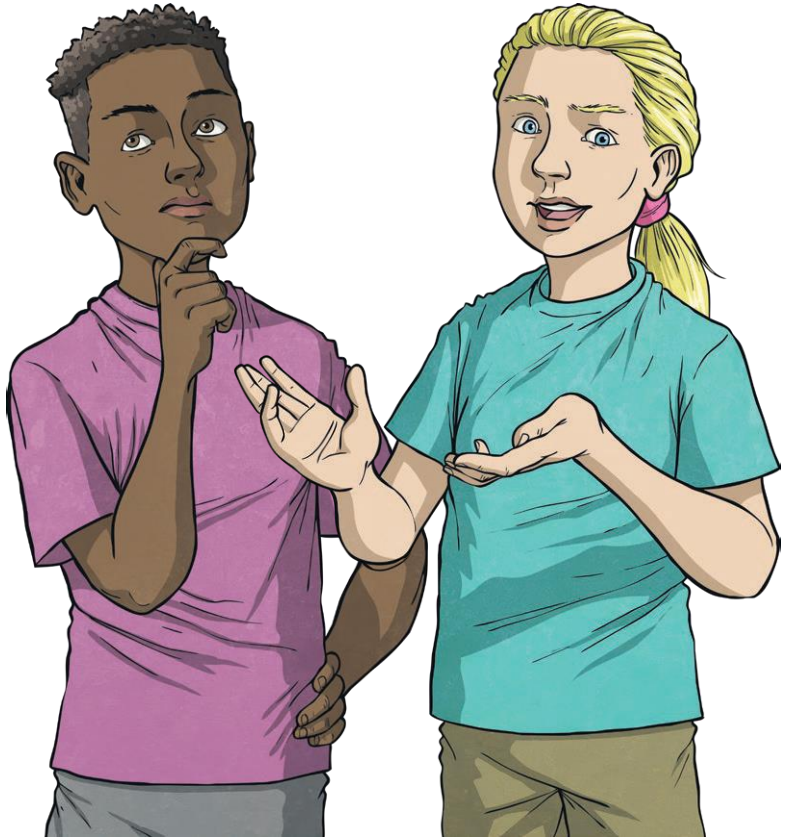
Key Vocabulary

forces	Pushes or pulls.
friction	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
surface	The top layer of something.



Key Knowledge

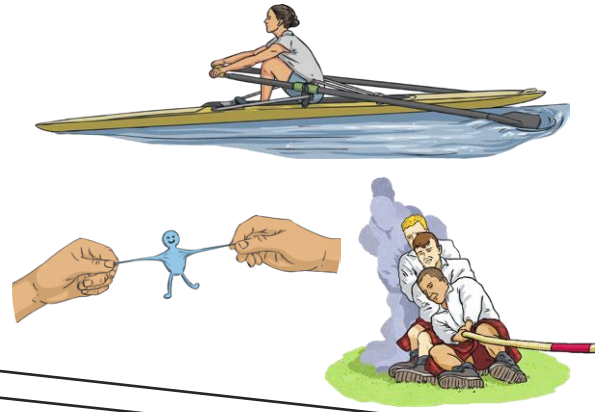
Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.

The driving force pushes the bicycle, making it move.

Friction pushes on the bicycle, slowing it down.

Pushes

Pulls

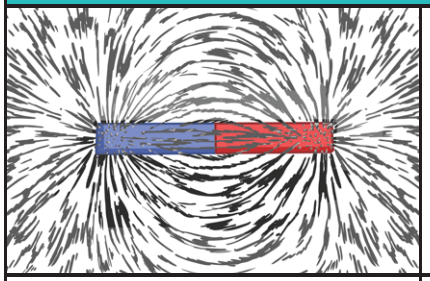


Forces will change the motion of an object.
They will either make it start to move, speed up, slow it down

Key Vocabulary

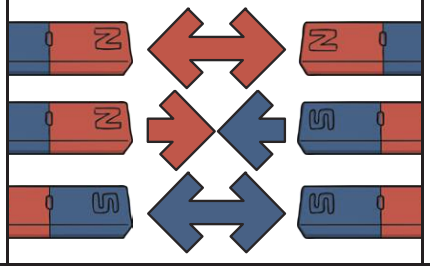
magnet	An object which produces a magnetic force that pulls certain objects towards it.
magnetic	Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.
magnetic field	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
poles	North and south poles are found at different ends of a magnet.
repel	Repulsion is a force that pushes objects away. For example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other).
attract	Attraction is a force that pulls objects together. For example, when a north pole is placed near the south pole of another magnet, the two poles attract (pull together).

Key Knowledge



Like poles repel.
Opposite poles attract.

A magnetic field is invisible. You can see the magnetic field here though. This is what happens when iron filings are placed on top of a piece of paper with a magnet underneath.



The needle in a compass is a magnet. A compass always points north-south on Earth.

Magnetic ✓

These objects contain iron, nickel or cobalt. Not all metals are magnetic.

Non-magnetic ✗

These objects do not contain iron, nickel or cobalt.

Key Vocabulary

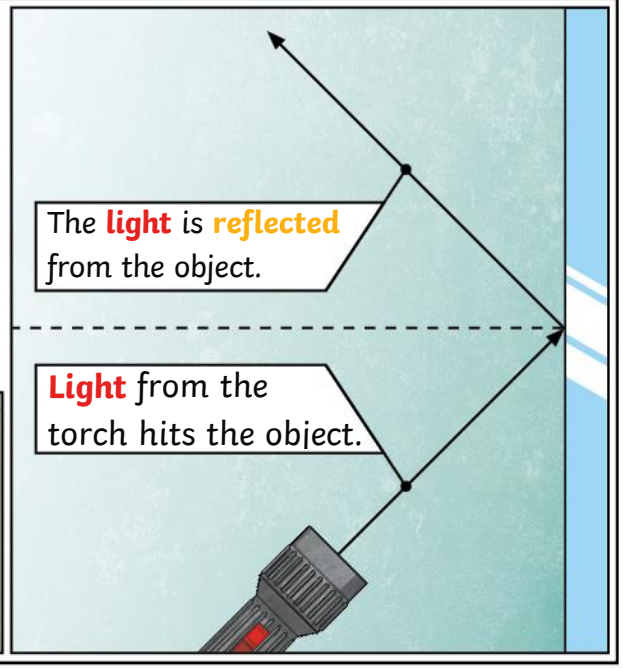
light	A form of energy that travels in a wave from a source.
light source	An object that makes its own **light**.
dark	**Dark** is the absence of **light**.
reflection	The process where **light** hits the surface of an object and bounces back into our eyes.
reflect	To bounce off.
reflective	A word to describe something which **reflects** **light** well.
ray	Waves of **light** are called **light rays**. They can also be called beams.

Key Knowledge

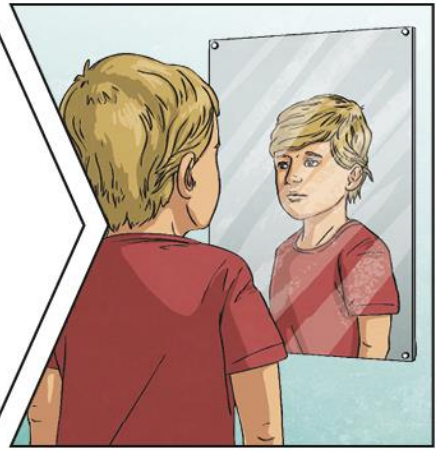
We need **light** to be able to see things. **Light** travels in a straight line. When **light** hits an object, it is **reflected** (bounces off). If the **reflected** **light** hits our eyes, we can see the object. Some surfaces and materials **reflect** **light** well. Other materials do not **reflect** **light** well. **Reflective** surfaces and materials can be very useful...


hi-vis jacket

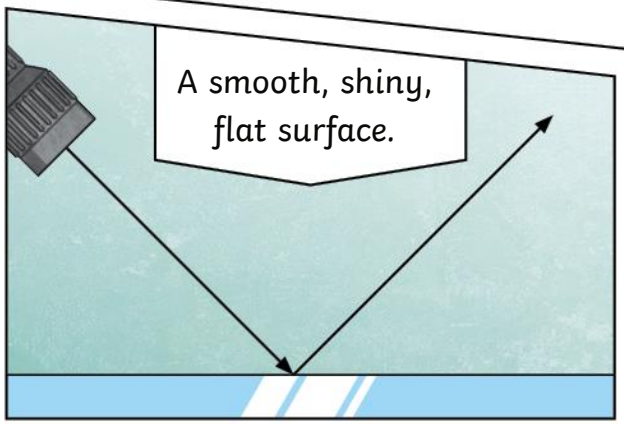

cat's eyes

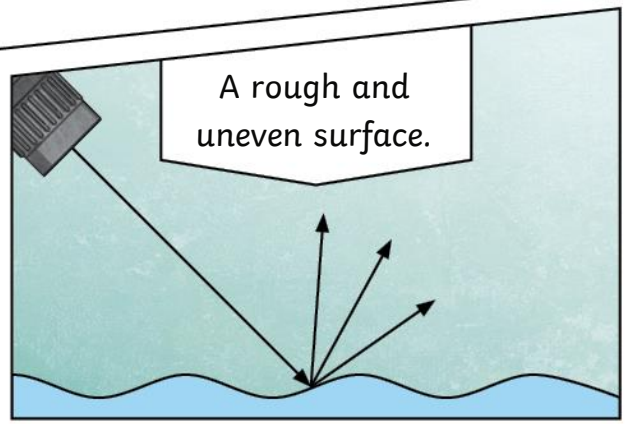


Mirrors **reflect** **light** very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your right hand, the mirror image appears to raise its left hand.



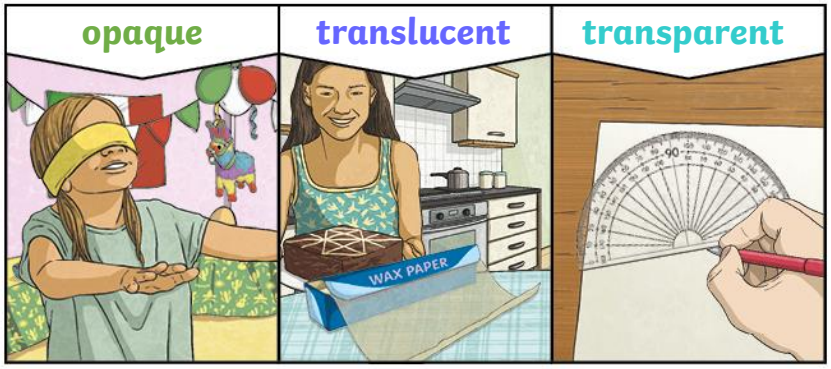
The surfaces that reflect **light** best are smooth, shiny and flat.



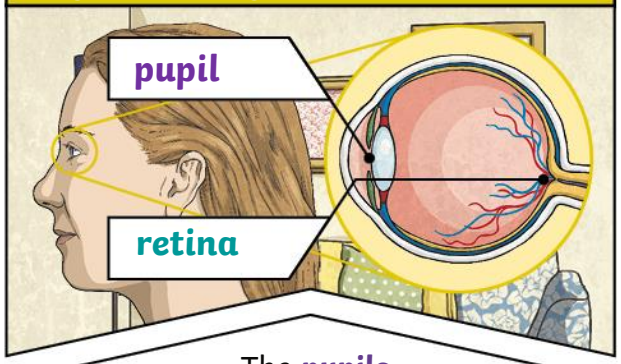


Key Vocabulary

pupil	The black part of the eye which lets **light** in.
retina	A layer at the very back of the eye. The **retina** takes the **light** the eye receives. It then changes it into nerve signals to send to the brain.
shadow	An area of darkness where **light** has been blocked.
opaque	Describes objects that do not let any **light** pass through them.
translucent	Describes objects that let some **light** through, but scatter the **light** so we can't see through them properly.
transparent	Describes objects that let **light** travel through them easily, meaning that you can see through the object.

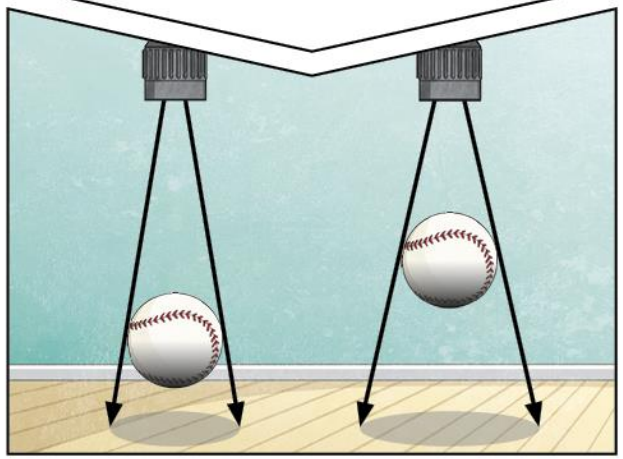


Key Knowledge



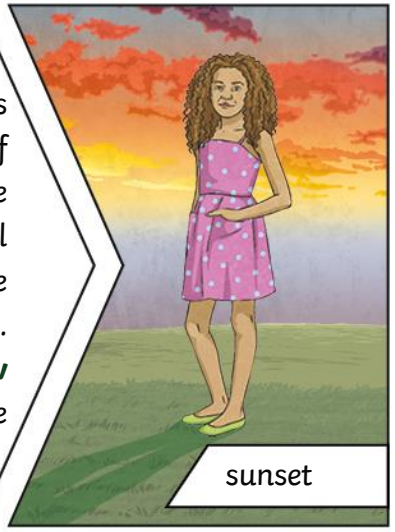
The **pupils** control the amount of **light** entering the eyes. If too much **light** enters, then it can damage the **retina**. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating.

A **shadow** is caused when **light** is blocked by an **opaque** object. A **shadow** is larger when an object is closer to the **light** source. This is because it blocks more of the **light**.



When the **light** source is directly above the object, the **shadow** will be directly underneath.

When a **light** source is to one side of an object, the **shadow** will appear on the opposite side. The **shadow** will also be longer.

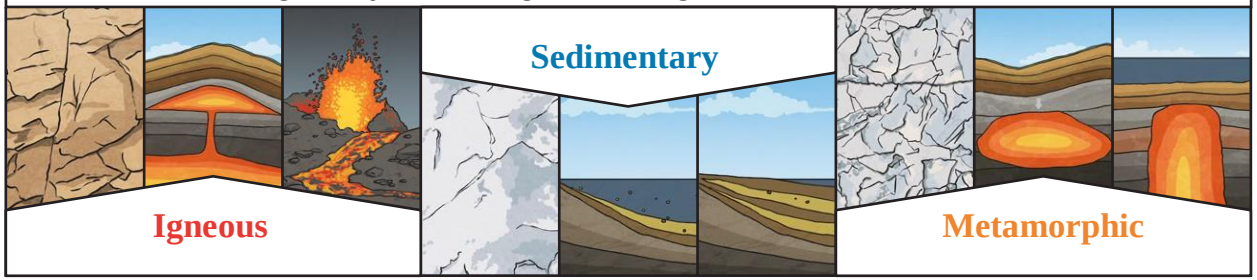


Key Vocabulary

igneous rock	Rock that has been formed from **magma** or **lava**.
sedimentary rock	Rock that has been formed by layers of **sediment** being pressed down hard and sticking together. You can see the layers of **sediment** in the rock.
metamorphic rock	Rock that started out as **igneous** or **sedimentary rock** but changed due to being exposed to extreme heat or pressure.
magma	Molten rock that remains underground.
lava	Molten rock that comes out of the ground is called **lava**.
sediment	Natural solid material that is moved and dropped off in a new place by water or wind, e.g. sand.
permeable	Allows liquids to pass through it.
impermeable	Does not allow liquids to pass through it.

Key Knowledge

There are three types of naturally occurring rock.



Natural Rocks			Human-Made Rocks
Igneous	**Sedimentary**	**Metamorphic**	
Obsidian	Chalk	Marble	Brick
Granite	Sandstone	Quartzite	Concrete
Basalt	Limestone	Slate	Coade Stone

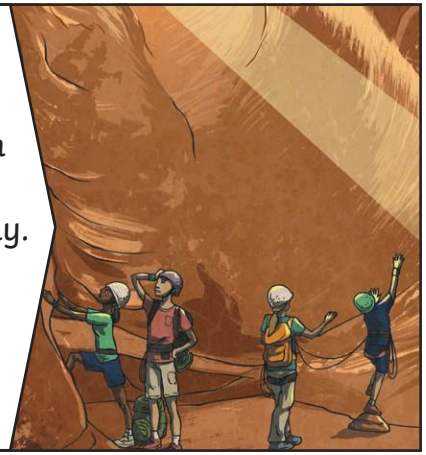
Some words you might use to discuss the properties of a rock:

hard, soft, **permeable**, **impermeable**, durable (meaning resistant to weathering), high density, low density. Density measures how 'bulky' the rock is (how tightly packed the molecules are).

Key Vocabulary

fossilisation	The process by which fossils are made.
palaeontology	The study of fossils.
erosion	When water, wind or ice wears away land.

Caves are formed when water **permeates** through the base rock and **erodes** some of the rock away. Over thousands of years these caves can become very large.

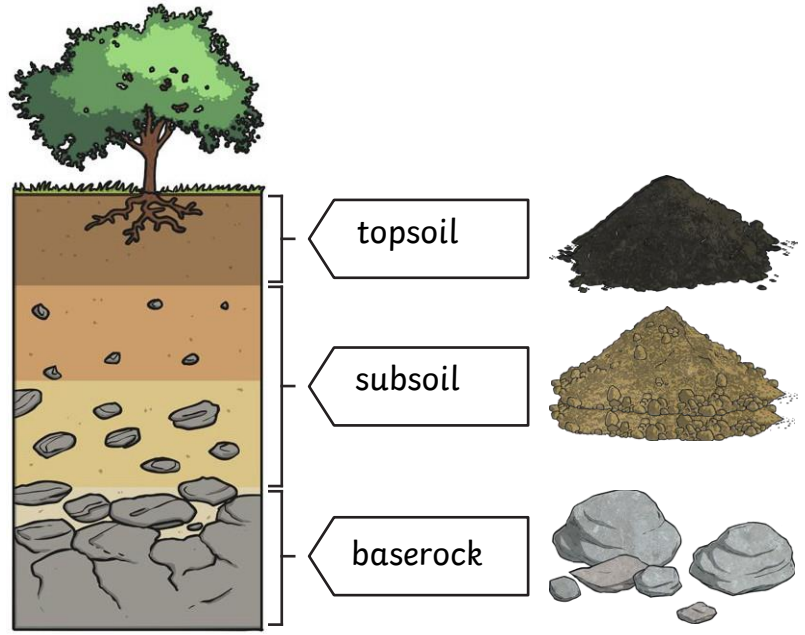


Key Knowledge

Soil

Soil is the uppermost layer of the Earth. It is a mixture of different things:

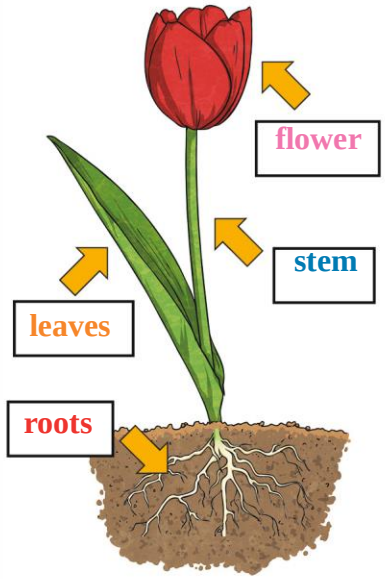
- minerals (the minerals in soil come from finely broken-down rock);
- air;
- water;
- organic matter (including living and dead plants and animals).



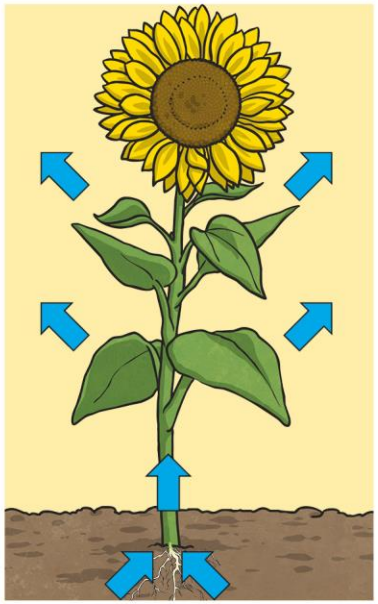
Fossilisation

An animal dies. It gets covered with **sediments** which eventually become rock.	More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth.	Over thousands of years, **sediment** might enter the mould to make a **cast fossil**. Bones may change to mineral but will stay the same shape.	Changes in sea level take place over a long period.	As **erosion** and weathering take place, eventually the fossil becomes exposed.

roots	These anchor the plant into the ground and absorb water and **nutrients** from the soil.
stem	This holds the plant up and carries water and **nutrients** from the soil to the **leaves**. A trunk is the **stem** of a tree.
leaves	These make food for the plant using sunlight and carbon dioxide from the air.
flowers	These make seeds to grow into new plants. Their **petals** attract **pollinators** to the plant.
nutrients	These substances are needed by a living things to grow and survive. Plants get **nutrients** from the soil and also make their own food in their **leaves**.
evaporation	When a liquid turns into a gas.



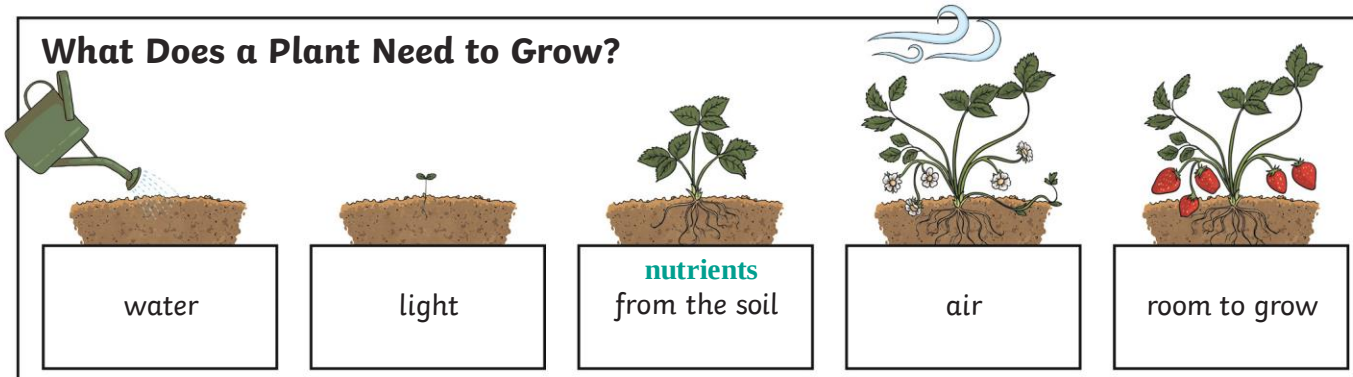
How Water Moves through a Plant



1. The **roots** absorb water from the soil.
2. The **stem** transports water to the **leaves**.
3. Water **evaporates** from the **leaves**.
4. This **evaporation** causes more water to be sucked up the **stem**.

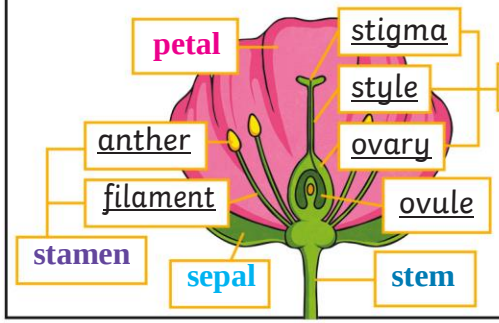
The water is sucked up the **stem** like water being sucked up through a straw.

What Does a Plant Need to Grow?



Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.

fertilisation	When the male and female parts of the **flower** have mixed in order to make seeds for new plants.
petal	The brightly coloured part of the **flower** that attracts insects to **pollinate** the plant.
stamen	The male parts of the **flower**. The **stamen** is made up of the anther and the filament. The filament's job is to hold up the anther. The job of the anther is to make the pollen.
carpel (pistil)	The female parts of the **flower**. Made up of the stigma, style and ovary. The job of the style is to hold up the stigma. The stigma collects the pollen when a **pollinator** brushes by it. The ovary contains the ovules, which are the part of the **flower** that gets **fertilised** and eventually becomes the new seed.
sepal	Leaf-like structures that protect the **flower** and **petals** before they open out.
pollination	When pollen (a fine powdery substance produced by a **flowering** plant) is moved from the male anther of a **flower** to the female stigma.
pollinator	Animals or insects which carry pollen between plants. Examples include birds, bees and bats.
germination	When a seed starts to grow.
seed dispersal	A method of moving the seeds away from the parent plant so that the seeds have the best chance of survival.



The **flower's** job is to create seeds so that new plants can be grown.

Life Cycle of a **Flowering** Plant

Germination The seed starts to grow.

Growing and Flowering The plant grows bigger and forms a **flower**.

Pollination Pollen from the anther lands on the stigma and travels down the style.

Fertilisation and Seed Formation The pollen joins with an ovule and a seed starts to form.

Seed Dispersal The fully formed seeds are moved away from the parent plant.

Seed Dispersal

Seeds can be dispersed by: