**Mutations Worksheet Name**

There are several types of mutation:

**DELETION** (a base is lost)

**INSERTION** (an extra base is inserted)

Deletion and insertion may cause what’s called a **FRAMESHIFT**, meaning the reading “frame” changes, changing the amino acid sequence.

**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 either Deletion, Insertion, or Substitution **AND** as either

frameshift, missense, silent or nonsense (hint: deletion or insertion will always be frameshift).

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| **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:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| Mutated DNA Sequence #1: **T A C A T C T T G G C G A C G A C T**  Circle the change in the DNA Sequence  What’s the mRNA sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  What will be the amino acid sequence?  Will there likely be effects? What kind of mutation is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Circle the change in the DNA sequence)  What will be the amino acid sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Will there likely be effects? What kind of mutation is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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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’s the mRNA sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Circle the change in the DNA Sequence)  What will be the amino acid sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Will there likely be effects? \_\_\_ What kind of mutation is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Circle the change in the DNA sequence)  What will be the amino acid sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Will there likely be effects? \_\_\_ What kind of mutation is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |