







Malpas Alport Primary School – Science Curriculum

Purpose of Study	A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.					
Aims	<p>The national curriculum for science aims to ensure that all pupils:</p> <ul style="list-style-type: none"> develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. 					
Curriculum Design	<p>The Malpas Alport Science Curriculum explicitly sets out the substantive and disciplinary knowledge children will learn in each lesson to ensure there is clear interplay between the types of knowledge. To support schema development, lessons are sequenced to build on prior learning with each lesson having clearly defined knowledge to revisit.</p> <p>The Malpas Alport Science curriculum is sequenced following the topics as they are set out in the National Curriculum for KS1 and KS2. At Malpas Alport, we prioritise the STEM subjects. All year groups have a STEM based topic that is covered for a full term each year. These topics make explicit links between the Design and Technology, Science and Computing curriculums.</p>					
Personal Development Links						
	RESPECT	SMSC	Rights Respecting	British Values	Jigsaw	Trips and Visits



Topic Overview Year 6

	HT1	HT2	HT3	HT4	HT5	HT6
Year 6	Animals including humans	Evolution and inheritance	Light	Living things and their habitat	Electricity	

HT1 - Animals including humans

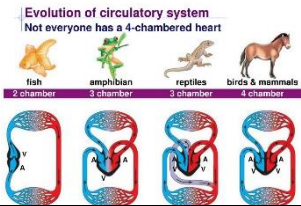
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review the names of the key parts of the digestive system. Review names of the different types of teeth and their functions.	Review the different components of blood and their functions. Review the different types of blood vessels and their functions.	Review the main parts of the digestive system and their functions. Review the different components of blood and their functions. Review the different types of blood vessels and their functions.	Review that nutrients come from the food we eat. Review carnivores, herbivores and omnivores and how we can tell an animal's diet by their teeth.	Review the different food groups and the importance to eat a balanced diet.	Review how diet, exercise and lifestyle can impact how the body functions.
Lesson sequence	Identify the components of blood and describe their functions. Name and describe the different blood vessels and their functions.	Explore the structure and function of the human heart.	Identify and name the main parts of the human circulatory system.	Describe the ways in which nutrients and water are transported within animals, including humans.	Recognise the impact of diet, exercise and lifestyle on the way our bodies function. Measure resting heart rate every week.	Identify how drugs and alcohol impact on the way the human body functions.

Knowledge - Animals including humans

Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	  <p>Blood Blood is made up of liquid and solids.</p> <p>The liquid part is water and protein (plasma). The solid part includes white blood cells, red blood cells and platelets.</p> <p>Plasma carries the solid parts of the</p>	<p>Research using secondary sources Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe,</p>			

		<p>blood through the body. Red blood cells carry oxygen through the body. White blood cells fight infection. Platelets help you top stop bleeding when you get hurt. The main vessels are arteries, veins and capillaries. <u>Arteries take blood away from the heart and veins in take blood in.</u></p>	<p>discuss and evaluate primary sources. Know that information texts use scientific language. Secondary sources of information can be used to research the make-up of blood.</p>	
2	 	<p><u>The Heart & Circulatory System</u> The circulatory system includes the heart, lungs veins, capillaries and arteries that run through the body.</p>		
3		<p>Children can name: - Left and right ventricles - Left and right atrium - Valves - Aorta - Pulmonary artery</p> 		
4	 	<p><u>Animals</u> Some animals have different circulatory systems to humans. · A human has a four chamber heart. · A fish has a two chamber heart.</p>		

• Reptiles and amphibians have three chamber hearts.



5



Exercise

Exercise is very important to maintain a healthy heart. The average resting heart beat per minute is 60 (bpm). Some athletes have resting heart beats between 30—40 bpm.

Diet

Healthy diets can look different for different types of people depending on their individual needs; weight lifters and ballerinas have very different diets.

Pulse can be used to measure heart rate because every time the heart contracts, a surge of blood is sent through all arteries.

Observation over time

Observing over time is when make systematic and careful observation to identify and measure changes over a period of time.

Regular observations/ measurements need to be made at set intervals.

External factors may affect results.

You need to control the variables to limit the impact of external factors.

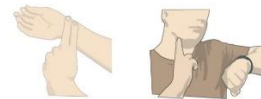
Stopwatches can be used to accurately measure time.



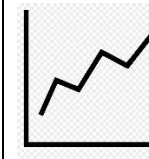
Time can be measured in minutes/seconds.

1 minute = 60 seconds.

To measure your heart rate/ pulse, place your index and third fingers on your neck to the side of your windpipe. To check your pulse at your wrist, place two fingers between the bone and the tendon over your radial artery — which is located on the thumb side of your wrist.



Line graphs can be used to plot data collection over time.



The x axis shows the time

The y axis represents what is being measured.


Plotted points on a line graph need to be joined by straight lines.

Know how to draw a line graph.

Know that results from a scientific enquiry can be used to answer a scientific question.

To answer a scientific question, you should include evidence from your scientific enquiry.

Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.








6		<p>Drugs Drugs are substances that have an effect on the body when it enters the system. There are legal and illegal drugs. Drugs, alcohol and smoking can impede the body's ability to focus and function normally.</p>
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HT2 - Evolution and inheritance

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review how sounds are made and how they are associated with something vibrating. Review volume and pitch. Review fossils and how they are made. Review Mary Anning and the discoveries she made.	Review offspring and changes over time. Review reproduction of plants and animals.	Review how habitats provide basic needs for plants and animals. Review basic needs of a living thing.	Review the term adaptation and revisit how animals have adapted to their environments.	Review term natural selection and how animals have adapted to their environment to aid survival.	Review ideas of adaptation and natural selection.
Lesson sequence	Investigate how fossils provide information about living things that inhabited the Earth millions of years ago.	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	Recognise that living things have changed over time. Identify how animals have adapted to suit their environment in different ways.	Understand the term natural selection and investigate how traits give them a survival advantage. E.g. giraffe necks. Look at how humans have impacted on natural selection through artificial selection.	Look at work by Charles Darwin on finches' beaks.	Identify that adaptation by animals and plants to their environment may lead to evolution. Look at work of Darwin.

Knowledge – Evolution and inheritance

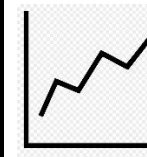
	Substantive knowledge	Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify,</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.

		<i>comparative/fair test, research using secondary sources)</i>				
1	 	<p>Fossils provide information about living things from the past. Fossils are the impressions of the remains of prehistoric animals or plants embedded in rock and preserved.</p>	<p>Identifying and classifying Classifying is when something is grouped or ordered into categories based on properties or criteria.</p>		<p>Scientists use fossils to develop explanations about animals that are now extinct, such as dinosaurs.</p>	
2	 	<p>Inheritance – the characteristic traits that are genetically passed to offspring from their parents. E.g. hair colour, eye colour, height. Offspring share 50% of their DNA with each parent.</p>	<p>Pattern Seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>You can carry out a pattern seeking enquiry to see how dominant characteristics are passed on through genes.</p>			
3	  	<p>Adaptation – living things change over time and adapt to the surroundings in which they live to increase survival and chances of reproduction.</p> <p>Different varieties of the same species live in different places around the world.</p> <p>Panda bears, polar bears and brown bears live in different environments and have adapted over time to increase their chances of survival and reproduction.</p>	<p>Identifying To identify, you make observations and measurements to find similarities and differences. This helps to organise things into groups and make connections.</p> <p>You can identify how animals have adapted over time to survive within their environment.</p>			<p>Scientists have studied the characteristics of different varieties of animals, such as bears. They have analysed the geographical locations of different bears and drawn conclusions about why that specific variation has survived within that specific environment.</p>
4	 	<p>Natural selection is the idea that species change over time in order to survive in their environment and reproduce. As offspring are born, they have the advantageous genetic characteristics passed on from their parents. Over time, this is how species</p>	<p>Identifying To identify, you make observations and measurements to find similarities and differences. This helps to organise things</p>			

		<p>adapt. Living things that are unable to adapt to the changes in the environment are unlikely to survive</p> <p>E.g. Giraffes used to have shorter necks but they have evolved to have longer necks so that they can reach the top leaves on tall trees.</p> <p>Artificial selection – when human’s intervene in evolution by breeding animals for specific traits.</p>	<p>into groups and make connections.</p> <p>You can identify how animals have adapted over time to survive within their environment.</p>
5		<p>Darwin’s finches – Darwin observed that there were many forms of finches that had different beak sizes and shapes. Each type of finch had a different food source which he noted as the reason for the adaptation.</p>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>We can mimic an observation of change across generations and note the patterns which occur.</p>
6	 	<p>Evolution describes the gradual changes that happen in the same species, living in the same location, over a long time. Scientists have proof that living things are continuously evolving – even today!</p>	

A table can be used to record results/patterns observed at different stages.

Line graphs can be used to plot data collection over time.



The x axis shows the time

The y axis represents what is being measured.

Plotted points on a line graph need to be joined by straight lines.

Know how to draw a line graph.

Evolution does not describe people changing their bodies by exercise or dyeing their hair. Evolution happens over a much longer time and can only happen between parents and offspring through inheritance.


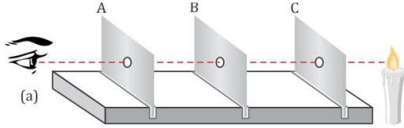

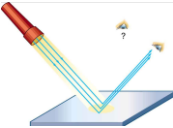

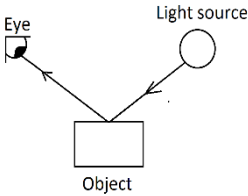


Charles Darwin – theory of evolution by **natural selection**. This is the process by which organisms change over time as a result of changes in inheritable physical or behavioural traits. The strongest traits survive over generations.

HT3 - Light

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review that light comes from a light source and we need it in order to see. Review dangers of staring directly at the sun. Review that darkness is the absence of light.	Review that light is reflected from different surfaces. Review that light travels in straight lines. Review that light is needed in order to see.	Review that we need light in order to see and that objects are seen because they reflect light into the eye. Review that the Earth's rotation in 24 hours is what causes day and night. Review how the Earth moves relative to the sun.	Review how the moon orbits the Earth in one month. Review that shadows are formed when a light source is blocked by an opaque object.	Review the planets in the solar system. Review that light travels in straight lines.	Review that we see because light travels from a light source or light sources to objects that then reflect light into our eyes.
Lesson sequence	Recognise that light appears to travel in straight lines	Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.	Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Understand that light can be bent when it is slowed down. (Refraction).	Recognise the white light can be split into 7 rainbow colours - the colours of the spectrum merge to make visible light.

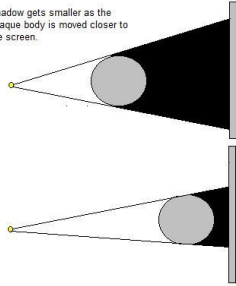
Knowledge – Light

	Substantive knowledge	Disciplinary Knowledge			
		Knowledge of methods that scientists use to answer questions	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.

Personal Development		<i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>			
<p>1</p> 	<p>Light travels in straight lines.</p> 	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>In order to prove that light travels in a straight line, children conduct an investigation into how they can get a light beam to reach a target.</p>	<p>A torch is a source of light.</p>  <p>Mirrors can be used to reflect light.</p> 		<p>Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.</p>
<p>2</p> 	<p>Objects are seen because they give out or reflect light into the eye.</p> 	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>A pattern seeking enquiry can be carried out to investigate how light reflects.</p>	<p>A torch is a source of light.</p> <p>Mirrors can be used to reflect light.</p>	<p>A diagram can be used to show scientific concepts.</p> <p>A diagram is a picture that is labelled.</p> <p>Know how to draw a diagram to show how we see.</p>	<p>To answer a scientific question, you need to identify evidence from your scientific enquiry that supports your conclusion.</p> <p>Know that scientific language should be used when explaining findings.</p>
<p>3</p> 	<p>We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p>				
<p>4</p> 	<p>Shadows have the same shape as the objects that cast them. This is because light travels in straight lines and shadows are formed when an object blocks the light.</p>	<p>Fair Testing A fair test is when one variable is changed and the others remain constant.</p> <p>A variable is a factor that can change.</p>	<p>A torch is a source of light.</p> <p>Distance between a light source and an object can be measured using rulers in m/cm/mm.</p>	<p>Recording results in a table</p>	<p>To answer a scientific question, you need to identify evidence from your scientific enquiry that supports your conclusion.</p> <p>Know that scientific language should be used when explaining findings.</p>

Shadows get smaller as the object is moved towards the opaque surface.

Shadow gets smaller as the opaque body is moved closer to the screen.



An independent variable is a variable that the experimenter can control.

A dependent variable is the variable being tested and measured in the experiment.

A fair test can be carried out to investigate how changing the distance of a light source from an opaque object affects the size of the shadow.



1m = 100cm
1cm = 10mm

Know that test results can be used to make predictions to set up further fair tests.

5



When light passes through a denser material (such as water) it slows down and therefore appears to 'bend'. This is called **refraction**.



The light changes direction as it has been slowed.

Pattern seeking

Pattern seeking is when you observe variables that cannot be controlled to notice patterns.

Variables are anything that can change or be changed.

A pattern seeking enquiry can be carried out to investigate how objects appear to change when placed in water due to light refraction.

To answer a scientific question, you need to identify evidence from your scientific enquiry that supports your conclusion.

Know that scientific language should be used when explaining findings.

Know that scientific evidence is used to support ideas.

6		<p>White light can be split into 7 rainbow colours - the colours of the spectrum merge to make visible light.</p>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>A pattern seeking enquiry can be carried out to investigate the colours of the rainbow merge to form white light.</p>	<p>A torch is a light source.</p> <p>Prisms can be used to refract light.</p>	<p>To answer a scientific question, you need to identify evidence from your scientific enquiry that supports your conclusion.</p> <p>Know that scientific language should be used when explaining findings.</p> <p>Know that scientific evidence is used to support ideas.</p>

HT4 - Living things and their habitat

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review work from Y4 - Characteristics of living things (MRS GREN) - Classification keys.	Review work by Carl Linnaeus on classification.	Revisit the 5 Kingdoms of living things. Revisit different types of animals from year 4.	Review classification keys and how to use them. Review classification of animals.	Review the classification of animals and plants.	Review microorganisms and the three types. Review work on bacteria
Lesson sequence	Look at the work of Carl Linnaeus and how he developed the system of classification.	Children are to find out about the 5 Kingdoms used to classify living things.	Classifying animals into vertebrate and invertebrate.	Classifying plants into 4 categories: flowering, ferns, conifers and mosses.	Introduce children to microorganisms. Investigate bacteria.	Children to investigate protista and fungi.

Knowledge – Living things and their habitat

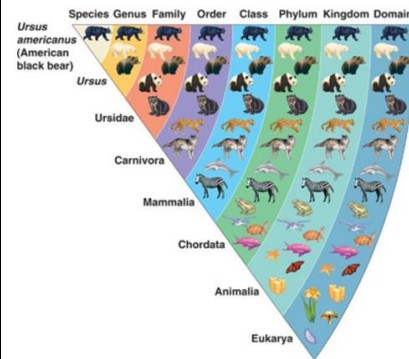
Substantive knowledge	Disciplinary Knowledge
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Personal Development

1



A classification key is a tool that uses yes and no questions to group living things based on their characteristics. Carl Linnaeus developed a system to classify living things (plants and animals) so they could be easily identified.



Knowledge of methods that scientists use to answer questions

(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)

Identify/ Classify

Classifying is when something is grouped or ordered into categories based on properties or criteria.

Know that you can classify animals, humans, plants and bacteria.

Know that each of these can be further classified based on their identifiable key features.

Research using secondary sources

Research is an investigation or study to find out facts in order to reach a conclusion.

Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.

Know that information texts use scientific language.

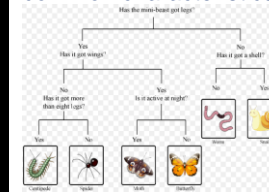
Secondary sources of information can be used to research the Linnaean classification system.

Knowledge of apparatus and techniques, including measurement

Knowledge of data analysis

Knowledge of how science uses evidence to develop explanations.



A classification key is a set of yes and no questions that help you to identify something based on common characteristics.




Know how to draw a classification key.

Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.

Know that scientific language should be used when explaining findings.

2		<p>Work on classification has developed since Linnaeus and we now categorise living things into 5 kingdoms: animal, plant, protista, fungi and menera. Menera and Protista are both single cell organisms - Protista are more complex</p> <p><u>Animal Kingdom</u> Animals can be categorised as vertebrates and invertebrates. These groups can then be subdivided.</p> <p>Vertebrate – animals with a back bone Bird – e.g. penguin, owl, ostrich Fish – e.g. tuna, shark, pike Mammal – e.g. dolphin, whale, human Reptile – e.g. snake, crocodile, turtle Amphibian – e.g. toad, salamander, frog</p> <p>Invertebrate – animals without a backbone Worms – e.g. earthworm, leech Arthropods – e.g. spiders, ants, butterfly Molluscs – e.g. snail, squid, octopus Flatworm – e.g. flat worm, tape worm Echinodermata – e.g. starfish, sea urchin.</p>	<p><u>Identify/ Classify</u> Classifying is when something is grouped or ordered into categories based on properties or criteria.</p> <p>Know that you can classify animals as vertebrates and invertebrates.</p> <p><u>Pattern seeking</u> Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p>		<p>Know that an exploded diagram shows how separate parts fit together.</p> <p>Know how to draw an exploded diagram.</p>	
3		<p><u>Plant Kingdom</u> Photosynthesis – the process where a green plant turns water and carbon dioxide into food when exposed to light.</p> <p>Plants can be classified into 4 main groups: flowering, conifers, ferns and mosses.</p>	<p><u>Identify/ classify</u> Classifying is when something is grouped or ordered into categories based on properties or criteria.</p> <p>Know that you can identify features in different classifications of plants.</p>			

	<p>Flowering plants – produce flowers which can develop fruits and seeds after being pollinated and fertilised.</p> <p>Conifers – seeds are housed inside woody protective structures called cones.</p> <p>Ferns – have neither seeds nor flowers, but reproduce via miniature cells called spores.</p> <p>Mosses – do not produce seeds or carry flowers. They reproduce by releasing spores. Mosses do not have true stems, leaves or roots.</p>		
4	 <p>Microorganisms A.K.A: microbes A micro-organism is a very tiny living thing that can only be seen with a microscope.</p> <p>There are 3 main groups of micro-organisms: menera, protista and fungi.</p> <p>Kingdom Fungi – yeast, mould and mushrooms. These are found everywhere. They cannot produce their own food like plants.</p>	<p>Observation over time Observing over time is when make systematic and careful observation to identify and measure changes over a period of time.</p> <p>Regular observations/measurements need to be made at set intervals.</p> <p>External factors may affect results.</p> <p>You need to control the variables to limit the impact of external factors.</p> <p>Know that you can observe slices of bread over time to investigate the growth of mould.</p>	<p>A grid can be used to increase accuracy and reliability of measuring mould growth.</p> <p>To observe something in detail that is very small you can use a microscope.</p>  <p>Know that different types of graphs are best suited to presenting different types of information.</p> <div data-bbox="1473 890 1765 1209"> <p>Bar Graph Compares choices by how much and how many. September Stationery Sales</p> <p>Line Graph Shows one variable over time. February Flower Sales</p> <p>Pie Chart Shows parts to the whole (percentages). How Students Get to School</p> <p>Pictograph Shows how many with an icon or picture. Students' Favourite Colour</p> </div> <p>Know how to select the most appropriate type of graph to display the data you have.</p>



5		<p>Micro-organisms: Bacteria and Viruses</p> <p>Bacteria are found almost everywhere on Earth and are vital to the planet's ecosystems Some bacteria are good and some are harmful Viruses infect a host and multiply within the living cells of another organism</p>	<p><u>Research using secondary sources</u></p> <p>Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>Know that secondary sources of information can be used to research the differences between bacteria and viruses.</p>
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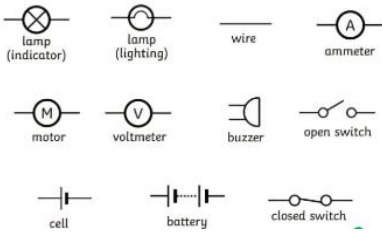
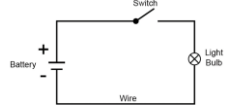

HT5/6 - Electricity







	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	<p>Review how levers and pulleys work and allow a smaller force to have a greater effect.</p> <p>Review simple parts of a series circuit including cells, wires, bulbs, switches and buzzers.</p> <p>Review that a circuit needs to be complete in order for the bulb to light/ buzzer to sound.</p>	<p>Review simple parts of a series circuit and how to make a complete circuit.</p>	<p>Review basic parts of a circuit and the related circuit symbols.</p>	<p>Review circuit symbols.</p> <p>Review how switches work.</p>	<p>Review circuit symbols.</p> <p>Review how the number/voltage of cells can change the brightness/volume.</p>	<p>Review properties of a solid, liquid and gas - reversible and irreversible changes.</p> <p>Review how the number/voltage of cells can change the brightness/volume.</p> <p>Review circuit symbols</p>
Lesson sequen	<p>Review insulators and conductors.</p> <p>Explore what electricity is and how it is generated.</p>	<p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Explore what a cell is and how it works.</p>	<p>Introduce term voltage.</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and</p>	<p>Compare and give reasons for variations in how components function, including the brightness of</p>	<p>Use knowledge of how to change the function of components by changing the position of a switch and</p>

			voltage of cells used in the circuit Investigate variations in components functions changing the brightness of bulbs and loudness of buzzers.	bulbs, the loudness of buzzers. Investigate the impact of changing the position of the on/off switch.	voltage/number of cells to design and make their own product e.g. burglar alarm, traffic lights.
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Knowledge - Electricity

Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	 <p>Electricity is a form of energy resulting from charged particles.</p> <p>Electrical conductor – a material that allows electricity to pass through it e.g. copper, iron, steel, silver gold.</p> <p>Electrical insulator – does not allow electricity to pass through e.g. rubber, wood, plastic, paper.</p> <p>In order for electricity to flow, a circuit needs: a source of electricity, no gaps in the circuit, conductors.</p>	<p>Classifying Classifying is when something is grouped or ordered into categories based on properties or criteria.</p> <p>Know that these materials can be classified as conductors or insulators:</p> <ul style="list-style-type: none"> - Copper tape - Metal paperclip - Plastic paperclip - Rubber 	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p>  <p>Outputs are achieved when there is a complete circuit.</p>		<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Conclude that effective circuits are created with an electricity source and conductors.</p>

<p>2</p>	 <p>Circuit symbols can be used to draw a simple series circuit including:</p> <ul style="list-style-type: none"> - Battery (cell) - Wire - Bulb Buzzer - Motor - Switch (on/off) 	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p>		<p>Circuits can be represented as diagrams using symbols for each component</p> <p>Know how to draw a circuit diagram:</p> <ul style="list-style-type: none"> • Wires are drawn with a straight line using a ruler • Circuit diagrams are drawn as a birds-eye-view • Circuit diagrams are drawn rectangular • Components of the circuit must touch the wire lines to show the circuit has no breaks 	
<p>3</p>	 <p>A cell is a device containing electrodes that is used for generating current.</p> <p>A battery is a collection of cells. It stores energy until it is needed.</p> <p>Voltage is the force that makes the electric current move through the wires. The greater the voltage, the more current will flow.</p> <p>Mains electricity has a voltage of 210-240 volts. A typical cell in school has 1.5 volts.</p> <p>Current is a flow of electricity which results from the ordered, directional</p>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>Know that a pattern seeking enquiry can be carried out to investigate how increasing the number of cells, increases the voltage.</p>	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p> <p>We measure the amount of electrical energy (voltage) in Volts.</p> <p>A volt metre is used to measure voltage.</p> <p>To attach a voltmeter to a circuit, use wires that touch the circuit. Do not touch the metal parts of wires- use the plastic coating to manoeuvre.</p>	<p>A line graph is a graph that is used to display change over time. A series of data points are connected by a straight line.</p> <p>Know how to draw a line graph and that appropriate scales need to be selected for each axis.</p> <p>Know that the axis on a line graph need to be labelled.</p> <p>A line graph can demonstrate the relationship between the increase of cells and voltage.</p>	

		movement of electrically charged particles.				
4			Fair test A fair test is when one variable is changed and the others remain constant.	A light meter can be used to measure the brightness of a bulb.	Know that different types of graphs are best suited to presenting different types of information.	
5		The brightness of a bulb is associated with the voltage. More batteries (or a higher voltage) creates more power to flow through the circuit a bulb would therefore be brighter. More buzzers/bulbs in a circuit means that power is shared by more components in the circuit. Increasing the number of buzzers/bulbs/motors would therefore decrease the power in each (the bulbs would be dimmer).	A variable is a factor that can change.	 The light meter must be held against the bulb. The brightness of a bulb is measure in amps.	Know how to select the most appropriate type of graph to display the data you have.	
6	 	Switch – an electrical component that can make/break an electrical circuit. When a switch is open there is a gap in the circuit and electricity cannot flow around the circuit. 	Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns. Variables are anything that can change or be changed. A pattern seeking enquiry can be carried out to identify that different components can be used within a circuit for different purposes.			Know that scientific diagrams e.g. circuit diagrams can aid scientific explanations. Conclude that a complete circuit creates an output, which can be used for a specific purpose.