DNA Sequence	① ➡	mRNA Sequence	② ➡	Amino Acid
TAC				
ACG				
CCA				
CGG				
CAT				
ACA				
GGT				
CTG				
CTC				
AGC				
TGA				
ATG				
TTA				
GTC				
TTT				
GTG				
TCT				
GAG				
TAA				
AAA				
ACC				
ATC				

Modeling Protein Synthesis

ONE submission per group. Working in a group of 4, you will use the genetic code to model the making of a protein.
❗ means there is something you'll submit.

PART 1: The genetic code. *Here is the DNA sequence. Here is a genetic code table.*

1. ❗ What is step 1 on the diagram? Where does this occur in cells? What enzyme performs this reaction?
2. ❗ What is step 2 on the diagram? Where does this occur in cells?
3. ❗ Upload a picture of your completed page.

PART 2: Amino Acids *Here are the amino acids. Here are the amino acid properties.*

1. ❗ What is common amongst all amino acids?
2. Color the "R" groups of each amino acid based on the property it displays. Yellow = non-polar, hydrophobic. Blue = polar, hydrophilic. Green = + charge, hydrophilic. Purple = - charge, hydrophilic.

PART 3: Primary Protein Structure

1. Place the amino acids in the sequence determined by the DNA code. Staple together or tape the amino acids in order.
2. Draw the peptide bonds and water that form between amino acids as they bond together.
3. ❗ What type of reaction binds amino acids together? Where does this reaction occur?
4. ❗ What is the primary structure of a protein?
5. ❗ Upload a picture of your completed polypeptide.

PART 4: Secondary Protein Structure (we will not model)

1. ❗ What are the two structure that form as the protein takes a secondary shape?
2. ❗ What type of bond holds together the secondary structure?

Part 5: Tertiary Protein Structure

1. The cystines will form a covalent bond. Staple them together.
2. The nonpolar, hydrophobic amino acids will want to clump together out of the way of water surrounding the protein. Arrange your amino acids so these amino acids are clumped together.
3. The + and - amino acids will be attracted to each other. Tape them together.
4. The polar, hydrophilic amino acids surround the outside of the protein, near the surrounding water.
5. ❗ Upload a picture of your completed protein.
6. ❗ What effect might high temperatures or changes to pH have on the structure and function of this fictional protein?
7. ❗ What effect might a change in the DNA (mutation) have on the structure and function of this fictional protein?

Part 6: Quaternary Protein Structure

8. Combine your polypeptide with that of another group.