What is DNA?

KS2 KS3 Ages 9-14 ⏰ 4 min read

DNA stands for *deoxyribonucleic acid*, which sounds like something from a villain's laboratory. What it actually is, though, is far more impressive: it's the instruction manual for building and running every living thing on Earth.

Inside the nucleus (the control centre) of almost every cell in your body, there's a complete copy of your DNA. Every single cell — and your body has about 37 *trillion* of them — contains the full set of instructions that makes you *you*.

Imagine a recipe book so detailed it doesn't just tell you how to make a cake — it tells you how to build the kitchen, grow the ingredients, design every utensil, and manage the whole bakery. That's roughly what DNA does for your body. And every room in the bakery has its own copy of the full recipe book, just in case.

What does it actually look like?

DNA is shaped like a twisted ladder — scientists call this a *double helix*. The sides of the ladder are made of sugars and phosphates. The rungs are made of pairs of four chemical "letters": A, T, G, and C (adenine, thymine, guanine, and cytosine). The order of these letters is the code — and your DNA has about 3 *billion* of these letter-pairs.

What's a gene?

A gene is a specific section of DNA — a particular stretch of those chemical letters that contains the instructions for one particular thing, like the colour of your eyes, or how to build a specific protein your body needs. You have around 20,000 genes. They're like individual chapters in that enormous recipe book.

Why do you look like your parents?

When you were created, you got half your DNA from your mum and half from your dad. Those two sets got shuffled and combined into something unique: you. That's why you might have your mum's nose but your dad's eyes, or a completely random combination of features from both sides of the family. You're a remix.

How is it stored?

If you uncoiled all the DNA from a single cell and stretched it out, it would be about 2 metres long. Yet it fits inside a cell nucleus you'd need a microscope to see. It does this by winding tightly around proteins called histones, then coiling up further into structures called chromosomes. Humans have 46 chromosomes — 23 pairs — in every cell.