Name _____ Date _____ Class _____

Amino Acids and Proteins

Though there are only 20 common amino acids, they can be combined in different ways to produce thousands of unique proteins. Proteins that differ in the order or type of amino acids they contain may have very different structures and functions. In fact, a change in even a single amino acid can sometimes affect the way a protein works.

Suppose that proteins could consist of just two amino acids. To see how many unique proteins, each composed of just two amino acids, can be formed from five different amino acids, fill in the spaces in the table below. Some of the spaces have been filled in to show you how. Assume that each letter represents a different amino acid.

Amino Acids	*A*	*B*	*C*	*D*	*E*
A	*AA*	*AB*	*AC*		
B	*BA*				
C					
D					
E					

Answer the following questions in the spaces provided.

1. What does each letter pair in the table represent?

   _____

2. Based on your completed table, how many unique proteins, each composed of just two amino acids, can be formed from five different amino acids?

   _____

3. How many unique proteins, each made up of just two amino acids, could be formed from six different amino acids? From 20 different amino acids?

   _____

4. Most proteins are made up of not just two, but hundreds or even thousands of amino acids. How does this affect the number of unique proteins that could be formed from just a few amino acids?

   _____

   _____