Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Evolution and Inheritance	**Class 4**	**Year A Summer Term**

What should they already know?

From their 'Habitats' topic in year 2, children should be able to:

- identify and name a variety of plants and animals in their habitats
- describe how animals obtain their food from plants and other animals
- identify that most living things live in habitats in which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants

Key vocabulary from year 2:

dead, alive, living, non-living, habitats, breathe, grow, eat, have babies, move, sense, go to the toilet, habitat, microhabitat, food chain

From their 'Classification and Interdependence' topic in year 4, children should be able to:

- recognise that living things can be grouped in a variety of ways
- identify that some animals feed on other animals and some on plants
- construct and interpret a variety of food chains, identifying producers, predators and prey
- recognise that environments can change and that this can sometimes pose dangers to living things

Key vocabulary from year 4:

predator, prey, producer, river, ocean, desert, arctic, rainforest, mountain, farmland, wood, dry, wet, vegetation, shelter, vertebrate, invertebrate, classify, characteristic, flowering plant, non-flowering plant

From their 'Life Cycles' topic in year 5, children should be able to:

- describe the differences in life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals

Key vocabulary from year 5:

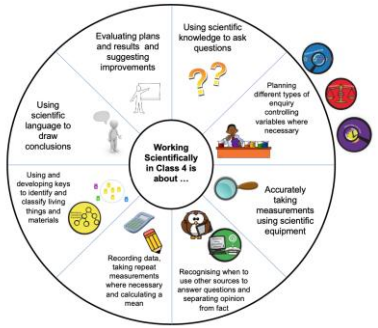
live young, hatch, tadpole, caterpillar, butterfly, ladybird, pupae, larvae, chrysalis, reproduction, asexual, sexual, life cycle, pollination, seed dispersal, pollen, stamen, stigma

Working Scientifically tasks that link to this unit:

Year 6 – Evolution and Inheritance – Birds and beaks	How do I plan an investigation and interpret the results? How did Darwin use evidence about different beaks to support his ideas about natural selection?

Key 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.
organism	A living thing (like an animal or plant). Synonym for organism = life form.
species	A group of similar organisms that are able to reproduce.
variation	The differences between individuals within a species.
adapt(ation)	An adaptation is a trait (or characteristic) changing to increase a living thing's chances of surviving and reproducing.
fossil	The remains or imprint of a prehistoric plant or animals, embedded in rock and preserved.
reproduce	Reproduction is the process by which a living organism creates a likeness of itself.
survive	Continue to live or exist, especially in spite of danger or hardship.
evolve(ution)	Adaptation over a very long time.
characteristics	The distinguishing features or qualities that are specific to a species.
inhabited	Live in or occupy.
natural selection	Living things that are better adapted to their environment tend to survive and produce more offspring.



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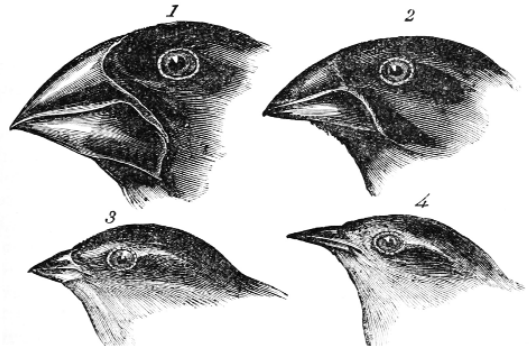
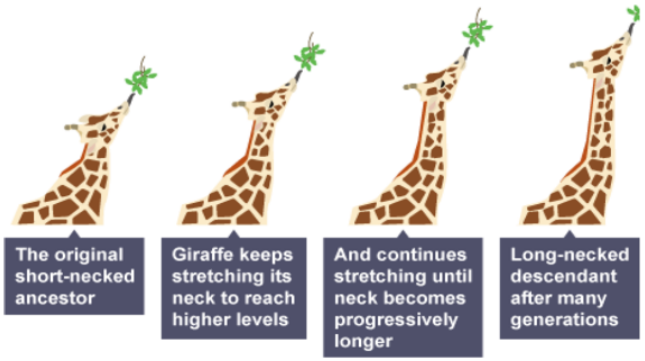
<table>
<tr><th colspan="2">HFL ARE statements explained</th></tr>
<tr><td>How do offspring vary from the parents?</td><td>Animals and plants produce offspring that are similar but not identical to them. Offspring often look like their parents because their features are passed on. On the other hand, individual members of species also have different characteristics. 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. Dogs also have different length tails. This means that no two members of a species are identical.</td></tr>
<tr><td>How are animals and plants adapted to suit their environment?</td><td>An adaptation is the way an animal's body helps it survive, or live, in its environment. Animals depend on their physical features to help them obtain food, keep safe, build homes, withstand weather and attract mates. Characteristics can be influenced by the environment the living things live in. These adaptations can develop as a result of many things, such as food and climate. Some examples include: the sape of a bird's beak, the number of fingers, the colour of the fur, the thickness or thinness of the fur and the shape of the nose or ears. Some other examples are below:
<table>
<tr><th>Living thing</th><th>Habitat</th><th>Adaptive traits</th></tr>
<tr><td>Polar bear</td><td>arctic</td><td>Its white fur enables it to camouflage in the snow.</td></tr>
<tr><td>Camel</td><td>desert</td><td>It has wide feet to make it easier to walk in the sang.</td></tr>
<tr><td>Cactus</td><td>desert</td><td>It stores water in its stem.</td></tr>
<tr><td>Toucan</td><td>rainforest</td><td>Its narrow tongue allows it to eat small fruit and insects.</td></tr>
</table></td></tr>
<tr><td>How do fossils provide information about living things that inhabited the Earth millions of years ago?</td><td>Fossils are the preserved remains, or partial remains, of ancient animals and plants. They can be actual preserved organic material (amber), mineralised bones, shells, casts, moulds, impressions of leaves and footprints. 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.</td></tr>
</table>

Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Evolution and Inheritance	**Class 4**	**Year A Summer Term**

Why do we not have a complete fossil record?	There are gaps in the fossil record because many early forms of life were soft-bodied, which means that they have left few traces behind. What traces there were may have been destroyed by geological activity. This is why scientists cannot be certain about how life began.
How does the introduction of new species in an isolated environments effect native species?	Some of these new species can spread rapidly and outcompete or pretty on native species. They can reduce the number of native species, which may lead to extinction. Newly introduced species may spread rapidly because this new location is free of predators, parasites and competitors that would normally limit their population in their natural environment.

Famous people that relate to this unit:		
Charles Darwin – Theory of evolution	The theory of evolution by natural selection. He had the idea that humans shared a common ancestor. He was recommended as a gentleman naturalist on a voyage around the world on the HMS Beagle. Over 5 years, he visited 4 continents, collecting specimens and investigating local geology. The HMS Beagle made a five-week stop at the Galapagos Islands. He found that animals more suited to their environment survive longer and have more young. Evolution occurred by a process he called natural selection. He wrote the book 'Origin of Species' and by the 5th edition he introduced the phase 'survival of the fittest'	
Jean-Baptiste Lamarck (before Charles Darwin)	Lamarck's theory about evolution involved 2 main ideas: 1. A characteristic which is used more and more by an organism becomes bigger and stronger, and one that is not used actually disappears. 2. Physical changes in organisms during their lifetime could be passed to their offspring. It is now commonly accepted that Lamarck's ideas were wrong. For instance, his theory implies that all organisms would gradually become complex and simple organisms would disappear. His theory about a giraffe's neck was that its neck stretched to reach the higher branches to eat. He believed this useful characteristic was passed onto future generations, but it is now known that mutations can create variation such as neck length.	

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Types of enquiry you could cover in this topic about evolution	
	
	• How have human beings evolved over time?
	• Is there a pattern between the size and shape of a bird's beak and the food it will eat? • What is the most common eye colour in my family?
	• What happened when Charles Darwin visited the Galapagos islands? • What did American geneticist, Barbara McClintock, have about genes that won her Nobel Prize?
	• Compare the skeletons of apes, humans and Neanderthals – how are they similar and how are they different? • Can you classify these observations into evidence for the idea of evolution and against?

Books/writing links
BOOKS • DNA Detectives
RECOUNT • Write autobiography in role Charles Darwin • Newspaper report Victorian London - moths changed colour during industrial revolution. • Letter (as Mary Anning) describing discoveries (Stone Girl, Bone Girl tells her story).
NON-CHRONOLOGICAL • Invent a new animal that would survive in certain conditions and write a report on them
INSTRUCTIONS • Beginners guide to fossil hunting (could be shared with Year 3)
EXPLANATION • How does the peppered moth provide evidence of evolution?