

# Point Mutation Problems

In the exercise below, determine from the original DNA, the new mutant DNA, the new mRNA sequence, and the amino acid sequence. Use the examples on the previous pages as a guide

and refer to the mRNA amino acid table on the activity *The Genetic Code*. In each case, identify the type of point mutation and describe its effect on the coding for the protein:

1. Substitute the 6th base (G) in the original DNA with a C (cytosine).

(a) Identify this type of point mutation:

\_\_\_\_\_

(b) Describe its effect on the protein produced:

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

2. Delete the 14th base (A) in the original DNA, with no replacement.

(a) Identify this type of point mutation:

\_\_\_\_\_

(b) Describe its effect on the protein produced:

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

3. Insert a new base (G) between the 14th and the 15th base, and delete the 6th base (G) in the original DNA.

(a) Identify this type of point mutation:

\_\_\_\_\_

(b) Describe its effect on the protein produced:

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

4. Discuss the difference between a **gene mutation** and a **chromosome mutation**: \_\_\_\_\_

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

Mutation: Substitute G with C

Original DNA	AAA ATG TTT CTC CAA GAT
Mutant DNA	_____
mRNA	_____
Amino Acids	○ ○ ○ ○ ○ ○

Mutation: Deletion of A

Original DNA	AAA ATG TTT CTC CAA GAT
Mutant DNA	_____
mRNA	_____
Amino Acids	○ ○ ○ ○ ○ ○

Mutation: Deletion of G

Mutation: Insertion of G

Original DNA	AAA ATG TTT CTC CAA GAT
Mutant DNA	_____
mRNA	_____
Amino Acids	○ ○ ○ ○ ○ ○