

# Year 3 Knowledge Organisers

Science

# Year 3

# Rocks and soils

## Key vocabulary

<b>igneous rock</b>	Rock that has been formed from <b>magma</b> or <b>lava</b> .
<b>sedimentary rock</b>	Rock that has been formed by layers of <b>sediment</b> being pressed down hard and sticking together. You can see the layers of <b>sediment</b> in the rock.
<b>metamorphic rock</b>	Rock that started out as <b>igneous</b> or <b>sedimentary rock</b> but changed due to being exposed to extreme heat or pressure.
<b>magma</b>	Molten rock that remains underground.
<b>lava</b>	Molten rock that comes out of the ground is called <b>lava</b> .
<b>sediment</b>	Natural solid material that is moved and dropped off in a new place by water or wind, e.g. sand.
<b>permeable</b>	Allows liquids to pass through it.
<b>impermeable</b>	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	Coarse 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

<b>fossilisation</b>	The process by which fossils are made.
<b>palaeontology</b>	The study of fossils.
<b>erosion</b>	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 illustrates the layers of soil. On the left, a tree is shown with its roots extending into the ground. The ground is divided into three layers: topsoil (the top layer, dark brown), subsoil (the middle layer, lighter brown), and baserock (the bottom layer, grey and rocky). To the right of the diagram, three soil samples are shown, each labeled with a bracket: topsoil (dark brown), subsoil (lighter brown), and baserock (grey rocks).

## 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.

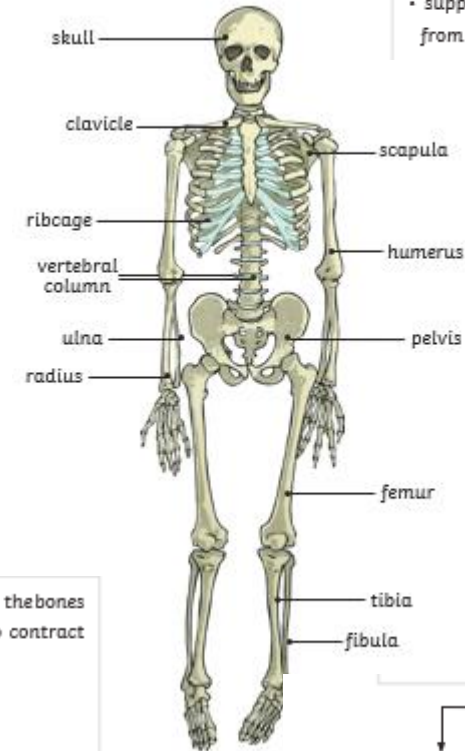
Changes in sea level take place over a long period.

As **erosion** and weathering take place, eventually the fossil becomes exposed.



## Key vocabulary

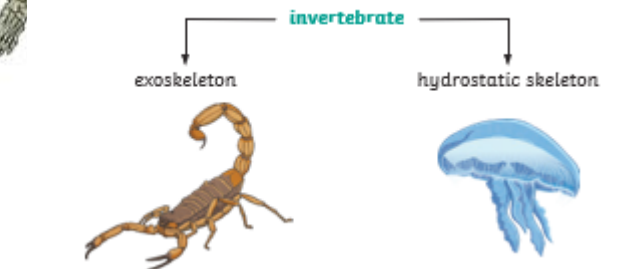
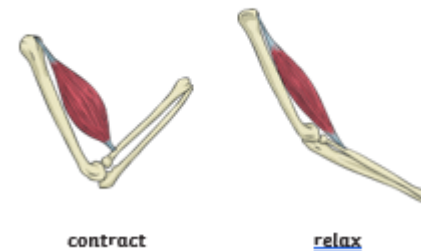
<b>Vertebrate</b>	animals with backbones
<b>Invertebrate</b>	Animals without backbones
<b>Muscles</b>	soft tissues in the body that contract and relax to cause movement
<b>Tendons</b>	ords that join muscles to bones
<b>Joints</b>	areas where two or more bones are fitted together



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).












# Year 3

# Animals Including Humans

## Key vocabulary

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

Nutrient	Found in... (examples)	What it does/they do
carbohydrates		provide <b>energy</b>
protein		helps growth and repair
fibre		helps you to digest the food that you have eaten
fats		provide <b>energy</b>
vitamins		keep you <b>healthy</b>
minerals		keep you <b>healthy</b>
water		moves <b>nutrients</b> 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.

## Key vocabulary

<b>Forces</b>	Pushes or pulls
<b>Friction</b>	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
<b>surface</b>	The top layer of something.
<b>magnet</b>	An object which produces a magnetic force that pulls certain objects towards it.
<b>magnetic</b>	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



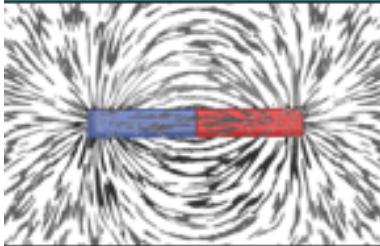


**Forces** will change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop.



# Year 3

# Forces and magnets

## Key vocabulary

<b>magnetic field</b>	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
<b>poles</b>	North and south poles are found at different ends of a magnet.
<b>repel</b>	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).
<b>attract</b>	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 <b>poles</b> repel. Opposite <b>poles</b> attract.	
A <b>magnetic field</b> is invisible. You can see the <b>magnetic field</b> here though. This is what happens when iron filings are placed on top of a piece of paper with a <b>magnet</b> underneath.		The needle in a compass is a <b>magnet</b> . A compass always points north-south on Earth.

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

Key vocabulary	
<b>Light</b>	A form of light energy that travels in a wave from a source.
<b>Light source</b>	An object that makes its own light.
<b>Dark</b>	Dark is the absence of light.
<b>Reflection</b>	The process where light hits the surface of an object and bounces back into our eyes.
<b>Reflect</b>	To bounce off.
<b>Reflective</b>	A word to describe something which reflects light well.
<b>Ray</b>	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...

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.

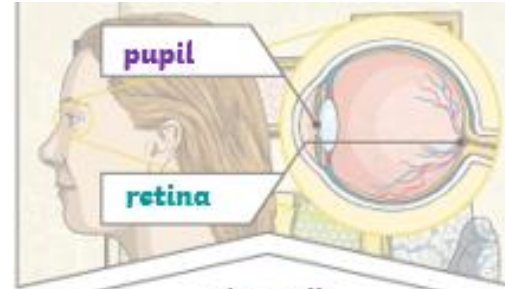
A smooth, shiny, flat surface.

A rough and uneven surface.



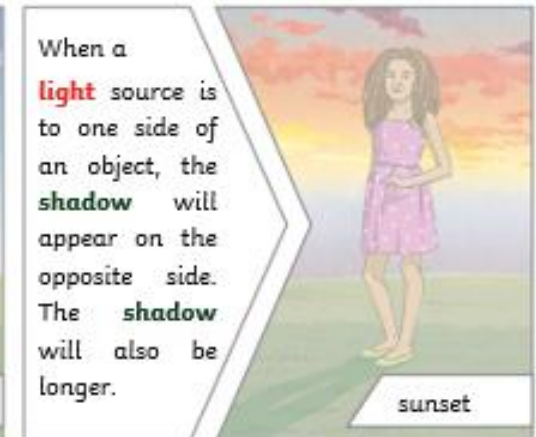
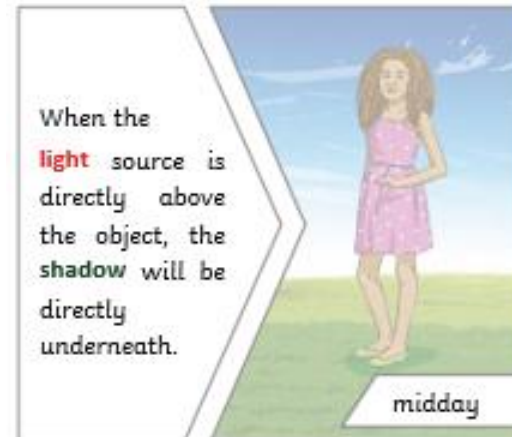
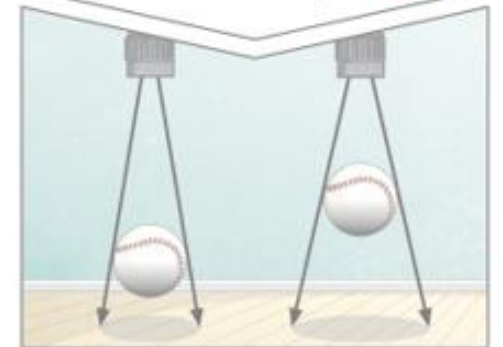
## Key vocabulary

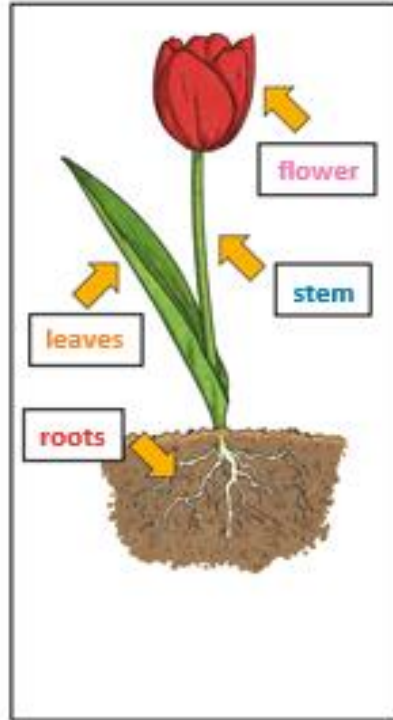
<b>Pupil</b>	The black part of the eye which lets light in.
<b>retina</b>	A layer at the very back of the eye. The retina takes the light the eye receives. It then changes it into nerve signals to send to the brain.
<b>shadow</b>	An area of darkness where light has been blocked.
<b>opaque</b>	Describes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





## 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

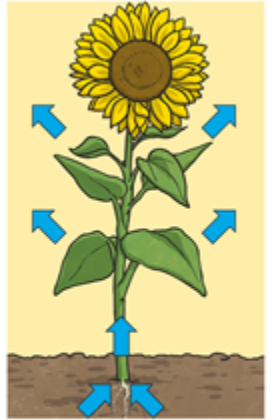
These substances are needed by living things to grow and survive. Plants get nutrients from the soil and also make their own food in their leaves.

### evaporation

When a liquid turns into a gas.

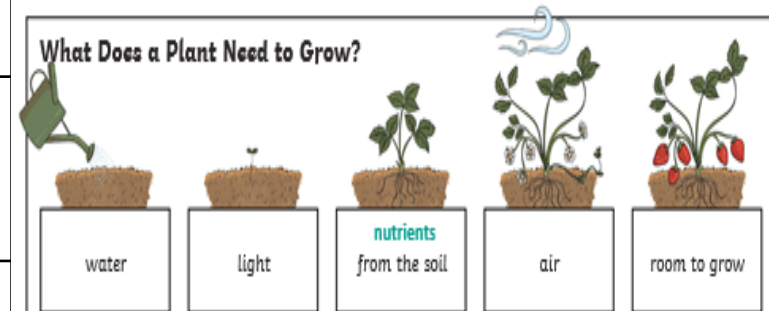
## How Water Moves through a Plant

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.

# Year 3

# Plants

## Key vocabulary

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

