

Vocabulary	
Key Word	Definition
luminous	Something that emits light.
dark	The absence of light.
reflect	A surface or body that throws back light without absorbing it.
shadow	An area where direct light from a light source cannot reach due to obstruction by an object.
opaque	Opaque materials do not let any light through them – they obstruct the light.
translucent	Translucent materials let some light through but scatter the light in all directions so they cannot see clearly through them.
transparent	Transparent materials let light through them in straight lines so you can see clearly through them.
luminous	Giving off light, bright or shining.
light	A source of energy that allows you to see.
light ray	An imaginary line that represents the line of light.
Refraction	When light changes direction when going through the boundary of state of matter and another.

Knowledge Organiser
Light
Strand: Physics



Light travels from the Sun in a straight line.

- Key Questions
- What is a light sources?

What is reflected light?

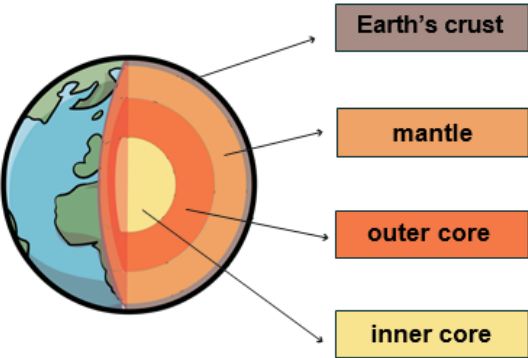
Is the sun dangerous?

What is a shadow?

Does moving the light source above the object make the object's shadow longer?

How do mirrors work?

Vocabulary	
Key Word	Definition
rock	A solid material that makes up the surface of the Earth.
soil	A black or dark brown material on the upper layer of the Earth where plants grow.
fossil	The remains of a prehistoric animal embedded in rock.
appearance	What something looks like.
physical properties	A characteristic of an object.
igneous rock	Rock formed through the cooling and solidification of magma or lava.
sedimentary rock	Rock formed from sediments that have settled at the bottom of a lake, sea or ocean and have been compressed together over millions of years.
metamorphic rock	Rock formed from other rocks that are changed because of heat or pressure.
geologist	A person who studies rocks.
crust	The outer layer of the Earth.
mantle	The part of the Earth between the crust and the core.
permeable	Allows liquid to pass through.
impermeable	Does not allow liquid to pass through.



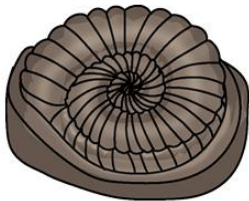
Knowledge Organiser

Rocks and Soils

Strand: Chemistry

Key Questions	
	What are rocks?
	Are all rocks the same?
	How are rocks formed?
	Which rocks make up the Earth?
	What are soils?
	How are fossils formed?

A fossil is the preserved remains or traces of a dead organism. The process by which a fossil is formed is called fossilisation.



								
marble	granite	sandstone	basalt	slate	clay	chalk	pumice	limestone

Vocabulary

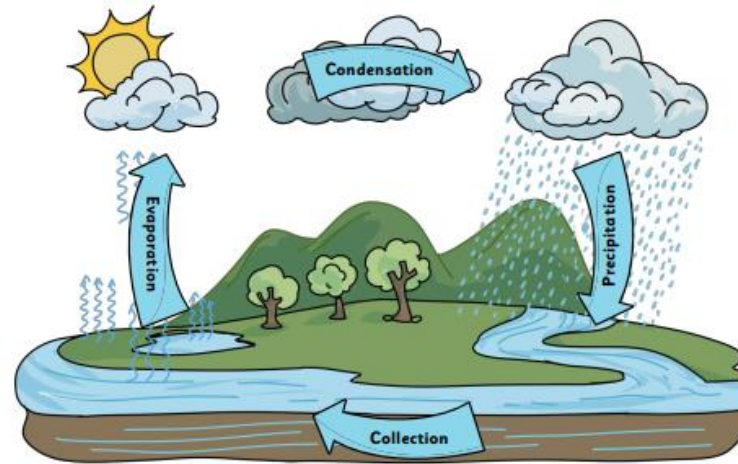
Key Word	Definition
collection	when water flows back into rivers, streams and lakes and gets carried back to sea
condensation	when water vapour cools and turns back into water
evaporation	when water is heated and turns into water vapour
freeze	when something is put at a very low temperature
gas	a state of matter that has no defined shape or volume
liquid	a state of matter that flows freely but keeps the same volume
solid	a state of matter that is firm and stable
precipitation	when water falls from the clouds in the sky
temperature	how hot or cold something is
thermometer	an instrument used for measuring temperature

Science Knowledge Organiser

States of Matter

Strand: Chemistry

Year 4



Key Questions

What are solids, liquids and gases?

Do all liquids behave the same?

What is a thermometer used for??

How do materials change state?

What is the water cycle?

Do all liquids evaporate??

Does temperature affect the rate of evaporation?

Gas	Liquid	Solid
<ul style="list-style-type: none"> Gases are often invisible. Gases do not keep their shape or always take up the same amount of space. They spread out and change their shape and volume to fill up whatever container they are in. Gases can be squashed. 	<ul style="list-style-type: none"> Liquids can flow or be poured easily. They are not easy to hold. Liquids change their shape depending on the container they are in. Even when liquids change their shape, they always take up the same amount of space. Their volume stays the same. 	<ul style="list-style-type: none"> Solids stay in one place and you can hold them in your hand. Solids keep their shape. They do not flow like liquids. Solids always take up the same amount of space. They do not spread out like gases. Solids can be cut or shaped.

Vocabulary

Key Word

Definition

heart

A muscle that pumps blood around the body.

lungs

Spongy air-filled organs that provide oxygen to the blood.

blood

A liquid that carries oxygen, water and nutrients around the body.

veins

Carry deoxygenated blood to the heart.

arteries

Carry oxygenated blood away from the heart.

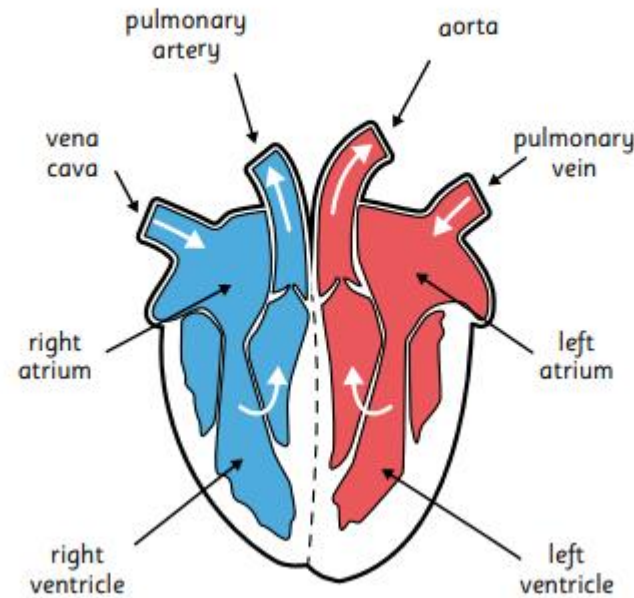
heart rate

The number of times our heart beats per minute.

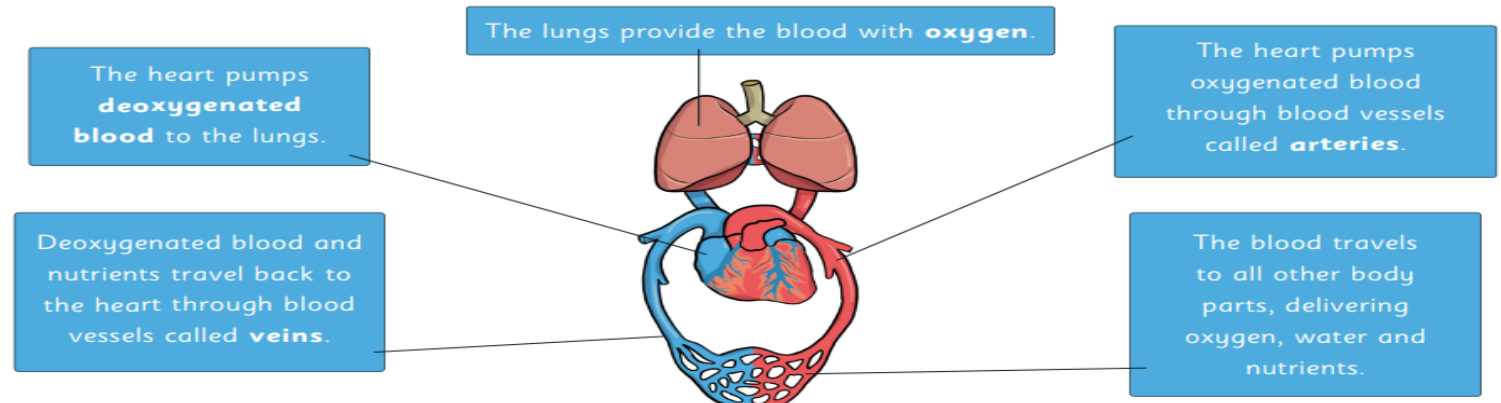
Knowledge Organiser

Animals including humans 6 - Heart, Blood & Circulation: Biology

The Human Heart



The Human Circulatory System



Key Questions

1

What is the circulatory system?

2

How does your heart work?

3

How does exercise affect your heart rate?

4

What does the blood transport around the body?

5

• How can I live a healthy lifestyle?

6

• What can damage your health?

Vocabulary

Key Word

Definition

Adaptation

When a plant or animal has changed in some way, usually over a long period of time, to be better suited to the environment in which they live.

environment

The conditions that surround an organism.

evolution

The process by which different kinds of living organisms are believed to have developed from earlier forms during the history of the Earth.

gene

A unit of heredity which is transferred from a parent to offspring and is held to determine some characteristics of the offspring.

Natural selection

When the fittest, most adapted organisms survive and multiply whilst the least adapted die out.

inheritance

The reception of genetic qualities by transmission from parent to offspring.

organism

An individual animal, plant or single-celled life form.

species

a group of similar organisms that are able to reproduce.

Knowledge Organiser Evolution: Biology

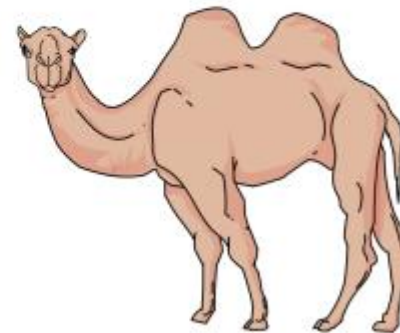
When parents have **offspring**, they pass on their **physical traits**. The offspring inherit their parents' **qualities**. This means that most **offspring look like their parents** but they are not identical. The offspring may take characteristics from the father, the mother or a mixture of both.

Traits you can inherit	Traits you can't inherit
eye/hair/skin colour, shape of nose, size of feet, height	a good singing voice, ability to play football, drawing skills

Adaptation is when a plant or animal has changed in some way, over a long period of time, to be better suited to the environment in which it lives.

Camels have long **eyelashes** to **protect** their eyes from the sand.

They also **have large, wide, flat feet** to help them **walk on the sand** without sinking.



Key Questions

1

How are plants adapted to their environment?

2

- How are animals adapted to their environment?

3

- What is natural selection, how does this lead to evolution?

4

- How do adaptations lead to evolution?

5

- What characteristics can you inherit from your parents?

6

- How can fossils help us explain evolution?

Vocabulary

Key Word

Definition

dark

The absence of light.

reflect

A surface (or body) that throws back light without absorbing it.

shadow

An area where direct light from a light source cannot reach due to obstruction by an object.

opaque

Opaque materials do not let any light pass through them. They block the light..

translucent

Translucent materials let some light through, but scatter the light in all directions so that they cannot see clearly through them.

transparent

transparent materials let light pass through them in straight lines so that you can see clearly through them

luminous

Giving off light, bright or shining.

scattering

When light is returned from a surface.

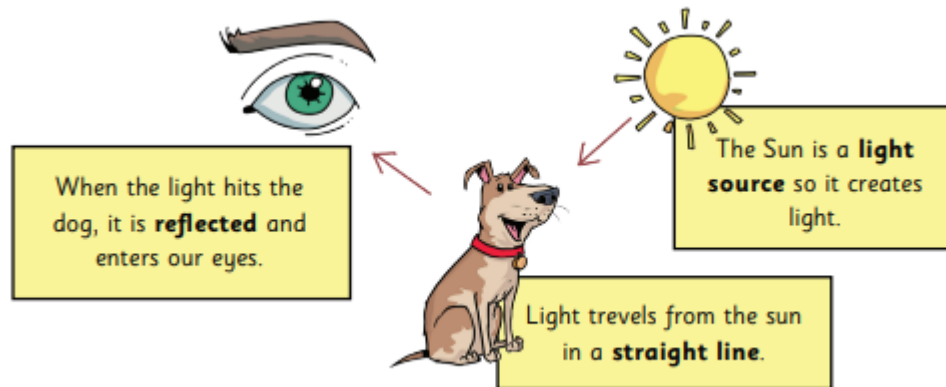
absorption

When light strikes a surface and is retained within it.

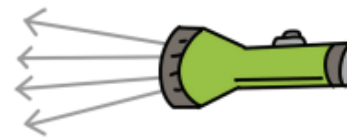
refraction

The “bending” of light when it passes from one transparent material to another.

Knowledge Organiser Light: Physics



Light travels very fast in **straight lines** called **light rays**. Even though light travels in straight lines, it travels in **different directions**.



Light rays from a torch travel in different directions but **always in straight lines**.



A **shadow** is made when an **object blocks light**. A shadow is a **dark area** or **shape** caused by a solid object blocking the rays of light from a light source.



Key Questions

1

How does light travel?

2

• Which materials make the best reflectors?

3

• How does the eye work?

4

• How do shadows change during the day?

5

• Why do objects look different in water?

6

• How do mirrors work?

Vocabulary

Key Word

Definition

soluble A substance that will dissolve in water.

insoluble A substance that will not dissolve in water.

saturation The point at which no more solute can be dissolved.

solution A soluble solid is dissolved in liquid to form a solution.

filtration The collection of larger particles in a mixture.

boiling The process by which molecules of a liquid change to vapour (much faster change than evaporation).

condensing The change of vapour into a liquid.

evaporation Change from a liquid to a vapour.

freezing The change of a liquid to a solid.

Melting point The point at which a solid substance liquefies.

Chemical change One where the molecular structures of the combined substances are broken down and recombined to make a new substance.

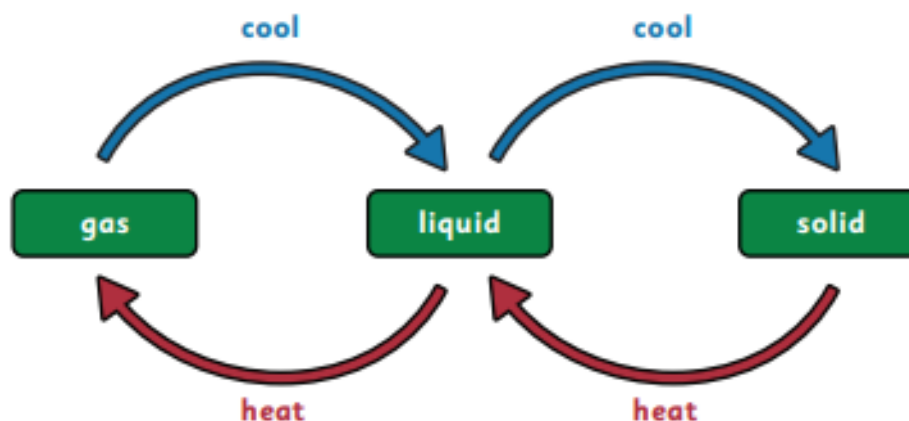
Physical change Where the molecular structures of the combined substance stay separate, allowing separation to occur.

Reversible change A physical change that we can undo.

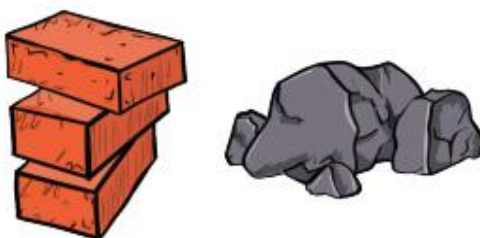
Irreversible change A physical change that we cannot undo.

Knowledge Organiser Materials: Chemistry

States of matter can change when they are heated or cooled.



Solid



Liquid



Gas



Key Questions

1

What are the properties of solids, liquids and gases?

2

• How can I describe the properties of materials?

3

• Which materials make the best thermal insulators?

4

• Which materials are magnetic?

5

• Which materials are soluble and which are insoluble?

6

• How can mixed materials be separated?

7

• What are irreversible changes?