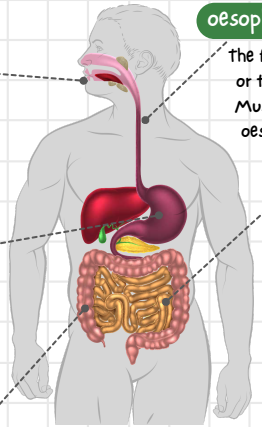
Food & the Digestive System



mouth

The tongue rolls the food around and the teeth break it into smaller pieces by biting and chewing. Digestive enzymes in saliva break down the food further so the food can be swallowed.

oesophagus

The food travels through the pharynx, or throat, then into the oesophagus. Muscles squeeze the food along the oesophagus and into the stomach.

stomach

Inside the stomach, the food is mixed with digestive enzymes and digestive acid to chemically break it down into tiny particles. Muscles also squeeze and churn the food.

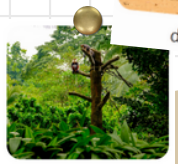
small intestine

Chemicals from organs called the liver and pancreas break the food down further to release nutrients, which are absorbed through the intestinal wall into the bloodstream.

large intestine

Food that cannot be digested is squeezed from the small intestine into the large intestine, where excess water is absorbed. The undigested waste, known as faeces, exits the body through the rectum and the anus at the end of the large intestine.

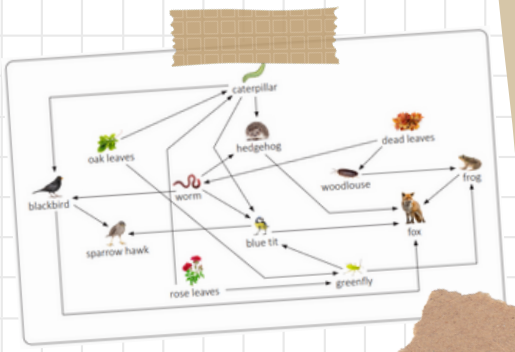
desert

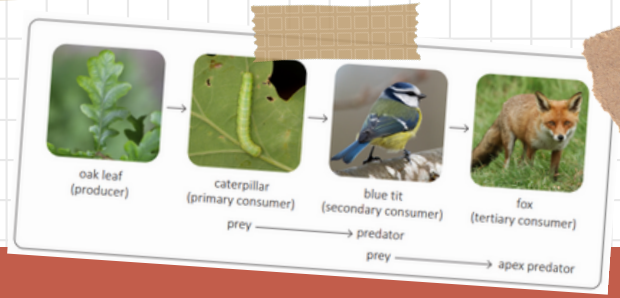


rainforest

How do food chains work?

Food chains start with a producer that makes its own food. Primary consumers are herbivores that eat the producers. Secondary consumers can be carnivores or omnivores that feed on primary consumers and producers. Tertiary consumers at the end of the food chain mainly feed on the secondary and primary consumers. They are called apex predators.





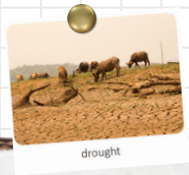
What is a food web?

Food webs show how different plants and animals in an ecosystem are connected through their interdependence.

What are ecosystems?

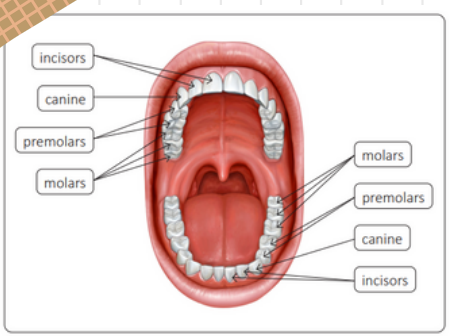
An ecosystem is a community of living organisms and their environments that interact with each other, such as a rainforest, desert or ocean. Ecosystems have biotic, or living, features. They also have abiotic, or non-living, features.

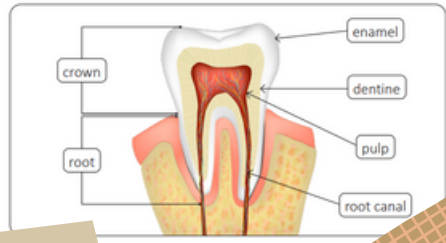
All the biotic and abiotic features of an ecosystem are finely balanced. Any change to one part will affect all the other parts. For example, a drought, or water shortage, can affect a plant's ability to grow. Animals that depend on that plant for food begin to starve and die unless they can adapt or move to a new ecosystem to survive.



drought

All living things depend on the biotic and abiotic features of their ecosystems to survive. This is called interdependence. For example, the hummingbird depends on abiotic features, such as water to drink and oxygen to breathe. It also depends on biotic features, including the hibiscus flower for nutrition and trees for shelter.





Teeth

How many teeth do we have?

Infants grow 20 primary teeth. These begin to fall out at around six years old and 32 permanent teeth then grow.

What are the parts of a tooth?

A tooth has a very hard, outer layer called enamel to protect against bacteria and hot and cold temperatures. Dentine under the enamel gives the tooth its structure and colour. Pulp in the middle of the tooth contains nerve endings and a blood supply which continues through a space in the root called the root canal.

How should we take care of our teeth?

To ensure good oral hygiene, it is important to:

- Avoid consuming too many sugary foods and drinks.
- Brush teeth twice a day with fluoride toothpaste.
- Visit the dentist at least once a year.

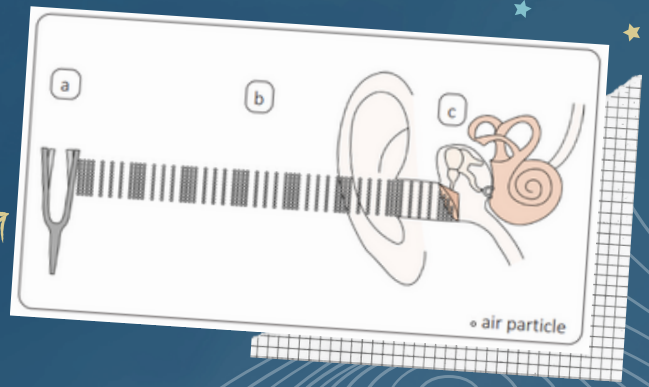
bacteria	A type of microorganism, some of which can cause disease.
fluoride	A chemical that can be added to toothpaste to prevent tooth decay.
microorganism	A living thing that is too small to be seen without a microscope.

SOUND

Sound is energy produced by vibrations from a sound source.

How do we hear sound?

a) When energy is put into a sound source, it starts to vibrate.
b) Air particles start to vibrate. They collide with the air particles next to them and pass the vibration energy along in sound waves.
c) When the sound waves enter the ear, they make the eardrum vibrate. These vibrations pass through small bones called ossicles and are turned into electrical signals in the spiral-shaped cochlea. These signals travel through the cochlear nerve to the brain and are interpreted as sounds.



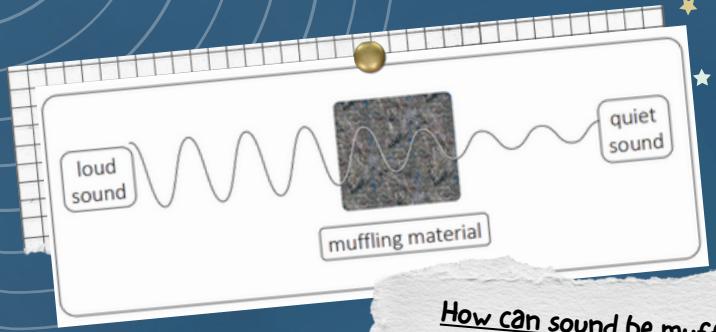
cochlea	the spiral-shaped part inside the inner ear that turns vibrations into electrical signals.
ossicles	three tiny, linked bones inside the ear through which vibrations pass.
particle	A single piece of matter that is too small to be seen.
eardrum	A thin layer of tissue inside the ear through which vibrations pass.

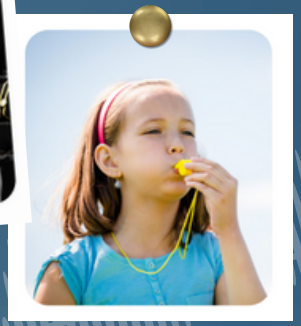
What is volume?

The volume of a sound is how loud it is. It is measured in units called decibels (dB). Energy affects volume. The larger the force of energy put into the sound source, the louder the volume. Distance also affects volume.

What is pitch?

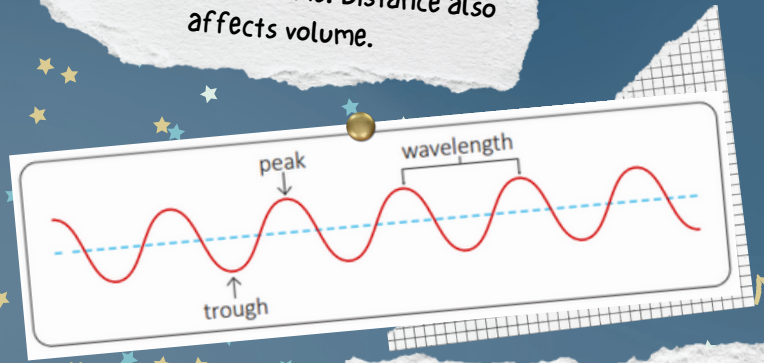
The pitch of a sound is how high or low it is. Pitch is measured in units called hertz (Hz). Fast vibrations produce high-pitched sounds, such as the sound of a whistle. Slow vibrations produce low-pitched sounds, such as the sound of a bass drum.





How can sound be muffled?

Materials that muffle sound absorb a lot of sound energy and reduce the volume of sound reaching our ears. Earplugs, ear defenders and soundproofing materials all muffle sound.

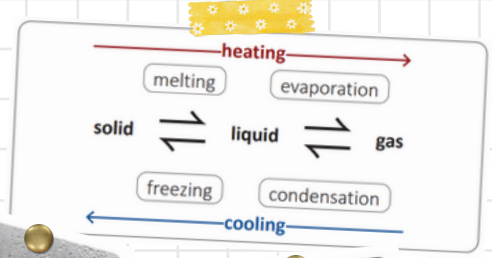


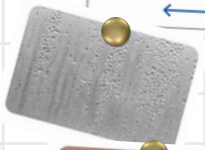
Sound waves can be represented by a wavy line in a sound wave diagram. Volume is represented by the size of the peaks and troughs. Pitch is represented by the distance between each peak, called the wavelength.

States of Matter

How can materials change states of matter?

Materials can exist as solids, liquids or gases. However, some materials change state when heat is added or removed. The processes involved in changing state are melting, freezing, evaporation and condensation.





Solids

- Solids can be held.
- they keep their shape and do not flow.
- they always take up the same amount of space.
- they cannot be compressed.

Gases

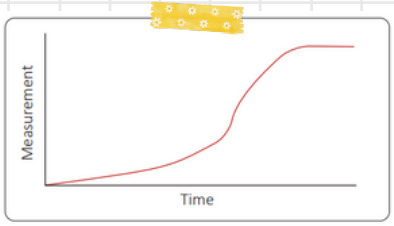
- Gases cannot be held.
- they have no fixed shape and fill the available space in the container.
- they can be compressed.
- they are normally invisible.

Are all melting and boiling points the same?

No. When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point. When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point. Different materials have different melting and boiling points. For example, solid gold melts at 1063°C and liquid argon evaporates at -189°C.

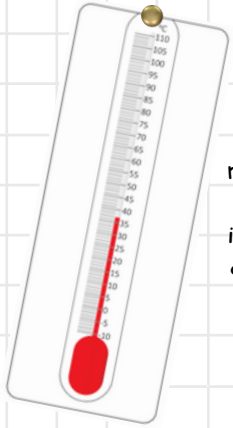
Liquids

- Liquids cannot be held easily.
- they flow and can be poured.
- they take the shape of the container they are in.
- they cannot be compressed.



What is a line graph?

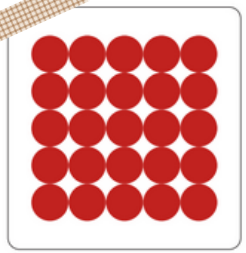
A line graph is a way of displaying data that shows a relationship between two things, or variables. Flat lines mean there is no change over time. The steeper the line, the faster the change.



Temperature is a measure of how hot or cold something is. It is measured in degrees (°) using a thermometer.

variable	A factor, such as an object or condition, that changes during an investigation.
matter	What all things are made from.
gaseous	In the form of a gas.
compress	To squash.

Particle theory

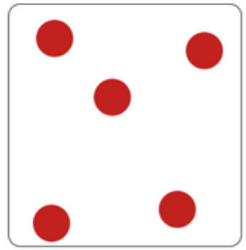


In a **solid**, the particles are close together, arranged in a regular pattern and cannot move around each other.

This arrangement means that solids keep their shape, always take up the same amount of space and cannot be compressed.

In a **liquid**, the particles are close together but arranged randomly, which means they can move around each other.

This arrangement means that liquids can flow, take the shape of the container and cannot be compressed.



In a **gas**, the particles are far apart, randomly arranged and can freely move.

This arrangement means that gases have no fixed shape, fill any container and can be compressed.

Grouping & Classifying

Classification

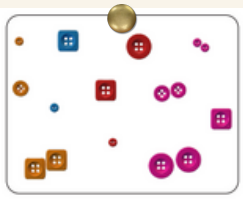
Classification is the arrangement of living and non-living things into groups or categories.

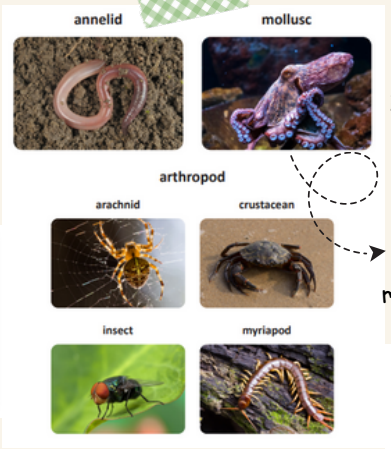
Single-stage classification involves separating a large group of objects into smaller groups based on a single property or according to whether they have a specific property or not.

Sorted into three groups: large, medium and small.

Sorted in two groups: pink and not pink

Multi-stage classification involves asking repeated questions about specific properties, to sort groups into subgroups again and again until all the objects in one group are the same.





Invertebrates do not have backbones. Instead, they have soft bodies or a hard outer shell or exoskeleton. they are further classified into three groups: annelid, mollusc and arthropod.

Vertebrates have backbones. They are covered with skin, feathers, scales, fur or hair. Vertebrates are further classified into five groups.

Plant Kingdom

All plants in the plant kingdom are classified as either vascular or non-vascular. Vascular plants are classified into three groups.

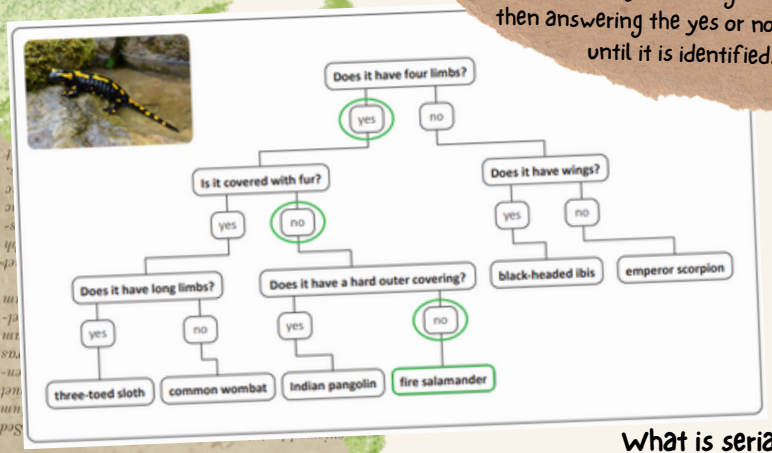
Plants with seeds - flowering

Plants with seeds - cone-bearing

Plants with spores

What is a classification key?

Classification keys use multi-stage classification to identify living things. they work by observing a living thing then answering the yes or no questions until it is identified.



How is classification used?

The science of classifying and naming living things is called taxonomy. Classification helps scientists identify and study living things and understand the origins and evolution of a species.

What is serial ordering?

This type of classification involves sorting objects into an order based on a property.

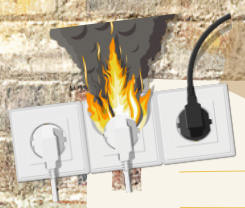
antenna	A long, thin body part on an invertebrate's head that is used to sense the environment.
gill	A body part that fish and some amphibians use to breathe underwater.
sense	The ability to understand our environment, such as sight, smell, touch, taste and hearing.
tail	A body part that sticks out from the base of an animal's back.

ELECTRICAL CIRCUITS & CONDUCTORS

WHAT IS ELECTRICITY?

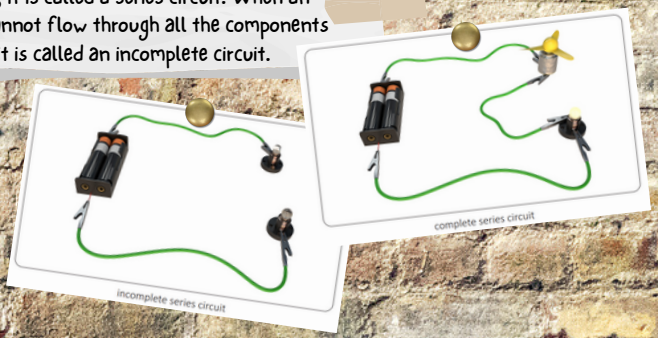
Electricity is a form of energy used to power many everyday items. It is essential to our daily lives. Lighting buildings, watching television, using computers, cooking meals and keeping in touch with family and friends all rely on electricity.

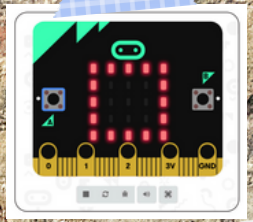
SAFETY



Mains electricity is very powerful. If not used carefully, it can be dangerous, causing fires, burns, electric shocks and death. Electricity can be dangerous when people overload plug sockets, touch electrical items with wet hands or touch damaged wires.

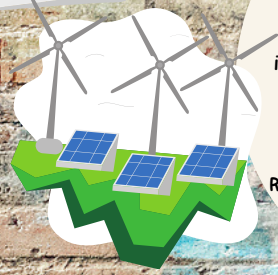
A circuit is a collection of components connected by wires through which an electric current can flow. If a circuit forms a complete loop with a single path for electric current to flow, it is called a series circuit. When an electric current cannot flow through all the components of a circuit, it is called an incomplete circuit.





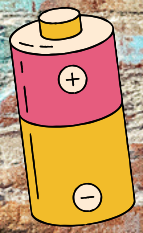
A micro:bit is a small, programmable computer with an LED display, buttons and sensors. Micro:bits can be programmed to carry out a sequence of instructions.

WHAT IS THE FUTURE OF ELECTRICITY?

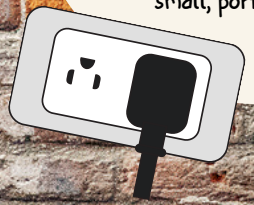


At the moment, most mains electricity is made by burning fossil fuels, such as coal, oil and gas, which pollute the environment, so alternative forms of renewable energy are needed. Renewable energy includes solar power, wind power and geothermal energy.

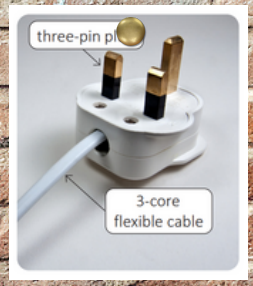
SOURCES OF ELECTRICITY

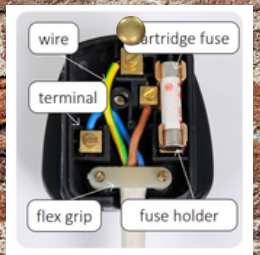


Electricity comes from two sources, mains electricity and cells. Mains electricity is used when we turn on a light switch or plug an electrical appliance into a socket. Cells contain chemicals that create electrical energy. They are usually used to power small, portable devices



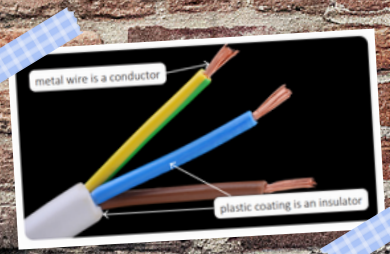
COMPONENTS





wired plug

Electrical conductivity is a measure of a material's ability to allow an electric current to pass through it. Materials that allow an electric current to pass through them are conductive. † Materials that do not allow an electric current to pass through them are non-conductive.



electric current	the flow of electric charge through a circuit.
LED	Light-emitting diode. A device that emits light when part of a complete circuit.
renewable	Something that can be used and then easily replaced.
resistance	the ability of a conductor to oppose the flow of electric current.