DNA Replication and Protein Synthesis Worksheets

Instructions: Answer the questions in complete sentences and follow the directions below.

1. After DNA Replication occurs, how many DNA strands are there?

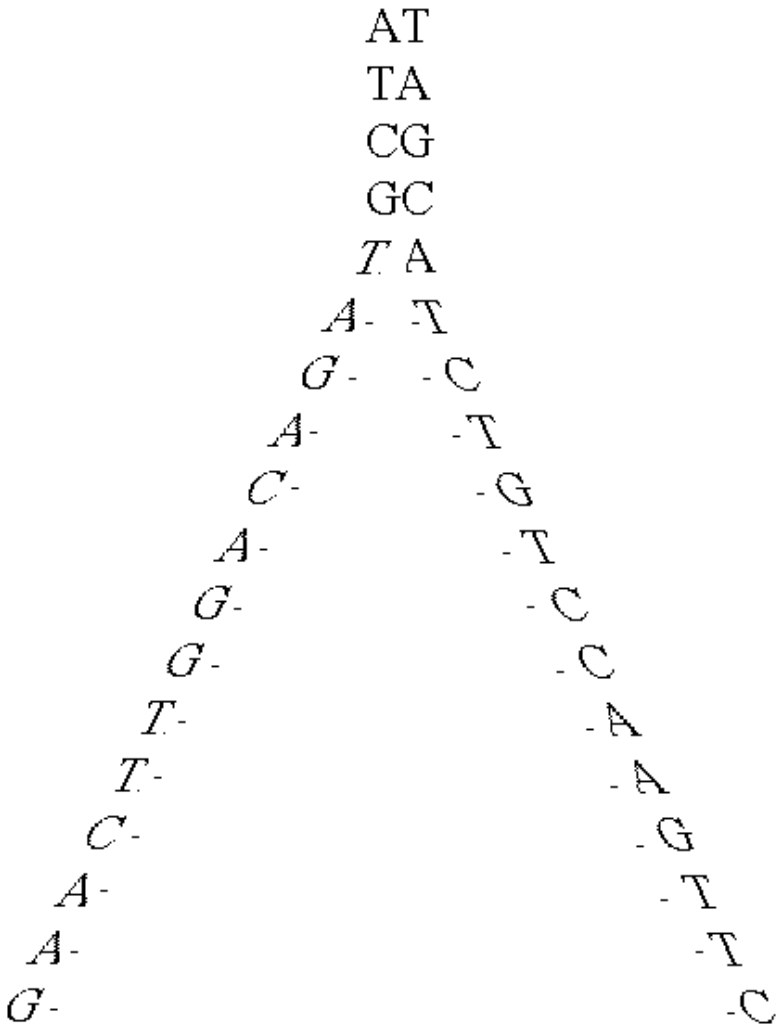
2. Why is DNA Replication considered semiconservative?

3. When does DNA Replication occur?

4. Why is DNA Replication important?

5. Where in the cell does DNA Replication occur?

6. The DNA molecule below is undergoing DNA replication. Fill in the appropriate bases



Amino Acid Codon Sheet

First Base	Second Base								Third Base
	U		C		A		G		
U	UUU UUC	Phenyl-alanine	UCU UCC UCA UCG	Serine	UAU UAC	Tyrosine	UGU UGC	Cysteine	U C
	UUA UUG	Leucine			UAA UAG	Stop Stop	UGA UGG	Stop Tryptophan	A G
C	CUU CUC CUA CUG	Leucine	CCU CCC CCA CCG	Proline	CAU CAC CAA CAG	Histidine Glutamine 	CGU CGC CGA CGG	Arginine	U C A G
A	AUU AUC AUA	Isoleucine	ACU ACC ACA ACG	Threonine	AAU AAC AAA AAG	Asparagine Lysine 	AGU AGC AGA AGG	Serine Arginine	U C A G
	AUG	Methionine-Start							
G	GUU GUC CUA GUG	Valine	GCU GCC GCA GCG	Alanine	GAU GAC GAA GAG	Aspartic Acid Glutamic Acid	GGU GGC GGA GGG	Glycine	U C A G

Protein Synthesis

Introduction: Protein Synthesis is a difficult process to understand. This worksheet will help you gain a basic understanding of this somewhat complicated process.

Procedure: Follow the instructions below and answer the questions.

Step 1 <u>Transcription</u>: The following sequence of bases is DNA. Transcribe it to mRNA by writing the corresponding mRNA bases below the strand.

T – A – C – T – G – A – A – G – T – C – T – C – G – G – C – A – C – T

1: What RNA base matches with C?

2: What RNA base matches with G?

3: What RNA base matches with T?

4: What RNA base matches with A?

5: Are the DNA bases and RNA bases the same? Why or why not? Explain using complete sentences.

Step 2 <u>Translation</u>: Once the mRNA molecule copies the information from the DNA molecule, it travels outside the nucleus and meets up with a ribosome.

6: What do the ribosomes do?

7: Define codon:

8: How many bases does it take to make a codon?

9: What do codons code for?

10: How many codons are in the above strand of RNA?

11: How many Amino Acids is that?

Step 3: Once the RNA molecule meets up with the ribosomes, the ribosomes read the codons and apply the corresponding tRNA molecule that is attached to the corresponding amino acid. Recopy the RNA sequence in the space at the top of the next page then use your 'Amino Acid Codon Sheet' to fill in the chart and find the correct amino acid sequence.

Recopy the RNA sequence here:

Protein Construction

Codons		Corresponding Amino Acids
1st (First 3 RNA bases)		
2nd		
3rd		
4th		
5th		
6th		

Step 4: This amino acid sequence is the formula for a protein. Answer the questions below in complete sentences.

12: Where did the information to make the amino acid sequence come from?

13: What are the 2 main jobs of proteins?

14: What happens to the protein after it is constructed? List the organelles used.

15: What difference would it make if the RNA miscopied one of the bases of the DNA molecule?

16: What are the functions of the start and stop amino acids?