



Evolution and inheritance – Year 6

Key areas to cover in unit

Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on Earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Pupils could consider different breeds of dogs, and what happens when, for example, labradors are crossed with poodles.

Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. This is evolution.

Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.

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.

Note: at this stage, pupils are not expected to understand how genes and chromosomes work.

Objectives

- 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.

Vocabulary:

offspring – the young animal or plant that is produced by the reproduction of that species.

inheritance – this is when characteristics are passed on to offspring from their parents.

variations – the differences between individuals within a species.

characteristics – The distinguishing features or qualities that are specific to a species

adaptation – a trait changing to increase a living things chances of surviving and reproducing.

habitat – refers to a specific area or place in which particular animals and plants can live.

environment – This contains many habitats and includes areas where there are both living and non-living things.

evolution – adaptation over a very long time.

			<p>natural selection – the process where organisms that are better adapted to their environment tend to survive and produce more offspring.</p> <p>fossil – the remains or imprint of a prehistoric plant or animals embedded in rock and preserved</p> <p>adaptive traits – genetic features that help a living thing to survive.</p> <p>inherited traits - these are traits you get from your parents e.g. curly hair.</p>
<p>Prior learning/Understanding</p> <p>Future Learning/understanding</p>	<ul style="list-style-type: none"> 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) 	<p>Working Scientifically Skills coverage:</p>	<ul style="list-style-type: none"> Make their own decisions about what observations to make Identify scientific evidence that has been used to support or refute ideas or arguments. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> Observing and raising questions about local animals and how they are adapted to their environment. Comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. Analysing the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

	<ul style="list-style-type: none"> • Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3) • A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. (KS3) • The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3) • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. (KS3) • 		
<p>Suggested activities /STEM Lab Opportunities</p>	<ul style="list-style-type: none"> • Design a new plant or animal to live in a particular habitat. • Use models to demonstrate evolution e.g. ‘Darwin’s finches’ bird beak activity. • Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution. • Make observations of fossils to identify living things that lived on Earth millions of years ago. • Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs. • Compare the ideas of Charles Darwin and Alfred Wallace on evolution. • Research the work of Mary Anning and how this provided evidence of evolution. <p>For further ideas and guidance follow the hyperlink below.</p> <p>stem.org.uk/resources/community/collection/12648/year-6-evolution-and-inheritance</p>	<p>Assessment tasks</p>	<p>Ongoing teacher assessment/judgement.</p> <p>Pupil’s may be able to:</p> <ul style="list-style-type: none"> • Explain the process of evolution. • Give examples of how plants and animals are suited to an environment • Give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth • Give examples of living things that lived millions of years ago and the fossil evidence we have to support this • Give examples of fossil evidence that can be used to support the theory of evolution

Key Local Links:

- The Lakes Wildlife park – offers workshops to show how animals have adapted to their environment.
lakedistrictwildlifepark.co.uk/education/school-trips/ (check crossover with year 4 and 5).
- Study of local birds e.g. Hawfinches (can be found at Brown Robin Nature Reserve, the Barkbooth Lot Nature Reserve and Underlaid Wood) which are endangered – research into why – links with evolution and Darwin’s study of Finches in the Galapagos.
- Study of the Northern Eurasian Lynx once indigenous to Cumbria, but now the only place to see this magnificent animal is at the Lake District Wildlife Park. (Check crossover with year 4)
- Research local and indigenous plants – how are they produced, discussion about characteristics inherited from parent plants. Why have some plants died out? Example – local forest school area, trees had to be chopped down because of diseases.

Common Misconceptions:

Children might think:

- adaptation occurs during an animal’s lifetime: giraffes’ necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life
- offspring most resemble their parents of the same sex, so that sons look like fathers
- all characteristics, including those that are due to actions during the parent’s life such as dyed hair or footballing skills, can be inherited
- cavemen and dinosaurs were alive at the same time.