

Type of mutation	No mutation none	Add 2 bases	Add 3 bases	Remove 2 bases	Remove 3 bases	Change 1 base
Original DNA	TAC,GGG,GGC,TCT,TCG,GGA,ATC	TAC,GGG,GGC,TCT,TCG,GGA,ATC	TAC,GGG,GGC,TCT,TCG,GGA,ATC	TAC,GGG,GGC,TCT,TCG,GGA,ATC	TAC,GGG,GGC,TCT,TCG,GGA,ATC	TAC,GGG,GGC,TCT,TCG,GGA,ATC
Mutated DNA						
mRNA						
Protein						
rank						

Mutations

Purpose: Evaluate the effect of different types of mutations on the resulting proteins.

Materials: protein synthesis and words cards

Procedure:

1. Complete the no mutation column with the class
2. Complete the Add 2 bases column with the class
3. Complete all other columns within your group
4. Rank each mutation according to the table below:

Rank	Degree of Change	Example
0	No change	We have dog breath
1	Modified, makes sense	We have puppies breath
2	Meaning changed, makes sense	We have dog music
3	Does not make sense	We mother life your

Conclusion:

1. In this analogy, when would a protein be able to function?

2. The sickle cell trait is caused by one amino acid, which is called glutamic acid, being changed into a different amino acid, valine. There are no other differences between the normal protein (called hemoglobin) and the protein that causes the sickle cell trait. What kind of mutation caused this change? Explain your answer.

Codon Chart for Sentences

FIRST BASE		SECOND BASE			THIRD BASE
	U	C	A	G	
A	AUU an	ACU dog	AAU dresses	AGU Beatles	U
A	AUC band	ACC have	AAC mother	AGC best	C
A	AUA rock	ACA breath	AAA your	AGA the	A
A	AUG start	ACG funny	AAG wears	AGG are	G
G	GUU nothing	GCU education	GAU and	GGU father	U
G	GUC dress	GCC much	GAC demented	GGC to	C
G	GUA a	GCA so	GAA all	GGA door	A
G	GUG brother	GCG fun	GAG puppies	GGG future	G
C	CUU music	CCU subject	CAU pulled	CGU day	U
C	CUC love	CCC biology	CAC rubber	CGC water	C
C	CUA I	CCA when	CAA old	CGA drink	A
C	CUG roll	CCG is	CAG breaks	CGG every	G
U	UUU life	UCU informed	UAU this	UGU little	U
U	UUC code	UCC must	UAC in	UGC you	C
U	UUA DNA	UCA together	UAA we	UGA around	A
U	UUG for	UCG be	UAG Stop.	UGG read	G