Mutations Worksheet	Name	Da	te:	_ Per	
There are several types of DELETION (a					
•	(an extra base is added)				
·	on and insertion may caus	e what's called	FRAMESH	(IFT, meaning the	e reading "frame"
	es, changing the amino aci				
	ON (one base is substitut			CENCEtatian	
	ubstitution <i>changes</i> the a ubstitution <i>does not chan</i>				
	ubstitution <i>changes the d</i>	_			
Complete the boxes frameshift, missens	below. Classify each as e se, silent or nonsense (hin	ither Deletion, t: deletion or in	Insertion, o sertion will	r Substitution <u>Al</u> always be frames	<u>ND</u> as either shift).
Original DNA Sequence:	T A C A C C T	TGGCGA	CGAC	СТ	
mRNA Sequence:					
Amino Acid Sequence:					
Mutated DNA Sequence #	†1: TACATCT	TGGCGA	CGAC	C T	
What's the mRNA sequen	ice?				(Circle the change)
What will be the amino ac	eid sequence?				
Will there likely be effects	s? W	hat kind of muta	tion is this?		
Mutated DNA Sequence #	[‡] 2: TACGACC	TTGGCC	GACGA	A C T	
What's the mRNA sequen	ice?				(Circle the change)
What will be the amino ac	eid sequence?				
Will there likely be effects	s? W	hat kind of muta	tion is this?		
N 1004 G		T	- C C + C	7. m	1
•	⁴ 3: T A C A C C T				(0: 1 1 1 1
	ice?				
	eid sequence?				
Will there likely be effects	s? W	hat kind of muta	tion is this?		
Mutated DNA Sequence #	±4: TACACCT	T G G C G	A C T A C	. T	
_	ice?				(Circle the change)
	eid sequence?				
	s? WI				

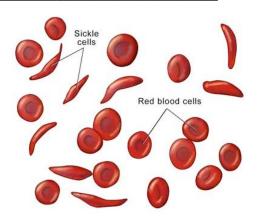
Original DNA Sequence:	TACACCTTGGCGACGACT
mRNA Sequence:	
Amino Acid Sequence:	

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

Sickle Cell Anemia

Sickel cell anemia is the result of a type of mutation in the gene that codes for part of the **hemoglobin** molecule. Hemoglobin is a **protein** 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 sickle 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.

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



<u>Transcribe</u> the mRNA strand from the DNA strands below. Then, <u>translate</u> the mRNA into its matching amino acids to see which 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