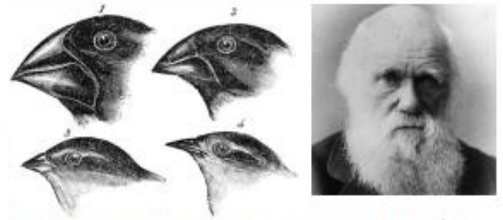
Science Knowledge Organiser

Evolution and Inheritance – Year 6

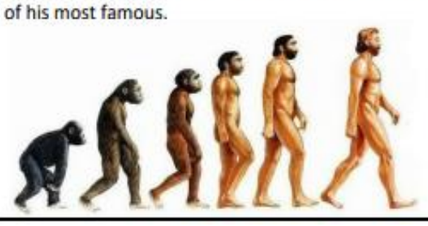
Sticky Learning

What you may already know…	What you are going to know by the end of this learning…
• 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	• Know how the Earth and living things have changed over time • Know how fossils can be used to find out about the past • Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) • Know how animals and plants are adapted to suit their environment • Link adaptation over time to evolution • Know about evolution and can explain what it is

Diagram

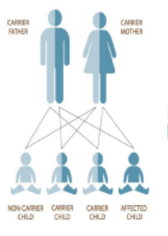


Charles Darwin, an evolutionary scientist, studied different animal and plant **species**, which allowed him to see how **adaptations** could come about. His work on the finches was some of his most famous.



Inheritance and Mutation

Evolution is the name given for changes to a species over time.



-Living things produce offspring of the same kind.

-Some of a parent's characteristics are passed down to the offspring – this is called inheritance.

-This is why we often share similar features with our parents, and some conditions are shared (see image).

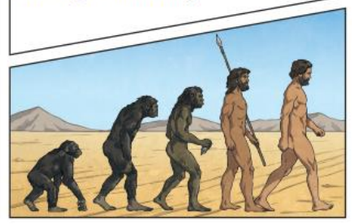
-Inheritance is genetic, not environmental. E.g. If two blonde-haired parents dye their hair black, this does not mean they will have a black-haired child.

-Some features are new to the offspring. These are called mutations. This is why we are not exact copies of our parents.

-These changes in offspring over time allow evolution to take place.

Fossils are the preserved remains, or partial remains, of ancient animals and plants. **Fossils** let scientists know how plants and animals used to look millions of years ago. This is proof that living things have evolved over time.

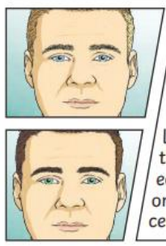
Evolution is the gradual process by which different kinds of living organism have developed from earlier forms over millions of years. Scientists have proof that living things are continuously evolving - even today!



Offspring
Animals and plants produce **offspring** that are similar but not identical to them. **Offspring** often look like their parents because features are passed on.

Variation
In the same way that there is **variation** between parents and their **offspring**, you can see **variation** within any species, even plants.

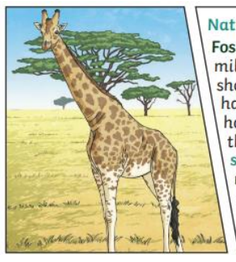
Adaptive Traits
Characteristics that are influenced by the **environment** the living things live in. These **adaptations** can develop as a result of many things, such as food and climate.



Inherited Traits
Eye colour is an example of an **inherited trait**, but so are things like hair colour, the shape of your earlobes and whether or not you can smell certain flowers.

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 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**.

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
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



Natural Selection
Fossils of giraffes from millions of years ago show that they used to have shorter necks. They have gradually **evolved** through **natural selection** to have longer necks so that they can reach the top leaves on taller trees.