

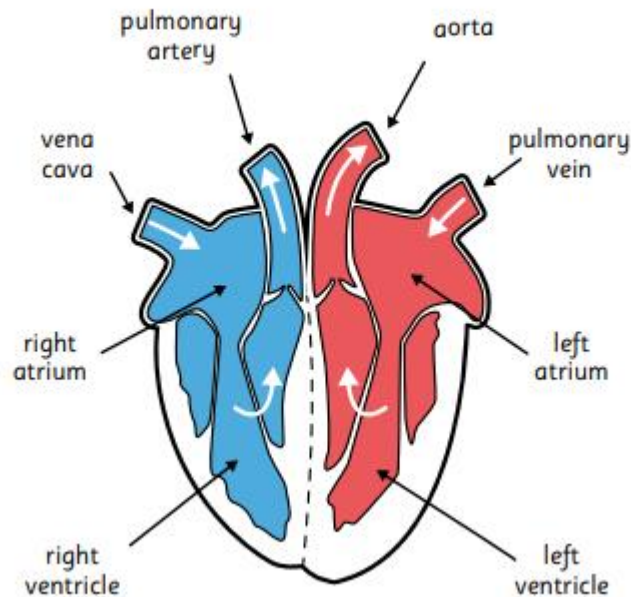
Vocabulary

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.

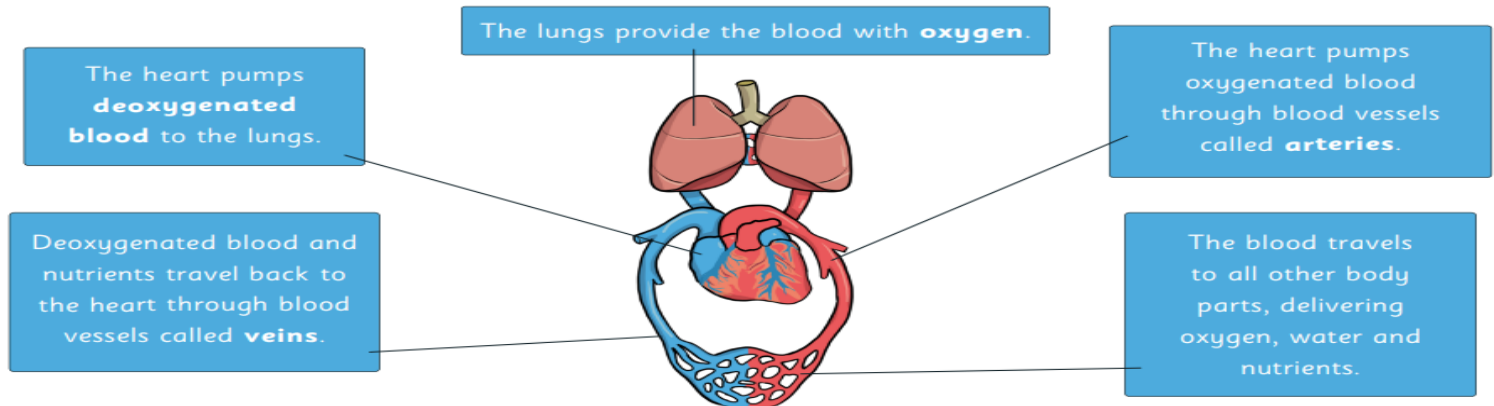
Knowledge Organiser

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

The Human Heart



The Human Circulatory System



Key Questions

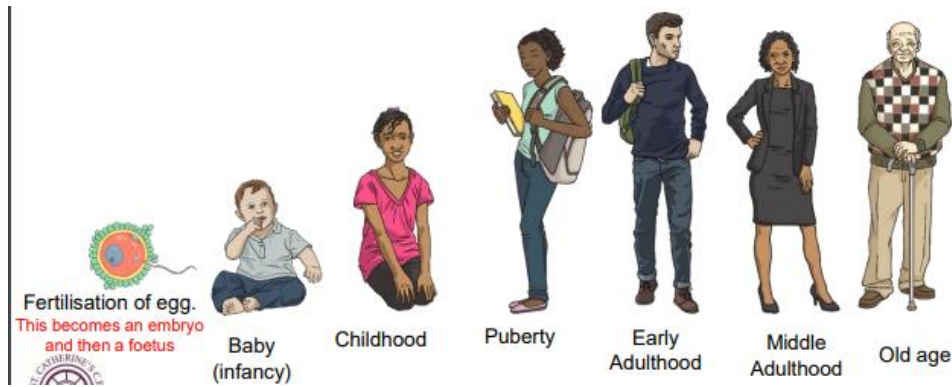
- 1 What is the circulatory system?
- 2 How does your heart work?
- 3 How does exercise affect your heart rate?
- 4 What does the blood transport around the body?
- 5 • How can I live a healthy lifestyle?
- 6 • What can damage your health?

Vocabulary

Key Word	Definition
Embryo	A newly fertilised egg in the womb
Foetus	An unborn baby that has developed from an embryo
Childhood	the age span ranging from birth to adolescence
Adolescence	The time when a child develops into an adult
Puberty	The time during which adolescents reach sexual maturity and become capable of reproduction
Hormones	Substances in our blood that influence our mood or behaviour
Lifespan	The length of time something lives for
Reproduction	The biological process by which new individual organisms – "offspring" – are produced from their "parents"

Knowledge Organiser Animals including humans 5 - Birth to Old Age: Biology

Foetal Growth From 8 to 40 Weeks



Key Questions

- 1 How do humans change throughout their life?
- 2 • How do we develop in the womb?
- 3 • How do we change through puberty?
- 4 • How do we change when we are senior?

Puberty

Puberty is the stage of development between childhood and adulthood. Changes happen inside and outside of the body during puberty. Physical growth occurs so that the body changes to that of an adult which enables reproduction. Two parts of the brain – the hypothalamus and the pituitary gland start to make more of some **hormones**.

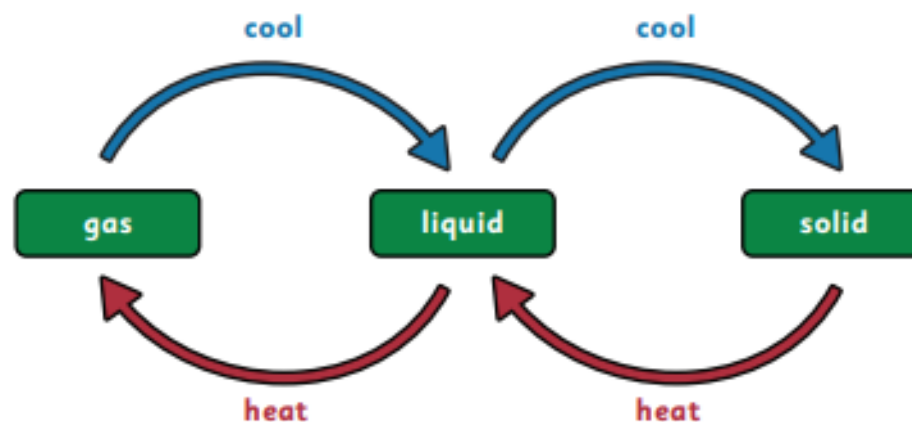


Vocabulary

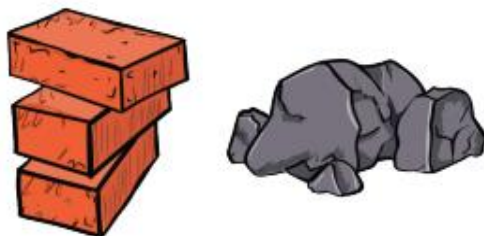
Key Word	Definition
soluble	A substance that will dissolve in water.
insoluble	A substance that will not dissolve in water.
saturation	The point at which no more solute can be dissolved.
solution	A soluble solid is dissolved in liquid to form a solution.
filtration	The collection of larger particles 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?

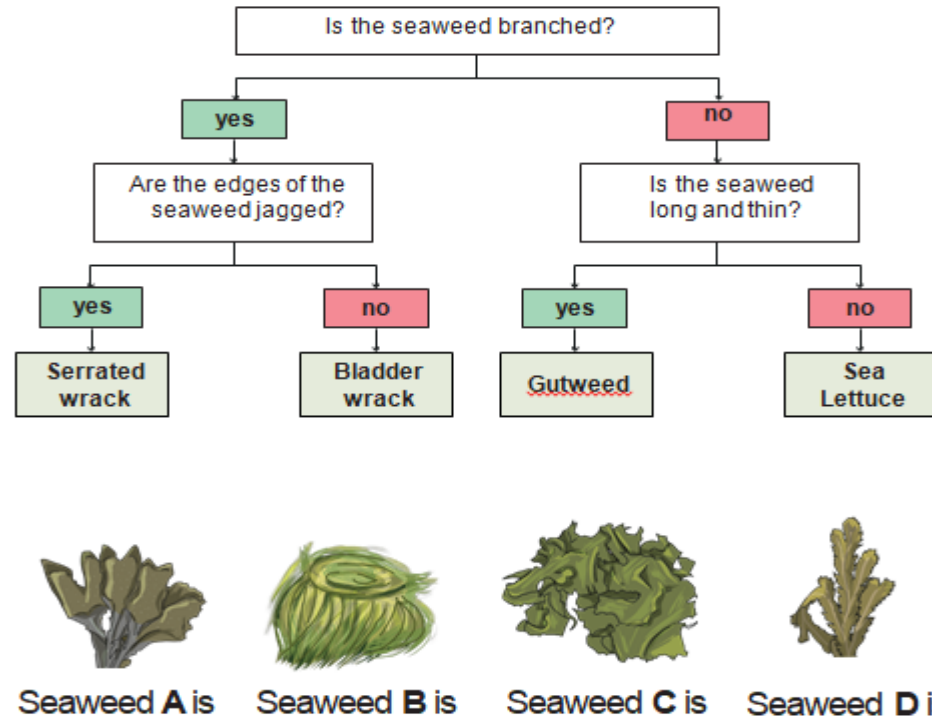
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• What are irreversible changes?

Vocabulary

Key Word	Definition
classify	To arrange a group of people or things in classes or categories according to shared qualities or characteristics.
vertebrate	An animal that has a backbone.
invertebrate	An animal without a backbone.
exoskeleton	A rigid external covering for the body in some invertebrate animals.
vascular	Plants that use roots and stems to take in water and nutrients.
Non-vascular	Plants that do not use roots and stems to take in water and nutrients.
taxonomy	The scientific process of grouping or classifying living organisms

Knowledge Organiser Living things and their Habitats 6 Classification: Biology



Carolus Linnaeus (also known as Carl Linnaeus) was a scientist who developed a detailed way to **classify** all living things known as a **taxonomy**.



His taxonomy helps us to determine what each living thing is. His scientific process involved **observing, recording** the information and making **conclusions**.

Microorganisms are **very small** living things. We can classify microorganisms into **five groups**.

viruses, bacteria, fungi, algae, protozoa

Key Questions

1

How are animals classified?

2

- What is a classification key?

3

- How can we classify plants?

4

- Is yeast a living microorganism?

5

- What are the five main groups of microorganisms?

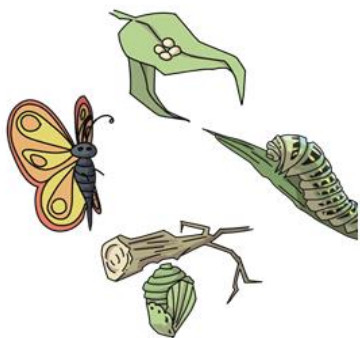
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- Who was Carolus Linnaeus?

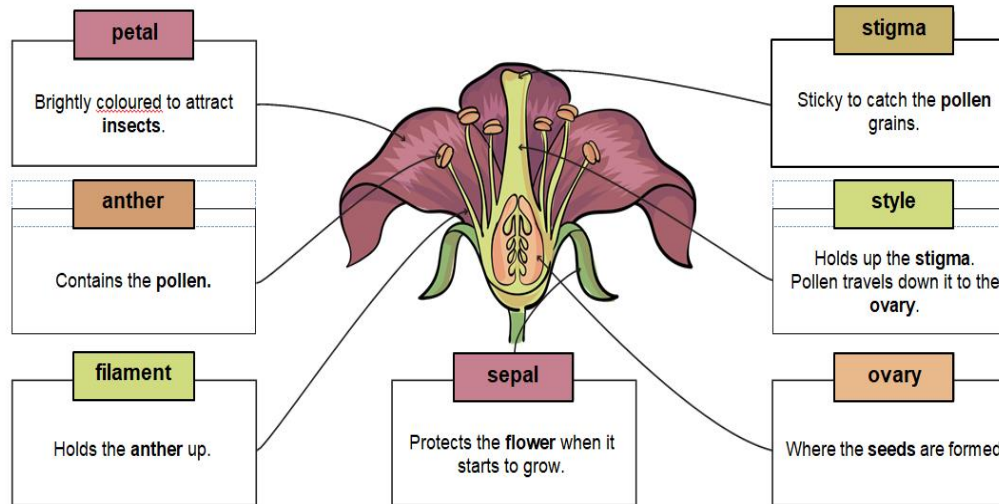
Vocabulary

Key Word	Definition
egg	Produced by female animals and plants which contains their genetic material
Life cycle	The different stages animals and plants go through as they develop
reproduction	The combining of genetic material from 2 individuals to produce new life
fertilisation	The point at which the sperm meets the egg
pollination	The process by which the pollen reaches the stigma
pollen	Granules which deliver the male genetic material to the female seed
stamen	The male part of the flower
pistil	The female part of the flower consisting of the stigma, style and ovary
Seed dispersal	The method by which plants spread their seeds

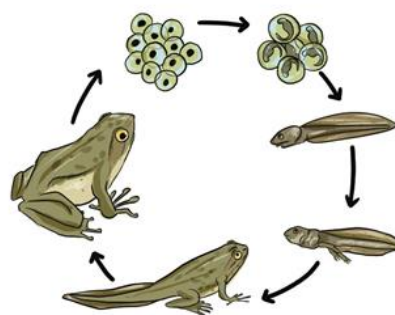
Butterfly life cycle



Knowledge Organiser Living things 5 - Lifecycles: Biology



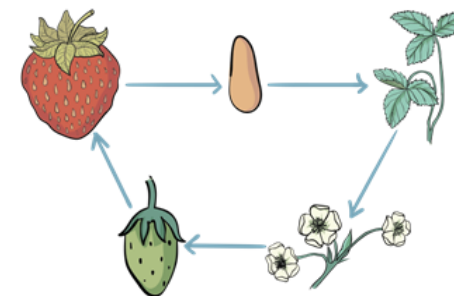
Frog life cycle



Key Questions

- 1 • What are the seven life processes?
- 2 • How do mammals reproduce?
- 3 • Do animals reproduce in the same ways?
- 4 • How do plants reproduce?
- 5 • What is a lifecycle?
- 6 • What are the stages in a plant lifecycle?

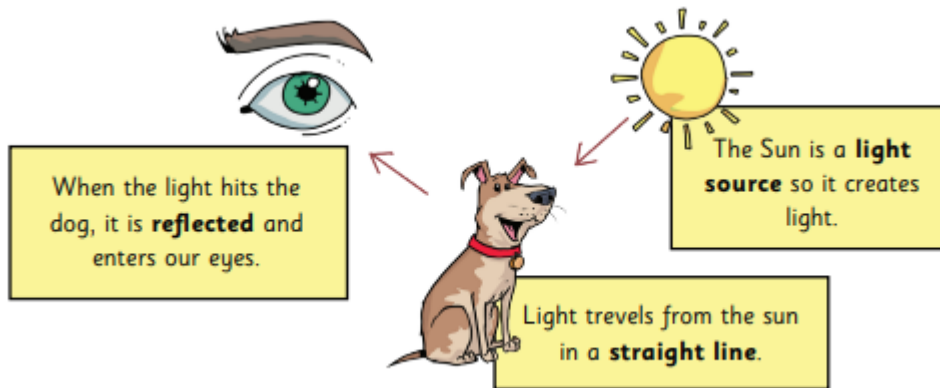
Strawberry life cycle



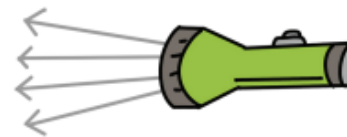
Vocabulary

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	Tanslucent 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
gravity	The force which attracts a body towards the centre of the Earth
friction	Is a force which slows moving objects when surfaces rub together.
air/water resistance	A force caused by air which acts in the opposite direction to the object moving through it
upthrust	A force which acts in an upwards direction in a liquid, usually water.
newtons	Is a measurement of force named after the scientist, Sir Isaac Newton
newtonmeter	Is a device used to measure forces.
mass	Is a measurement of the amount of matter something has.
weight	Is a measurement of the force exerted on a mass by gravity.
gears	Are small wheels with small small teeth which when combined change the force needed to move an object.
pulleys	A pulley is a device which helps move objects by making a smaller force larger.
lever	A lever is a long beam that rests on a fulcrum. Depending on the position of the fulcrum, this makes lifting loads easier.

Knowledge Organiser Forces: Physics



Water resistance is a type of friction caused by water pushing against any moving object.



Air resistance is a type of friction caused by air pushing against any moving object.

Pulleys

The **load** is the force being lifted

Levers

A **lever** is a long beam that rests on a **fulcrum**.

The **fulcrum** is what the lever turns on.

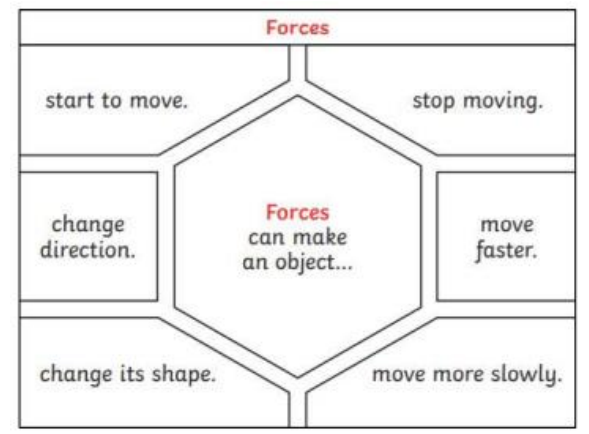
Effort is the force needed to move a

Gears

Gears or cogs can be used to change the speed, force or direction of a motion.

Key Questions

1. What is gravity?
- What is Friction?
- Can I carry out Friction Investigation?
- Can I Identify the effects of air resistance?
- What is water resistance?
- Can I explain about gears, levers and pulleys?



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

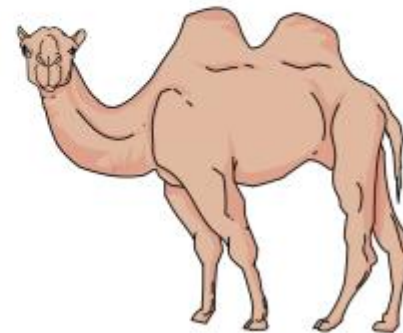
When parents have **offspring**, they pass on their **physical traits**. The offspring inherit their parents' **qualities**. This means that most **offspring look like their parents** but they are not identical. The offspring may take characteristics from the father, the mother or a mixture of both.

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

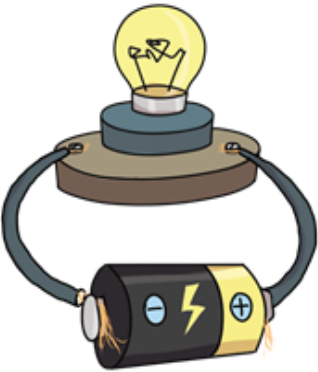
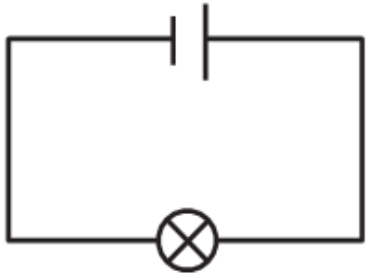
- 1 How are plants adapted to their environment?
- 2 • How are animals adapted to their environment?
- 3 • What is natural selection, how does this lead to evolution?
- 4 • How do adaptations lead to evolution?
- 5 • What characteristics can you inherit from your parents?
- 6 • How can fossils help us explain evolution?

Vocabulary

Key Word	Definition
appliance	A device or piece of equipment that has been made to perform a specific task.
battery	A small item used to power small appliances.
circuit	A route through which electricity flows.
components	The parts of a circuit.
conductor	Allows electricity to flow through it.
electrical	Something that uses electricity to work.
insulator	Doesn't allow electricity to flow through it.
mains power	Electricity provided by power stations.
pylon	A tower used for keeping electrical wires above the ground.
renewable energy	Energy from a source that is not depleted when used, such as wind or solar power.
non-renewable energy	Energy from a source that is depleted when used, such as coal, gas and oil.

Knowledge Organiser Electricity: Physics

Simple Circuit








The circuit has to be complete to allow the **electricity** to travel all the way around it.

Key Questions

- 1 How do I draw a scientific diagram of a circuit?
- 2 How does voltage in a circuit affect the brightness of a bulb?
- 3 How do I plan a fair test experiment to investigate variations in how components function?
- 4 How do I write a conclusion for my experiment?
- 5 • What is renewable and non-renewable energy?

Scientific Symbols

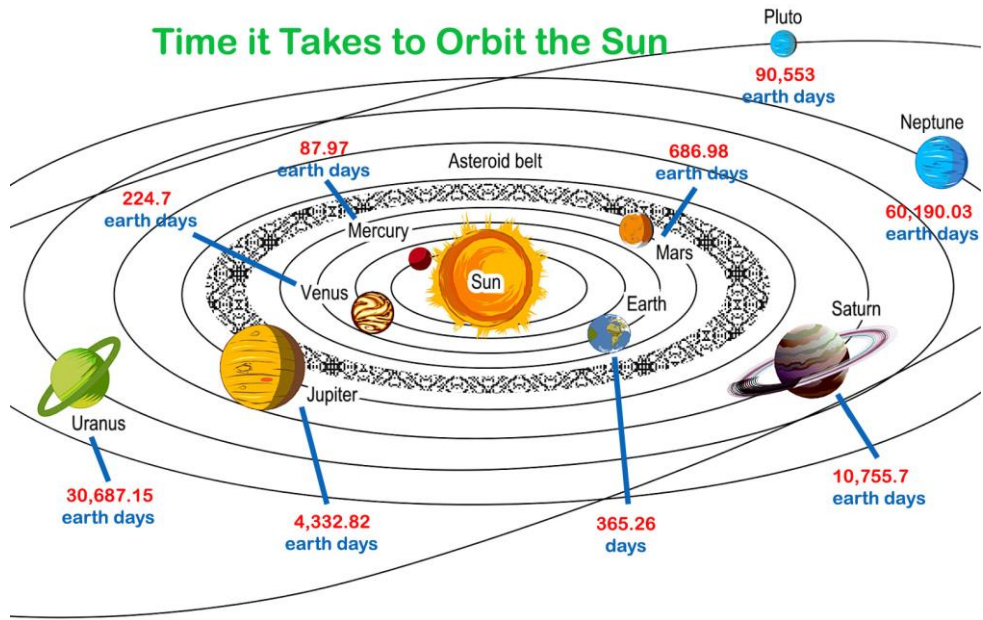
When scientists draw electrical circuits, they use **scientific symbols** to show **different components**.

						
battery or cell	bulb	wire	open switch (off)	close switch (on)	motor	buzzer

Vocabulary

Key Word	Definition
solar system	Is made up of the sun and the planets which orbit it.
axis	An imaginary line which passes through the middle of an object.
planet	A celestial body which orbits a star. They have their own gravity.
sun	The star at the centre of our solar system.
moons	Are satellites of planets. Some planets have none and some can have several.
The Earth	The only known planet which can sustain life. It orbits the Sun every 365 days
lunar	Anything relating to the moon.
orbit	The path taken by one body as it travels around another. E.g. The Earth orbits the Sun.
waxing moon	When the moon is becoming more visible after a new moon.
waning moon	When the moon is becoming less visible after a full moon.
gibbous moon	When $\frac{3}{4}$ of the moon is visible to the naked eye.

Knowledge Organiser Earth & Space: Physics



Key Questions

1. What are the names of the planets in the Solar System?
2. How do we know the Earth is a sphere?
3. How long does it take the Earth (and other planets) to orbit the sun once?
4. What is the largest object that orbits the Earth?
5. Why is there day and night on Earth?
6. Does the moon change shape?

