Name: Period:	Unit 6 Topic 3 Page:
Mutations Practice	
There are several types of mutation:	
FRAMESHIFT DELETION (a base is lost)	
FRAMESHIFT INSERTION (an extra base is inserted)	
Deletion and insertion may cause what's called a <b>FRAMESHIFT</b> , meaning t	he reading "frame"
changes, changing the ENTIRE amino acid sequence. <b>POINT MUTATION (SUBSTITUTION)</b> (one base is substituted for another)	
If a substitution <i>changes</i> the amino acid, it's called a <b>MISSENSE</b> mutation.	
If a substitution <b>does not change</b> the amino acid, it's called a <b>SILENT</b> muta	
If a substitution <i>changes the amino acid to a "stop,"</i> it's called a <b>NONSEN</b>	SE mutation.
Complete the boxes below. Classify each as either Frameshift or Point (substitution insertion, missense, silent or nonsense (hint: deletion or insertion will always be from the second	
Original DNA Sequence: TACACCTTGGCCGACGACT	
mRNA Sequence:	
Amino Acid 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 mRNA sequence?	(Circle the change
What will be the amino acid sequence?	
Will there likely be effects? 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 mRNA sequence?	(Circle the change
What will be the amino acid sequence?	-
Will there likely be effects?       What kind of mutation is this?	
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 mRNA sequence?	(Circle the change
•	
What will be the amino acid sequence?	
Will there likely be effects?    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	
	(Circle the change
What's the mRNA sequence?	
What's the mRNA sequence?	

Original DNA Sequence:	T A C A C C T T G G C G A C G A C T	
Amino Acid Sequence:		
Matatad DNIA Common #5.	тьсьсствсссьст	

Mutated DNA Sequence #5: I A C A C C I I G G G A C G A C I		
What will be the corresponding mRNA sequence?		
What will be the amino acid sequence?		
Will there likely be effects? What kind of mutation is this?		
1. Which type of mutation is responsible for new variations of a trait?		

2. Which type of mutation results in abnormal amino acid sequence?

3. Which type of mutation stops the translation of the mRNA?

## Sickle Cell Anemia

Sickle cell anemia is the result of a type of mutation in the gene that codes for part of the hemoglobin molecule. Recall that hemoglobin 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 hemoglobin DNA
CACGTGGACTGAGGACTCCTC

Normal hemoglobin mRNA

Normal hemoglobin AA sequence

Sickle cell hemoglobin DNA

CACGTGGACTGAGGACACCTC

Sickle cell hemoglobin mRNA

Sickle cell hemoglobin mRNA