Name _____ **Date** _____ **Period** _____

<u>**Mutations Worksheet**</u>

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)

➡ Complete the boxes below. Classify each as either Deletion, Insertion, or Substitution

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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

Matching DNA Sequence:

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 matching DNA Sequence?   (circle the change)

What kind of mutation is this?

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 matching DNA Sequence?   (Circle the change)

What kind of mutation is this?

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 matching DNA Sequence?   (Circle the change)

What kind of mutation is this?

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 matching DNA Sequence?   (Circle the change)

What kind of mutation is this?

Mutated DNA Sequence #5:   T A C A C C T T G G G A C G A C T

What's the matching DNA Sequence?   (Circle the change)

What kind of mutation is this?

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1. Which type of mutation is responsible elongating a DNA strand?

2. Which type of mutation results in shortening of a DNA strand?

3. Which type of mutation doesn't change the length of a DNA strand?

Sickle Cell Anemia

Sickle cell anemia is the result of a type of mutation in the gene that codes for part of the red blood cell. Recall that red blood cells carries oxygen in your red bloods cells. The mutation causes the red blood cells to become stiff and sickle-shaped when they release their oxygen. The sickled cells tend to get stuck in blood vessels, causing pain and increased risk of stroke, blindness, damage to the heart and lungs, and other conditions.
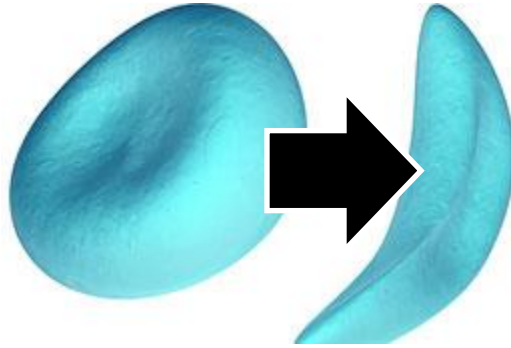
Analyze the DNA strands below to determine what amino acid is changed and what type of mutation occurred.

Normal red blood cell DNA   C A C G T G G A C T G A G G A C T C C T C

Normal matching DNA strand

Sickle cell matching DNA strand   G T G C A C C T G A C T C C T G T G G A G

Sickle cell red blood cell DNA

What kind of mutation is this?