Living Things

Scientists estimate there are over 10 million **species** of living things on the planet. Living things include plants (like trees, bushes, flowers or pond plants) and animals (including mammals, reptiles, fish and insects) as well as things like bacteria and fungus which are so small they can only be seen with a microscope.

Living things have seven common characteristics:

Movement	Living things can move without being pushed or pulled, for example using their limbs or turning towards the sun.
Reproduction	Living things must reproduce in order for their species to survive.
Responding to Stimuli	Animals can escape from danger or fear while many plants can repair themselves when damaged.
Taking on Nutrients	All living things need nutrients to survive. We often call these nutrients food.
Excreting Waste	Living things get rid of waste products from the body, for example waste gases.
Respiration	Using gases from the air is a common feature among all living things.
Growth	Living things can change in size, structure and form as they grow.

Mammals

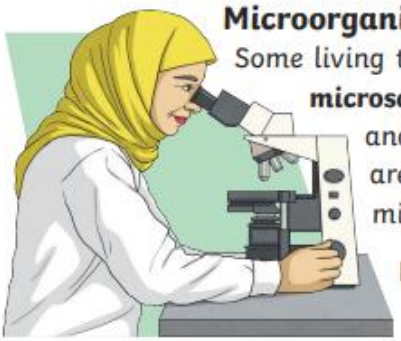
Humans are mammals and mammals are just one group of living things. Mammals are warm-blooded, which means that these are animals who have a constant body temperature regardless of the temperature of their environment, and they make milk to feed their babies.

Most mammals have hair or fur, are **vertebrates** and give birth to live young. However, there are some **exceptions** to these characteristics. For example, the platypus presented scientists with a challenge when it was first studied because its young hatch from eggs. The platypus is a special type of mammal.

Metamorphosis

Some animals begin life in one **form** and change completely during their lifetime. This total body structure change (and behaviour change) is called metamorphosis. The butterfly is an excellent example of metamorphosis because it begins life in the form of a caterpillar and later metamorphosises into a butterfly. Another animal which goes through metamorphosis is the frog, experiencing many gradual changes during its life cycle.

Microorganisms



Some living things are so tiny that they can only be seen under a **microscope**. These are called microorganisms. Bacteria, yeast and moulds are all examples of microorganisms but there are also some plants and animals that are classed as microorganisms.

Microorganisms are all around us but people often think of them as harmful. Sometimes this is true - some bacteria can be dangerous and cause illness - but there are many examples of how microorganisms are helpful to humans, such as bacteria in yoghurt and yeast in bread.

Classification

When scientists study living things, it helps to inform our understanding of human behaviour, **evolution**, medicine, illness and much more. Scientists group living things according to their similarities and differences and this is called classification.

A Swedish scientist called Carl Linnaeus designed a way to classify animals, plants and shells that he had studied. He grouped them first into a kingdom, then gradually broke down each kingdom into smaller and smaller groups. He designed this method in the 1700s and an adapted form of the model is still used today. Now, the Linnaeus system for classifying focuses on living things (shells are no longer included) and there is a larger grouping before kingdoms called domains.

plants

animals

shells

Glossary

evolution:
The process by which different organisms have developed over time.

exceptions:
Things that do not follow the rule.

form:
The body or shape of an organism.

microscope:
A tool to view very small objects by magnifying them.

species:
A group of organisms with similar characteristics.

vertebrates:
An animal with a backbone.

Questions

1. Which of these is not considered to be a 'living thing'? Tick one.

   - ○ trees
   - ○ fish
   - ○ shells
   - ○ bacteria

2. Draw **four** lines and match each characteristic of a living thing to its meaning.

Living things can move without...	in order that their species survives.
Living things must reproduce...	waste gases.
Living things can change in...	size, structure and form as they grow.
Living things get rid of waste products from the body, for example...	being pushed or pulled, for example using their limbs or turning towards the sun.

3. Look at the section titled 'Mammals'. Find and copy one word which shows that the temperature does not change.

   _____

4. Look at the section titled 'Classification'. Fill in the missing words.

   Scientists group living things according to their _____ and _____ and this is called classification.

5. Find two animals in the text who experience metamorphosis during their life cycle.

   1. _____
   2. _____

6. Using 25 words or fewer, summarise why microorganisms might be thought of as harmful.

7. Why do you think Linnaeus's model for classification has been changed since he first created it? Give two reasons.

8. 'It is important that scientists study living things.' Do you agree? Explain your answer.