Tuesday 2nd March 2021

L.O: I can identify how animals and plants have adapted to their environment in order to survive.

Variation

What does variation mean?

What causes variation?

Inheritance

These are characteristics that are passed on to offspring from their parents.

Adaptation

Over many generations, a species will adapt to its environment. Animals with the most successful characteristics are more likely to survive

What is an environment?

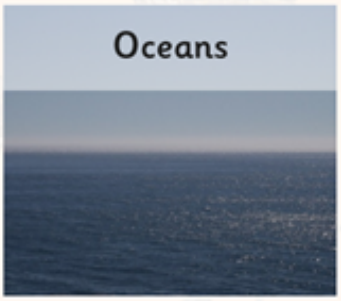
What is a habitat?

Sometimes the words '**environment**' and '**habitat**' are used as though they have the same meaning. However, there are important differences:

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

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

So a bird may live in the woods, its habitat, but its environment could include a stream and a mountain, which are habitats in their own right.



Remember: an environment is more than one habitat.

What Does Adapted Mean?

'Adapted' means to adjust to new conditions – like a new home or school.

'Adapted' is when you turn a book into a TV programme or a film!!

'Adapted' means making something suitable for a new purpose - like cutting off the legs of jeans to make them into shorts.

What do you think? Discuss with your talk partner.

Adaptation

Living things are adapted to their habitats. This means that they have special features that help them to survive.

An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool.

A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm.

https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zxg7y4j

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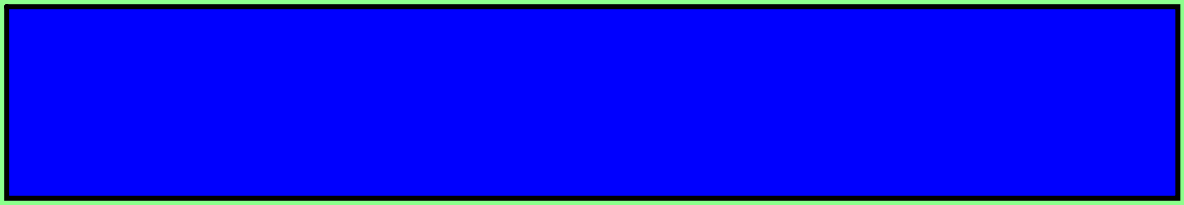
When you see a fish swimming in its habitat, it is noticeable that it is suited to it.

Can you think of two ways that fish are suited to living in the water?

Examples:
It has gills to breathe in oxygen in the water.
It has fins that allow it to move through water easily.
It has a special bladder called a swim bladder which allows it to remain buoyant.



So it's easy to think that the fish has adapted (changed) – to suit its habitat or environment. But this is incorrect! No living thing changes deliberately to adapt to an environment.

Think about it - if you wanted to change and live in the sea would you be able to choose to grow fins? If you were in the water long enough would you start to develop gills? The answer for both is no!

Even though it may seem hard to believe, this fish has developed all of these features accidently, not intentionally or deliberately.

The adaptations, each of which have occurred over time (which is called evolution) make it easier for the fish to live in water and survive.

We only see the fish as it is now and not the other fish who started off similar to it but whose adaptations made it harder, rather than easier, to live in the water. These fish have become extinct as a result.

The successful adaptations allowed the fish to survive in the water better. Hence the fact that this fish is still alive now.

Adaptation is not a part of a living thing, it is a process. The parts, such as gills, are called the 'adaptive traits'.

Adaptation

It's not just animals that are adapted to their environment, plants are too. A cactus is well adapted for survival in the desert. They have long roots to collect water from a large area and a stem that can store water for a long period of time.

The animals and plants in one habitat are suited to live there and may not be able to survive in other habitats. When a habitat changes, the animals and plants that live there are affected.

Accidental Adaptations

So how do these random, accidental adaptations occur? The usual cause is random mutations.

We need to go back to our DNA.

Each cell has a copy of the DNA. Random mutations occur when the cell becomes damaged and fails to repair itself completely. Sometimes this failure affects the DNA in the cell.

In this situation, the DNA stays slightly different. When the cell with the mutated DNA replicates, it will do so with the mutation.

Accidental Adaptations

Mutations are not in themselves good or bad. Some mutations have no effect at all! However, other mutations can cause us to lose or gain functions.

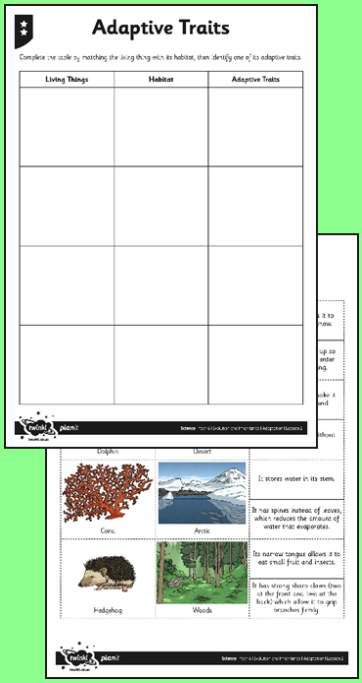
One example of this is the ability of humans to drink milk after infanthood.

All other mammals stop drinking milk after they are weaned. As they develop they become lactose intolerant (the body stops being able to digest milk).

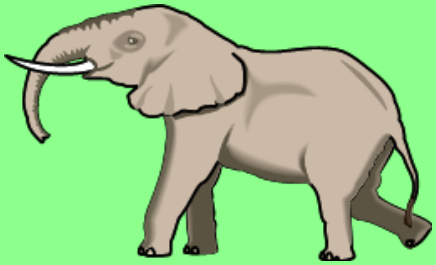
A mutation in humans has allowed us to carry on drinking milk even after we are weaned as babies. Further mutation means we can drink the milk of other mammals – such as cows, sheep and goats. Again no other mammal does this!

Adaptive traits enable a living thing to survive better in its habitat or environment. As it lives longer, it means that it has a greater chance of reproducing and so the adaptive trait gets passed on.

Task 1: Complete the cut and stick activity matching up the living thing to its habitat to its adaptive trait.

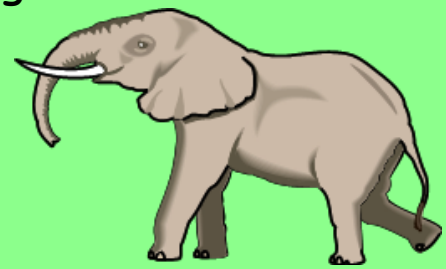


There are many different ways in which animals are adapted to their environment. But why do they need to adapt?

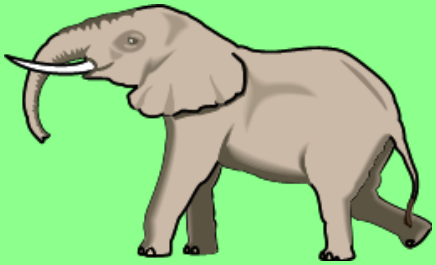


Animals adapt themselves to their surroundings for food getting, protection and survival.

When habitats change quickly due to climate change or the introduction on a new predator, animals have to evolve and adapt to survive. If they don't they face becoming extinct.



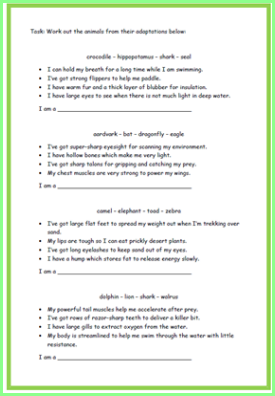
Those animals which do adapt to their environment survive and live on. This is known as natural selection or you may have heard it as survival of the fittest.



Your final two tasks of the lesson:

1) Complete the activity 2 sheet where you need to identify an animal from its adaptive traits.

2) Using the information sheets, select a couple of animals and explain why they are suited to their environment in your book.



Task: Work out the animals from their adaptations below:

crocodile – hippopotamus – shark – seal

- I can hold my breath for a long time while I am swimming.
- I've got strong flippers to help me paddle.
- I have warm fur and a thick layer of blubber for insulation.
- I have large eyes to see when there is not much light in deep water.

I am a _____

aardvark – bat – dragonfly – eagle

- I've got super-sharp eyesight for scanning my environment.
- I have hollow bones which make me very light.
- I've got sharp talons for gripping and catching my prey.
- My chest muscles are very strong to power my wings.

I am a _____

camel – elephant – toad – zebra

- I've got large flat feet to spread my weight out when I'm trekking over sand.
- My lips are tough so I can eat prickly desert plants.
- I've got long eyelashes to keep sand out of my eyes.
- I have a hump which stores fat to release energy slowly.

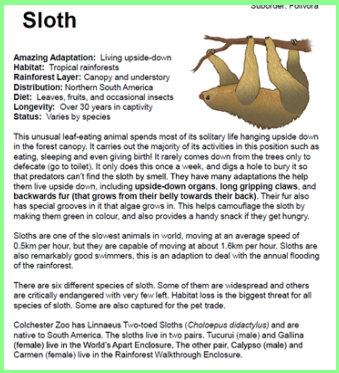
I am a _____

dolphin – lion – shark – walrus

- My powerful tail muscles help me accelerate after prey.
- I've got rows of razor-sharp teeth to deliver a killer bit.
- I have large gills to extract oxygen from the water.
- My body is streamlined to help me swim through the water with little resistance.

I am a _____

Activity 2 Sheet.pdf



Sloth

Amazing Adaptation: Living upside-down
Habitat: Tropical rainforests
Rainforest Layer: Canopy and understory
Distribution: Northern South America
Diet: Leaves, fruits, and occasional insects
Longevity: Over 30 years in captivity
Status: Varies by species

This unusual leaf-eating animal spends most of its solitary life hanging upside down in the forest canopy. It carries out the majority of its activities in this position such as eating, sleeping and even giving birth! It rarely comes down from the trees only to defecate (go to toilet). It only does this once a week, and digs a hole to bury it so that predators can't find the sloth by smell. They have many adaptations the help them live upside down, including **upside-down organs**, **long gripping claws**, and **backwards fur (that grows from their belly towards their back)**. Their fur also has special grooves in it that algae grows in. This helps camouflage the sloth by making them green in colour, and also provides a handy snack if they get hungry.

Sloths are one of the slowest animals in world, moving at an average speed of 0.5km per hour, but they are capable of moving at about 1.6km per hour. Sloths are also remarkably good swimmers, this is an adaption to deal with the annual flooding of the rainforest.

There are six different species of sloth. Some of them are widespread and others are critically endangered with very few left. Habitat loss is the biggest threat for all species of sloth. Some are also captured for the pet trade.

Colchester Zoo has Linnaeus Two-toed Sloths (*Choloepus didactylus)* and are native to South America. The sloths live in two pairs. Tucurui (male) and Gallina (female) live in the World's Apart Enclosure, The other pair, Calypso (male) and Carmen (female) live in the Rainforest Walkthrough Enclosure.

Activity 3 Information Sheets.pdf

The Water Specialists

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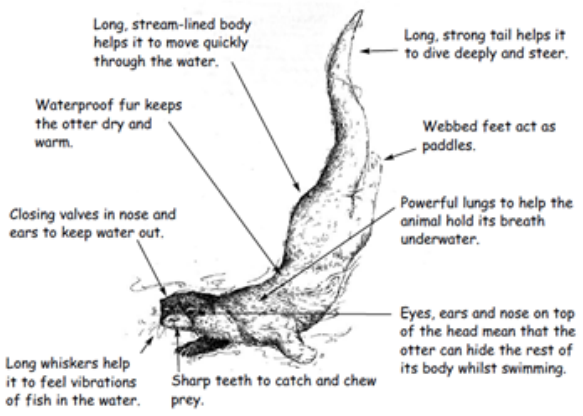
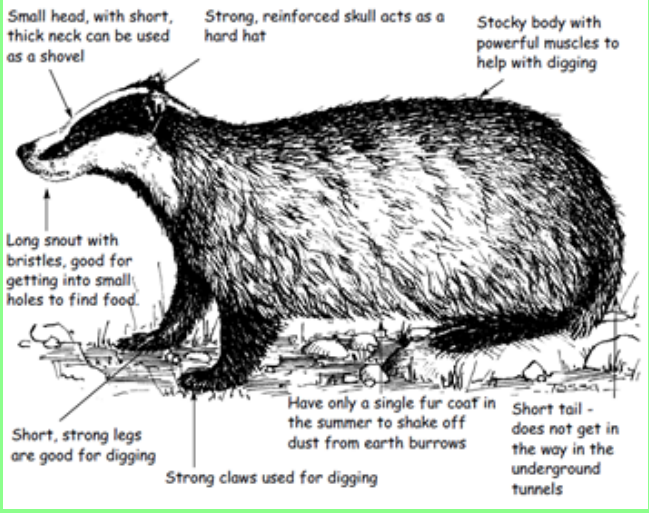
Otters have many features which mean they are suited for life in the water - they are **aquatic** animals.



Badgers make their home and spend most of the daytime underground.



Attachments

Activity 3 Information Sheets.pdf

Activity 2 Sheet.pdf