the formation of antibodies.
- (3) AIDS is a bacterial disease that strengthens the immune system.
- (4) All allergic reactions are caused by an immune response to microorganisms.

S4K5

ANSWER

2

Regents Date

Aug2022

25

Data Base File Number

1644

vaccination

1735. Many vaccinations stimulate the immune system by exposing it to
- (1) antibodies
 - (2) enzymes
 - (3) mutated genes
 - (4) weakened microbes

S4K5

ANSWER

4

Regents Date

Jan2003

8

Data Base File Number

733

vaccination

1736. Vaccinations help prepare the body to fight invasions of a specific pathogen by
- (1) inhibiting antigen production
 - (2) stimulating antibody production
 - (3) inhibiting white blood cell production
 - (4) stimulating red blood cell production

S4K5

ANSWER

2

Regents Date

Jan2006

23

Data Base File Number

490

vaccination

1737. Dogs can be vaccinated against the rabies virus. When a vaccinated dog is exposed to the rabies virus, the dog will most likely
- (1) develop a mutation that will make the dog sick and the dog will be unable to recover
 - (2) have a damaged immune system and will not be able to be protected
 - (3) have an immune response and will be able to fight the microbes
 - (4) develop a response that will allow the immune system to attack some of the body's own cells

S4K5

ANSWER

3

Regents Date

Jan2016

50

Data Base File Number

1207

vaccination

1738. Which activity would stimulate the human immune system to provide protection against an invasion by a microbe?
- (1) receiving antibiotic injections after surgery
 - (2) choosing a well-balanced diet and following it throughout life
 - (3) being vaccinated against chicken pox
 - (4) receiving hormones contained in mother's milk while nursing

S4K5

ANSWER

3

Regents Date

June2003

26

Data Base File Number

769

vaccination

- 1739.** Which statement best describes what will most likely happen when an individual receives a vaccination containing a weakened pathogen?
- (1) The ability to fight disease will increase due to antibodies received from the pathogen.
 - (2) The ability to fight disease caused by the pathogen will increase due to antibody production.
 - (3) The ability to produce antibodies will decrease after the vaccination.
 - (4) The ability to resist most types of diseases will increase.

S4K5

ANSWER

2

Regents Date

June2004

22

Data Base File Number

685

vaccination

- 1740.** Which statement best describes how a vaccination can help protect the body against disease?
- (1) Vaccines directly kill the pathogen that causes the disease.
 - (2) Vaccines act as a medicine that cures the disease.
 - (3) Vaccines cause the production of specific molecules that will react with and destroy certain microbes.
 - (4) Vaccines contain white blood cells that engulf harmful germs and prevent them from spreading throughout the body.

S4K5

ANSWER

3

Regents Date

June2007

21

Data Base File Number

41

vaccination

- 1741.** When getting a vaccination, which substance is injected into the body?
- (1) bacteria to combat a pathogen
 - (2) white blood cells to engulf a pathogen
 - (3) a weakened form of a virus
 - (4) antibiotics to kill a virus

S4K5

ANSWER

3

Regents Date

June2015

27

Data Base File Number

1140

vaccination

- 1742.** Vaccinated individuals are protected from disease because their bodies have been stimulated to
- (1) produce antibodies against specific pathogens
 - (2) synthesize antigens against harmful microbes
 - (3) make fewer white blood cells during infection
 - (4) manufacture more enzymes to react to microbes

S4K5

ANSWER

1

Regents Date

June2024

29

Data Base File Number

1775

vaccination

- 1743.** A pandemic is a medical event in which a disease spreads across many countries and affects a large number of people. Historically, a number of infectious diseases have had pandemic significance. The diseases are: mumps, small pox, measles, Rubella, chicken pox and polio to name a few. The diseases mentioned have been largely eradicated by vaccinating very large numbers of the population. In 2019 a respiratory virus called "Covid-19" has reached pandemic proportions and millions have died. What would be the most effective way to eradicate "Covid-19"?
- (1) Let the disease infect large numbers of the population.
 - (2) Use an antibody treatment.
 - (3) Vaccinate large numbers of the population.
 - (4) Isolate diseased areas of the population.

RBS

ANSWER

3

Regents Date

RBS2021

1

Data Base File Number

1593

vaccine

- 1744.** The use of a vaccine to stimulate the immune system to act against a specific pathogen is valuable in maintaining homeostasis because
- (1) once the body produces chemicals to combat one type of virus, it can more easily make antibiotics
 - (2) the body can digest the weakened microbes and use them as food
 - (3) the body will be able to fight invasions by the same type of microbe in the future
 - (4) the more the immune system is challenged, the better it performs

S4K5

ANSWER

3

Regents Date

Aug2004

17

Data Base File Number

707

vaccine

1745. A vaccine used against an infectious disease may contain
- (1) specialized blood cells
 - (2) toxic enzymes
 - (3) a variety of antibiotics
 - (4) weakened pathogens

S4K5

ANSWER

4

Regents Date

Aug2009
19

**Data Base File
Number**

215

vaccine

1746. When a new viral infection appears in a population, scientists usually try to develop a vaccine against the virus. Which substances would most likely be contained in the new vaccine?
- (1) live bacteria that ingest viruses
 - (2) white blood cells from an infected individual
 - (3) weakened viruses associated with the infection
 - (4) a variety of microbes that will attack the virus

S4K5

ANSWER

3

Regents Date

Aug2010

5

**Data Base File
Number**

283

vaccine

1747. Why does injecting dead or weakened viruses into a person help to fight against future infections from that virus?
- (1) Your body responds to the injection by making red blood cells that protect you from future infection.
 - (2) Your body responds to the injection by making antibodies that protect you from future infection.
 - (3) Your body responds to the injection by making antigens that protect you from future infection.
 - (4) Your body responds to the injection by making plasma that protects you from future infection.

S4K5

ANSWER

2

Regents Date

Aug2016

64

**Data Base File
Number**

1265

vaccine

1748. Doctors sometimes use a vaccine to prepare the body to defend itself against future infections. These vaccines most often contain
- (1) antibodies
 - (2) antibiotics
 - (3) white blood cells
 - (4) weakened pathogens

S4K5

ANSWER

4

Regents Date

Aug2019

5

**Data Base File
Number**

1502

vaccine

1749. Ebola is a deadly viral disease. Victims of Ebola suffer from massive blood loss and organ failure. Researchers are testing a vaccine on people who have not yet been infected by Ebola, but live in high-risk areas. The vaccine must be given to the subjects before exposure to Ebola because

- (1) the vaccine will mutate the virus when a person gets infected
- (2) if a subject is infected with Ebola, it will destroy the vaccine
- (3) vaccines stimulate the subject's immune system to react to future exposure to the virus
- (4) vaccines are only effective for a few days, so the patient must get the vaccine before exposure

S4K5

ANSWER

3

Regents Date

Aug2024

20

Data Base File Number

1799

vaccine

1750. A vaccine for the viral disease known as chicken pox would contain

- (1) a large amount of live virus
- (2) a dead or weakened form of the pathogen
- (3) several different antibiotics
- (4) a small number of white blood cells

S4K5

ANSWER

2

Regents Date

Jan2014

9

Data Base File Number

1005

vaccine

1751. A student received a flu shot in the fall. During the flu season, the student caught a cold. The most likely reason the vaccine he received did not prevent the cold was that

- (1) his illness was not caused by a pathogen
- (2) he did not get the vaccine at the right time of year
- (3) his body produced antibiotics in response to the vaccine
- (4) the vaccine he received contained only flu virus antigens

S4K5

ANSWER

4

Regents Date

Jan2017

7

Data Base File Number

1272

vaccine

	1752.	In order to prepare for a future outbreak of Ebola, a harmful virus, two vaccines were tested. In order for either of these vaccines to be effective, they must	Regents Date Jan2023
S4K5	(1)	cause the immune system to produce special proteins that will recognize and destroy the virus	12
	(2)	be able to destroy the DNA code that produces white blood cells that can carry the virus	Data Base File Number
ANSWER	(3)	stimulate the human body to produce antigens that can attach to and destroy the Ebola virus	1657
1	(4)	produce bacterial cells that can attack the Ebola virus	

vaccine

	1753.	A dead or weakened pathogen used to establish immunity would most likely be found in	Regents Date June2016
S4K5	(1)	a pesticide	20
	(2)	an antibiotic	Data Base File Number
ANSWER	(3)	a vaccine	1224
3	(4)	a toxin	

vaccine

	1754.	Scientists are developing a malaria vaccine that would most likely contain	Regents Date June2017
S4K5	(1)	weakened drugs used to treat the symptoms of malaria	16
	(2)	white blood cells from the malaria-infected individuals	Data Base File Number
ANSWER	(3)	a weakened form of the malaria-causing organism	1313
3	(4)	antibodies made from the malaria-causing organism	

vacuole

	1755.	In single-celled organisms, materials are stored primarily in	Regents Date Jan2019
S4K1	(1)	ribosomes	1
	(2)	mitochondria	Data Base File Number
ANSWER	(3)	nuclei	1436
4	(4)	vacuoles	

vacuole

1756. What is the main function of a vacuole in a cell?

- (1) storage
- (2) coordination
- (3) synthesis of molecules
- (4) release of energy

S4K1

ANSWER

1

Regents Date

**June2010
6**

**Data Base File
Number**

259

variation

1757. Some variation must be present in a population in order for natural selection to take place. These variations arise from mutations in the DNA and

- (1) sorting of chromosomes during sexual reproduction
- (2) combining of chromosomes during organ development
- (3) changing of chromosomes during cloning
- (4) removal of chromosomes during selective breeding

S4K2

ANSWER

1

Regents Date

Aug2013

9

**Data Base File
Number**

977

variation

1758. When a paramecium, a single-celled organism, is living under stressful conditions, it sometimes switches from asexual to sexual reproduction. The main advantage when this switch occurs is that the paramecium is most likely to

- (1) produce fewer offspring
- (2) increase variation among its offspring
- (3) avoid having to find a mate
- (4) produce clones of itself

S4K3

ANSWER

2

Regents Date

Aug2015

16

**Data Base File
Number**

1163

variation

1759. Evolution can occur at different rates; however, for evolution to occur, there must be

- (1) variations within a species
- (2) extinction of the species
- (3) asexual reproduction
- (4) no change in the genes of an organism

S4K3

ANSWER

1

Regents Date

Aug2016

9

**Data Base File
Number**

1245

variation

	1760. Which process is LEAST likely to add to the variety of traits in a population?	Regents Date Jan2005
S4K3	(1) deletion of bases from DNA	8
	(2) genetic engineering	Data Base File Number
ANSWER	(3) accurate replication of DNA	547
3	(4) exchange of segments between chromosomes	

variation

	1761. The sorting and recombination of genes during reproduction is important to evolution because these processes	Regents Date Jan2011
S4K3	(1) decrease variation and help maintain a stable population	15
	(2) increase variation that enables species to adapt to change	Data Base File Number
ANSWER	(3) decrease the chances of producing offspring that are adapted to the environment	315
2	(4) increase the ability of all the offspring to adapt to the environment	

variation

	1762. The variations that exist in a population of wild giraffes are usually a result of events that occur during	Regents Date Jan2014
S4K3	(1) mitotic division	5
	(2) genetic engineering	Data Base File Number
ANSWER	(3) asexual reproduction	1001
4	(4) sexual reproduction	

variation

	1763. Which processes lead to the greatest variety of genetic combinations?	Regents Date Jan2014
S4K3	(1) asexual reproduction and cloning	26
	(2) meiosis and fertilization	Data Base File Number
ANSWER	(3) meiosis and mitosis	1018
2	(4) cloning and mitosis	

variation

	1764.	A significant difference between the effects of the genetic information passed on from asexually reproducing parents to their offspring and sexually reproducing parents to their offspring is the	Regents Date Jan2015
S4K2		(1) degree of modification of the size of chromosomes	10
ANSWER	4	(2) types of DNA subunits	Data Base File Number
		(3) number of chromosomes in the body cells of the offspring	1100
		(4) amount of variation between the parents and the offspring	

variation

	1765.	Survival of at least a few members of a population after a major environmental change is most dependent on	Regents Date Jan2017
S4K3		(1) the population having an individual that is adapted to the original environment	12
ANSWER	3	(2) the population having an individual that is adapted to great changes in the temperature in its environment	Data Base File Number
		(3) variations in many different traits in many individuals in the population	1277
		(4) no variations in the color of the fur, skin, or feathers of the individuals in the population	

variation

	1766.	The process of sexual reproduction is an important part of the process of evolution. One reason for this is that meiosis and fertilization directly produce many new	Regents Date Jan2019
S4K3		(1) antigens	17
ANSWER	2	(2) variations	Data Base File Number
		(3) species	1449
		(4) pathogens	

variation

	1767.	Some organisms have variations. Two sources of these variations are	Regents Date Jan2023
S4K3		(1) mitotic and meiotic cell division	11
ANSWER	2	(2) mutations and recombination	Data Base File Number
		(3) cloning and sexual reproduction	1656
		(4) natural selection and evolution	

variation

	1768.	Within ten years after the introduction of a new mosquito spray, very few of the descendants of the targeted mosquito populations were killed by the usual dose of the spray. The best explanation for this is that	Regents Date Jan2024
S4K3	(1)	ingesting the spray caused the mosquitoes to become resistant to it	12
	(2)	the spray polluted the water in which the mosquitoes deposited their eggs	Data Base File Number
ANSWER	(3)	the spray killed organisms that caused diseases in mosquitoes	
4	(4)	existing variations in the mosquito population provided resistance to the spray	1749

variation

	1769.	Mutations can be beneficial to a species because they	Regents Date Jan2024
S4K3	(1)	can lead to some members of a species having favorable traits in a changing environment	11
	(2)	allow organisms to mate with other species	Data Base File Number
ANSWER	(3)	will lead to the loss of traits that are helpful in a specific environment	
1	(4)	cause the reproductive rate of a species to decrease	1748

variation

	1770.	A farmer wanted to rid his apple trees of a particular leaf-eating insect. He sprayed his trees with an insecticide that killed 98% of the insects. The survival of 2% of this population of insects is most likely due to	Regents Date June2016
S4K3	(1)	genes obtained from another species	16
	(2)	certain chemicals that stimulated overproduction	Data Base File Number
ANSWER	(3)	variations that resulted from sexual reproduction	
3	(4)	their ability to produce food from the pesticide	1220

variation

1771. Farmers may someday clone their best milk producing cow into a whole herd. What potential disadvantage might be important to consider in having such a large group of clones on one farm?

- (1) It may be difficult to tell the animals apart.
- (2) Lack of variation may limit survival in the herd.
- (3) The cows could be fertilized by only one type of bull.
- (4) The cows could be mated only with each other.

S4K1

ANSWER

2

Regents Date

June2016

3

Data Base File Number

1211

vegetative propagation

1772. A tree produces only seedless oranges. A small branch cut from this tree produces roots after it is planted in soil. When mature, this new tree will most likely produce

- (1) oranges with seeds, only
- (2) oranges without seeds, only
- (3) a majority of oranges with seeds and only a few oranges without seeds
- (4) oranges and other kinds of fruit

S4K4

ANSWER

2

Regents Date

Jan2007

16

Data Base File Number

59

vegetative propagation

1773. Potatoes were the main crop in Ireland in the 1800s. Almost the entire population of Ireland was dependent on a single variety of potato, the "lumper." These potatoes were reproduced by a method of asexual reproduction known as vegetative propagation. In the middle of the 1800s, a disease caused by a fungus killed almost the entire lumper crop within two years. As a result, millions of people in Ireland died of starvation. The most likely reason the potato disease was able to destroy the potato crop in such a short time is that the

- (1) potato population lacked variations
- (2) lumper variety had a long reproductive cycle
- (3) lumper had several variations caused by vegetative propagation
- (4) potato population in Ireland utilized all of the finite resources

S4K3

ANSWER

1

Regents Date

Jan2014

40

Data Base File Number

1026

vitamin

1774. Base your answer to this question on the information given and on your knowledge of biology. Folic acid is a type of vitamin that is essential for the normal growth and development of cells in the body. If a woman consumes folic acid in her diet before and during the earliest stages of pregnancy, it can help to reduce her baby's risk for developing a type of birth defect called a neural tube defect. Early in pregnancy, the neural tube forms the brain and spinal cord. If the neural tube does not form properly, serious birth defects may result. Why is taking folic acid early in pregnancy important in the prevention of neural tube defects?

S4K4

ANSWER 1

- (1) It is essential for normal development of the neural tube.
- (2) It is essential for normal development of the entire body.
- (3) It is essential for normal development of the heart.
- (4) It is essential for normal development of the lungs.

Regents Date

Aug2019

67

Data Base File Number

1527

waste removal

1775. When people exercise, their body cells build up more waste quickly. Which two body systems work together to remove these wastes from their cells?

LAB2

ANSWER 4

- (1) immune and endocrine
- (2) digestive and skeletal
- (3) respiratory and circulatory
- (4) circulatory and digestive

Regents Date

Jan2015

74

Data Base File Number

1121

waste removal

1776. During periods of vigorous physical activity, a person's breathing and heart rates increase. This enables the cells of the body to perform more efficiently because it helps the cells to

LAB2

ANSWER 1

- (1) remove waste products faster
- (2) store excess glucose in muscles
- (3) reduce the amount of ATP produced
- (4) convert more oxygen to glucose

Regents Date

Jan2018

73

Data Base File Number

1381

waste removal

		Regents Date
		June2015
		28
S4K7	1777. Many beverage companies are required to recycle bottles and cans because this activity directly reduces	Data Base File Number
	(1) air pollution and destruction of the ozone shield	1141
ANSWER	(2) overpopulation and soil erosion	
3	(3) solid waste and depletion of resources	
	(4) thermal pollution and extinction of wildlife	

waste removal

		Regents Date
		June2017
		29
S4K1	1778. The kidney is an organ that collects wastes and excess water from the blood and sends them to the bladder where they are stored before being removed from the body. Which two systems work together to perform this function?	Data Base File Number
	(1) immune and respiratory	1322
ANSWER	(2) circulatory and excretory	
2	(3) skeletal and nervous	
	(4) digestive and circulatory	

water balance

		Regents Date
		Jan2008
		2
S4K2	1779. Damage to which structure will most directly disrupt water balance within a single-celled organism	Data Base File Number
	(1) ribosome	75
ANSWER	(2) cell membrane	
2	(3) nucleus	
	(4) chloroplast	

wet mount

		Regents Date
		Aug2010
		32
LABS	1780. A wet-mount slide preparation of a specimen is stained in order to	Data Base File Number
	(1) eliminate some organelles	303
ANSWER	(2) make cell structures more visible	
2	(3) use the high-power lens	
	(4) remove water from the slide	

white blood cell

1781. Which activity is NOT a response of human white blood cells to pathogens?

- (1) engulfing and destroying bacteria
- (2) producing antibodies
- (3) identifying invaders for destruction
- (4) removing carbon dioxide

S4K5

ANSWER 4

Regents Date

Aug2001

24

Data Base File Number

932

white blood cell

1782. Some human white blood cells help destroy pathogenic bacteria by

- (1) causing mutations in the bacteria
- (2) engulfing and digesting the bacteria
- (3) producing toxins that compete with bacterial toxins
- (4) inserting part of their DNA into the bacterial cells

S4K5

ANSWER 2

Regents Date

Aug2006

21

Data Base File Number

541

white blood cell

1783. White blood cells are most closely associated with which two body systems?

- (1) circulatory and digestive
- (2) immune and circulatory
- (3) digestive and excretory
- (4) excretory and immune

S4K1

ANSWER 2

Regents Date

Aug2019

8

Data Base File Number

1505

white blood cell

1784. Which type of cell engulfs pathogens and marks them for killing?

- (1) red blood cell
- (2) white blood cell
- (3) nerve cell
- (4) muscle cell

S4K5

ANSWER 2

Regents Date

Aug2024

16

Data Base File Number

1797

white blood cell

- 1785.** Which activity is not a function of white blood cells in response to an invasion of the body by bacteria?
- (1) engulfing these bacteria
 - (2) producing antibodies to act against this type of bacteria
 - (3) preparing for future invasions of this type of bacteria
 - (4) speeding transmissions of nerve impulses to detect these bacteria

S4K5

ANSWER 4

Regents Date

Jan2005

20

Data Base File Number

558

white blood cell

- 1786.** An infection in the body might result in a sudden
- (1) decrease in the activity of antigens produced by the mitochondria
 - (2) decrease in the amount of DNA present in the nuclei of cells
 - (3) increase in the activity of white blood cells
 - (4) increase in the number of red blood cells

S4K5

ANSWER 3

Regents Date

Jan2014

13

Data Base File Number

1007

white blood cell

- 1787.** A direct indication that the white blood cells of the body are functioning would be
- (1) an increase in the number of oxygen molecules in the lungs
 - (2) a decrease in the number of pathogens in the body
 - (3) a decreased secretion of hormones by certain glands
 - (4) an increase of carbon dioxide in the cells of the body

S4K5

ANSWER 2

Regents Date

Jan2017

5

Data Base File Number

1270

white blood cell

- 1788.** A function of white blood cells is to
- (1) transport oxygen to body cells
 - (2) produce hormones that regulate cell communication
 - (3) carry glucose to body cells
 - (4) protect the body against pathogens

S4K5

ANSWER 4

Regents Date

June2011

23

Data Base File Number

345

zygote

1789. A scientist wants to change the DNA of a sexually reproducing organism and have the new DNA present in every cell of the organism. In order to do this after fertilization, she would change the DNA in the

- (1) zygote
- (2) placenta
- (3) testes of the father
- (4) ovaries of the mother

S4K2

ANSWER

1

Regents Date

Aug2011

10

Data Base File Number

363

zygote

1790. All the information necessary for growth, development, and eventual reproduction of sexually reproducing organisms is present in

- (1) sperm cells, only
- (2) egg cells, only
- (3) zygotes
- (4) either sperm cells or egg cells

S4K2

ANSWER

3

Regents Date

Aug2014

14

Data Base File Number

1076

zygote

1791. A human cell that contains all of the information necessary for the growth and development of a complete organism is

- (1) a sperm cell
- (2) a gamete
- (3) a zygote
- (4) an egg cell

S4K4

ANSWER

3

Regents Date

Aug2016

20

Data Base File Number

1253

zygote

1792. Which two processes are directly required for a human zygote to be produced?

- (1) mitosis and fertilization
- (2) meiosis and fertilization
- (3) mitosis and differentiation
- (4) meiosis and differentiation

S4K4

ANSWER

2

Regents Date

Aug2023

23

Data Base File Number

1721

zygote

1793. All the genetic information necessary for the growth and development in a sexually reproducing animal is present in
- (1) egg cells, only
 - (2) sper cells, only
 - (3) either sperm cells or egg cells
 - (4) zygotes

S4K4

ANSWER

4

Regents Date

Jan2024

30

Data Base File Number

1743

zygote

1794. A human zygote is produced from gametes that are usually identical in
- (1) the expression of encoded information
 - (2) the number of altered genes present
 - (3) chromosome number
 - (4) cell size

S4K2

ANSWER

3

Regents Date

June2002

10

Data Base File Number

840

zygote

1795. Tissues develop from a zygote as a direct result of the process of
- (1) fertilization and meiosis
 - (2) fertilization and differentiation
 - (3) mitosis and meiosis
 - (4) mitosis and differentiation

S4K4

ANSWER

4

Regents Date

June2007

16

Data Base File Number

36

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