Year 6 – Evolution and Inheritance

National Curriculum Objectives:

- Know about evolution and can explain what it is.
- Know how fossils can be used to find out about the past.
- 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- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

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, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. 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. 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.

Key Ideas

- Life cycles have evolved to help organisms survive to adulthood
- Over time the characteristics that are most suited to the environment become increasingly common.
- Organisms best suited to their environment are more likely to survive long enough to reproduce.
- Organisms are best adapted to reproduce are more likely to do so.
- Organisms reproduce and offspring have similar characteristic patterns.
- Variation exists within a population (and between offspring of some plants)
- Competition exists for resources and mates

Assessment

- Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago?
- Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?

	● Can they give reasons why offspring are not identical to each other or to their parents? ● Can they explain the process of evolution and describe the evidence for this? ● Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? ● Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? **Greater Depth** ● Can they research and discuss the work of famous scientists, such as Charles Darwin, Mary Anning or Alfred Wallace? ● Can they explain how some living things adapt to survive in extreme conditions?

Prior Learning	Being scientists	Vocabulary
	Fossil evidence suggests mammoths lived from 400,000 to 10,000 years ago. What happened to them? Did they become extinct? Did they evolve into modern elephants? Are they still here? Children consider what scientists would have to do to find out which of these is the most likely. ● Show some trilobite fossils and ask children to consider the possible reasons as to why no fossils younger than 250 million years have ever been found. ● Some traits are inherited and others are not. Children don family research to try and work out if the following traits are inherited or not: earlobe attachment, hand clasping (when you link your fingers in a hand clasp which thumb do you place over the other?), cheek dimples, cleft chin, ability to remember random numbers, how far you can stand jump. ● Provide children with a simple Darwinian and Lamarckian explanation for evolution (but keep anonymous). Children try and work out what the illogical arguments are and therefore workout which one is the better argument. They could try and apply both arguments to explain why giraffes evolved longer necks as available food became higher in trees. ● Polar bears habitat is rapidly changing, what possible futures do they face and can we predict which is most likely? ● "Dinosaurs became extinct, so they can't have been very well adapted." Pupils consider this question and do some research and prepare feedback to other groups. ● All edible bananas have been bred so they have no seeds. All new banana trees are grown from cuttings of existing ones. If the climate changed would bananas be able to evolve?	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetic

KS3:

Genetics and evolution:

Inheritance, chromosomes, DNA and genes:

- heredity as the process by which genetic information is transmitted from one generation to the next
- 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 mode
- differences between species
- the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
- the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection
- 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
- the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.