Enriching lives every day; enabling our school community to learn, achieve and flourish through living 'life in all its fullness'

Sustainability

Subject: Science

Year group: 6

Term: Spring

Unit name: Evolution and Inheritance

National curriculum:

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Prior Knowledge - Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (Y2 - Living things and their habitats)
Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)
Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) Describe the life process of reproduction in some plants and animals.
(Living things and their habitats - Y5)

Scientific enquiry	
Classifying	Animals/organisms suited to their environment – advantages and disadvantages of specific adaptations Fossils as records over time
Observing over time	Variation in offspring over time i.e. how giraffes' necks got longer Fossils as records over time Natural selection
Pattern seeking	Hereditary
Comparative/fair testing	Not relevant
Researching	Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.

Assessment for learning

Recapping prior knowledge- beginning of unit- what do children already know?

Beginning of each lesson- focus on recall of previous learning (quick quizzes)

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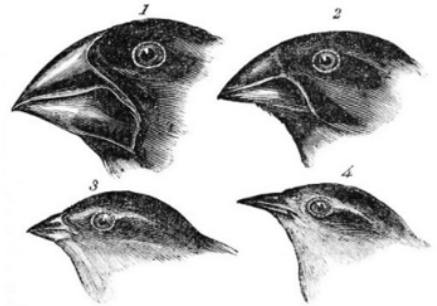
What should I already know?

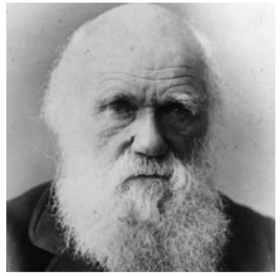
- Which things are living and which are not.
- Identifying animals (e.g. amphibians, reptiles, birds, fish, mammals, invertebrates) and plants using classification keys
- Animals that are carnivores, herbivores and omnivores.
- Animals have **offspring** which grow into adults.
- The basic needs of animals for **survival** (water, food, air)
- Some animals have skeletons for support, protection and movement.
- Food chains, food webs and the role of predators and prey.
- Features of habitats and the animals and plants that exist there (**biodiversity**) .
- Examples of different **biomes**
- The life cycle of some animals and plants
- Sometimes **environments** can change and this has an effect on the plants and animals that exist there
- Living things **breed** to produce **offspring** which grow into adults. This is called **reproduction**.
- The role of Mary Anning in **palaeontology** and the discovery of **fossils**.
- The features of some rocks and the role they play in the formation of **fossils**

What will I know by the end of the unit?

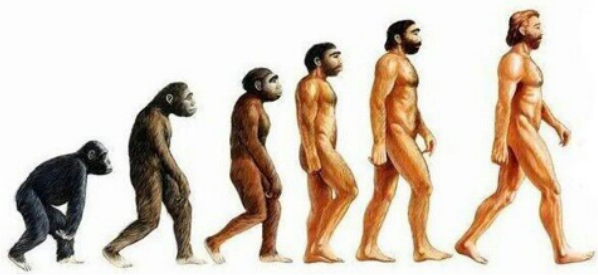
What is **evolution**?	• **Evolution** is a process of change that takes place over many **generations**, during which **species** of animals, plants, or insects slowly change some of their physical **characteristics.** This is because **offspring** are not identical to their parents. • It occurs when there is competition to **survive**. This is called **natural selection.** • Difference within a **species** (for example between parents and **offspring**) can be caused by **inheritance** and **mutations**. • Inheritance is when **characteristics** are passed on from

Diagram





Charles Darwin, an evolutionary scientist, studied different animal and plant **species**, which allowed him to see how **adaptations** could come about. His work on the finches was some of his most famous.



Vocabulary

adaptation	a change in structure or function that improves the chance of **survival** for an animal or plant within a given **environment**
ancestor	an early type of animal or plant from which a later, usually dissimilar, type has **evolved**
biodiversity	a wide variety of plant and animal **species** living in their natural **environment**
biome	a large naturally occurring community of animals and plants occupying a major habitat
breeding	the process of producing plants or animals by **reproduction**
characteristics	the qualities or features that belong to them and make them recognisable

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	generation to the next. • **Mutations** in **characteristics** are not **inherited** from the parents and appear as new **characteristics**.
How do we know about **evolution**?	• Evidence of **evolution** comes from **fossils** - when these are compared to living creatures from today, **palaeontologists** can compare similarities and differences. • Other evidence comes from living things - comparisons of some **species** may reveal common **ancestors**.
What is **adaptation**?	• **Adaptation** is when animals and plants have **evolved** so that they have **adapted** to **survive** in their **environments**. For example, polar bears have a thick layer of blubber under their fur to **survive** the cold, harsh **environment** of the Arctic while giraffes have long necks to reach the leaves on trees. • Some **environments** provide challenges yet some animals and plants have **adapted** to **survive** there • Sometimes **adaptations** can be disadvantageous. One example of this can be the dodo, which became **extinct** as it lost its ability to fly through **evolution**. Flying was unnecessary for the dodo as it had lived for so many years without predators, until its native island became inhabited. • When **adaptations** are more harmful than helpful, these are called **maladaptations**.

Investigate!

- Research the work of Charles Darwin and Alfred Russel Wallace.
- Create a fact file of an animal or plant identifying how it has **adapted** to its **environment** and how it has **evolved** to **survive**.
- Create a new planet and describe the **environmental** features. What animals and plants can live there? How have they **adapted** to survive?

environment	all the circumstances, people, things, and events around them that influence their life
evolution	a process of change that takes place over many **generations**, during which **species** of animals, plants, or insects slowly change some of their physical **characteristics**
extinct	no longer has any living members, either in the world or in a particular place
fossil	the hard remains of a **prehistoric** animal or plant that are found inside a rock
generation	the act or process of bringing into being; through **reproduction**, especially of **offspring**
inherit	If you inherit a **characteristic** you are born with it, because your parents or **ancestors** also had it.
maladaptation	the failure to **adapt** properly to a new situation or **environment**
mutation	**characteristics** that are not **inherited** from the parents or **ancestors** and appear as new **characteristics**.
natural selection	a process by which **species** of animals and plants that are best **adapted** to their **environment** **survive** and **reproduce**, while those that are less well **adapted** die out
offspring	a person's children or an animal's young
palaeontology	the study of **fossils** as a guide to the history of life on Earth
reproduction	when an animal or plant produces one or more individuals similar to itself
species	a class of plants or animals whose members have the same main **characteristics** and are able to **breed** with each other
survive	continue to exist
theory	a formal idea or set of ideas that is intended to explain something
variation	a change or slight difference

Lesson Sequence


1. Understand how offspring vary and are not identical to their parents


2. Learn about animal adaptations


3. Learn about plant adaptations


4. Explore what we can learn from fossils


5. Explore the theory of evolution by natural selection


6. Explore human evolution

Characteristics and Variation

A characteristic describes how something looks or how it behaves. **Characteristics** can be passed on from parents to their offspring, meaning that they can be **inherited**. They can include hair colour, eye colour and height. However, **environmental** factors are important too.

Charles Darwin, the Galapagos Islands and Human Evolution

Charles Darwin was a famous naturalist who studied finches and tortoises on the Galapagos Islands. He suggested that some species may share a common ancestor and evolve to suit their habitats. He called this process natural selection.

Australopithecus
Homo habilis
Homo erectus
Homo heidelbergensis/ neanderthalensis
Homo sapiens

3.6 million years ago
↓
Human Evolution
↓
Today

Adaptations

Plants and animals have numerous **adaptations** which help them to survive in their **habitats**.

- Camels have humps to store food, two rows of eyelashes and small slits for nostrils
- Epiphytes are plants which can grow on the surface of another plant
- Some plants contain toxic minerals to protect themselves from predators
- Other plants can store water, trap insects and smother other plants

Fossils

Mary Anning was a palaeontologist who found and collected many fossils along the Jurassic Coast in Dorset. She was the first person to uncover a full ichthyosaurus skeleton.