

Knowledge Mats

Autumn 1



Science - Autumn 1 Living Things and Their Habitats

Plymouth Science

Knowledge Organiser

Year 4

Living things and their habitats

VOCABULARY

Classify- To arrange or group things into categories depending on characteristics.

Vertebrate- an animal with a backbone.

Invertebrate- an animal without a backbone.

Cold-blooded- an animal whose body temperature varies with the environment they are in e.g. fish.

Warm-blooded- animals that maintain a regular body temperature.

Sample- a small amount of something to show what the whole of it may be like.

Exoskeleton- an external covering of the body found in some invertebrates such as arthropods.

Creature- an animal, distinct from a human being.

Habitat- place where an organism makes its home.

Hibernate- to become inactive or dormant

Migrate- move from one region or habitat to another.

Amphibian- cold-blooded vertebrate animal

Reptile- vertebrate animal with scaly skin and typically lay soft-shelled eggs on land.

Mammal- warm-blooded animal with fur/hair, give birth to live young.

Endangered- at risk of extinction.

What is classification?

This is the arrangement of things into groups according to their observed similarities.

Invertebrates and Vertebrates

Invertebrates
(Animals without a backbone)



Vertebrates
(Animals with a backbone)



Deciduous and Evergreen

Deciduous
(Loses leaves after growing season)



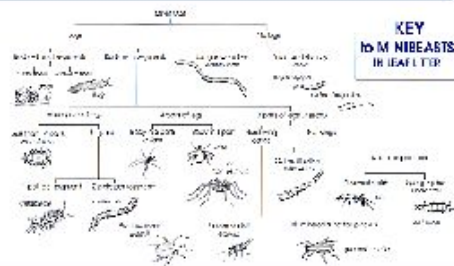
Maple Oak Elm

Evergreen
(Stays green all year)



Palm Holly Spruce

Classification keys.



Features of living things.

Movement

Respire (breathe)

Sensitivity to environment

Nutrients

Excrete

Reproduce

Grow



Plymouth Science

Key scientists

Year 4

Living things and their habitats

Linnaeus
1707-1778



Swedish botanist who devised a system for naming organisms.

David
Attenborough
1926- present



English broadcaster and naturalist. Best known for his educational tv programmes.

Endangered Animals

Environments change all the time e.g., leaves fall from the trees during Autumn. Sometimes the changes are not expected and have a drastic effect on the living things there.

How changes in environment pose dangers to living things.

Litter



Plastic pollution



Chemical pollution

Oil spill

Deforestation



Development



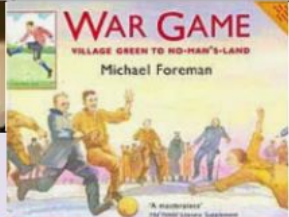




Global warming

There are 41,415 endangered species. 13,306 of them are endangered species threatened with extinction.

10 most endangered species: Giant Panda, Tiger, Whooping crane, Blue whale, Asian Elephant, Sea otter, Snow leopard, Gorilla, Tasmanian Devil, Orangutan



World War 1: KS2 Knowledge Mat

Subject Specific Vocabulary		Sticky Knowledge about World War 1	    
trench	Along narrow ditch dug into the ground where soldiers lived		
airships	Huge balloon like crafts used to carry out bombing raids in Britain.		
Archduke Franz Ferdinand of Austria	His assassination was believed to be the trigger to the outbreak of the WW1 war. He was heir to the Austro-Hungarian throne.	<input type="checkbox"/> Aircraft were still very new in 1914, so when the Germans launched bombing raids on London, they were carried out from airships, known as zeppelins	
Central Powers	The alliance of Germany, Austria, Hungary, Bulgaria and Turkey	<input type="checkbox"/> In 1918 a pigeon, Cher Ami, one of about 100,000 homing pigeons used during the war, managed to save 500 US soldiers	
front line	The trench closest to the enemy.	<input type="checkbox"/> Tanks were developed by the British during the first world war	
no man's land	The area between the two sides during battle.	<input type="checkbox"/> Before the war most women stayed at home or worked in domestic service	
Battle of the Somme	The largest battle of WW1 and the bloodiest battle in history.	<input type="checkbox"/> When the war started, British soldiers went into battle with just a cloth cap for protection	
zeppelin	Giant German airships that carried out 52 air raids on Britain.	<input type="checkbox"/> Many people suffered facial injuries during the first world war	
blackout	When lights from buildings, including houses, were not allowed to be seen from the sky.	<input type="checkbox"/> The first ever motorized ambulances were used during the first world war	
Armistice Day	The day the agreement was signed between the Allies and Germany to end the war on 11 th November.	<input type="checkbox"/> Approximately 16,000 British conscientious objectors refused to fight during the war	
conscription	Arule that said ALL healthy men aged 18 – 41 had to fight.	<input type="checkbox"/> Due to food shortages, Britons were banned from throwing rice at weddings and feeding pigeons	

RE - Autumn 1

Understanding Christianity

Creation Unit

Key Vocabulary

Creation

Causing something to exist

Creator

The maker; God

Human

A person

The Fall

The breakdown of the relationship between God and his people.

Genesis

The first book of the Bible

Stewards

Stewardship is a theological belief that humans are responsible for taking care of the world

Ten Commandments

A set of rules/laws given to Moses for the people by God

LKS2 Unit 2A.1 – Creation/ Fall

What do Christians learn from the Creation Story?

Human beings do best when they listen to God.

God the Creator cares for the creation, including human beings.

The Bible tells a story (in Genesis 3) about how humans spoiled their friendship with God (the fall).

Christians show they want to be close to God through obedience, worship and saying sorry.

God offers forgiveness even when his people keep falling short.

The Bible shows that God wants to help people to be close to him -he keeps his relationship with them.

Outcomes

- Place the concepts of God and Creation on a timeline of the Bible's 'Big Story'.
- Make clear links between Genesis 1 and what Christians believe about God and Creation.
- Describe what Christians do because they believe God is Creator. (For example, follow God, wonder at how amazing God's creation is; care for the earth in some specific ways.)
- Ask questions and suggest answers about what might be important in the creation story for Christians living today, and for people who are not Christians.

Knowledge Mats

Autumn 2



Science - Autumn 2 Forces and Magnets

VOCABULARY

Forces - changes the motion of an object. Pushes and pulls in a particular direction.

Gravity - a force which pulls things towards the centre of the Earth. Discovered by Sir Isaac Newton.

Push - force which causes movement away from something.

Pull - force which causes movement towards something.

Contact force - requires contact to happen.

Non-contact force - doesn't require contact.

Attract - causes something to move towards.

Repel - causes something to move away.

Poles - Magnets have a North and South Pole.

Magnetic field - magnets electric charge

Sir Isaac
Newton

1643-1727



An English mathematician, physicist, astronomer and author who is famous for his laws of motion, theory of colour and the discovery of gravity. Gravity is measured in Newtons (N)

John
McAdam

1756-1836



John McAdam was a Scottish engineer who modernised the way we build our roads.

Albert
Einstein

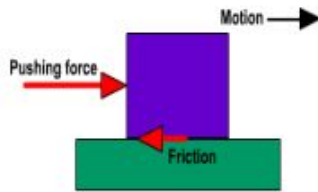
1879-1955



His theories of motion and forces started at five years old when his father gave him his first compass.

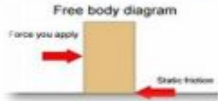


Friction



Friction is a force **between two surfaces** that are sliding, or trying to slide, across each other. For example, when you try to push a book along the floor, friction makes this difficult.

What is a force?



Forces are pushes or pulls.
Push and pull forces can make things start and stop moving, make a moving object change direction and change the shape of an object.

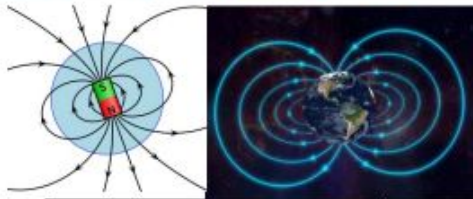
Magnets



Magnets have North Poles and South Poles.
Magnets can come in all shapes, sizes and strengths.



Opposite poles attract. (Stick together)
The same poles repel. (Move away)






Magnets have magnetic fields.
The Earth is also a giant magnet. This is how compasses work.

Magnetic		Not Magnetic	
Iron	Nickel	Aluminium	Copper
Cobalt	Steel	Lead	Brass



Mountains KS2 Knowledge Mat

Subject Specific Vocabulary			Exciting Books	
peak	The peak is the highest point of any mountain.		<p style="text-align: center;">Sticky Knowledge about mountains</p> <ul style="list-style-type: none"> <input type="checkbox"/> Mountains make up one-fifth of the world's landscape. <input type="checkbox"/> Mount Everest is the world highest mountain and it is 8,850m high. <input type="checkbox"/> There are mountains under the surface of the sea. <input type="checkbox"/> 80% of our fresh water originates from mountains. <input type="checkbox"/> The highest 14 mountains in the world are all found in the Himalayas. <input type="checkbox"/> Generally mountains are higher than 600m, if they are less they are called hills. 	 
valley	A valley is a long depression, or ditch, in the Earth's surface and usually lies between ranges of hills or mountains.			
cliff	Cliffs are tall, steep rocks that were created by erosion and have vertical faces.			
ridge	A ridge is part of the steep, sloping side of a mountain.			
plateau	A plateau is an area of flat ground that is much higher than the surrounding area.			
summit	The summit is the highest point of a mountain.			
hill	A hill is a landform that is high but not high enough to be a mountain.			British mountains
terrain	Terrain is used as a general term when referring to the lie of the land.			Ben Nevis
range	A mountain range is a group or chain of mountains that are close together.			Snowden
tectonic plates	The Earth's outer layer is made up of large, moving pieces called plates.			Pennines

Knowledge Mats

Spring 1



Science - Spring 1 Animals Including Humans

VOCABULARY

Vertebrate- An animal with a backbone inside their body.

Bones- The hard parts inside your body which form your skeleton.

Skeleton- The framework of bones in your body.

Backbone (Spine) The column of small, linked bones down the middle of your back.

Muscle- move the different parts of your body, inside and out.

Healthy- feeling well and not suffering any illness.

Exercise- a physical activity to keep your body fit.

Hygiene- how clean something is.

Disease- an illness which affects people, animals or plants. bacteria or virus.

Balanced diet- Choosing foods in the right amounts from each of the food groups.

What do we need to survive and be healthy?

Balanced diet
(Food)



Water



Air



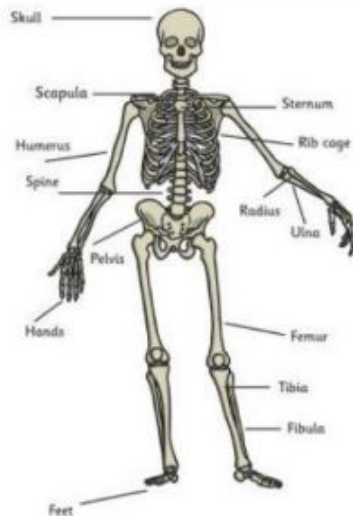
Exercise



Hygiene



The Skeletal System.



Bones of the hand



Phalanges

Metacarpal

Sesamoid

Characteristics of Living Things:

Movement

Respire (breathe)

Sensitive to the environment

Nutrients

Excrete (Get rid of waste/poo!)

Reproduce (have babies)

Grow.

Skeleton


All mammals (including humans), birds, fish, reptiles and amphibians are vertebrates. This means they have a skeleton inside their bodies.

The human skeleton is made of bones and grows as we grow. Our skull protects our brain and our ribs protect our heart and lungs.

The skeleton bends at joints such as knees and ankles. Joints are where two or more bones join together.



Three types of skeleton.

Endoskeleton	Exoskeleton	Hydrostatic skeleton
 <p>Skeleton inside the body. As the animal grows so does the skeleton.</p>	 <p>Skeleton is on the outside. They shed their skeleton. Skeleton does not grow with the animal, so it sheds it and grows a new one.</p>	 <p>The skeleton does not consist of bones. They are all invertebrates. They have fluid filled compartments in their body.</p>

Muscles

- Your body has over 650 muscles and may have different types of joints to allow your bodies to move in different ways.
- They are attached to the skeleton to help us move. They either contract (bunch up) or relax (go back to normal) to move the bones.
- It takes 17 muscles to smile
- It takes 43 muscles to frown!

Drink plenty of **water**.

Carbohydrates give us energy.

Proteins help our bodies repair themselves.

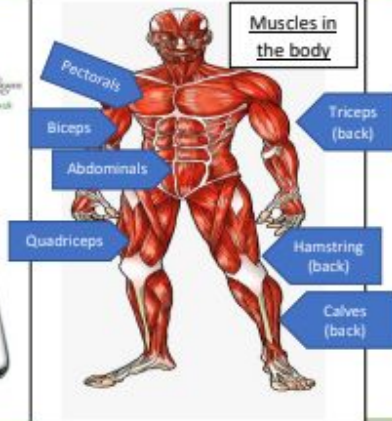
Fats help store energy for our bodies.

Fibre is important for helping us digest our food.

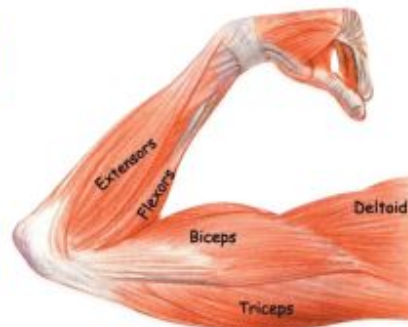
A Balanced Diet

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Our arm muscles



Nutrition

Nutrition means getting the food they need to grow and be healthy.



History - Spring 1

Anglo Saxons and Scots

How did the Anglo-Saxon period change Britain?

Subject Specific Vocabulary

archaeologist	People who discover our history by looking at artefacts that have been found.
Anglo-Saxon kingdoms	The Anglo-Saxons formed many regions each with one ruler, known as kingdoms.
shires	Saxon lands were divided into shires, which helped to make up the counties we have today
Shire reeve	The peace officer of a shire, later known as 'sheriff'.
thane	An important Anglo-Saxon person.
legacy	Anglo-Saxons left a legacy which included the language we speak, culture and politics. Many of the shires are our boundaries for counties today.
Wessex	Known today as Dorset, Hampshire, Somerset and Wiltshire.
Witan or witenagemot	A council that helped the Saxon king rule.
wergild	A fine imposed for stealing or killing.
churl	A lower-class Anglo-Saxon but better than a slave.
Mercia	Known today as East Anglia, Essex, Kent and Sussex.



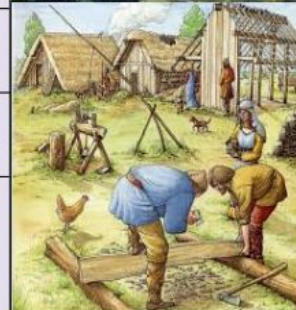
Sticky Knowledge about the Anglo-Saxons

- The Anglo-Saxons were made up of three tribes: the Angles; Saxons; and Jutes.
- The name 'Angles' eventually became 'English' and their land, 'Angle-land', became 'England'.
- They came to Britain from across the North Sea in the middle of the 5th Century.
- For a long time, England was not one country. Anglo-Saxon kings ruled lots of small kingdoms across the land.
- The Anglo-Saxons were fierce people who fought many battles, including fighting each other.
- The Anglo-Saxon period ended when the Normans conquered Britain in 1066.

Exciting Books



Anglo-Saxon Settlements



RE - Autumn 1
Understanding Christianity
Gospel Unit

Key Vocabulary

Gospel

The books of the Bible which are about Jesus' life.

Disciple

Someone who follows Christ

Leprosy

A disease of the skin. People have sores on their body

LKS2 – Unit 2A.4 – Gospel

What kind of world did Jesus want?

Christians believe Jesus shows people how to live.

Christians believe Jesus shows people how to love God and their neighbour.

Jesus sets the example of putting others first,

Christians believe Jesus shows love and forgiveness to unexpected people.

Christians try to be like Jesus, using his example in worship and by helping people.

Outcomes

Identify this as part of a 'Gospel', which tells the story of the life and teaching of Jesus.

Make clear links between the calling of the first disciples and how Christians today try to follow Jesus and be 'fishers of people'.

Offer suggestions about what Jesus' actions towards the leper might mean for a Christian.

Make simple links between Bible texts and the concept of 'Gospel' (good news).

Give examples of how Christians try to show love to all, including how members of the clergy follow Jesus' teaching.


Make links between the Bible stories studied and the importance of love, and life in the world today, expressing some ideas of their own clearly.

Knowledge Mats

Spring 2



Local Area KS2 Knowledge Mat

Subject Specific Vocabulary			Exciting Books
street	A public road in a city, town, or village, typically with houses and buildings on one or both sides.		<p>Sticky Knowledge about British villages, towns and cities</p> <ul style="list-style-type: none"> <input type="checkbox"/> A village is usually associated with the countryside and is smaller than a town. <input type="checkbox"/> Every street in our country has a name and a <u>post code</u>. The name is usually on a wall or a sign at the beginning of the street. <input type="checkbox"/> There are many signs on the roads to help drivers use the highway code properly. There are different shaped signs to help drivers know what to do. <input type="checkbox"/> London is our capital city and has a population of more than 8 million. <input type="checkbox"/> Your address has the name of the street you live in, the number or name of your house; the village, town or city you live in and a <u>post code</u>. <input type="checkbox"/> London is the capital of England; Cardiff the capital of Wales, Edinburgh the capital of Scotland and Belfast the capital of Northern Ireland. <input type="checkbox"/> One of the oldest parliaments in the world is situated in London and is called the Houses of Parliament.
road signs	Road sign gives you information, directions to places or warn you of possible dangers.	<p>Major English cities</p> <ul style="list-style-type: none"> • Birmingham • Manchester • Newcastle • Sheffield 	
office	A building where people work from. Some are large, tall buildings and others are very small.		
supermarket	A place where you buy groceries and other items. They are usually very large with parking space.		
post office	A place where you buy stamps for your letters and can send your letters and parcels.		
church	A place of worship normally found in every village, town and city. Mosques and temples are similar places for different religions.		
map symbol	A small picture on a map to tell you about something. There are symbols for schools, churches, post offices and pubs.		
address	Locates exactly where someone lives by having the house or flat number, street and town names.		
post code	This locates exactly where a street or a place is by using letters and numbers.		
urban	A busy locations which has lots of houses and usually shops and offices.		
rural	It is a location in the country. It is not usually as busy as an urban place.	<p>Attractions of London</p> <ul style="list-style-type: none"> • Buckingham Palace • Tower of London • Windsor Castle • The London Eye • London Bridge 	

RE - Autumn 1
Understanding Christianity
Salvation Unit

Key Vocabulary

Incarnation

God in human form

God in the flesh

Salvation

Jesus rescuing people

Crucifixion

being killed by being nailed to a cross

Resurrection

coming back alive

Easter

Festival when Christians celebrate Jesus resurrection

Holy Week

The week leading up to Easter including Palm Sunday and Good Friday

Betrayal

LKS2 – Unit 2A.5 – Salvation

Why do Christians call the day Jesus died Good Friday?

Outcomes

Order Creation and Fall, Incarnation, Gospel and Salvation within a timeline of the Bible's 'big story'.

Offer suggestions for what the texts about the entry into Jerusalem, and the death and resurrection of Jesus might mean.

Give examples of what the texts studied mean to some Christians.

Make simple links between the Gospel texts and how Christians mark the Easter events in their church communities.

Describe how Christians show their beliefs about Palm Sunday, Good Friday and Easter Sunday in worship.

Make links between some of the stories and teachings in the Bible and life in the world today, expressing some ideas of their own clearly.

Christians see 'Holy Week' as the most important part of Jesus' life resulting in his death and resurrection.

The Last Supper and other events from Holy week were important in showing the disciples what Jesus came to earth to do.

Christians believe that Jesus rose from dead.

Christians believe that Jesus is still alive today.

Christians remember and celebrate Jesus' last week, death and resurrection at Easter.

Knowledge Mats

Summer 1



Science - Summer 1 Plants

VOCABULARY

Plant- a living thing that usually grows from the ground.

Germinate- start of growth.

Photosynthesis- plant uses sunlight to make food for the plant.

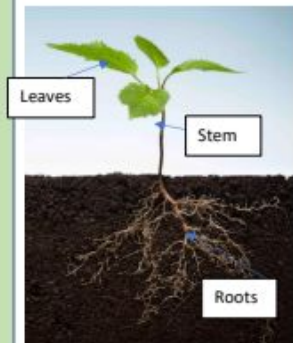
Pollination- flower reproduction.

Animal dispersal- seeds transported on animals through being buried, carried on fur, in berries or in poo.

Water dispersal- seeds are carried from one place to another in the water.

Wind dispersal- seeds are carried from one place to another by wind.

Capillary action- water being transported through the plant.



Roots



Covered in small hairs.
Anchors plant.
Absorb nutrients and minerals.

Flower



Attracts insects.
Helps pollination.
Uses pollen to make new seeds.
POLLINATION

Leaf



Makes food for the plant using sunlight and carbon dioxide from the air.
PHOTOSYNTHESIS.

Stem

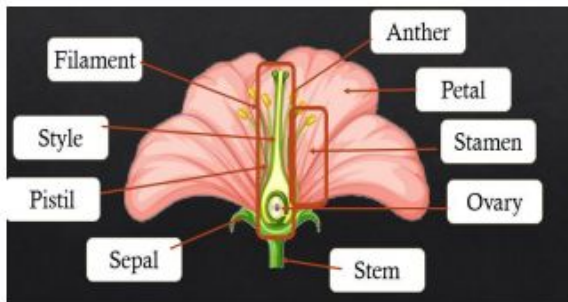


Hold plant up.
Carries nutrients and minerals from the roots to the leaves.

Conditions for growth

Rain/water	Sunlight	Temperature
Air	Time	Nutrients

Parts of a flower.



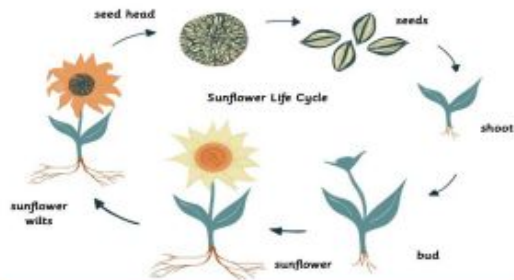
Water, minerals and nutrients

stem xylem

The water is transported through the flower using a process called **capillary action**. The water transports up the stem to the rest of the flower. The water is needed keep the plant alive and healthy.



Lifecycle of a sunflower



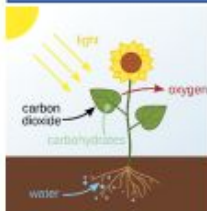
Pollination



Pollination happens when an insect carries pollen from the male part of the plant (stamen) to the female part (pistil).

This allows the new plant to make new seeds and fruit.

Photosynthesis



Photosynthesis uses sunlight to make food for the plant.

Photosynthesis happens in the leaves of a plant.

The leaves contain chlorophyll, this and light energy help convert carbon dioxide and water into oxygen and glucose- which is food for the plant.

Seed Dispersal



By animals



By wind



By explosion



By water

Famous botanists.



Carl
Linnaeus



George
Washington
Carver



Alexander
Von
Humboldt



Oliver
Rackham



Dr Angie
Burnett.



Knowledge Mats

Summer 2



Science - Summer 1 Electricity

Plymouth Science

Knowledge Organiser

Year 4
Electricity

VOCABULARY

Electricity- form of energy formed by charged particles.

Circuit- a complete flow of electricity and the way it affects objects.

Bulb- provides light when powered.

Mains- domestic or wall powered.

Plug- device for making an electrical connection

Buzzer- An electrical device that makes a buzzing sound.

Wire- A long piece of metal that carries an electrical current often covered in plastic for safety.

Motor- A device that changes electrical energy into movement.

Cell- a device used to generate electricity.

Battery- More than one cell/

Conductor- Any material that electricity can pass through or along.

Insulator- Any material that electricity cannot pass through or along.

Symbol- Representation of the components.

Electrons- move around a circuit.

Current- stream of charged particles moving through an electrical conductor.

Voltage- An electrical force that makes electricity move through a wire, measured in volts (V)

Electricity can produce...



Light



Sound



Movement



Heat

The battery produces electricity. It has stored chemical energy.

The chemical energy converts to electrical energy which produces electrons. They travel around the circuit to all the components.

Circuit Components



Cell



Bulb/Lamp



Wires



Buzzer



Switch



Motor



Battery

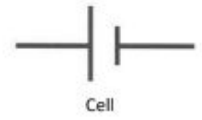
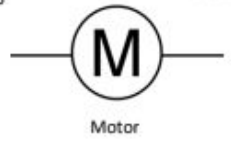
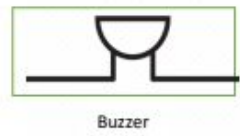
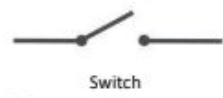
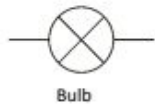
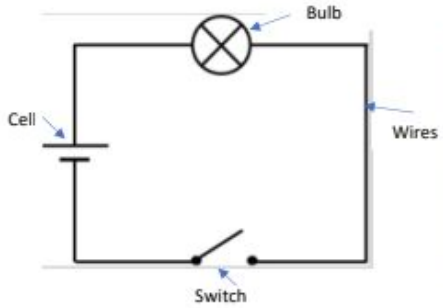
Simple Circuit



This is a simple circuit. It is a complete circuit where electrons can flow around the circuit.



Scientific Diagrams and Symbols



Science Capital

Alessandro Volta



He discovered the first practical method of making electricity.

Michael Faraday



First person to discover that moving a magnet near a coil of copper wire introduced an electric current in a wire.



Thomas Edison



He developed many devices including the early version of the electric light bulb.


1941- Solar Power





1956- Nuclear Power



2000- Wave Power




How did Britain change in the Stone Age?

Subject Specific Vocabulary			Exciting Books
archaeologists	People who discover our history by looking at artefacts that have been found.		<h3>Sticky Knowledge about the Stone-age period</h3> <ul style="list-style-type: none"> <input type="checkbox"/> The Stone Age period is said to have started around 3 million year ago when humans started to live in Europe. <input type="checkbox"/> The Stone Age was followed by the Bronze Age period. This is when humans started to use metal. <input type="checkbox"/> The Bronze Age was followed by the Iron Age when tools and weapons became more advanced and were used for farming, hunting and fighting. <input type="checkbox"/> During the Palaeolithic Age (old Stone Age), people gathered food by hunting wild animals and birds, fishing, and collecting fruits and nuts. <input type="checkbox"/> During the Neolithic Age (towards end of the Stone Age), the humans formed settled communities, and domesticated plants and animals for the first time in history.
artefact	An object made by human beings, usually with historical or cultural interest.		
Neolithic	The later part of the Stone Age and following the Palaeolithic and Mesolithic Age.	<h3>Important</h3> <p>Skara Brae The archaeological site found on the Orkney Islands in Scotland. It is a Stone Age village that has been well preserved.</p> <p>Stonehenge A famous Stone Age monument in Wiltshire.</p>	
B.C.	Before Christ. The date 250BC means 250 years before Christ was born.		
chronology	The ordering of events, for example the Stone, Bronze and Iron Age.		
tribal	Groups of people who live together.		
hunter-gatherers	People who mainly live by hunting, fishing and gathering wild fruit.		
shelter	A house where Stone Age people would have lived.		
civilization	When people live in a large society with a shared culture and rules.		
settlement	A place where there were several Stone Age shelters, like a small village.		
prey	An animal that is hunted for its food.		