Name_____Name_____Protein_____

DNA Triplets	Messenger RNA (mRNA) Codons	Transfer RNA (tRNA) Anti-codons	Protein Amino Acid Sequence (use mRNA for chart)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			

Protein Synthesis Model Lab

Day 1

- Use the DNA strand that codes for your enzyme to complete the chart on the other side of this page.
  - Partner 1 Complete 1-11
  - Partner 2 Complete 12-23
- Color the bases of your tRNA molecules:
  - A- red
  - U- blue
  - C- yellow
  - G- green
- Color the amino acids the color designated on each amino acid.
  - Stop should not be colored
- Decorate ribosome:
  - Front
    - Name of protein
    - Illustrations showing examples of its function and where it may be found in the body
  - Back
    - Both partner's names & period number

Day 2

- Create the mRNA strand
  - Cut along the bold lines on the grid to give you 7 strips, each with 10 white squares and 1 shaded square for overlap to glue/tape
  - Attach strips end to end with shaded regions covered by the strip above.
- Cut out the tRNA molecules
  - Cut along the bold lines only.
  - They are all "T" shaped with a number at the bottom of the molecule.
  - You should cut out 24 molecules. (one of which is a spare with no bases written on it)
- Cut out the amino acids
- Beginning at the start codon, match the appropriate tRNA anticodon to the mRNA codon
  - Tape/ glue the pieces together so the long part of the tRNA anticodon runs behind the middle base of the mRNA codon.
  - Attach the correct amino acid to the end of the tRNA anticodon that sticks out past the mRNA codon.
- Complete the questions below:

1. What does <u>your</u> protein do for the body? _____
2. What macromolecule (biomolecule) is this? _____
3. Explain what happens in each step of protein synthesis. _____

   _____

   _____

   _____
4. Specify what you did in this lab to simulate each step of protein synthesis. _____

   _____

   _____

   _____
5. What would be the result if you changed the second DNA triplet to **ACT**? _____

   _____
6. What is the start codon? _____ What amino acid does it code for? _____
7. If the 23rd DNA **<u>base</u>** was switched to an A during **DNA replication**, what amino acid would this code for? _____

   _____
8. Would that mutation affect the outcome of your enzyme/protein? Explain.

   _____

   _____