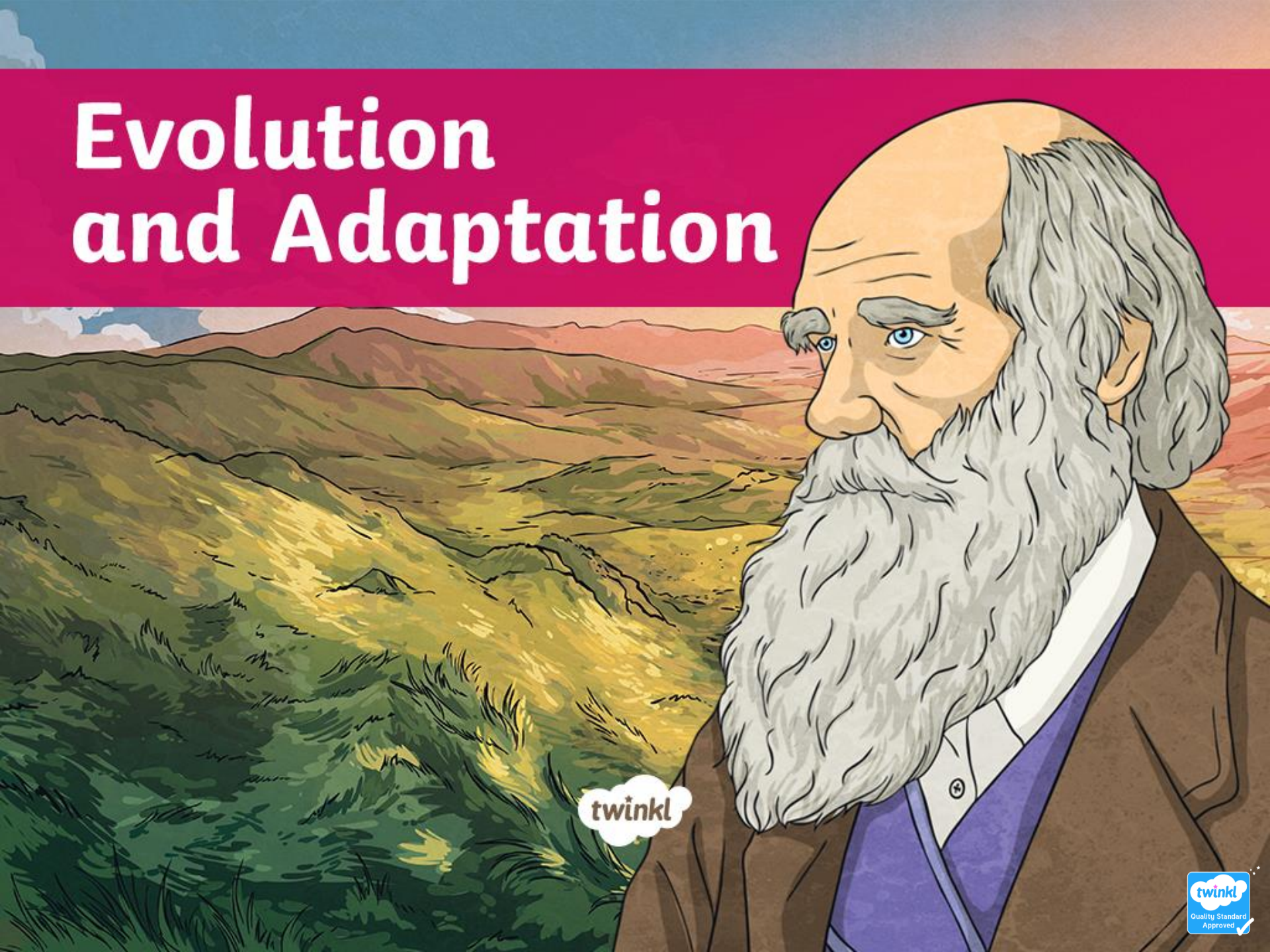
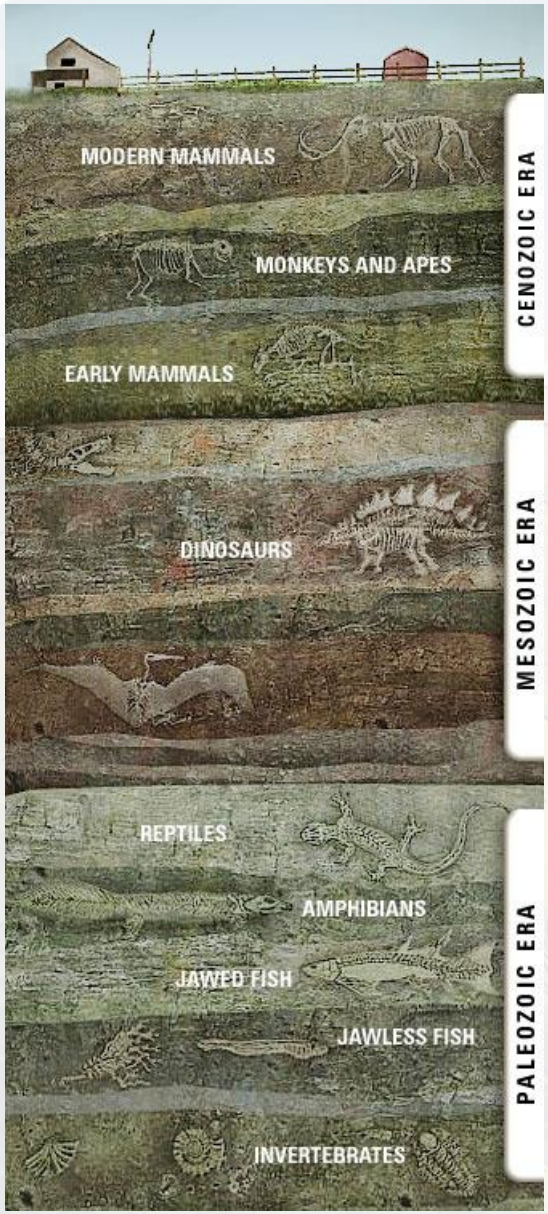
Evolution and Adaptation



Evolution and Adaptation

What do these words mean?

Evolution	The way something gradually develops and makes changes over time.
Adaptation	The way something changes for the better to suit something new or different.



Earth's History – A Quick Recap

Our planet is estimated to be 4.6 billion years old. The first life appeared around 2 billion years ago. We can see evidence of this in fossils – the preserved remains of life forms formed in rocks. The further down we dig, the further back in time we go.

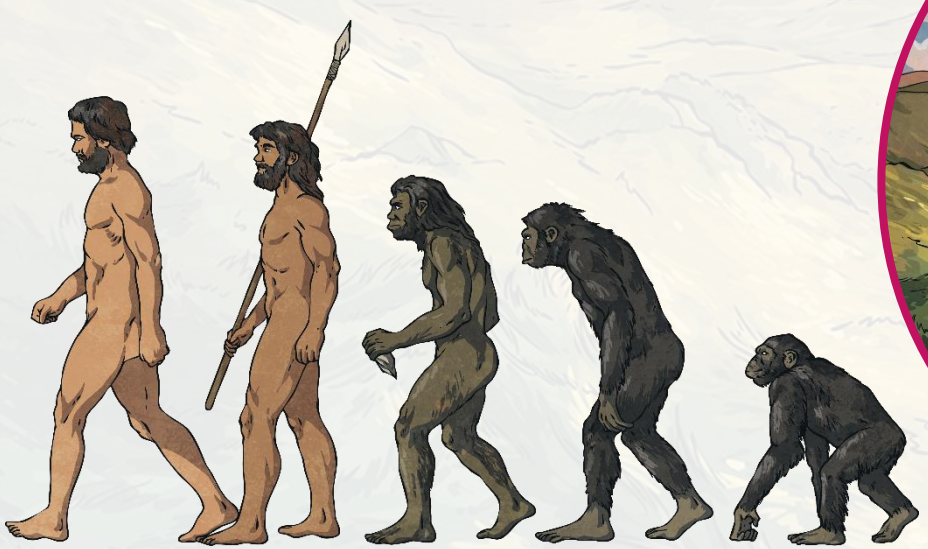
Scientists believe that modern species of plants and animals have developed from earlier species.

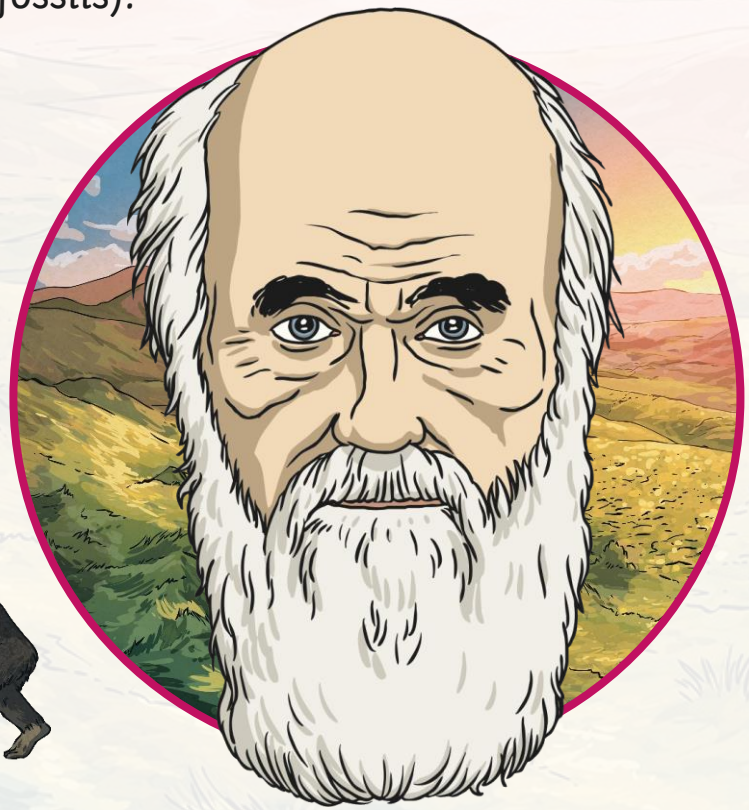
Modern animals might look similar to ancient ancestors but there are also lots of differences. Animal species change over time, a process known as evolution through natural selection.

The Theory of Evolution

Charles Darwin (1809-1882) introduced the theory of evolution. He was a famous English naturalist (an expert in studying nature), biologist (an expert in living things) and geologist (an expert in rocks and fossils).

He discovered that humans and apes shared **ancestors** which led to this famous image...



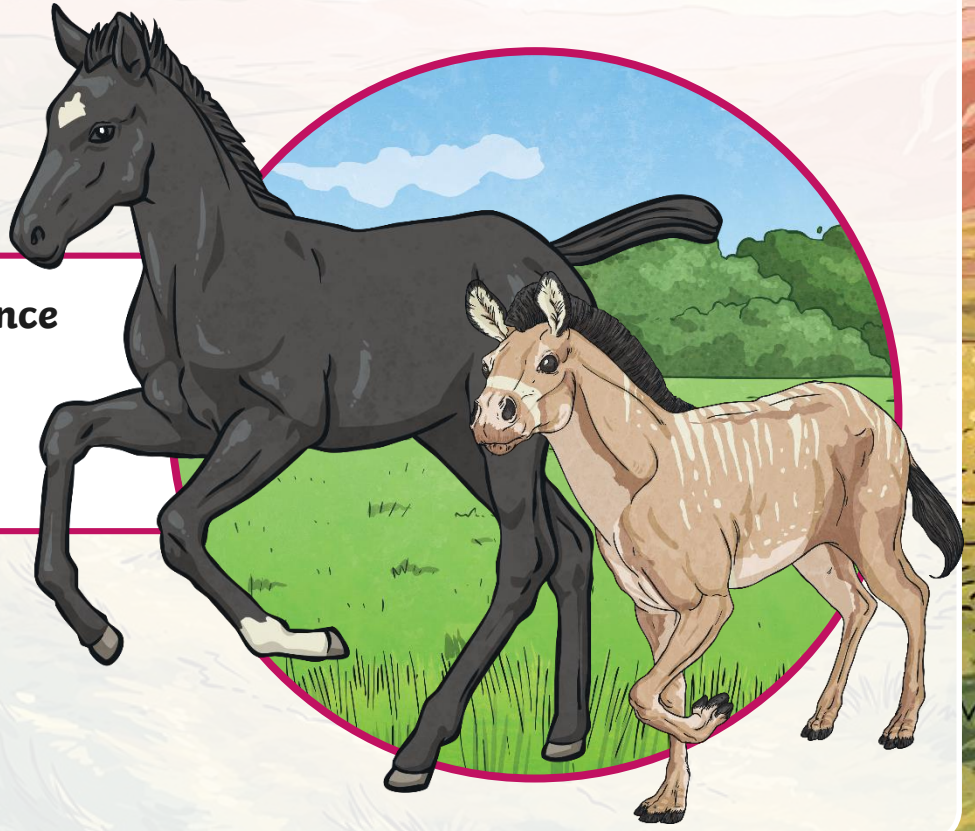


How Evolution Works

The thing about **evolution** is that it happens over the space of a long, long, long time so we don't really notice it happening.

One animal, plant or person doesn't just change... there are small changes with each new **generation**.

Evolution happens through **inheritance** – meaning that tiny changes only happen as traits pass to the next generation.



What Sort of Changes?

Animals and plants evolve to make adaptations to not only survive but to survive better. Some of these changes are down to habitats.

Darwin studied different finches living in different parts of the Galapagos Islands and realised, even though they were different, they all had the same ancestors! Some had evolved to have larger beaks in certain areas, some with smaller beaks in other areas due to different food being available.

Small Changes Add up to Big Changes

Over time, the result of a few generations start to make noticeable differences.

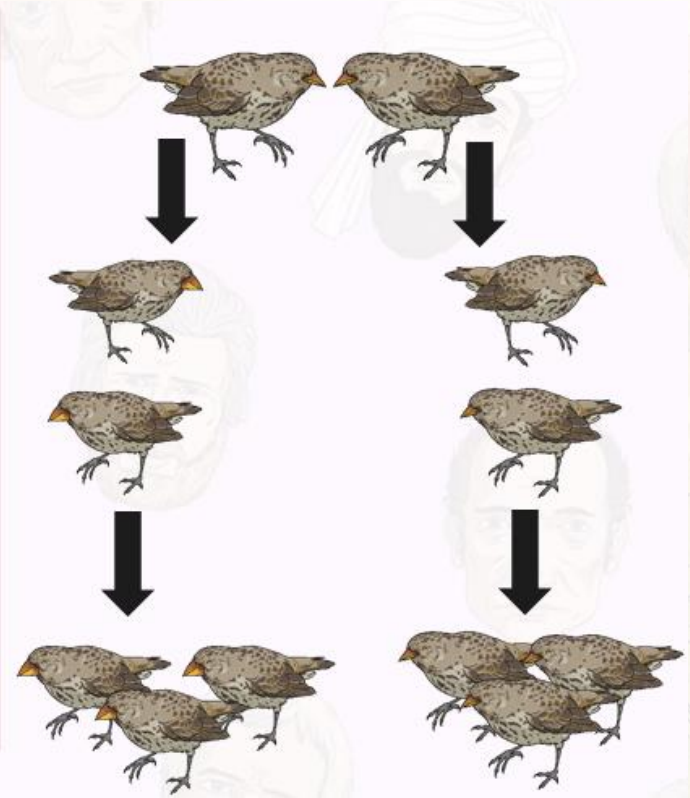
Looking at the Galapagos finches

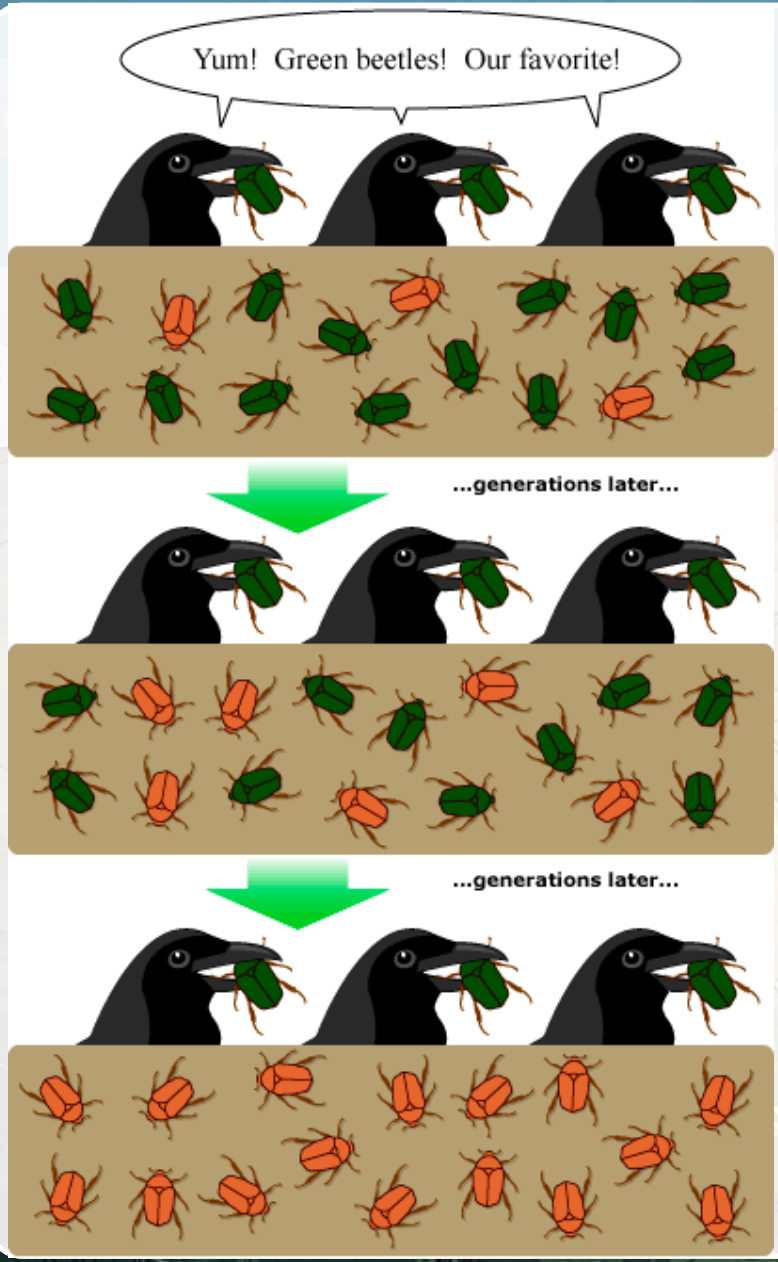
The ones with large beaks reproduced and had offspring.

More of these offspring inherited large beaks and survived.

In other parts of the Galapagos, smaller beaks ensured better survival than larger ones.

The adaptations meant that over a long period of time, the Galapagos finches evolved adaptive traits that caused differences between them.





Natural Selection

The Theory of Natural Selection or Survival of the Fittest says that the animals that are best adapted to fit in with their environment are the ones that will survive and reproduce, passing on their genes.

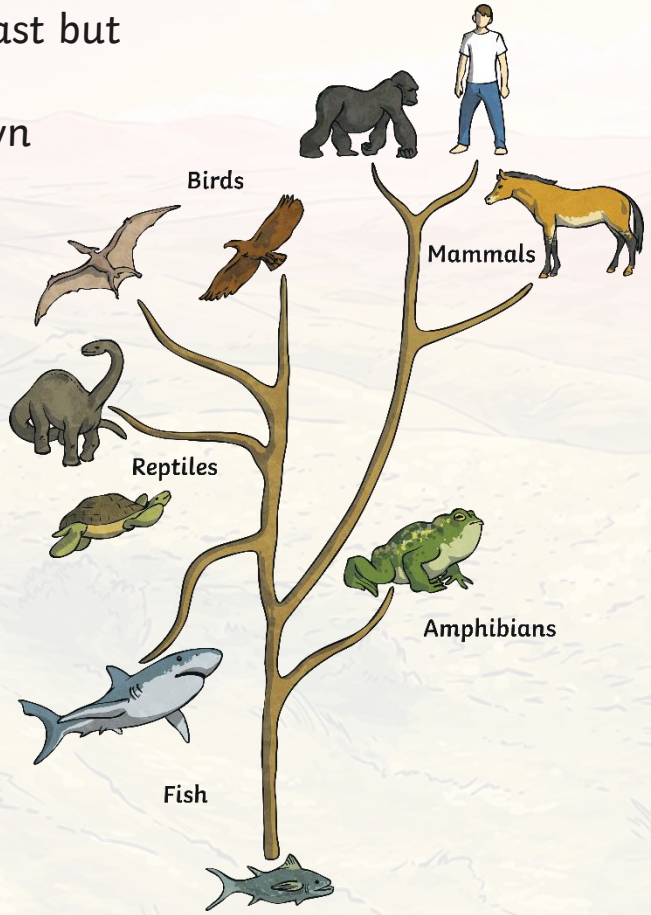
In this example, the green beetles stand out and so are easily spotted and eaten by the birds. They are "selected against".

The brown beetles are camouflaged and so they are the ones that will survive (they're less likely to be eaten). These beetles will reproduce and pass on the brown gene, leading to more brown beetles. Because of Natural Selection, eventually, the only type of beetle will be the brown beetle.

Small Changes Add up to Even Bigger Changes

Each generation is slightly different from the last but different families make their own generational changes and this can lead to species going down different evolutional paths.

This is part of the tree of life that shows how birds, reptiles and even humans developed from fish... but remember... over millions of years!

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