Activity AB5.21 Making proteins

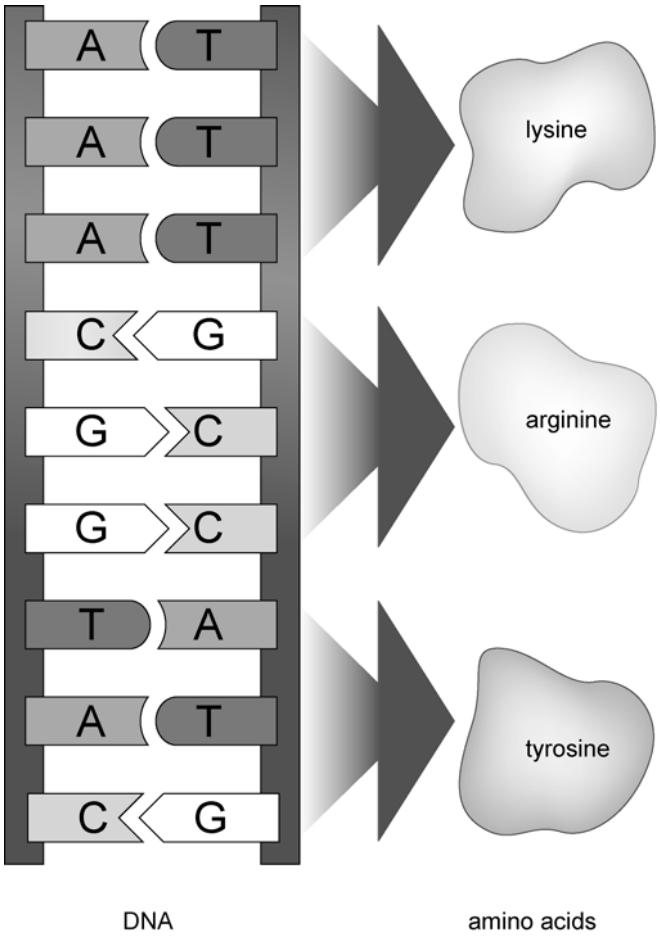
To do

Read the following then answer the questions on the next sheet.

The great number of jobs carried out by proteins means that they have to vary a lot in structure. Some proteins are insoluble strings, such as keratin and collagen. Others are soluble and round in shape such as enzymes and haemoglobin. The exact shapes of proteins can be very important in how they work.

Proteins are made of 20 different kinds of amino acids joined in a chain. The chains can contain between 50 and many thousands of amino acids, but most are a few hundred amino acids in length. Amino acids can be joined in any order along the chain, so thousands of different kinds of protein are possible. The sequence (order) of amino acids fixes the way the protein folds into its three-dimensional shape. The shape gives the protein its chemical properties.

DNA contains the genetic code which instructs the cell to join up the amino acids in the right order to make a particular protein. The genetic code is contained in the sequence of bases in the DNA molecule. Just four bases: A, T, G and C, provide enough codes for all 20 amino acids. This sounds impossible, but the cell does it by having three bases coding for each amino acid. This is called the triplet code. There are 64 different triplet codes we can make using three bases. The diagram shows three examples:



Three bases on the DNA code for each amino acid in a protein:
TTT codes for the amino acid lysine
GCC codes for the amino acid arginine
ATG codes for the amino acid tyrosine

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To answer

For questions marked * you may need to use your textbook.
Use the index and the glossary to help you find the information.

1 Name two different types of protein.

2* Write down what they do.

3 Copy and complete these sentences:

There are ……. different kinds of amino acids in proteins.

4 Explain why your cells can make thousands of different proteins.

5* Explain why a protein's shape is very important.

6* What does DNA stand for?

7 Describe in one sentence the shape of a DNA molecule.

8 Explain how DNA is made up of bases, like the rungs of a ladder.

9* Where are proteins made in the cell?

10* Where are genes kept in the cell?

11* Explain how proteins are made in a cell. You could draw a diagram.