



How Species Change and Adapt Over Time

KS4 BIOLOGY

EVOLUTION

Ages 11-16 ⌚ 3 min read

What Does It Mean for Species to Change?

Species don't stay exactly the same forever. Over very long periods—millions of years—living things gradually change and adapt to their surroundings. This process is called **evolution**. It's how dinosaurs transformed into birds, how land animals developed into whales, and how ape-like creatures became humans.

The main reason species change is because of something called **natural selection**. This happens when creatures that are better suited to survive in their environment have more babies, and pass on their helpful traits to the next generation.

Think of it like a video game where characters with the best skills are more likely to win and have children. Those children inherit the winning skills, so over many generations, the whole population becomes stronger.

How Natural Selection Works

Imagine a population of beetles living in a forest. Some beetles are green, and some are brown. If the forest is full of green leaves, green beetles blend in better and don't get eaten by birds as easily. Brown beetles get spotted and eaten more often. So more green beetles survive to have babies, and most of those babies are also green. Over hundreds of generations, the entire beetle population becomes mostly green.

This isn't beetles choosing to change—it's random. Some beetles are born green by chance because of their **genes** (instructions in their DNA). The ones with better traits simply survive longer and have more offspring.

Think of it like a shop that stocks toys nobody buys. Eventually, they stop ordering those toys and order more of the ones that sell well instead.

Why Does Evolution Take So Long?

Evolution is incredibly slow because it takes thousands or millions of years for small changes to add up into big differences. A single generation of beetles might not look

much different from the previous one. But after **10,000 generations**, the differences become huge.

We can see evidence of evolution all around us. Scientists study **fossils** (ancient preserved bones), compare **DNA** between different species, and watch bacteria evolve in laboratories—sometimes in just weeks because they reproduce so quickly.

Species change because Earth's environment is always changing: climates warm and cool, continents move, new competitors arrive. Living things that adapt survive. Those that can't adapt may go **extinct**.