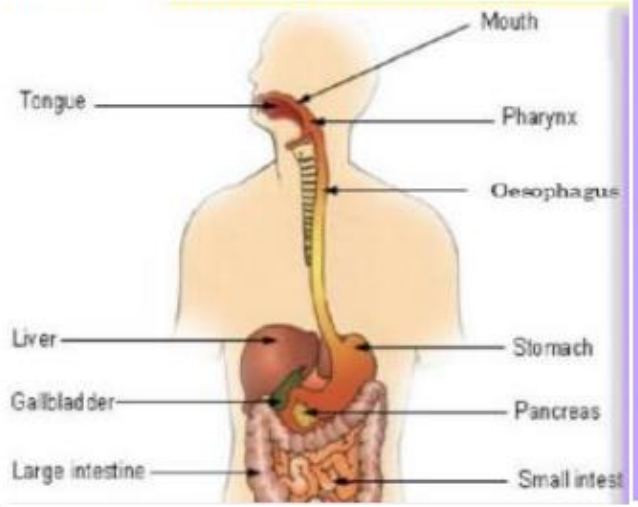
Animals, including Humans

Key Vocabulary

Digestion	Breaking down ingested food material.
Excretion	The process of eliminating faeces, sweat or urine from the body.
Nutrients	A source of nourishment that gives energy.
Food Chain	Shows how plants and animals get their energy.
Producer	The start of a food chain and an organism that makes its own food (normally a plant).
Consumer	A living thing that eats other plants and animals.
Predator	An animal that eats other animals.
Prey	The animals that predators eat.
Energy	Is strength and power, enables us to do the things we do.
Canine, Incisors and Molar	Different types of teeth.

DIGESTIVE SYSTEM – many organs are involved in the process of digestion which softens food so that it can pass through the body. As it moves through the body the nutrients which are required to keep us healthy and have energy are absorbed into the body.



The Digestive Journey

Humans put food into their mouth.

↓

Food is chewed by the teeth.

↓

Food is swallowed and passed through the oesophagus to the stomach.

↓

In the stomach, it is mashed and mixed with acid.

↓

The mixture passes into the small intestine, where tiny bits of food pass into the bloodstream.

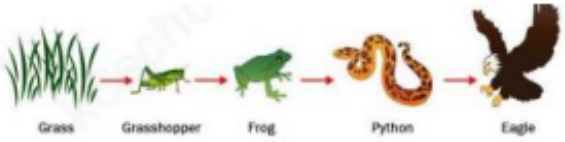
↓

The food that is still left goes into the large intestine.

↓

Finally, waste products leave the body.

FOOD CHAINS



Food chains show the relationships between plants and animals when they are eaten. When a living thing is eaten the energy from it is passed to the animal that has eaten it.

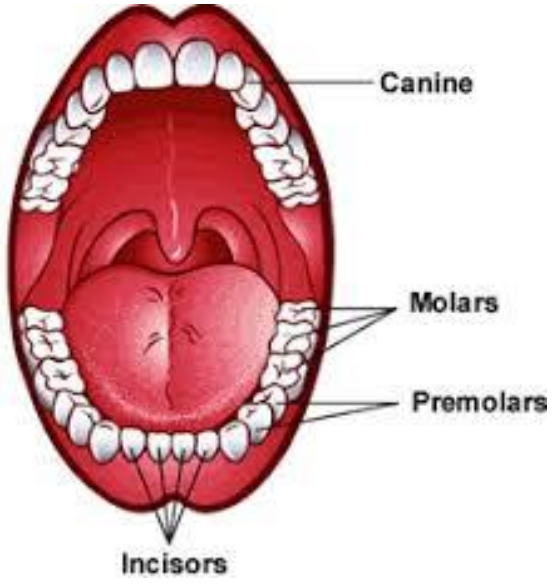
The arrows show the transfer of energy.

Names and Functions

Canines are pointed for tearing and ripping food - these are usually used when chewing meat.

Incisors are shovel shaped and help bite lumps out of and cutting food.

Premolars and molars are flat and they grind and crush food.



Earth and Space

Earth and Space

The Solar System

The Sun is a star at the centre of our solar system.

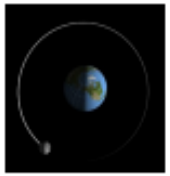
There are 8 planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

These all orbit the Sun.

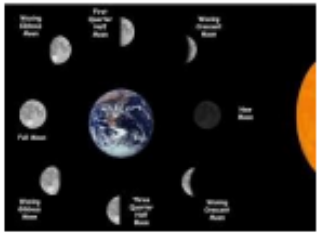
Key Vocabulary

Earth	The planet we live on. It is the third planet from the Sun.
Sun	The Sun is the star at the centre of our solar system.
Moon	The moon is the only natural satellite of the Earth.
planets	Large round objects, made of rock or gas, that move around the sun.
Solar system	The sun and all the planets that orbit around it.
Star	A huge ball of glowing gas in space.
Rotate	When an object rotates it turns (spins) on its axis.
Orbit	The curved path that an object follows going around a star or a planet.

Phases of the Moon

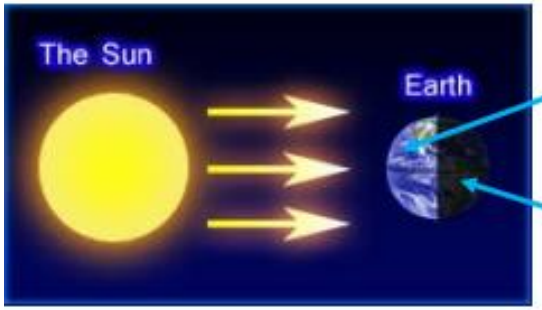


The moon orbits the Earth. It takes about 28 days to complete its orbit.



The phases of the moon are caused by its orbit around the Earth. As the moon orbits the Earth, we can see a different amount of the moon is lit by the sun from Earth.

Day and Night



It is day for the half of the Earth facing the Sun

It is night for the half of the Earth facing the Sun

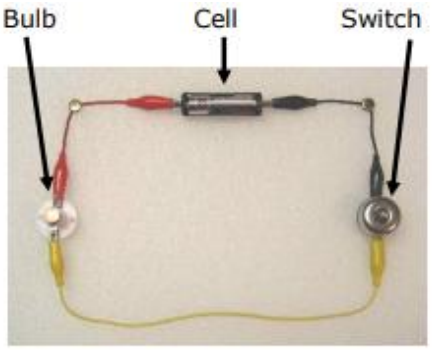
The Earth orbits the Sun.

It takes 365¼ days to complete its orbit around the Sun. This is a year.

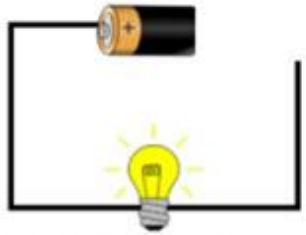
A Year on Earth

Electricity

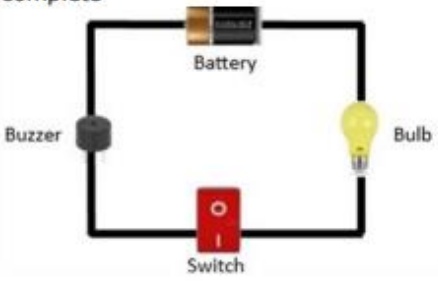
Electrical Circuits



The switch opens and closes the circuit. The bulb lights because the switch is



This circuit will not work as it is not complete



This circuit is complete so the buzzer will sound and the bulb will light.

Key Vocabulary

electricity	A form of energy used for lighting, heating, making sound and making machines work.
electrical appliance	A machine or device that runs on electricity.
mains	The electricity supplied to households from power stations.
electrical circuit	This consists of a cell or battery connected to a component using wires. It needs to be a complete circuit to work
cell and battery	A cell is a single unit and a battery is a collection of cells.
electrical component	A part that combines with others to form a circuit. E.g. bulb, motor, buzzer
switch	Can be added to a circuit to turn a component on or off. It allows the electricity to flow or it stops it.
conductor	Material that allows electricity to pass through.
insulator	Material that does not allow electricity to pass through it.

Electrical Safety

Electricity can be dangerous if not used properly. It can cause shocks, burns and even death. There are electrical dangers both in the home and outdoors.

Conductors

Some materials let electricity pass through them easily. These are known as electrical conductors. Many metals are good electrical conductors, such as iron, copper and steel.


Insulators

Some materials do not allow electricity to pass through them. They are known as insulators. Plastic, wood, rubber and glass are good electrical insulators.


Mains	Battery
	
	

Evolution and Inheritance

Characteristics are passed on

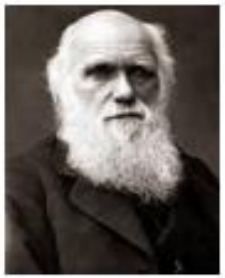
Living things produce offspring of the same kind. The offspring are not normally identical to their parents and vary from each other.

Fossils

Fossils are the remains of living things which are found in sedimentary rocks. These rocks form in layers so animals and plants can get trapped between the layers. They provide information about living things that inhabited the Earth millions of years ago and can show the evolution of species over time.

Key Vocabulary

adaptation	Animals and plants are adapted to their environment. Their bodies are suited to the way they live.
characteristics	A distinguishing trait, feature or quality.
environment	The conditions in which a living thing exists.
evolution	The way in which plants and animals have changed over millions of years.
fossil	The naturally preserved remains or traces of animals or plants that lived long ago.
inherited	The way a trait or characteristic is passed to offspring from parents.
species	A group of closely related organisms that are very similar to each other. We are the human species.
Variation	A change or small difference.

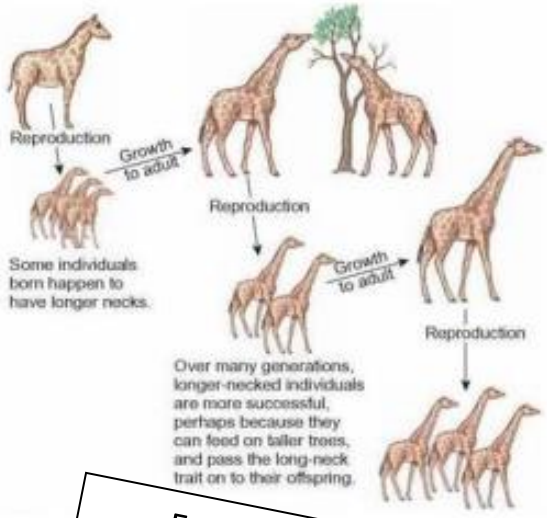


Charles Darwin
(1809-1882)

Alfred Wallace
(1823-1913)

Adaptation can lead to evolution if the environment changes. Animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. This is natural selection. Over time these inherited characteristics become more dominant within the population.

The evolution of the giraffe through natural selection



Evolution

Mary Anning
(1799 - 1847)

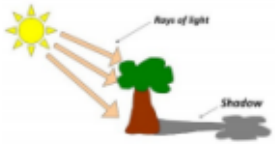
Light

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	The absence of light.
Reflective	A word to describe something which reflects light well.
Pupil	The black part of the eye which lets light in.
Shadow	An area of darkness where light has been blocked.
Opaque	Not see-through. Lets no light through at all.
Transparent	See-through. Lets all light pass through.
Translucent	Not see-through. Lets some light pass through.

How are shadows formed?

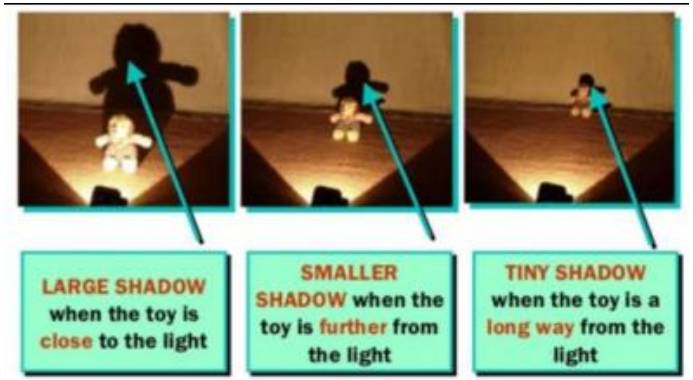
- **Light** travels in a **straight line** from a light source (eg. Sun or torch) to an object.
- When light is **blocked** by an object a shadow is made.
- The shadow is caused by the light being **unable** to pass through the material from which the object is made.

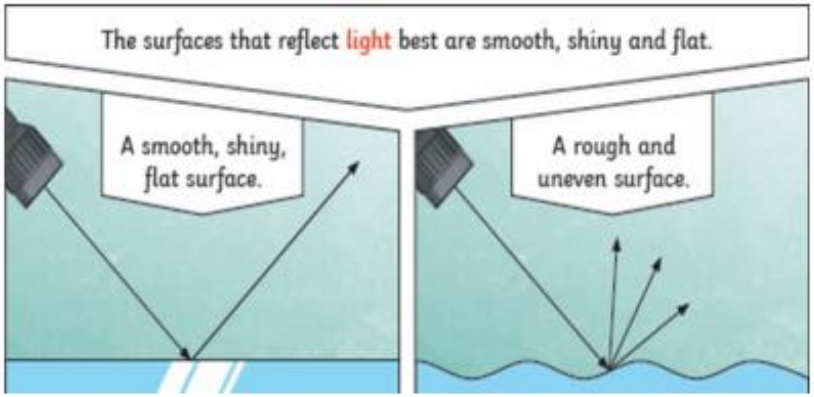


Opaque materials **absorb all** of the **light** them and so objects made of them make a **dark shadow**.

- **Translucent** materials allow **some light** to pass through them and creates a **fairly dark shadow**.
- **Transparent** materials allow **even more light** to pass through them as a result, a **faint or weak shadow** is made.

Sticky Knowledge





Reflection

- Reflection is when light bounces off an object.
- All objects will reflect some light.
- Smooth, shiny surfaces such as mirrors and polished metals reflect light well.
- Dull and dark surfaces such as dark fabrics do not reflect light well.
- When light from an object is reflected by a surface, it changes direction.

Living things and their Habitats

Key Vocabulary

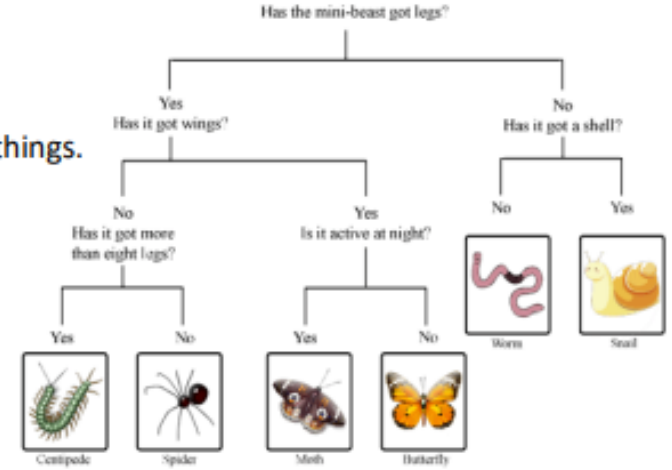
Vertebrate	animals which have a backbone/spine
Invertebrate	animals which do not have a backbone/spine
Classification	grouping living things by looking at similarities and differences
Habitat	where a plant or animal lives
Environment	the surroundings or conditions in which an animal or plant lives
Deforestation	the action of clearing a wide area of trees
Life cycle	the stages a living thing goes through in its life

CLASSIFICATION KEYS

A set of yes or no questions about the characteristics of living things.

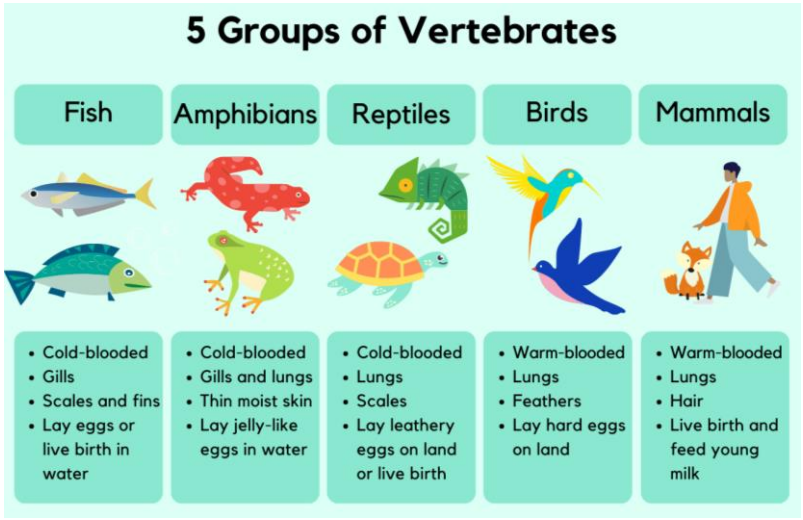
They are used to group and sort animals and plants.

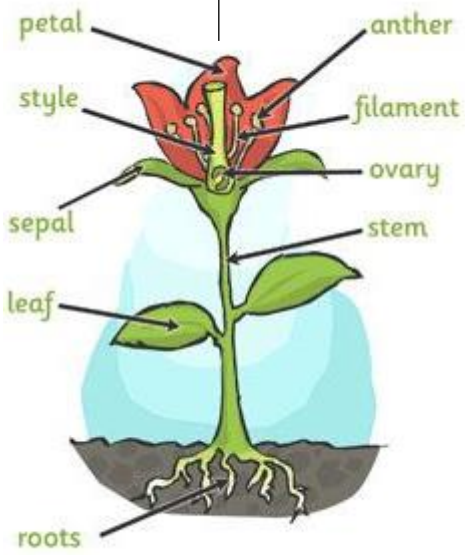
Answer the questions and follow the Lines depending on whether the answer is yes or no.

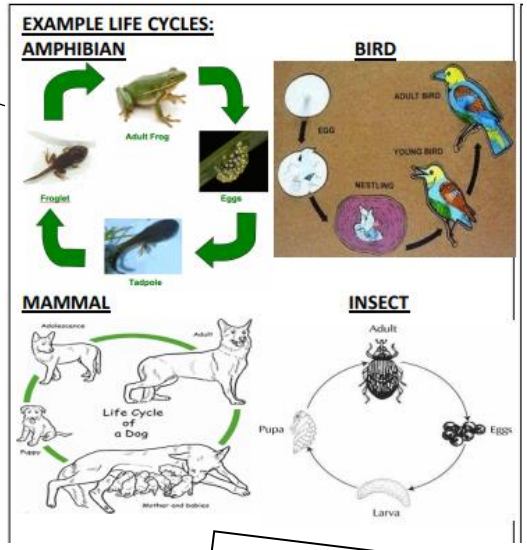


"Sticky Knowledge"

5 Groups of Vertebrates







Life Cycles

Properties and Changes in Material

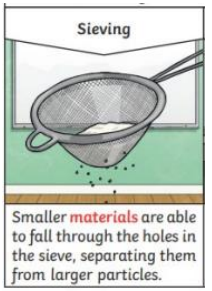
Key Vocabulary

Materials	the matter or substance that objects are made of.
Reversible change	a change that can be changed back again. Melting and heating are examples of reversible changes.
Irreversible change	a change that cannot be changed back again. Burning or mixing a liquid with bicarbonate of soda are examples of irreversible changes.
Insoluble	impossible to dissolve, esp. in a given liquid.
Soluble	able to be dissolved.
Dissolves	when a substance is mixed with a liquid and the substance disappears.
Filtering	a device used to remove dirt or other solids from liquids or gases. A filter can be made of paper, charcoal, or other material with tiny holes in it.
Evaporate	to turn from liquid into gas; pass away in the form of vapour.
Conductor	the ability of a material to conduct either heat or electricity.
Insulators	a non-conductor of electricity or heat.
Permeable	a substance that a gas or liquid can pass through.
Transparent	an object you can see through.
Particles	a tiny amount or small piece.
Thermal	relating to or caused by heat or by changes in temperature.

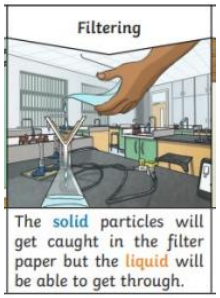
Key Knowledge

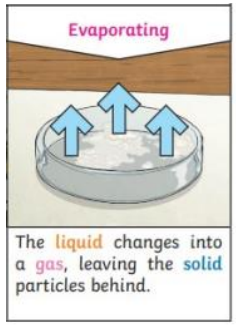
Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity & transparency

Materials can be grouped based on their properties using more complex vocabulary.



Sticky Knowledge





Reversible and irreversible changes

Some materials can be separated after they have been mixed based on their properties - this is called a reversible change.

Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation, e.g. The Water Cycle. When a mixture cannot be separated back into original components, this is called an irreversible change.

Sound

Volume

The volume of a sound is how loud or quiet it is.
Quieter sounds have a smaller amplitude and less energy (smaller vibrations) and louder sounds have a bigger amplitude and more energy.

The closer we are to a sound source the louder it will be.

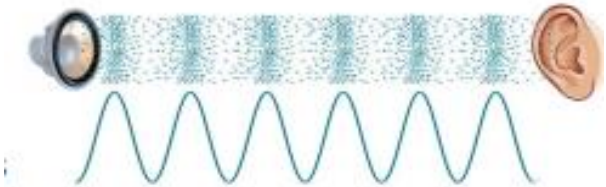
A train arriving at a station sounds loud

The further away from a sound the fainter it will be.

A train in the distance sounds quieter

How do we hear?

The sound waves travel to the ear and make the ear-drums vibrate. Messages are sent to the brain which recognises the vibrations as sounds.



amplitude	A measure of the strength of a sound wave. The size of the vibration
energy	Sound energy is a type of energy that we can hear
insulation	A material used to block sounds
medium	A material that allows the transfer of energy from one place to another, eg solids, liquids and gases
pitch	How high or low a sound is. It depends on the frequency of the sound
sound source	Where sound comes from. A sound source will produce vibrations
vibrations	Something moving backwards and forwards very quickly
volume	How loud or quiet a sound is. It depends on the amplitude of the sound wave
wave	A sound wave is an invisible wave which moves through different medium

Pitch

The pitch of a sound is how high or low it is.
A squeak of mouse has a high pitch
A roar of a lion has a low pitch.

A high pitch sound is made because it has a high frequency. The sound source vibrates many times a second.

How are sounds made and how do they travel?

When objects **vibrate**, a sound is made.

The vibration makes the air around the object vibrate and the air vibrations enter your ear. These are called **sound waves**.

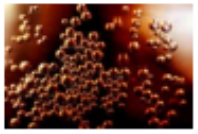
If an object is making a sound, a part of it is vibrating, even if you cannot see the vibrations

Sound waves travel through a medium (such as air, water, glass, stone, and brick).

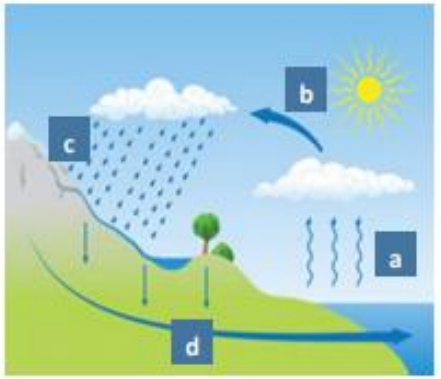
States of Matter

Key Vocabulary	
change of state	When a material changes from one state to another.
melting	The change of state from solid to liquid.
freezing	The change of state from liquid to solid. When a liquid becomes cold enough to turn solid, it freezes. The freezing point of water is 0°C.
melting point	The temperature at which a solid becomes a liquid. The melting point of water is 0°C.
boiling point	The temperature at which a liquid turns into a gas. Water boils when it is heated to 100°C.
evaporation	The change from a liquid to a gas at the surface of the liquid.
condensation	The process when a gas changes into a liquid, caused by cooling. the change from a gas to a liquid, caused by cooling.
water cycle	The never-ending process of water moving from the oceans, up into the atmosphere, and back to the Earth and oceans.
temperature	The measure of how hot or cold something is. It is measured in degrees Celsius with a thermometer

Solids, Liquids and Gases

Solid	Liquid	Gas
 Ice  Sugar	 Water  Honey	 Water vapour  Bubbles in cola
A **solid** keeps its shape and has a fixed volume.	A **liquid** has a fixed volume but changes in shape to fit the container. It can be poured.	A **gas** fills all the available space; it has no fixed shape or volume.

The Water Cycle

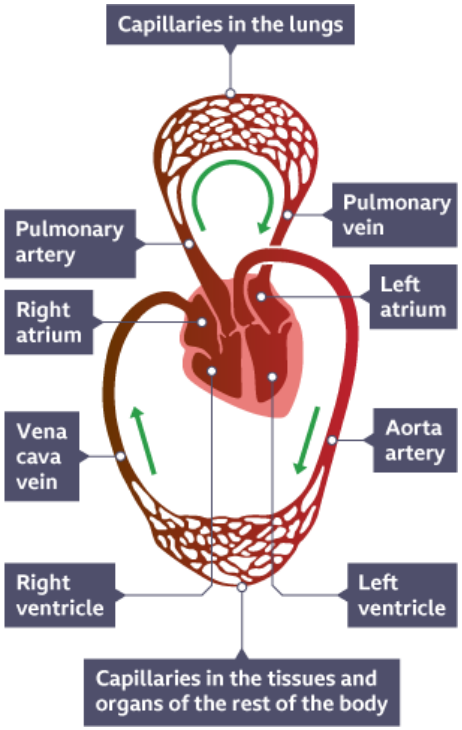


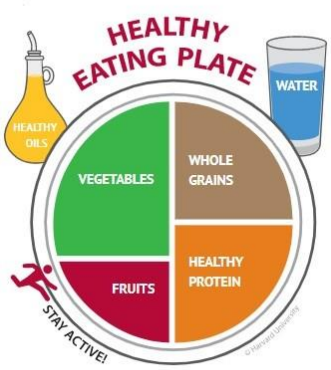
a	**Water evaporates into the air** The sun heats up water at the surface of seas, rivers, lakes and turns it into water vapour. The water vapour rises into the air.
b	**Water vapour condenses into clouds** Water vapour in the air cools and changes back into tiny drops of liquid water, forming clouds.
c	**Water falls as rain snow, sleet etc** When too much water has condensed the water droplets in the clouds get too heavy and water falls back down to Earth in the form of rain, snow, sleet etc. This is called precipitation.
d	**Water returns to the sea.** Rainwater runs over the land and collects in lakes or rivers which take it back to the sea. **The cycle starts all over again**

Animals, including Humans (Circulatory System)

Sticky Knowledge

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.





Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel.

Heart	A hollow muscular organ that pumps the blood through the circulatory system.
Pulse	This is your heartbeat, created by your heart pumping repeatedly around the body.
Circulatory System	How your heart pumps blood and oxygen around your body.
Respiratory System	How our lungs inflate/ deflate to help us breathe in oxygen and breathe carbo dioxide out.
Oxygen	A colourless, odourless, reactive gas, the chemical element of atomic number 8 and the life-supporting component of the air.
Nutrients	Obtaining the food/ vitamins necessary for health and growth.
Blood vessels	Blood vessels are a complex, 60,000-mile network of tubular structures (arteries, veins, and capillaries) that transport blood throughout the body.
Lifestyle	The way in which a person lives.

Key Vocabulary

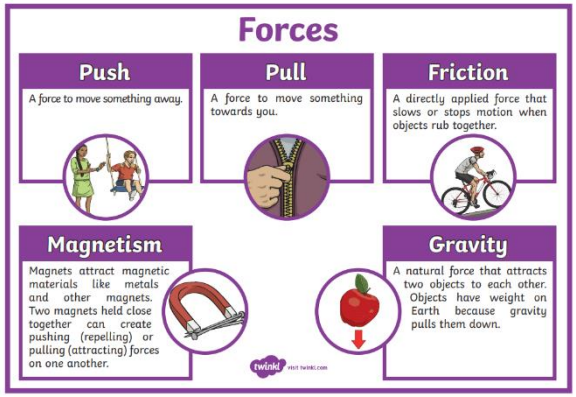
Forces

Sticky Knowledge

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Key Vocabulary

Force	A pushing or pulling effect that something has on something else.
Gravity	Really large objects (stars, planets and moons) attract other objects.
Air Resistance	A type of friction force that acts against an object as it moves through the air.
Water Resistance	A type of force that uses friction to slow things down that are moving through water.
Friction	Resistance to motion when one object rubs against another.
Mechanisms	A system of parts working together in a machine; a piece of machinery.
Levers	A basic tool to lift heavy things or open things
Pulley	A wheel with a groove that makes it easier to lift heavy things
Gears	Part of a machine with teeth that lock with teeth on another part to make it move.



A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.

Did you know… pulleys and levers allow a smaller force to have a greater effect?

A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.