Adaptation and Inheritance

Reading comprehension Y6

In this topic, we will find out about what plants and animals need to do in order to survive in their natural environments. All living things (like plants and animals) are ancestors of earlier species, but change and evolve over time. This will be explored in more detail.

Adaptation

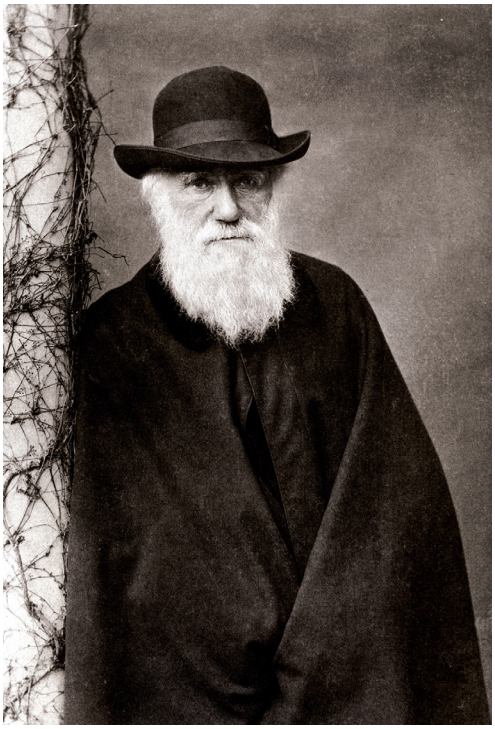
Lots of animals and plants have had to adapt to suit their environment. Adaptation is when a plant or an animal has changed in some way (over a long period of time) in order to better suit and survive in its environment.

Examples of adaptation:

Plant	Animal
Cacti grow in the desert, which is hot and sandy. They have adapted to this environment in the following ways: • **Spines instead of leaves (stops them being eaten by predators)** • **Thick, waxy skin (helps them to retain water)** • **Shallow, widespread roots (allows fast absorption of water when it rains)** • **Large, thick stems (allows lots of water to be stored)**	**Polar bears live in very cold, icy environments. They have adapted to this environment in the following ways:** • **White fur (helps them to blend in with the ice and snow)** • **Thick layer of fat under its skin (helps them to stay warm in cold temperatures)** • **Small, round ears (helps them to maintain body heat and helps to avoid water going into their ears)** • **Thick, rough paws (helps them get good traction on the slippery ice)**

Who was Charles Darwin?

Charles Darwin was an English Naturalist born on February 12, 1809 in Shrewsbury, England. He is best known for developing a theory of evolution to explain biological change. This theory showed how Man evolved from lower life forms. With this theory, Darwin shocked religious Victorian Society by suggesting that animals and humans shared a common ancestry. He planned to study medicine at Edinburgh University as he came from a family of doctors. Eventually, he was offered a place on the HMS Beagle as a natural scientist in 1831.



Natural selection: A Case Study

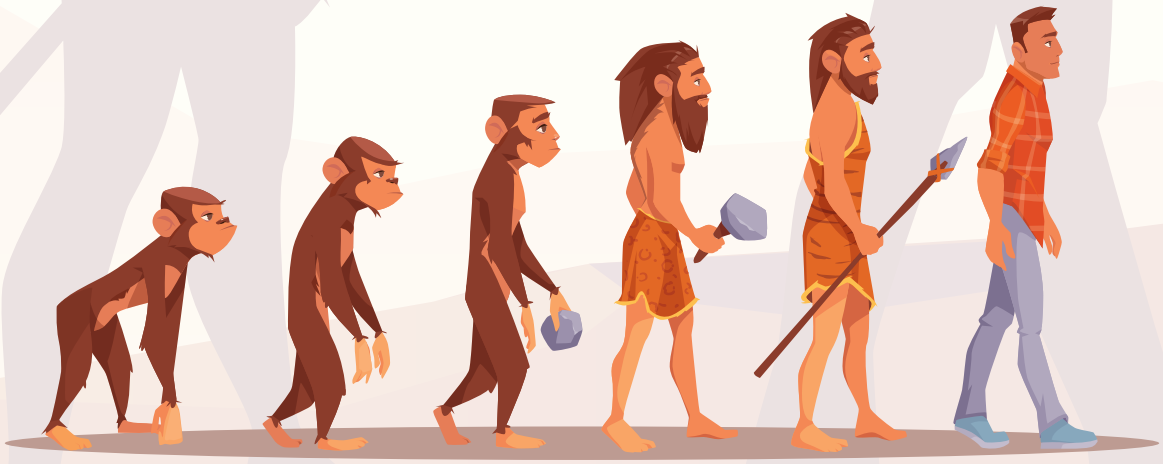
Peppered moths are common around the UK and Ireland. Peppered moths are usually white with black speckles across their wings, hence the name 'peppered'. Their pattern enables them to be well camouflaged when resting on their favoured lichen-covered tree trunks during the day. However, during the 19th century, factories were causing the air to become 'sooty'. This soot was then being deposited onto tree trunks, which covered them with a black layer. The consequence of this was that the peppered moths were no longer camouflaged when resting. This made them more susceptible to predators as they were easy to spot. Because of this, dark-coloured moths became more common as they were able to camouflage into the soot-covered trees. This is an example of what Darwin defined as natural selection.

What does natural selection mean?

Natural selection is when plants and animals that are best suited to their environment survive and pass on their genetic traits. It means that animals that are less suited to their environment (e.g. the peppered moth) do not survive as well, and their species is eliminated from the ecosystem. The fittest, most adapted organisms survive and multiply whereas the less adapted organisms die out. In the case study above, the dark coloured moths were better suited to their environment on the soot-covered trees, so they survived whereas the lighter coloured moths died out.

What is evolution?

Evolution is a theory that states all living plants and animals today have developed and adapted from previous species. Some scientists believe that humans have evolved from apes and they point out there are many similarities and differences between humans and apes.



Evolution over millions of years

What is inheritance?

Adaptations and evolution would not occur if species did not have offspring. When parents have offspring, they pass on their physical traits. The offspring inherit their parents' qualities e.g. they have similar (not identical) characteristics as their mother and father e.g. eye colour, skin tone, bone structure. Genes carry information that determine what characteristics are inherited from an organism's parents. Genes are the basic units of heredity and they consist of DNA and are part of a larger structure called the chromosome. This is what we call genetics.