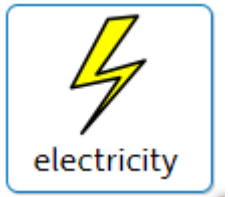
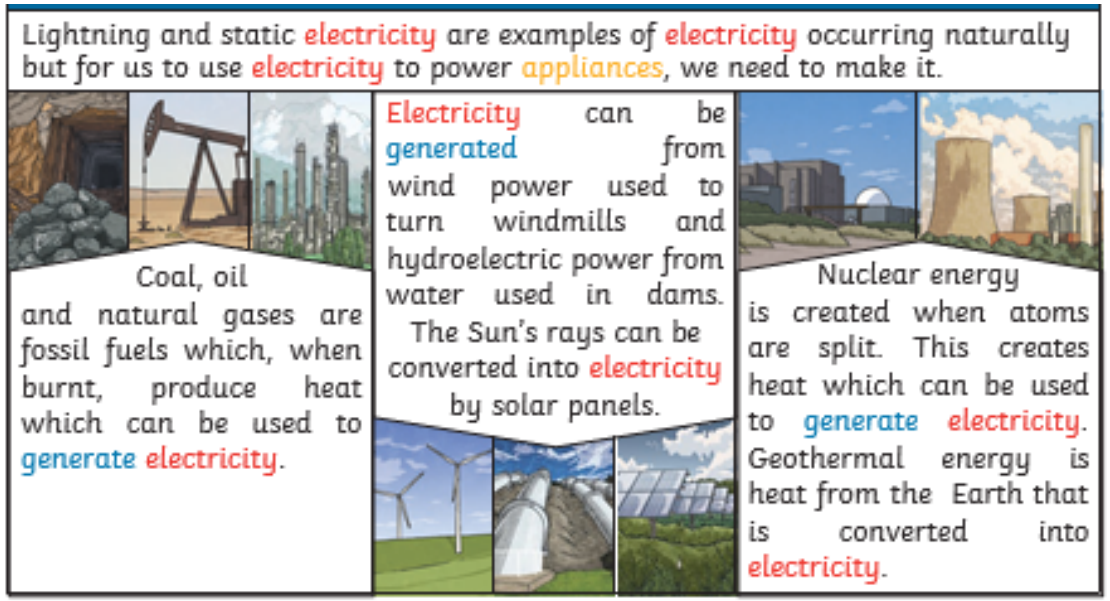
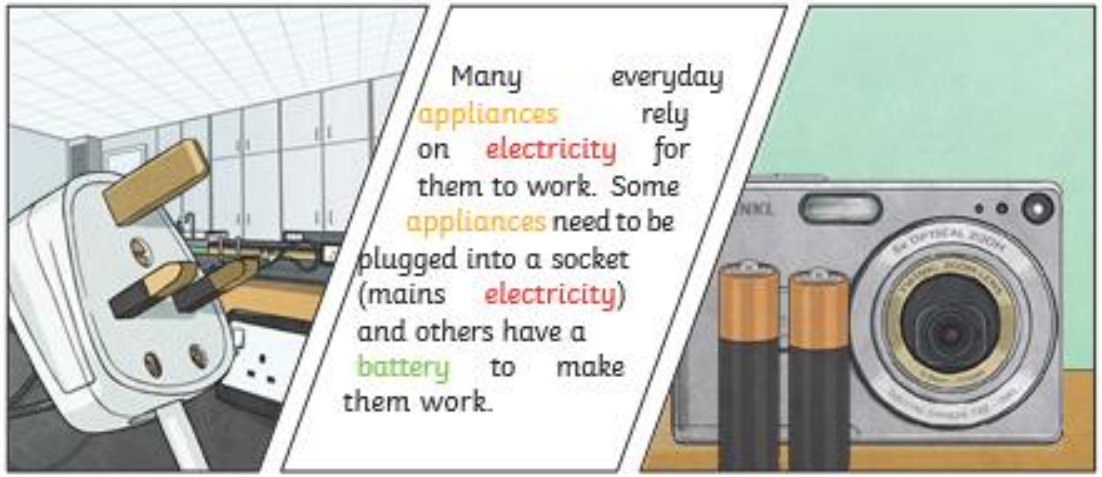
Year 4 SEN Knowledge Organisers

Science

Year 4 Electricity

Key vocabulary	
Electricity 	The flow of an electric current .
generate	To make or produce.
renewable	A source of electricity that will not run out.
non-renewable	This source of energy will eventually run out and so will no longer be able to be used to make electricity.
Appliances 	A piece of equipment or device designed to perform a particular job, such as a washing machine or mobile phone.
Battery 	A device that stores electrical energy as a chemical.





Year 4 Electricity

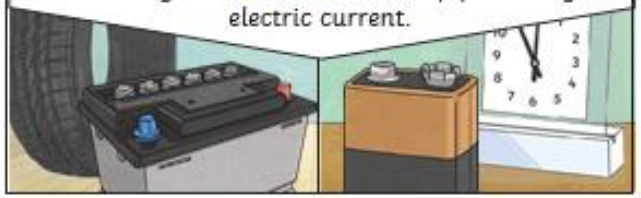
Key vocabulary

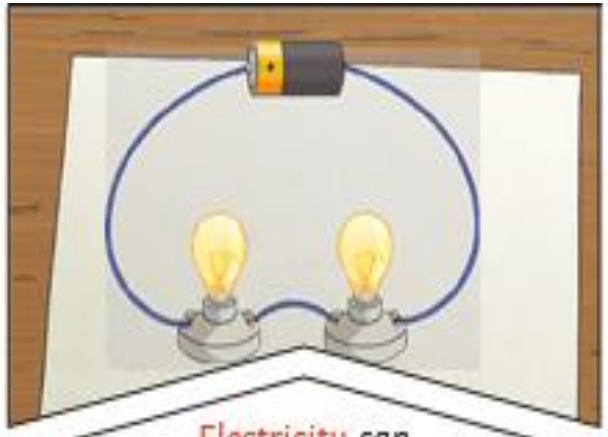
circuit	A pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.

There are two types of electric current.

Mains electricity: power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry the electricity into our homes via wires in the walls and out through plug sockets.

Battery electricity: batteries store chemicals which produce an electric current. Eventually, even rechargeable batteries will stop producing an electric current.



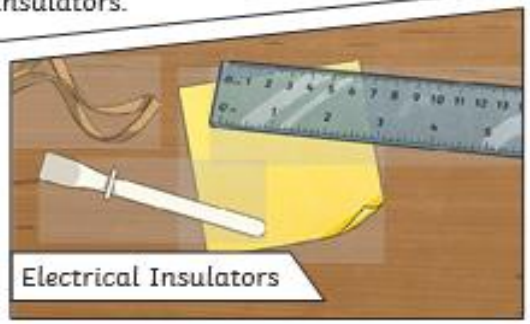


Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/battery.

Switches can be used to open or close the circuit. When off, a switch 'breaks' the circuit to stop the flow of electrons. When the switch is on, the circuit is complete and the electrons are able to flow around the circuit.

A conductor of electricity is a material that is made up of free electrons which can be made to move in one direction, creating an electric current. Metals are good conductors. Electrical insulators have no free electrons and so no electric current can be made. Wood, plastic and glass are good insulators.

Electrical Conductors



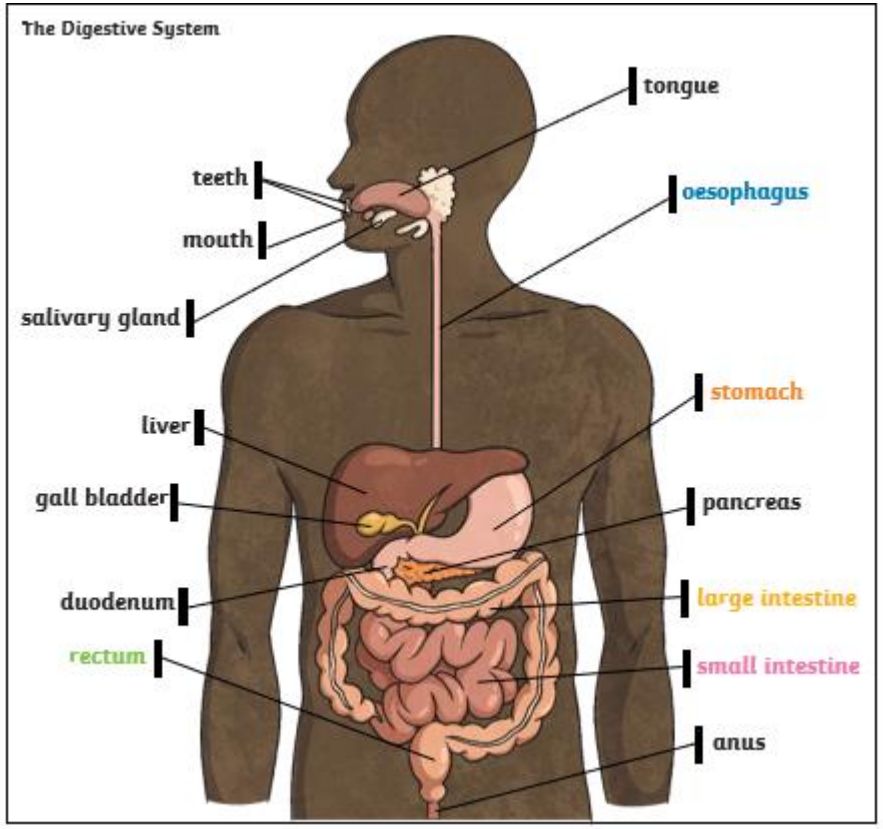
Electrical Insulators

Year 4 Animals Including Humans

Digest: Break down the food

Salivary glands can be found in the mouth and help break down foods.

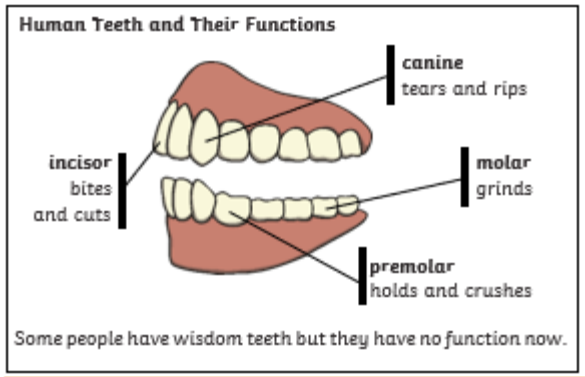
Small intestines: Break down the food



Oesophagus: A tube which moves food down from mouth to the stomach.

Large intestines: poo is made here and water is absorbed.

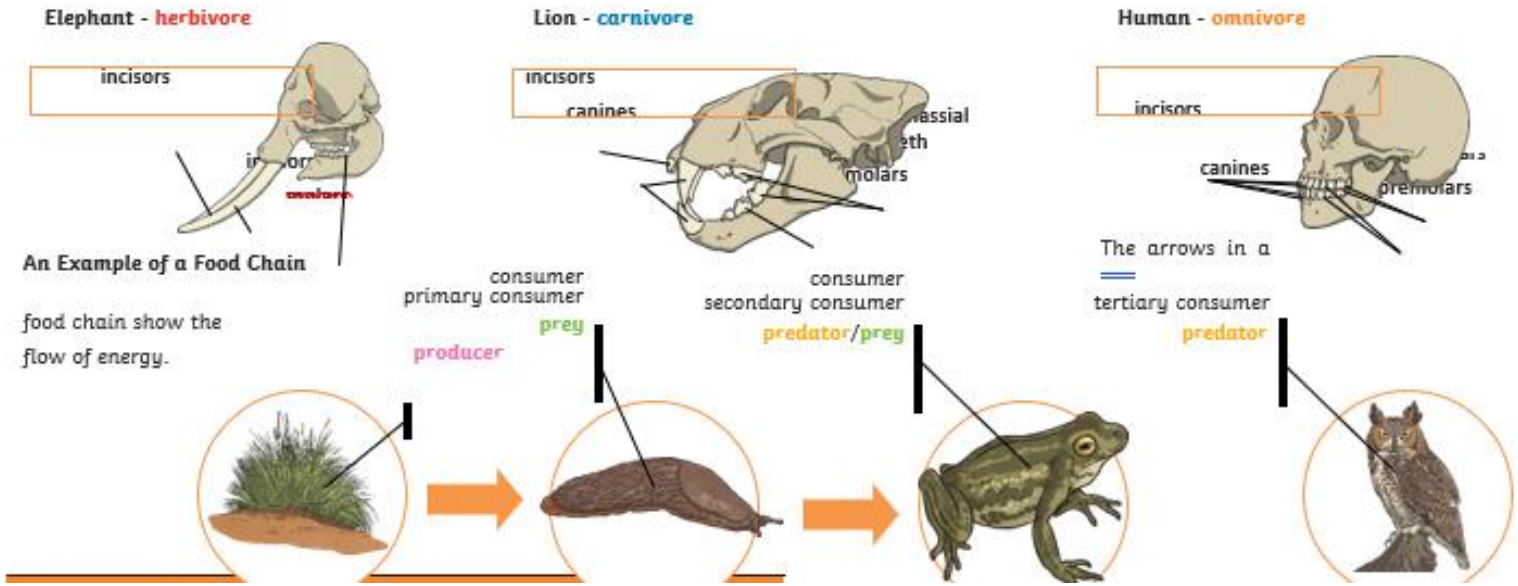
Year 4 Animals Including Humans



To help prevent tooth decay:

- limit sugary food and drink;
- brush teeth twice daily using a fluoride toothpaste;
- visit your dentist regularly.

The teeth of an animal are designed to eat different foods depending on the diet of the animal. Examples of a **herbivore**, a **carnivore** and an **omnivore** skull:



An Example of a Food Chain

food chain show the flow of energy.

The arrows in a food chain show the flow of energy.

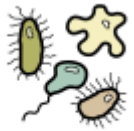
herbivore	An animal that eats plants.
carnivore	An animal that feeds on other animals.
omnivore	An animal that eats plants and animals.
producer	A plant that produces its own food.
predator	An animal that hunts and eats other animals.
prey	An animal that gets hunted and eaten by another animal.

Year 4 Living things and their habitats

Life Processes

To stay alive and healthy, all living things need certain conditions that let them carry out the seven **life processes**:

Movement
Respiration
Sensitivity
Growth
Reproduction
Excretion
Nutrition


organism

Organism is another word meaning living things.


endangered species

A plant or animal that not many of them are left and may die out. .


respiration

This is where plants and animals use oxygen.


reproduction

New babies are produced.


habitat

The area where animals or plants live.

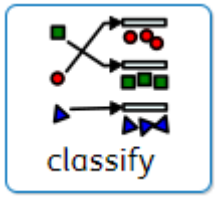

environment

These may include habitats where both living and non living things live.

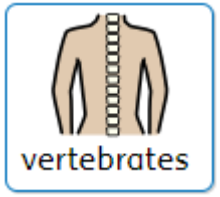

extinct

Animals or plants that are no more on the planet.

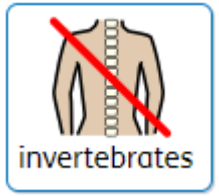
Year 4 Living things and their habitats



This is where plants or animals are put into groups.



Animals with a backbone.

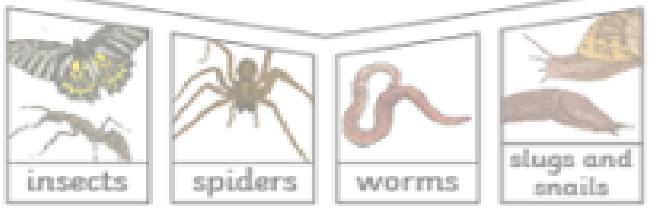


Animals without a backbone.

Animals can be grouped in lots of different ways based upon their **characteristics**.

vertebrates

invertebrates

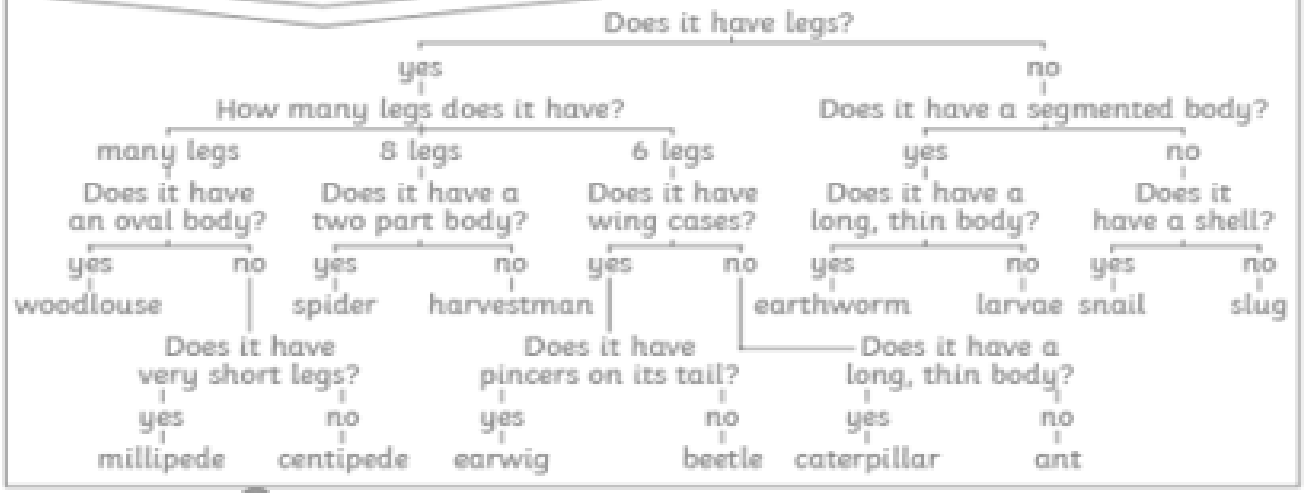


Vertebrates can be separated into five broad groups.

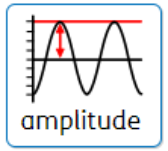
You could sort **invertebrates** you might see around school in different ways, such as in this example. The vast majority of living things on the planet are **invertebrates**.

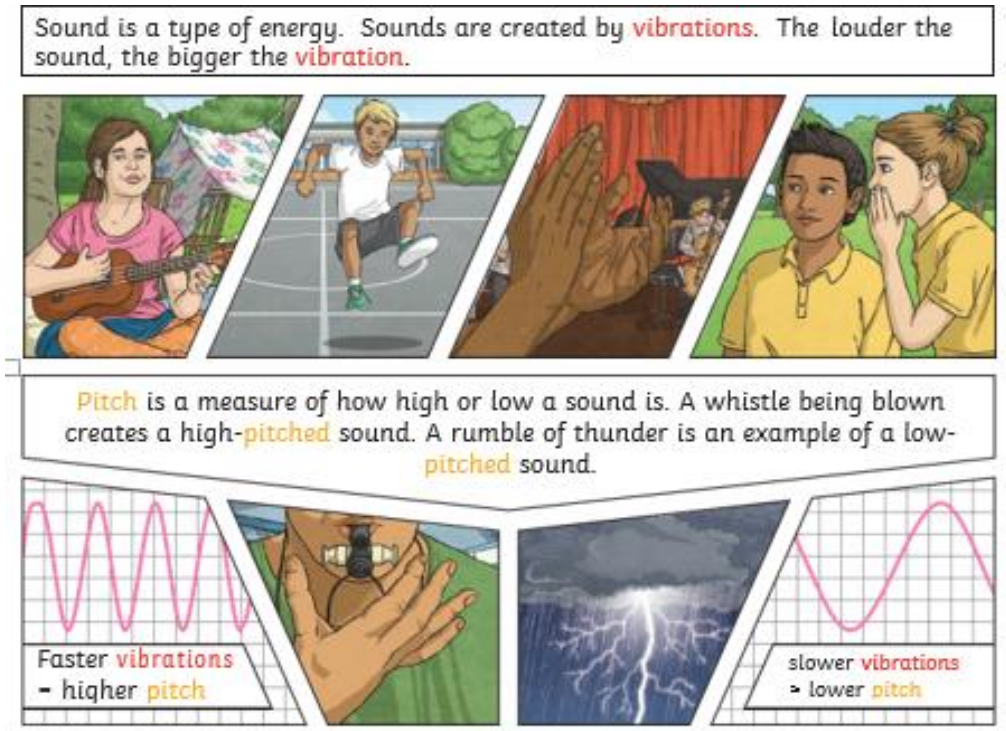
You can use **classification** keys to help group, identify and name a variety of living things. Here is an example of a **classification** key:

Invertebrate Classification Key

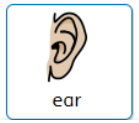


Year 4 Sound

Key vocabulary	
Vibration 	A movementbackwards and forwards.
sound wave 	Vibrations travelling from a sound source.
Volume 	The loudness of a sound.
Amplitude 	The size of a vibration. A larger amplitude = a louder sound.
Pitch 	How low or high a sound is.



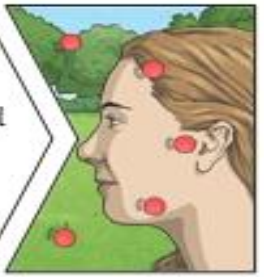
Year 4 Sound

Key vocabulary	
ear 	An organ used for hearing.
distance	A measurement of length between two points.
soundproof	To prevent sound from passing.
absorb sound	To take in sound energy. Absorbent materials have the effect of muffling sound.
vacuum	A space where there is nothing. There are no particles in a vacuum.
eardrum 	A part of the ear which is a thin, tough layer of tissue that is stretched out like a drum skin. It separates the outer ear from the middle and inner ear. Sound waves make the eardrum vibrate.

Sound can travel through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. Sound cannot travel through a vacuum.

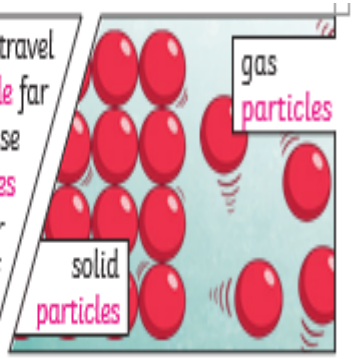
When you hit the drum, the drum skin vibrates. This makes the air particles closest to the drum start to vibrate as well.

The vibrations then pass to the next air particle, then the next, then the next. This carries on until the air particles closest to your ear vibrate, passing the vibrations into your ear.



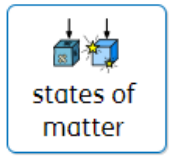
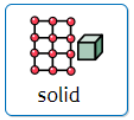
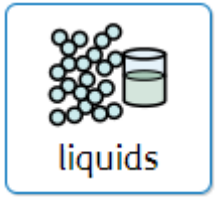
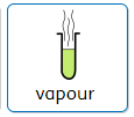
Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.

Sound energy can travel from particle to particle far easier in a solid because the vibrating particles are closer together than in other states of matter.

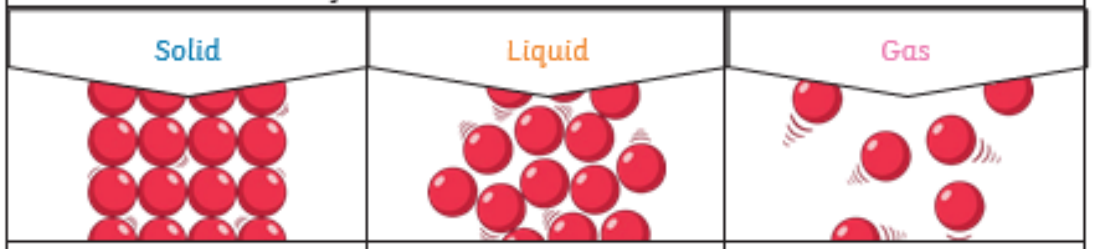


If you throw a stone in a pond, it will produce ripples. As the ripples spread out across the pond, they become smaller. When sound vibrations spread out over a distance, the sound becomes quieter, just like ripples in a pond.

Year 4 States of Matter

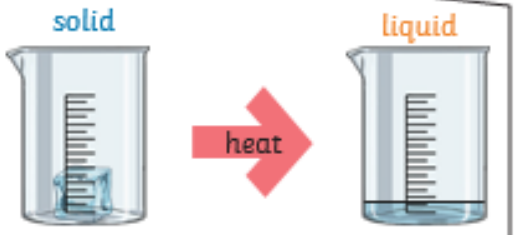
Key vocabulary	
states of matter 	Materials can be one of three states: solids, liquids or gases.
solids 	These are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy.
Liquids 	Liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.
Gases 	Gases can spread out to completely fill the container or room they are in. They do not have any fixed shape but they do have a mass.
water vapour 	This is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.

There are three states of matter.

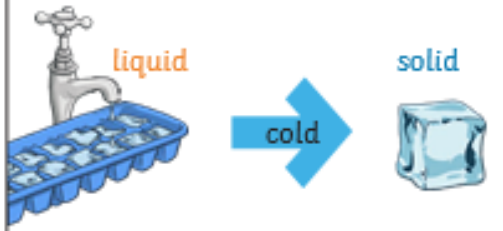


Solid	Liquid	Gas
Particles in a solid are close together and cannot move. They can only vibrate.	Particles in a liquid are close together but can move around each other easily.	Particles in a gas are spread out and can move around very quickly in all directions.

When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen at are called the boiling, melting or freezing point.



If a solid is heated to its melting point, it melts and changes to a liquid. This is because the particles start to move faster and faster until they are able to move over and around each other.



When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a solid structure.

Year 4 States of Matter

melt

This is when solid changes to liquid.

freeze

Liquid turns to solid during freezing process.

evaporate

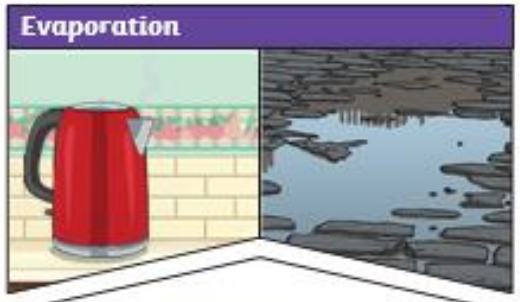
When it turns into gas.

condense

Turns gas into liquid.

precipitation

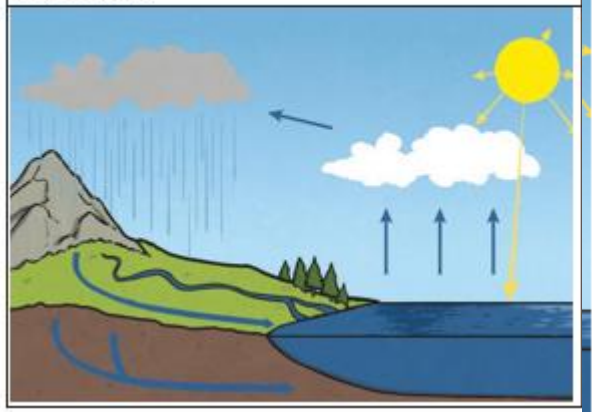
Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.



Evaporation occurs when water turns into water vapour. This happens very quickly when the water is hot, like in a kettle, but it can also happen slowly, like a puddle evaporating in the warm air.

Condensation is when water vapour is cooled down and turns into water. You can see this when droplets of water form on a window. The water vapour in the air cools when it touches the cold surface.

Condensation and evaporation occur within the water cycle.



1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour.
2. This water vapour rises, then cools down to form water droplets in clouds (condensation).
3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).