

Name: _____ Period: _____

4.7: Identifying Genetic Mutations

To start, you are given a normal or “wild-type” DNA sequence. Use this DNA code to compare the five mutated sequences. For each of the following problems, you are given a mutated DNA sequence. Transcribe and translate the mutated sequence and identify the difference between the normal DNA sequence and the mutated DNA sequence. Given the descriptions of different types of genetic mutations, label what kind of mutation you think is being represented in the mutated DNA sequence.

Wild-Type DNA: T A C G G C A T G T A G C A G A T C

RNA: _____

Amino Acids: _____

Mutation #1

Mutated DNA: T A C G G C A T G A A G C A G A T C

RNA: _____

Amino Acids: _____

Type of Mutation: _____

Mutation #2

Mutated DNA: T A C G G T A T G T A G C A G A T C

RNA: _____

Amino Acids: _____

Type of Mutation: _____

Mutation #3

Mutated DNA: T A C G G A C A T G T A G C A G A T C

RNA: _____

Amino Acids: _____

Type of Mutation: _____

Mutation #4

Mutated DNA: T A C G G C A T G T A C A G A T C

RNA: _____

Amino Acids: _____

Type of Mutation: _____

Mutation #5

Mutated DNA: T A C G G C A T C T A G C A G A T C

RNA: _____

Amino Acids: _____

Type of Mutation: _____

Class Copy! Please do not write on this paper!

Descriptions of Mutations

Silent Mutation

A base is changed but the resulting amino acid is still the same as in the normal or "wild-type" DNA. There are no actual changes to the overall resulting polypeptide.

Deletion Mutation

One or more bases have been removed or deleted. This may result in a "shift" in the codons resulting in a change in the amino acid sequence leading to a non-functional protein.

Nonsense Mutation

One or more nitrogenous bases are changed resulting in a codon changing to a STOP codon. This may result in a polypeptide sequence being cut short leading to a non-functional protein.

Insertion Mutation

One or more bases have been added or inserted. This may result in a "shift" in the codons resulting in a change in the amino acid sequence leading to a non-functional protein.

Point Mutation

A single nitrogenous base is substituted for another nitrogenous base. May result in a change in the amino acid within the polypeptide.