



DNA: The Instruction Manual Inside Your Cells

KS4 BIOLOGY

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What is DNA?

DNA stands for **deoxyribonucleic acid**. It's a special molecule that contains all the instructions your body needs to grow, develop, and stay alive. Think of it like a giant instruction manual for building a person.

Your DNA tells your cells how to make proteins, which do almost everything in your body. It also determines things like your eye colour, your height, and even some aspects of your personality. DNA is passed down from your parents to you, which is why you might look similar to them.

Think of it like... a recipe book. Just as a recipe tells a cook exactly what ingredients to use and how to combine them to make a cake, DNA tells your cells exactly what ingredients to use and how to combine them to build your body.

Where is DNA Found?

DNA is found inside almost every cell in your body, tucked away in a special area called the **nucleus**. The nucleus is like a tiny vault at the centre of each cell that protects your DNA and keeps it safe.

Most of your body's cells contain DNA in their nucleus. However, a few special cells don't have a nucleus. **Red blood cells**, for example, have no nucleus and therefore no DNA. Also, your **mitochondria** (the energy factories of your cells) contain their own tiny amount of DNA.

Think of it like... a safe in a bank. The nucleus is the safe, and your DNA is the precious treasure locked inside. The cell membrane acts like the bank walls, protecting the whole cell.

The Structure of DNA

DNA has a famous twisted shape called a **double helix**. It looks like a spiral staircase made of two strands twisted around each other. This shape was discovered by

scientists **James Watson, Francis Crick, and Rosalind Franklin** in **1953**.

The information in DNA is written using just **four chemical letters**: A, T, G, and C. These letters pair up in specific ways (A with T, and G with C) to create **genes**. Each gene contains instructions for making one specific protein.

You have roughly **20,000 to 25,000 genes** in your body, and they're all packed into your cells' nuclei. If you unwound all the DNA in one cell, it would stretch about **2 metres** long—yet it all fits inside something too tiny to see without a microscope!