

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

### DNA Mutations Practice

There are two main types of mutations:

- **Frameshift:** The reading frame is moved due to an added or deleted base
- **Substitution:** One base replaces another (a substitution is made)

**Frameshift** mutations come in two varieties: **Insertion** or **Deletion** mutations.

- **Insertion:** An extra base is added (inserted)
- **Deletion:** A base is lost (deleted)

**Substitution** mutations can result in either a **Missense**, **Silent**, or **Nonsense** mutation.

- **Missense:** A substitution **changes** a single amino acid but the rest of the sequence is unchanged.
- **Silent:** A substitution does **not** change the coded amino acid.
- **Nonsense:** A substitution **changes** a single amino acid to a **STOP** codon, ending the protein early.

*Directions: Transcribe and translate each DNA sequence below. Classify each mutation as a **Frameshift** or **Substitution**. Then give the mutation a secondary classification as a **Insertion**, **Deletion**, **Missense**, **Silent**, or **Nonsense** mutation. Finally, explain how the mutation might affect the resulting protein.*

<b>Original DNA Sequence:</b>	T A C   A C C   T T G   G C G   A C G   A C T
<b>mRNA Sequence:</b>	
<b>Amino Acid Sequence:</b>	

Mutated DNA sequence #1:      T A C   A T C   T T G   G C G   A C G   A C T	
What is the mRNA sequence?	
What is the amino acid sequence?	
Will the protein be affected? Y or N	What kind of mutation is this?
How did the mutation change the resulting protein?	

<b>Original DNA Sequence:</b>	T A C   A C C   T T G   G C G   A C G   A C T
<b>mRNA Sequence:</b>	
<b>Amino Acid Sequence:</b>	

Mutated DNA sequence #2:   T A C   G A C   C T T   G G C   G A C   G A C   T	
What is the mRNA sequence?	
What is the amino acid sequence?	
Will the protein be affected? Y or N	What kind of mutation is this?
How did the mutation change the resulting protein?	
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Mutated DNA sequence #3:   T A C   A C C   T T A   G C G   A C G   A C T	
What is the mRNA sequence?	
What is the amino acid sequence?	
Will the protein be affected? Y or N	What kind of mutation is this?
How did the mutation change the resulting protein?	
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Mutated DNA sequence #4:   T A C   A C C   T T G   G C G   T C G   A C T	
What is the mRNA sequence?	
What is the amino acid sequence?	
Will the protein be affected? Y or N	What kind of mutation is this?
How did the mutation change the resulting protein?	
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