

NAME _____ **KEY**
Mutations Worksheet - Deletion, Insertion & Substitution



There are several types of mutations:

- > **DELETION** (a base is lost/deleted)
- > **INSERTION** (an extra base is added/inserted)
 - Deletion & insertion may cause what's called a **FRAMESHIFT** mutation, meaning the reading "frame" changes, thus changing the amino acid sequence from this point forward
- > **SUBSTITUTION** (one base is substituted for another)
 - If a substitution **changes** the amino acid, it's called a **MISSENSE** mutation
 - If a substitution **does not change** the amino acid, it's called a **SILENT** mutation
 - If a substitution **changes the amino acid to a "stop,"** it's called a **NONSENSE** mutation



Complete the boxes below. Classify each as **Deletion, Insertion or Substitution AND** as either **frameshift, missense, silent or nonsense** (**Hint:** Deletion & Insertion will always be frameshift).

Original DNA Sequence: T A C A C C T T G G C G A C G A C T ...
mRNA Sequence: A U G / U G G / A A C / C G C / U G C / U G A
Amino Acid Sequence: Methionine-Tryptophan-Asparagine-Arginine-Cysteine-Stop

Mutated DNA Sequence #1 T A C A T C T T G G C G A C G A C T ...
What's the mRNA sequence? A U G / U **A** G / A A C / C G C / U G C / U G A (Circle the change)
What will be the amino acid sequence? Methionine-Stop
Will there likely be effects? **Yes!** What type of mutation is this? **Nonsense**

Mutated DNA Sequence #2 T A C G A C C T T G G C G A C G A C T ...
What's the mRNA sequence? A U G **C** U G / G A A / C C G / C U G / C U G / A (Circle the change)
What will be the amino acid sequence? Methionine-Leucine-Glutamic Acid-Proline-Leucine-Leucine-
Will there likely be effects? **Yes!** What type of mutation is this? **Insertion**

Mutated DNA Sequence #3 T A C A C C T T A G C G A C G A C T ...
What's the mRNA sequence? A U G / U G G / A A **U** C G C / U G C / U G A (Circle the change)
What will be the amino acid sequence? Methionine-Tryptophan-Asparagine-Arginine-Cysteine-Stop
Will there likely be effects? **No!** What type of mutation is this? **Silent**

Mutated DNA Sequence #4 T A C A C C T T G G C G A C T A C T ...
What's the mRNA sequence? A U G / U G G / A A C / C G C / U G **A** U G A (Circle the change)
What will be the amino acid sequence? Methionine-Tryptophan-Asparagine-Arginine-Stop
Will there likely be effects? **Yes!** What type of mutation is this? **Nonsense**

Biology Chapter 133 Mutations Answers

JE Gale



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