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.*

Original DNA Sequence:	T A C A C C T T G G C G A C G A C T
mRNA Sequence:	
Amino Acid Sequence:	

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? _____ _____	

Original DNA Sequence:	T A C A C C T T G G C G A C G A C T
mRNA Sequence:	
Amino Acid Sequence:	

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? _____ _____	

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? _____ _____	

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? _____ _____	