

Year 3 Knowledge Organisers

Science

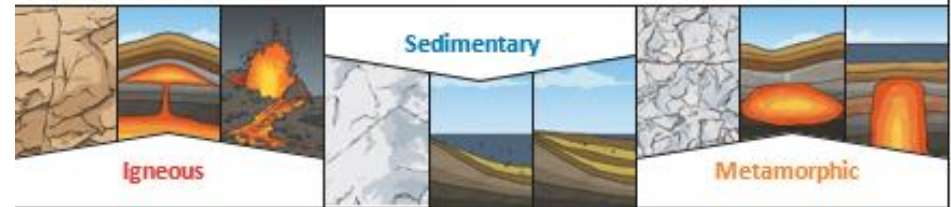
Year 3

Rocks and soils

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.

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).

Year 3

Rocks and soils

Key vocabulary

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

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).

The diagram shows a cross-section of the ground with a tree on top. Three layers are labeled: topsoil (dark brown), subsoil (lighter brown), and baserock (grey rocks). To the right, three piles of soil samples correspond to these layers: dark topsoil, lighter subsoil, and grey baserock.

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.




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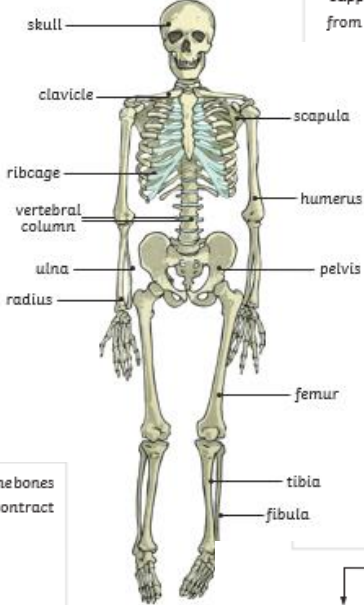
Animals Including Humans

Key vocabulary

Vertebrate	animals with backbones
Invertebrate	Animals without backbones
Muscles	soft tissues in the body that contract and relax to cause movement
Tendons	cords that join muscles to bones
Joints	areas where two or more bones are fitted together

vertebrate
↓
endoskeleton







Skeletons do three important jobs:

- protect organs inside the body;
- allow movement;
- support the body and stop it from falling on the floor.

Skeletal **muscles** work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).




contract




relax

invertebrate

exoskeleton



hydrostatic skeleton










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Animals Including Humans

Key vocabulary

Healthy	in a good physical and mental condition
Nutrients	substances that animals need to stay alive and healthy
Energy	strength to be able to move and grow
Saturated fats	types of fats, considered to be less healthy, that should only be eaten in small amounts
Unsaturated fats	fats that give you energy, vitamins and minerals

Nutrient	Found in... (examples)	What it does/they do
carbohydrates		provide energy
protein		helps growth and repair
fibre		helps you to digest the food that you have eaten
fats		provide energy
vitamins		keep you healthy
minerals		keep you healthy
water		moves nutrients around your body and helps to get rid of waste

- Living things need food to grow and to be strong and **healthy**.
- Plants can make their own food, but animals cannot.
- To stay **healthy**, humans need to exercise, eat a **healthy** diet and be hygienic.
- Animals, including humans, need food, water and air to stay alive.

Year 3

Forces and magnets

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.
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.

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

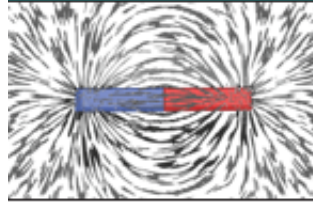






Forces will change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop.

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Forces and magnets

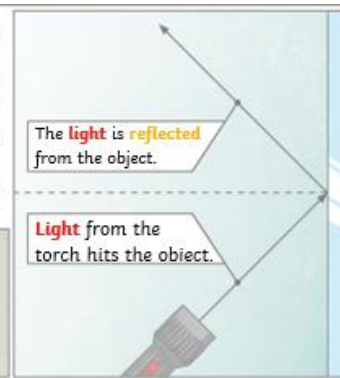
Key vocabulary	
magnetic field	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
poles	North and south poles are found at different ends of a magnet.
repel	Repulsion is a force that pushes objects away. For example, when a north pole is placed 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).

	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 ✓	Non-magnetic ✗
	
These objects contain iron, nickel or cobalt. Not all metals are magnetic .	These objects do not contain iron, nickel or cobalt.

Key vocabulary	
Light	A form of light 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.

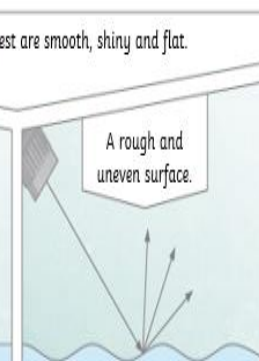
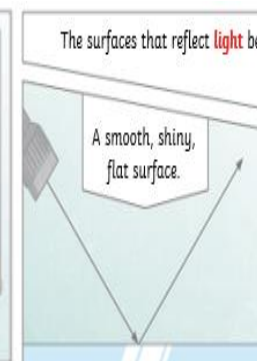
We need **light** to be able to see things. **Light** travels in a straight line. When **light** hits an object, it is **reflected** (bounces off). If the **reflected light** hits our eyes, we can see the object. Some surfaces and materials **reflect light** well. Other materials do not **reflect light**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



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.

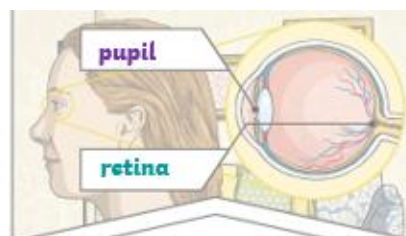


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Light

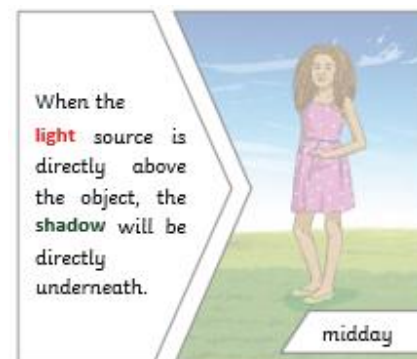
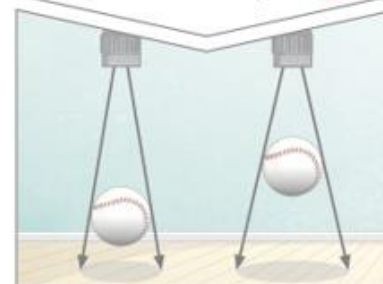
Key vocabulary

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 you can see through the object.

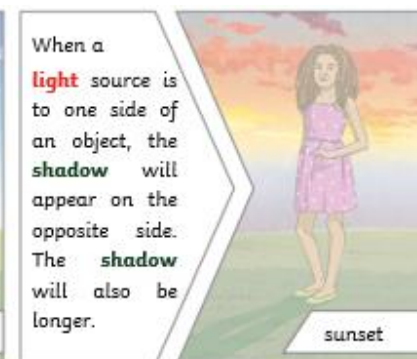


The **pupils** control the amount of **light** entering the eyes. If too much **light** enters, then it can damage the **retina**. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating.

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**.



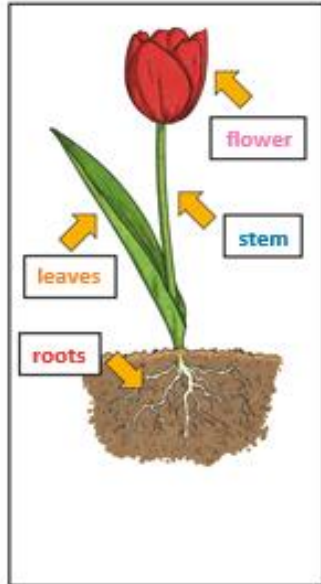
When the **light** source is directly above the object, the **shadow** will be directly underneath.



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.

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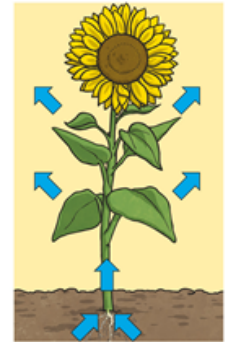
Plants



Key vocabulary	
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 pollination to the plant.
nutrients	These substances are needed by 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.

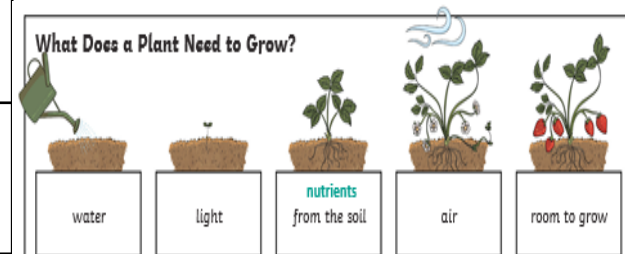
How Water Moves through a Plant

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?



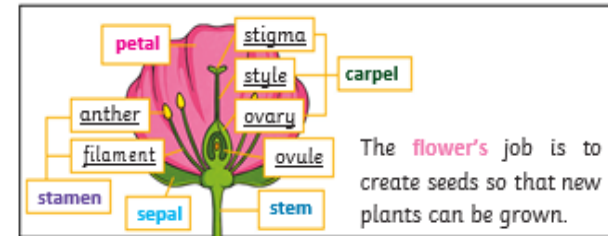
Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.

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Plants

Key vocabulary

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 <u>anther</u> and the <u>filament</u> . The filament's job is to hold up the <u>anther</u> . The job of the <u>anther</u> is to make the pollen.
carpel (pistil)	The female parts of the flower . Made up of the <u>stigma</u> , <u>style</u> and <u>ovary</u> . The job of the <u>style</u> is to hold up the <u>stigma</u> . The <u>stigma</u> collects the pollen when a pollinator brushes by it. The <u>ovary</u> contains the <u>ovules</u> , 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 <u>anther</u> 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.



Life Cycle of a Flowering Plant

