

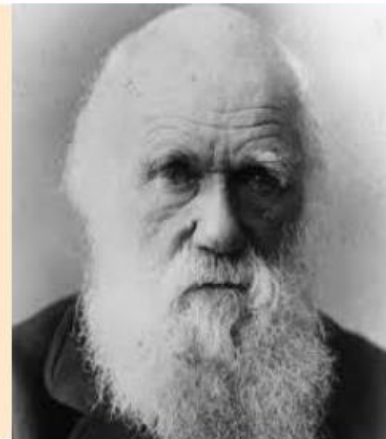


Evolution

What is evolution?	Evolution is the way that living things change over time
Do things evolve?	We know that living things used to look a lot different to how they do now. We know this because fossils have been found that show creatures that look a lot different to how they do today. Fossils show us that living things have changed over time
How do things evolve?	Charles Darwin observed that although individuals in a species shared similarities, they were not exact copies of each other . He noticed that there were small differences or variations between them He also noticed that everything in the natural world was in competition . The winners were those that had characteristics that made them better adapted for survival . He noticed that living things were more likely to reproduce and pass on their useful characteristics to their offspring. Over time a species gradually changes . Given enough time these small changes add up to the extent a new species altogether can evolve.

Charles Darwin

Charles Darwin (1809 – 1882) was an expert in natural history. He went on a famous sea voyage in 1831 on a ship called HMS Beagle and visited many places around the world, collecting animal and plant samples. The observations he made led him to his theory of evolution.



He came up with the idea that animals evolve due to having the characteristics that make them best suited to their environment. He called this 'the survival of the fittest' or 'natural selection'.

Adaptation

Adaptation is when things **evolve** to overcome challenges in their environment. For example by adapting their behaviour

Examples of adaptation

Migration	Birds have adapted to move around the world to find weather and food sources to suit them. Birds that didn't do this may have run out of food and died.
Sticking together in packs	Animals that learned to live in packs were more likely to be safer and more successful when hunting, leading to them being more likely to survive.

Key Vocab

1	Fossils	The remains of a once-living organism preserved as a rock
2	Variation	Natural differences between living things in a species
3	Reproduce	To produce again/give birth
4	Offspring	Children or young
5	Migration	Seasonal movement of animals from one location to another
6	Adaptation	A characteristic of a living thing that makes it suited to its environment
7	Evolution	The process by which living things gradually change over time
8	Species	A group of organisms that have common characteristics and can breed
9	Natural selection	The process where organisms that are most suited to their environment are more likely to reproduce, and in doing so, pass on these adaptations to the next generation
10	Inheritance	The process of passing on characteristics, such as eye colour, from parents to their offspring



Variation

Living things produce offspring of the same kind. E.g. owls produce baby owls and humans produce baby humans

...BUT... normally offspring vary and are not identical to their parents



Natural variation like this can lead to offspring being more likely or less likely to survive in their environment. If the variant makes them more likely to survive, they are more likely to be alive to pass this on to their offspring. As a result, this variant is more likely to become more common in the species.

Evolution and Inheritance



Evolution occurs when there is competition to survive (natural selection) and differences within a species caused by inheritance and mutations. Inheritance is when something is passed on to the next generation. Offspring are not identical to their parents and therefore species change over time.

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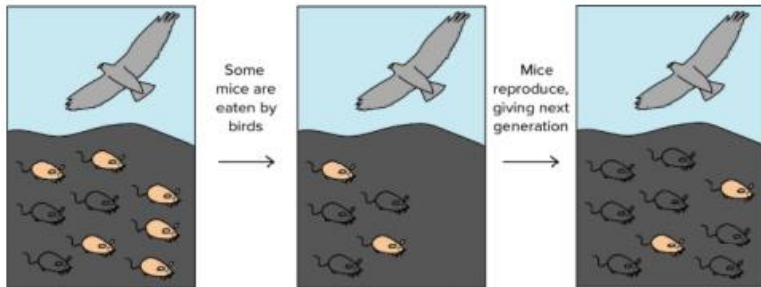
Bird beaks (Darwins' finches) investigation.

Birds have different shaped beaks. The shape is an adaptation to enable them to eat different types of food. On the Galapagos islands, the different species of finch can be classified into six groups. Each group has a beak specially adapted to eating its type of food.

Are your characteristics inherited or acquired?

Previous knowledge

How variation can impact on evolution



A population of mice has moved into a new area where the rocks are very dark. Due to natural genetic variation, some mice are black, while others are tan.

Tan mice are more visible to predatory birds than black mice. Thus, tan mice are eaten at higher frequency than black mice. Only the surviving mice reach reproductive age and leave offspring.

Because black mice had a higher chance of leaving offspring than tan mice, the next generation contain a higher fraction of black mice than the previous generation.

Fossils

The only way information can be obtained about evolution and animals and plants that are now extinct, is to examine fossils.



Fossils are the preserved remains or traces of ancient plants and animals. They develop over millions of years, as the soft tissues of a dead animal or plant are slowly replaced by minerals from underground water. These minerals gradually harden to stone and the mud and sand surrounding the body slowly turn to rock.



We will use our Science Ninja skills when investigating adaptations and natural selection.

