

Name: _____

Date: _____

Period: _____

Biology: DNA and Protein Synthesis Activity

Background

Protein synthesis (or making proteins) takes place in every cell of your body. In our cell unit, we discussed how proteins are made on ribosomes, transported to the endoplasmic reticulum for shaping, and packaged for delivery by the golgi apparatus. Scientists estimate that there are over a million different proteins in your body, and instructions for making these different proteins are "written" in your DNA using the GATC alphabet. Proteins are made by assembling building blocks of amino acids. A different order of amino acids will make a different protein. In this activity, you will investigate how your body goes from reading the DNA instructions to building a protein.

Directions

1. Use the base pairing rules and fill out the complementary DNA strand with the correct bases.
2. Now, use the base pairing rules and fill out the correct bases to make the mRNA strand.
3. Complete the tRNA complexes below with the missing information- find either the anticodon OR the name of the amino acid (use the provided codon chart, or one in your textbook).
4. Cut out and color the tRNA complexes. Then attach them to the mRNA strand in the proper place.

DNA Strand	Complementary DNA Strand	DNA Strand	Messenger RNA strand
T		T	
A		A	
C		C	
G		G	
C		C	
T		T	
C		C	
A		A	
C		C	
G		G	
T		T	
A		A	
C		C	
T		T	
T		T	
T		T	
A		A	
C		C	
G		G	
A		A	
T		T	
A		A	
T		T	
T		T	

Questions

1. Which part of this activity represents DNA replication? Where does it take place in the cell?
2. Which part of this activity represents transcription? Where does it take place in the cell?
3. Which part of this activity represents translation? Where does it take place in the cell?
4. What do we call a long chain (or polymer) of amino acids?
5. How would the end product change if the 4th base, "G" was eliminated (a deletion mutation) from the entire sequence?
6. How would the end product change if the very last codon, ATT, was changed to ATC?

