Mutations Practice Sheet

Vocab you need to know:

Mutation – change in the DNA sequence

Point Mutation – change in only one base

Frameshift Mutation – a change that makes MANY changes

Non-sense Mutation – A protein is not made

MISSENSE Mutation – a protein is made but it is not the correct protein

Insertion – a base is added (causes a frameshift)

Deletion – a base is deleted (causes a frameshift)

Original DNA Base sequence:

TAC GGC TTA ATG CTC ATC TTC GGG CCC

What is the mRNA sequence that would come from the transcription of the original DNA sequence?

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

 What would the amino acid sequence be from the translation of the mRNA above?

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

MUTATIONS: The mutations are large (notice them) the rest of the DNA is the same

Mutation A is as follows

 TAC GGC TTG ATG CTC ATC TTC GGG CCC

What is the mRNA sequence that would come from the transcription of the **MUTATED** DNA sequence?

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

 What would the NEW amino acid sequence be from the translation of the mRNA above?

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Compare the mRNA of the original to that from mutation A. What is the difference?

Compare the amino acids from the original and mutation A. What is the difference?

Is this a point mutation or frameshift mutation?

Does the mutation A have any affects?

Mutation B is as follows

TAC GGC TTA ATG CTG ATC TTC GGG CCC

New mRNA is \_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_

New amino acid sequence from the mutated DNA would be

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Compare the mRNA of the original to that from mutation B. What is the difference?

Compare the amino acids from the original and mutation B. What is the difference?

Is this a point mutation or frameshift mutation?

Does the mutation B have any affects?

Mutation C is as follows

TAC GGC *A TT***A AT***G CT*C ATC TTC GGG CCC

(REMEMEBER you still READ every three) (I got you started)

What is the mRNA sequence that would come from the transcription of the **MUTATED** DNA sequence?

AUG CCG UAA \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

 What would the NEW amino acid sequence be from the translation of the mRNA above?

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Compare the mRNA of the original to that from mutation C. What is the difference?

Compare the amino acids from the original and mutation C. What is the difference?

Is this a point mutation or frameshift mutation?

Does the mutation C have any affects?

Write mutation A, B, C under each description that it matches (may match more than one\_

Point mutation Frameshift missense

Nonsense insertion