

DNA structure

4.6.1.5 · Inheritance, variation and evolution · revision notes

DNA is a polymer of nucleotides, and the order of its bases codes for the order of amino acids in a protein. This is in GCSE Biology only, not in Combined Science.

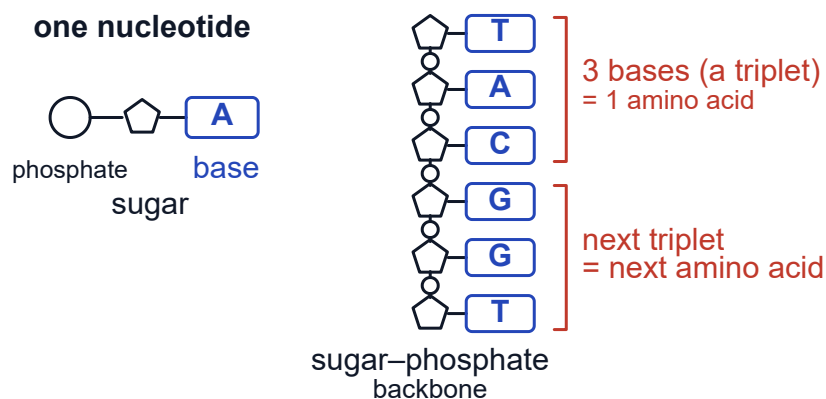
Key facts

- Nucleotide = sugar + phosphate + one base
- DNA strand: alternating sugar and phosphate, with a base on each sugar
- Four bases: A, C, G, T
- 3 bases = the code for 1 amino acid

Notes

DNA is a polymer of nucleotides

- DNA is a **polymer** made from repeating units called **nucleotides**.
- Each nucleotide is a common **sugar** and a **phosphate** group, with one of **four bases** attached to the sugar.
- The four bases are **A, C, G and T**. You do not need to know the structures of the bases.
- Each long strand has alternating **sugar and phosphate** sections, with a base attached to each sugar.



DNA is a polymer of nucleotides. Every three bases code for one amino acid.

The genetic code

- A sequence of **three bases** is the code for one particular **amino acid**.
- The order of bases controls the **order in which amino acids are assembled** to make a particular protein.

How to answer each type of question

Describe the structure of DNA

3 to 4 marks

Grade 5

1. Say DNA is a polymer of repeating nucleotides.
2. Describe a nucleotide: sugar, phosphate and one of four bases (A, C, G, T).
3. Describe the strand: alternating sugar and phosphate, with a base on each sugar.

Example. Describe the structure of a DNA molecule. [4 marks]

Model answer. DNA is a polymer made of repeating nucleotides (1). Each nucleotide contains a sugar, a phosphate group and a base (1). There are four different bases: A, C, G and T (1). Each strand has alternating sugar and phosphate sections with a base attached to each sugar (1).

Don't lose marks

- ✗ Saying each base codes for an amino acid. It takes a sequence of three bases.
- ✗ Saying a nucleotide contains amino acids. A nucleotide is a sugar, a phosphate and a base.

More tips

Memory tricks

- Number of amino acids = number of bases $\div$ 3.

Exam technique

- Write 'a sequence of three bases codes for one amino acid', not 'three bases code for a protein'.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 4

Name the four bases in DNA

The four bases are A, C, G and T.

Grade 5

Describe the structure of a nucleotide

A common sugar and a phosphate group, with one of four bases attached to the sugar.

Grade 5

Describe DNA as a polymer of nucleotides

Long strands of alternating sugar and phosphate sections, with a base attached to each sugar.

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