



Evolution (Biology)

Year 6

End Points:

- Fossils are the remains of organisms.
- A small percentage of life on earth is preserved as a fossil, most organisms decompose.
- Fossils provide evidence for evolution.
- Inheritance is passing on characteristics from a parent to their offspring.
- There are differences in characteristics within an individual species, known as variation.
- Evolution is the change in inherited traits.
- Animals and plants that adapt well to an environment have more chance of surviving.
- Adaptation plays an important part in evolution as species change over time.
- Charles Darwin spent years observing, comparing and analysing many specimens of plants and animals.
- Animals and plants that adapt well to an environment have more chance of surviving, this is called natural selection.
- Alfred Wallace explored the Amazon, collecting species of beetles, butterflies and birds.
- He created an imaginary line, known as the Wallace Line.

In this unit, children will be introduced to concept of evolution: the process by which living organisms (plants and mammals) develop and change, over time. The substantive concepts of this unit are **inheritance**, **variation**, **adaptation** and **evolution by natural selection**. Declarative knowledge (knowledge which manifests from the central principle), such as knowledge of biomes, habitats and reproduction, will also be built upon in this unit. The disciplinary knowledge gained in this unit will allow the children to think more like palaeontologists, naturalists, biologist and anthropologists (all types of scientists), by using data and diagrams to deduce and draw logical conclusions.

The study of evolution is complex, and it is connected to many elements of science, geography and history. Therefore, we have developed this unit so that children first understand that fossils are evidence of evolution (a change over time), then ensuring the children understand the concepts of inheritance and adaptation, before progressing onto teaching the concept of evolution by natural selection. Cognitive science tells us that starting with concrete understanding will help support more abstract concepts.

In our first lesson, the children will build upon prior knowledge of rocks and fossils to deepen their understanding of how fossils provide evidence for evolution. Misconceptions are addressed, such as the understanding that most life on Earth does not become fossilised. Children will be shown images of the different fossil types, and utilising their vocabulary, they will outline how each fossil type is helpful for

palaeontologists (a scientist who studies fossils), and how this data is used to support the theory of evolution, building on their disciplinary knowledge. In lesson 2, children will learn that inheritance is the process of passing on characteristics from a parent to their offspring, and how there are various combinations of characteristics, resulting in variation, which explains why we may look similar to our parents or siblings but not identical (unless you are an identical twin, this will be built upon from our Yr6 unit on Reproduction). The children will learn that evolution is the change in inherited traits. In our third lesson, we will explore adaption. In this lesson, children will marry together their previous knowledge of biomes and habitats (from many of our previous Geography units). They will be shown images of different animals and will be asked to consider their natural habitat and what challenges these animals may face; and, therefore, what adaptations have been made, and perhaps what adaptations will be made in the future. Again, this activity will link back to developing the children's disciplinary knowledge. The children will learn that adaption plays an important part in evolution as species change over time. In lesson 4, the children will be introduced to the history's most famous biologist Charles Darwin. They will learn that Darwin spent years observing, comparing and analysing many specimens of plants and animals before he developed his theory of natural selection and evolution. In particular, the lesson focuses on Darwin's observations of Finches. The children will be asked to analyse images of Finches and think about what adaptations have been made, and why this bird may have evolved in this particular way in different locations. The lesson ends with the children thinking about the phrase, 'survival of the fittest' and what this might mean in the context of evolution. Finally, in lesson 5, the children will be introduced to Alfred Wallace, another scientist who also developed the theory of evolution during the same period as Charles Darwin. Wallace found that several birds, mammals and fish species are found in abundance in one location and only in small numbers, or not at all, in another.

Overall, this unit complements our overarching science curriculum aim, which is to enable children to understand the important role that science plays in the sustainability of life on Earth. This unit lays the foundation of the children's substantive knowledge concepts of **inheritance**, **variation**, **adaptation** and **evolution by natural selection**, which will be built upon in later secondary schooling.

Lesson Sequencing:

In lesson one, pupils will learn that fossils are physical evidence of life from long ago. In lesson two, pupils will learn that offspring are usually similar, but not identical, to their parents, learning that inherited traits can vary. Lesson three will explore how species can adapt over time to suit their environment. Lesson four and five will develop this knowledge by looking at Charles Darwin and Alfred Wallace respectively. In the assessment lesson, pupils may write in response to how we know fossils support the theory of evolution or to a quote from Wallace.

Misconceptions:

- A fossil is an actual part of the extinct animal or plant
- Artefacts like pottery or coins are fossils
- Fossils are only of animals and not plants
- Cavemen and dinosaurs were alive at the same time

- Offspring most resemble their parent of the same sex
- An example of variation is that a dog looks different to a cat
- Confusing environmental and inherited factors
- All characteristics can be inherited (e.g. sporting ability or dyed hair)
- Adaptation occurs during an animal's lifetime
- Humans evolved from chimpanzees
- An example of variation is that a dog looks different to a cat
- Evolution is a theory about the origin of life
- Evolution implies life evolved randomly or by chance
- Evolution means living things are always getting better
- Natural selection acts for the good of the population

Working Scientifically criteria met in this unit:

- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments