YEAR 5: LIVING THINGS & THEIR HABITATS

young people's trust for the environment

ypte

LEARNING OBJECTIVE

To understand the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Key Vocabulary

Lifecycle - the process of adults having young which then grow into adults and in turn produce young.
Gestation period - the period of time that a mammal carries her offspring, or babies, inside her body before giving birth.
Mammary glands - a gland in a female animal that produces milk.
Life expectancy/average life span - the average number of years that a person or animal can expect to live.

Key Vocabulary

Marsupial - a type of mammal that gives birth to babies before they are fully developed; the babies continue to grow in a pouch on their mother's stomach.
Incubate - to sit on eggs so that they will be kept warm and will hatch.
Hatchling - a newly hatched young bird.
Nestling - a young bird that is living in the nest and is dependent on its parents.
Fledgling - a young bird that is ready to fly the nest.
Migrate - to move from one region or habitat to another, according to the seasons.
Metamorphosis - a major change in form or structure that some animals go through to become adults.

WHAT ARE THE DIFFERENCES IN THE LIFE CYCLES OF A MAMMAL, AN AMPHIBIAN, AN INSECT & A BIRD?

Photo: Mark Dumont

Mammal Life Cycle

Before Birth

Young

Adult

Nearly all mammals give birth to live young. Mammal young are similar to the parents, just smaller.

Photo: Mark Dumont

Photo: Bethan Phillips

There are only two egg-laying mammals in the world

Spiny anteater

Duck-billed platypus

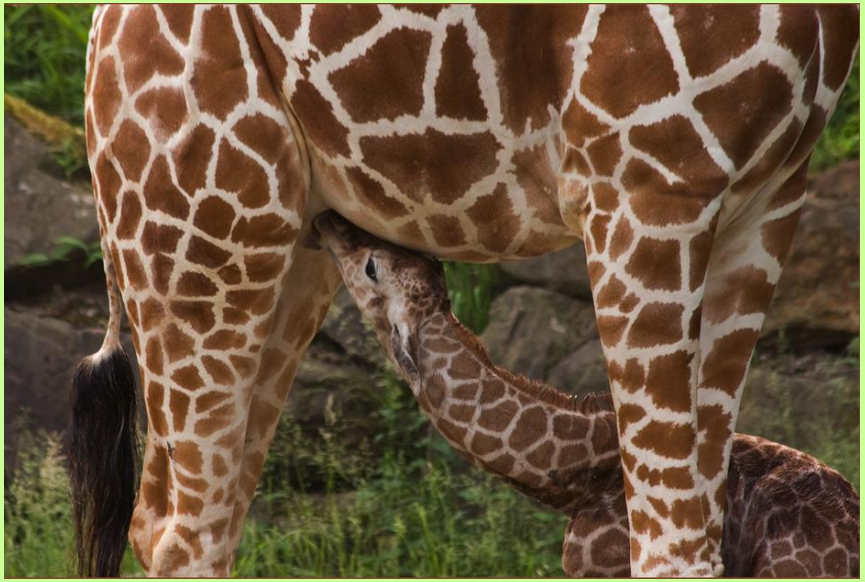

Photo: HelloMokona

Hamsters have a gestation period of just 16-23 days

Elephants have the longest gestation period of all mammals – about 23 months. That's nearly 2 years!


Photo: Albuquerque BioPark

Mammals all have mammary glands - in a female, these produce milk for feeding their young.



Mammal life expectancy varies hugely

The Harvest Mouse lives for around 2.5 years.

The Bowhead Whale can live for over 100 years & it is thought that one lived for over 200 years!

The human life cycle: from newborn baby, to child, to adult, to old age


Photo: Allie Osmar Siarto


Photo: Ashok Saravanan.Ay

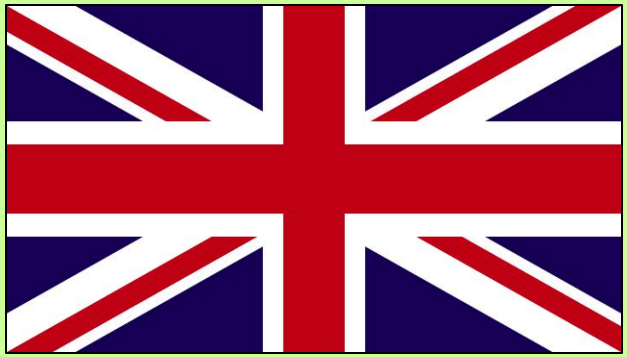

Photo: Toms Baugis


Photo: Eric Montfort

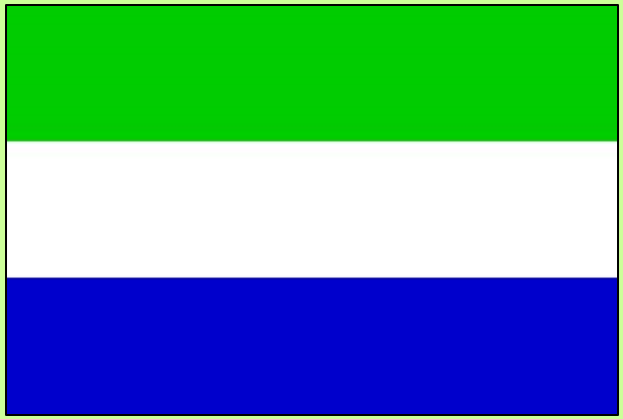
The Human Life Cycle and Life Expectancy

Before birth → Baby → Toddler → Child → Teenager → Adult → Old Age → Death

In the UK, average life expectancy is 81 years.



In Sierra Leone, Africa it is only 46 years.



Can you think of reasons for this difference?

Kangaroo Life Cycle (Australia and Tasmania)

Kangaroos are marsupials. They give birth to poorly developed babies that weigh less than a lump of sugar, are the size of a jelly bean and are blind and hairless.

Shortly after birth, the baby kangaroo (called a joey) will crawl to the mother's pouch where it will live, feed and grow for 6-8 months.

This joey is about 6 months old and can now climb out of his mother's pouch to spend time exercising and eating.

Pregnant polar bears make a den in the snow around October/November, after fattening themselves up with lots of food. They give birth in December/ January to small and helpless cubs (the cubs are born blind). They start suckling straight away and grow quickly. The cubs will stay with their mother for several years before they can cope on their own.

When the cubs are 3-4 months old, they emerge from the den with their mother to go hunting.

Photo: trasroid

Bird Life Cycle

Before birth


Photo: brittgow

Young


Photo: Anne Petersen

Parent


Photo: Steven Johnson

Birds have a similar life cycle to mammals in some ways. But a very important difference is that chicks grow inside eggs outside of the mother's body, getting their nutrition from the yolk.

Photo: rabbit_mage

Parent birds take it in turns to sit on the eggs to protect and keep them warm so that the chicks inside develop properly – this is called incubation. Different birds sit on their eggs for different lengths of time. Bigger birds lay bigger eggs which take longer to hatch.

A baby chick is hatching in this picture – it is called a hatchling. Most hatchlings can't walk or fly straight away.

This duckling is only a day old and still has its egg tooth – it used this to hatch out of the egg and it will drop off in a few days

Photo: Daniela

Parent birds look after their young. As most chicks can't walk or fly straight away their mother feeds them in their nest. They stay in the nest (they are now called nestlings) where the parent birds look after and feed them. They practise flying until they are ready to leave the nest (they are then called fledglings).

Some birds migrate a long way as part of their life cycle. They often migrate to find food and usually move in flocks. For example, the swallow breeds in the northern hemisphere, flies south in the winter to southern Africa and then returns to its breeding grounds in the Spring. This is because our temperature drops in winter, trees lose their leaves and so many insects begin hibernating. Rather than risk starvation, the swallow flies to Africa where the temperatures are high enough for their prey.

The Arctic Tern makes the longest migration of any animal in the world.

In its lifetime (about 30 years) the Arctic Tern can migrate up to 1.5 million miles - that's equal to three trips to the moon and back!

Kiwis (from New Zealand) lay huge eggs 6 times larger than normal for a bird of their size. The baby can take up to 3 days to hatch from them, as they have no egg tooth. The chicks emerge from them fully feathered.

Penguin (Antarctic)
In some birds, only the mother sits on the eggs. But for others, for example the penguin parents share the caring for the eggs and chicks and the father takes his turn.
This king penguin is incubating an egg.

Amphibian life cycle

Amphibians and insects have another type of lifecycle as they both go through metamorphosis.
By the time they are adults they look completely different from how they did when they were born.

In the Spring the frog lays eggs in a blob of clear jelly called frog spawn. Each black dot could eventually grow into an adult frog. One week later the eggs start to change into tadpoles.

By late Spring the black dots hatch into tadpoles. They swim very well using their wriggly tails and breathe through gills.

6 weeks after hatching the tadpoles grow hind legs.They are still tiny but will soon grow bigger and stronger.

10 weeks after hatching the tadpoles grow front legs and start to breathe through their lungs.

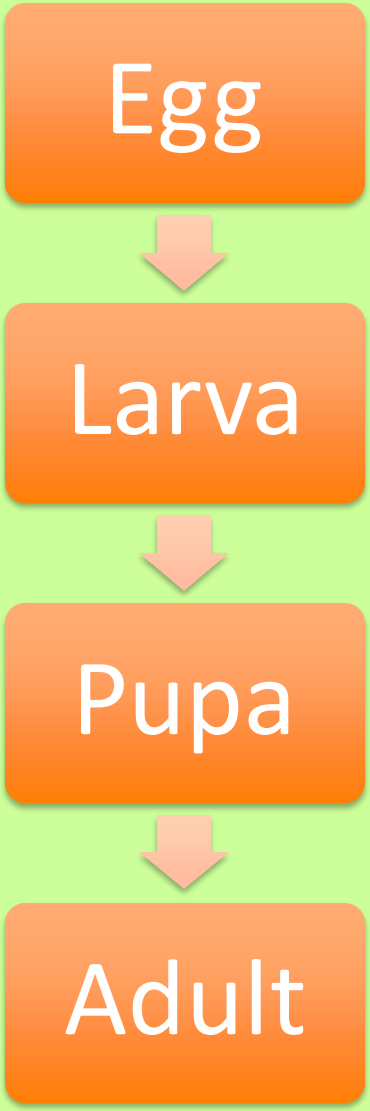
12 weeks after hatching and after growing legs the tadpole develops into a small froglet.

The froglet will soon lose its tail and its eyes will get bigger.


By late summer the froglet has grown into a large adult frog. After 2 years a female frog will lay more frogspawn and the cycle begins again
Most frogs do not look after their offspring

Insect Life Cycle

Insects have very complicated life cycles and like amphibians, they go through metamorphosis.



Unborn stage

Young stage
Eat lots
Usually have soft bodies

Inactive stage
No eating
Seal themselves in protective casing & transform into adults

Final breeding stage
Emerge fully grown, often with wings

The Butterfly Life Cycle

A butterfly begins its life as something completely different.

This is how the transformation happens:


The female Monarch butterfly lays her eggs usually on the leaves or stems of plants. Inside the tiny egg, a caterpillar (larva) starts to grow.
Photo: Brenda Reamy

When it is ready, the caterpillar eats its way out of the egg and immediately starts chomping on the plant leaves! As it grows, its skin becomes too tight and it splits open to reveal a new and larger skin underneath. A caterpillar can shed its skin 4 or 5 times. When fully grown it can be over 100 times larger than when it emerged from the egg!

Once fully grown, the caterpillar forms itself into a chrysalis (pupa). A hardened case forms around it to protect it from predators and weather. Inside a transformation is taking place - the tissue, limbs and organs of the caterpillar transform into a beautiful winged butterfly.

When the butterfly is ready, the case around the chrysalis splits open. The butterfly waits for its wings to dry and then takes to the air in search of flowers to feed on -so the cycle is complete and ready to begin again.

The newly emerged, damp Monarch butterfly is still clinging to the empty shell of the chrysalis


The new Monarch Butterfly takes to the air in search of flowers to feed on
Photo: Martin LeBar

All butterflies start life as caterpillars. But the colouring of the caterpillars is often very different from the beautiful colours of the butterflies they become.

Incomplete Metamorphosis

About 10% of insects do not have a pupal form and only have three stages in their life cycle.

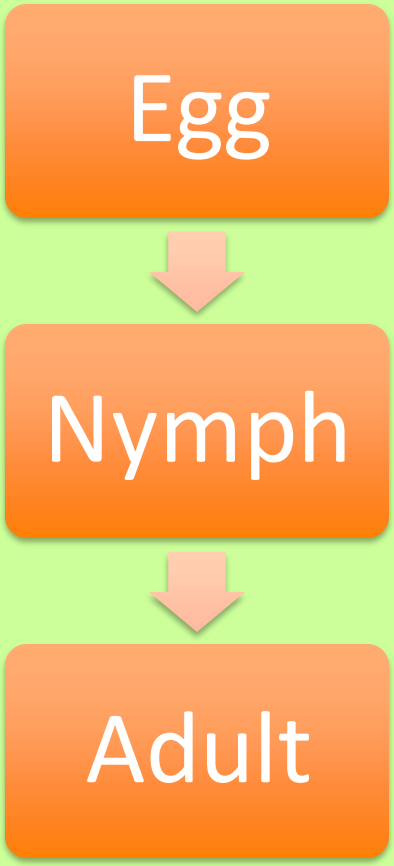
Insects with incomplete metamorphosis:

Dragonfly

Grasshopper

Locust

Cockroach



The nymph looks like the adult but lack features such as wings

Activities

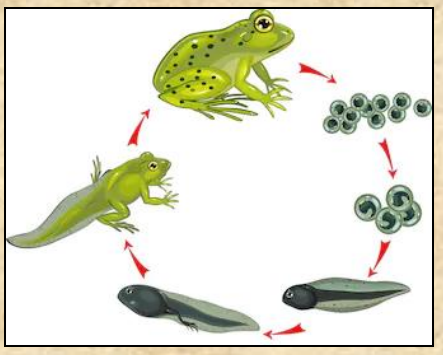
1. **Hatching Observation** – watch a chick hatching – follow this link

https://www.youtube.com/watch?v=gZ-XLz8cGFE

What do you notice? Write down your observations.

2. **Butterfly & Frog Lifecycles**

Draw each of these lifecycles: use arrows to link them together and add detailed labels to explain what is happening at each stage.



3. Mammal Lifecycle Research Task

a) Choose a mammal you are familiar with e.g. a pet or farm animal and research the following:

- What is the baby animal known as?
- What is the gestation period?
- At what age does the animal become adult?
- What is the average life expectancy?
- How does their lifecycle compare with the human life cycle?

b) Find out about one or more mammals from around the world. that Consider the different habitats for example rainforest, desert areas or the oceans.

- Research the life cycle of these animals.
- How are they similar/different to the animals you have studied in our local environment?
- Can you suggest reasons for these differences?

LEARNING OBJECTIVE

To understand how the work of Naturalists and animal behaviorists have contributed to our understanding of the natural world.

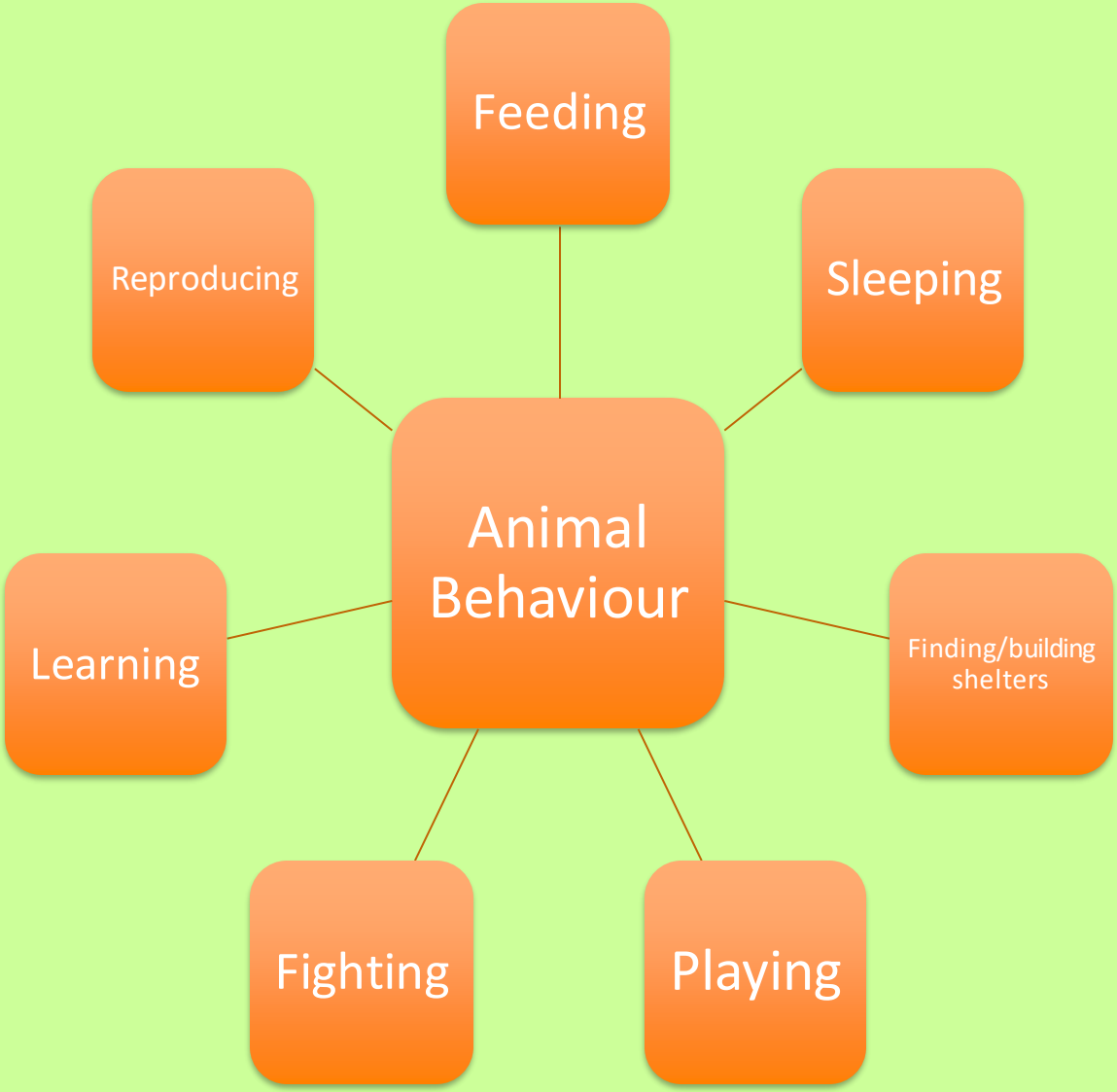
Key Vocabulary

Animal Behaviourist - a person who studies animal behaviour, especially as it occurs in the natural environment.
Naturalist - A person who studies plants and animals as they live in nature.

Why is it important that we understand how plants and animals live?

- Helping endangered species
- Understanding why some habitats are important for the survival of particular species
- Helping us improve conservation and look after the environment
- Understanding how removing a species can affect the whole food chain in that habitat

What can we study about animal behaviour?



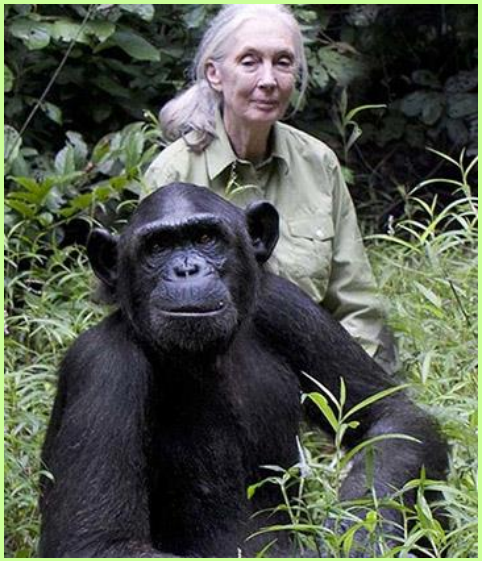
Jane Goodall (1934 -), Animal Behaviourist

Jane Goodall is a well known animal behaviourist . She is an expert on primates and well known for her work with chimps, over a period of 50 years.

Primates - any member of the group of animals that includes human beings, apes and monkeys

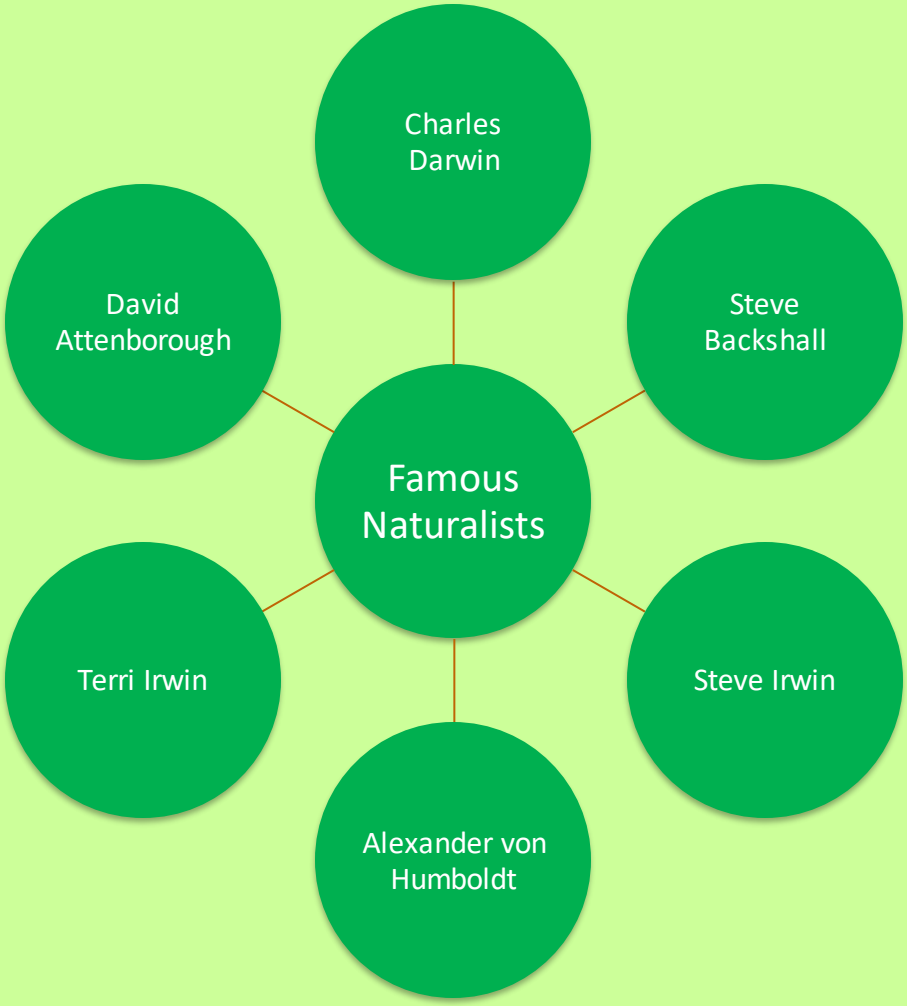
Jane Goodall is one of a small number of people who have ever been accepted into a chimpanzee community.

She showed that chimps have individual personalities and experience emotions.

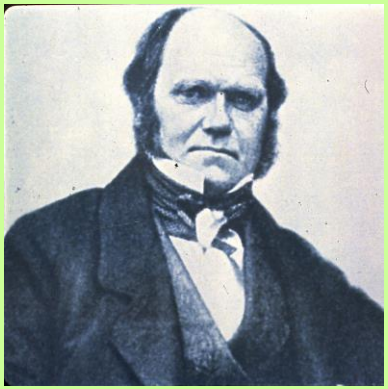


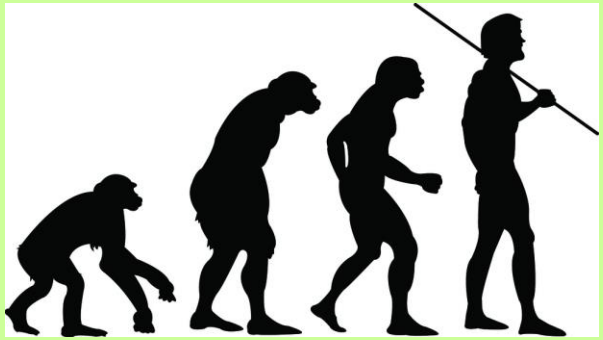
Naturalists

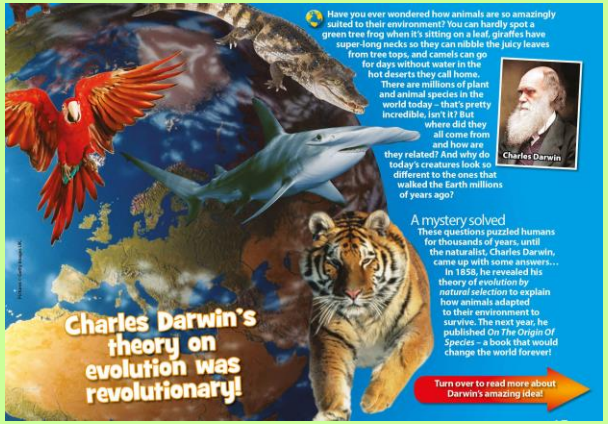
Here are just a few naturalists who have made a valuable contribution to our understanding of the natural world.



Charles Darwin (1809-1882), Naturalist







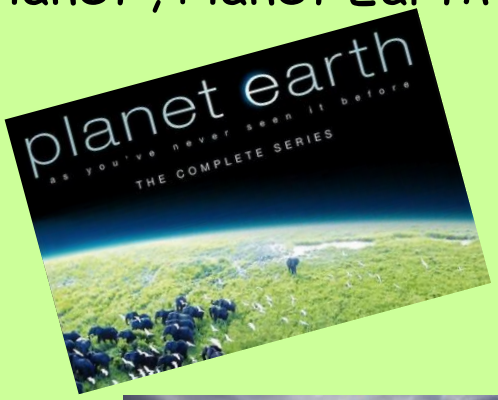
Charles Darwin changed the way humans viewed themselves and the world around them. He is most well known for his ground-breaking Theory of Evolution published in his book 'On the Origin of Species' in 1859. His theory stated that all species have evolved from simple life forms, becoming more and more complex over millions of years. Over time, evolution meant that individuals within a species that were stronger and better adapted to their environment, were more likely to breed and pass their genetic advantages e.g. strength, camouflage, speed onto their offspring, who in turn would pass on and magnify these advantages in the genes of their own offspring.

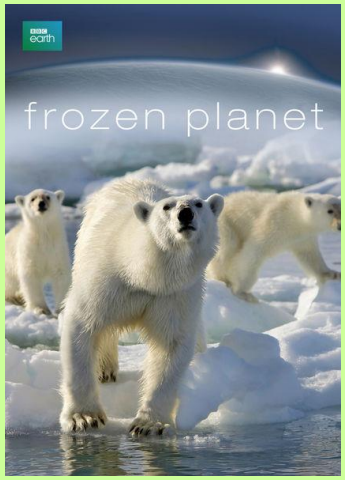
David Attenborough (1926-), Naturalist

David Attenborough is a naturalist and broadcaster who has become known as the face and voice of natural history documentaries. His storytelling has inspired many generations to learn more about the natural world. Attenborough's many superb television series include The Living Planet , Living With Dinosaurs , The Blue Planet , Planet Earth and The Frozen Planet .

Fact: By the age of 7, David Attenborough had already created his own "museum" of bird eggs and ancient fossils.

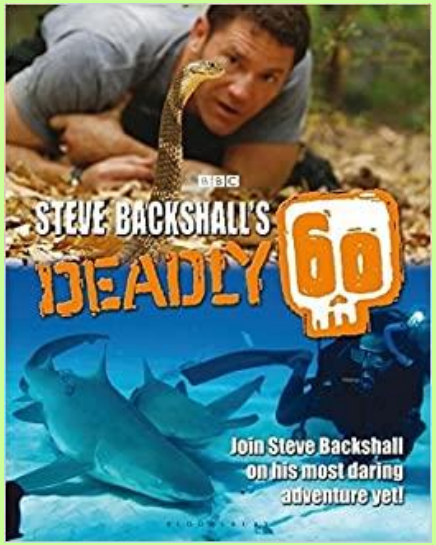
Could you be a famous naturalist when you are older?

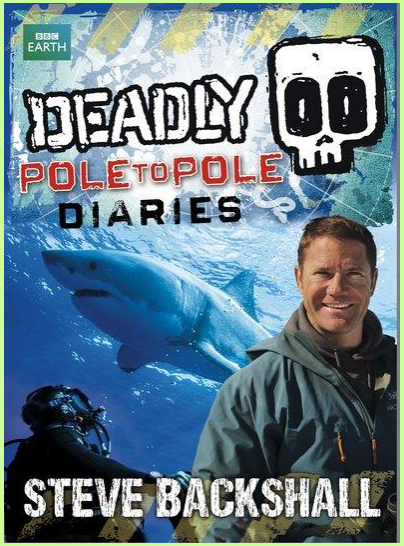




Steve Backshall (1973 -), Naturalist

Steve Backshall is a naturalist, writer and television presenter who has inspired thousands of young people and adults to take an active interest in animals and nature. His many TV shows include Deadly 60, Live n' Deadly and Deadly Pole to Pole . For BBC TV's Deadly 60, Steve travelled 6 continents in 6 months to find 60 of the deadliest creatures on the planet.





Activities

Research Task

Choose a naturalist or animal behaviourist and produce a fact file on their life and their contribution to our understanding of the natural world.

Creative Task

Imagine you are a famous naturalist and have discovered a new species of animal in a remote part of the world e.g. the rainforest, desert, Antarctica, under the sea.
Draw or make a model of your new species, give it a name and describe its characteristics and life cycle.