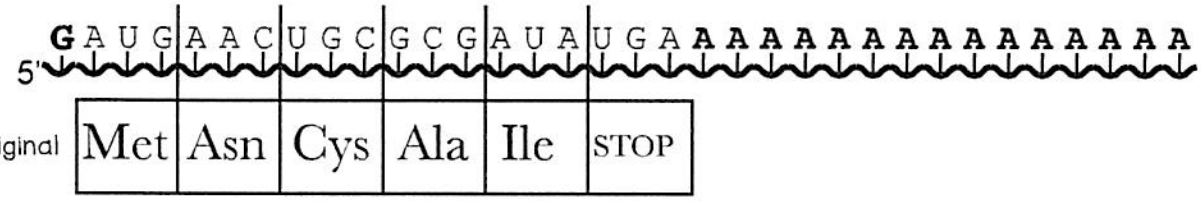
Outcome Practice : Mutations

Name: Class: Date:

Mutation Types I: Base Substitutions

Answer the questions below.

Below, several mRNA transcripts with a mutation are shown below the original. Using your codon table, write the amino acid sequence below each mRNA transcript. Once you reach a stop codon, stop (even if there are more spaces available at the end of the answer box.) Compare each one to the first mRNA. What type of mutation caused each mRNA change? Name the mutation type next to it (missense, nonsense, silent)



original	Met	Asn	Cys	Ala	Ile	STOP

1. | | | | | | | Mutation Type: _____

2. | | | | | | | Mutation Type: _____

3. | | | | | | | Mutation Type: _____

4. Which type of mutation affects the end result (the polypeptide) the most?

_____

5. Which type of mutation affects the end result (the polypeptide) the least?

_____

6. Do mutations actually occur in the DNA or the mRNA of an organism?

_____

7. Are these mRNA base changes a result of a mutation in an exon or a mutation in an intron in a particular gene?

_____

8. Consider the following statement:
All mutations are harmful.

Do you agree or not? Explain your answer.

_____

_____

_____

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Mutation Types 2: Frameshifts

Answer the questions below.

Below, several mRNA transcripts with a mutation are shown below the original. Using your codon table, write the amino acid sequence below each mRNA transcript. Once you reach a stop codon, stop (even if there are more spaces available at the end of the answer box.) Compare each one to the first mRNA. Describe in your own words the changes that occured and circle how many bases were changed.

original	Met	Asn	Cys	Ala	Ile	STOP

1.

How was the polypeptide affected?

Circle one:

_____

_____

1 base insertion
2 bases insertion
3 bases insertion

2.

How was the polypeptide affected?

Circle one:

_____

_____

1 base insertion
2 bases insertion
3 bases insertion

3.

How was the polypeptide affected?

Circle one:

_____

_____

1 base insertion
2 bases insertion
3 bases insertion

4. Do all insertions and deletions cause frameshifts? Explain your answer.

_____

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MUTATIONS

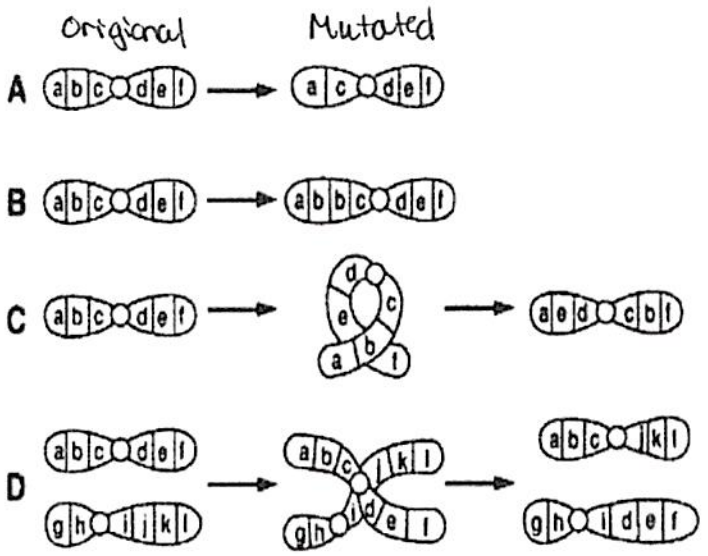
CHROMOSOMAL MUTATION

A. _____

B. _____

C. _____

D. _____



1. For each diagram on the left, indicate what type of chromosome mutation is illustrated. Choose from: translocation, deletion, insertion/duplication, and inversion

SUM IT UP!!!

2. Variation in the genetic code caused by _____ may alter the protein sequence, which can lead to variation in species.

3. Mutations that occur in somatic cells usually results in killing only body cells. An exception to this is if the mutation occurs to the DNA that controls regulation of the cell cycle. This can result in _____. Somatic mutations _____ be passed on to the next generation.

4. Mutations that occur in gamete (sex) cells means that every cell of the developing fetus/baby will have that mutation. _____mutations can be passed on to the next generation. Gene mutations and _____ mutations can occur in gametes. Chromosomal mutations can lead to several syndromes and abnormalities, since they affect several genes on the chromosomes.