

Science skills and progression coverage map 2025/2026

This science skills and progression document is a working document – the objectives catalogued for each year group are non-negotiable as they describe a sequential progression, through year groups, carefully designed to build substantive and disciplinary concepts as defined in the National Curriculum. The Cornerstones lessons listed, and the additional ideas in the appendix, however are suggested. Individual teaching teams may find alternative resources that teach the same objectives appropriately. Where year groups are taught in mixed age, we operate a Year A/B model for substantive learning. Within disciplinary learning, the National Curriculum stipulates a two-year objective, where there is an introductory and embedding year. This progression stipulates the differentiated expected output for each year group.

		YEAR 3	YEAR 4	YEAR 5	YEAR 6	
Disciplinary Knowledge	Asking questions and recognising that they can be answered in different ways	To ask relevant questions and use different types of scientific enquiries to answer them <ul style="list-style-type: none"> To answer relevant questions posed by the teacher and use sentence stems or practical work to answer them. 	<ul style="list-style-type: none"> To consider prior knowledge when asking questions using a range of given resources, and answer them through practical work. 	To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary <ul style="list-style-type: none"> To decide how to gather evidence to answer a scientific question, choosing and controlling variables where necessary. 	<ul style="list-style-type: none"> To choose a type of science enquiry to carry out and justify the choice, including controlling variables where necessary. 	
	Making observations and taking measurements	To make systematic and careful observations and, where appropriate, taking accurate measurements <ul style="list-style-type: none"> To record observations and understand outcomes can be measured. 	<ul style="list-style-type: none"> To make systematic and careful observations, take accurate measurements and use standard units of measurements. 	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate <ul style="list-style-type: none"> To select appropriate measuring equipment to give the most precise results. <i>e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. Teacher directed as to whether to take repeat readings</i> To repeat readings in discussion with the teacher. 	<ul style="list-style-type: none"> To make scientific decisions during an investigation. <i>e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value)</i> 	
		To use standard units, using a range of equipment, including thermometers and data loggers				
		<ul style="list-style-type: none"> To select from given resources to take measurements and identify how the measurements change (including using thermometers and data loggers) (<i>e.g. the temperature increases when..., it was faster when...</i>) 	<ul style="list-style-type: none"> To use standard units when taking measurements, using a range of equipment (including thermometers and data loggers). 			

Engaging in practical enquiry to answer questions	<p>To set up simple practical enquiries, comparative and fair tests</p> <ul style="list-style-type: none"> To select from a range of given resources to set up simple practical enquiries, comparative and fair tests <div data-bbox="344 272 663 552" style="border: 1px solid black; padding: 5px;"> <p>Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.</p> <p>A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.</p> </div> <ul style="list-style-type: none"> To plan and carry out practical enquiries, comparative and fair tests <div data-bbox="792 272 1111 552" style="border: 1px solid black; padding: 5px;"> <p>Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.</p> <p>A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.</p> </div>	<p>To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> To select from a range of practical resources to gather evidence to answer own questions To carry out fair tests, recognising and controlling variables To identify patterns and relationships <ul style="list-style-type: none"> To design a scientific enquiry to answer a specific question To decide what observations or measurements to make and for how long. To look for patterns and relationships using a suitable sample
Recording and presenting evidence	<p>To gather, record, classify and present data in a variety of ways to help answer questions</p> <ul style="list-style-type: none"> To present the same data in different ways (e.g. results in a table are shown in a bar chart, initial observations then shown in a labelled diagram) <ul style="list-style-type: none"> To decide how to record and present evidence (e.g. they choose how to record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams) <p>To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <ul style="list-style-type: none"> To record findings under teacher direction using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (e.g. could be given formats for tables and charts to complete) <ul style="list-style-type: none"> To record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables increasingly of their own design 	<p>To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <ul style="list-style-type: none"> To decide how to record and present increasingly complex evidence, including own measurements (e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.) <ul style="list-style-type: none"> To decide how to present the same increasingly complex data in different ways in order to help with answering the question
	To use straightforward scientific evidence to answer questions or to support findings	To identify scientific evidence that has been used to support or refute ideas or arguments

Answering questions and concluding	<ul style="list-style-type: none"> To use evidence to answer questions and to support findings 	<ul style="list-style-type: none"> To answer questions and support findings where the answers given are consistent with scientific evidence 	<ul style="list-style-type: none"> To identify how or if own scientific ideas have changed due to new evidence gathered To identify how new discoveries have change scientific understanding 	<ul style="list-style-type: none"> To identify whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer to the question posed
	To identify differences, similarities or changes related to simple scientific ideas and processes		To report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	
	<ul style="list-style-type: none"> To identify differences, similarities or changes within their investigations 	<ul style="list-style-type: none"> To identify differences, similarities or changes related to simple scientific ideas and processes investigated 	<ul style="list-style-type: none"> To present what was found out To identify causal relationships and patterns To begin to explain why investigation results may not be trusted 	<ul style="list-style-type: none"> To conclude results from investigations using their scientific knowledge To identify and explain understanding of findings that do not fit the overall pattern or causal relationship
	To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions			
	<ul style="list-style-type: none"> To interpret findings to generate simple and comparative statements based on evidence in explanations, displays and presentations 	<ul style="list-style-type: none"> To interpret findings from enquiries to identify patterns and causal relationships in explanations, displays and presentations 		
Evaluating and raising further questions and predictions	To use results to draw simple conclusions		To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentation	
	<ul style="list-style-type: none"> To identify ways in which methods were adapted as the experiment progressed 	<ul style="list-style-type: none"> To identify ways to improve the validity of the results if the enquiry was repeated 	<ul style="list-style-type: none"> To evaluate the choice of method, the control of variables or the precision and accuracy of the measurements; including the credibility of secondary sources 	<ul style="list-style-type: none"> To identify any limitations that reduce the trust they have in their data; including the credibility of secondary sources
	To make predictions for new values, suggest improvements and raise further questions		To use test results to make predictions to set up further comparative and fair test	
	<ul style="list-style-type: none"> To ask further questions which can be answered by extending the same enquiry 	<ul style="list-style-type: none"> To use evidence to suggest values for different items tested using the same method 	<ul style="list-style-type: none"> To use the scientific knowledge gained from enquiry work to make further predictions 	<ul style="list-style-type: none"> To use the scientific knowledge gained from enquiry work to make further predictions they can investigate using comparative and fair tests
Communicating their findings	To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions		To report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	

		<ul style="list-style-type: none"> To communicate findings both orally and in writing, using appropriate, subject specific scientific vocabulary, with teacher guidance 	<ul style="list-style-type: none"> To communicate findings both orally and in writing, using appropriate, subject specific scientific vocabulary 	<ul style="list-style-type: none"> To communicate findings to an audience using relevant scientific language and illustration, with teacher guidance 	<ul style="list-style-type: none"> To communicate findings to an audience using relevant scientific language and illustration
	Key vocabulary	Accurate, bar chart, chart, classify, comparative test, conclusion (What have we found out?), criteria, data, develop, diagram, evaluate, evidence, explanation, key, making a test fair, fair test , method, observations, plan (What will we do?), practical enquiry, prediction (What do you think will happen?), primary sources, questioning, reasoning, relationships results (What happened?), secondary sources, standard units, table, What do we change, what do we keep the same, what are we measuring?	Accurate, bar chart, chart, classify, comparative test , conclusion (What have we found out?), criteria, data, develop, diagram, evaluate, evidence , explanation, key, making a test fair, method, observations, plan (What will we do?), practical enquiry, prediction (What do you think will happen?), primary sources, questioning, reasoning, relationships results (What happened?), secondary sources, standard units, table, What do we change, what do we keep the same, what are we measuring?	accuracy and precision, bar graphs, causal relationship , degree of trust, dependent variable, independent variable, justify, line graphs, refute repeat results , scatter graphs, support, variables (what do we change, what do we keep the same, how and what are we measuring?)	accuracy and precision, bar graphs, causal relationship, degree of trust, dependent variable , independent variable , justify, line graphs, refute repeat results, scatter graphs, support, variables (what do we change, what do we keep the same, how and what are we measuring?)
	Skill	CYCLE B (Year 3 objectives)	CYCLE A (Year 4 objectives)	CYCLE B (YEAR 5 objectives)	CYCLE A (YEAR 6 objectives)
Substantive Knowledge	Plants	<ul style="list-style-type: none"> To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) To explore the requirements of plants for life and growth vary from plant to plant To investigate the way in which water is transported within plants To explore the part that flowers play in the life cycle of flowering plants -pollination To explore the part that flowers play in the life cycle of flowering plants - seed formation 			

	<ul style="list-style-type: none"> To explore the part that flowers play in the life cycle of flowering plants - seed dispersal 			
Animals, including humans	<ul style="list-style-type: none"> To identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat To identify that humans have skeletons for support, protection and movement To identify that some other animals have skeletons for support, protection and movement To identify that humans and some other animals have muscles for support, protection and movement 	<ul style="list-style-type: none"> To describe the simple functions of the basic parts of the digestive system in humans To identify the different types of teeth in humans To identify the functions of different teeth in humans To construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> To describe the changes as humans develop to old age (TEACH BEFORE ANIMALS INCLUDING HUMANS AND LIVING THINGS YR6) 	<ul style="list-style-type: none"> To identify and name the main parts of the human circulatory system To describe the functions of the heart To describe the functions of blood vessels and blood To recognise the impact of diet on the way their bodies function To recognise the impact of exercise on the way their bodies function To recognise the impact of drugs on the way their bodies function To recognise the impact of lifestyle on the way their bodies function To describe the ways in which nutrients and water are transported within animals, including humans
Evolution and inheritance				<ul style="list-style-type: none"> To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Living things and their habitats		<ul style="list-style-type: none"> To recognise that living things can be grouped in a variety of ways To explore and use classification keys to help group, identify and name a variety of living things in the local environment 	<ul style="list-style-type: none"> To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird To describe the life process of reproduction in some animals To describe the life process of reproduction in some plants (TEACH 	<ul style="list-style-type: none"> To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals

		<ul style="list-style-type: none"> • To explore and use classification keys to help group, identify and name a variety of living things in the wider environment • To recognise that environments can change and that this can sometimes pose dangers to living things 	BEFORE ANIMALS INCLUDING HUMANS AND LIVING THINGS YR6)	<ul style="list-style-type: none"> • To give reasons for classifying plants based on specific characteristics • To give reasons for classifying animals based on specific characteristics
Light	<ul style="list-style-type: none"> • To recognise that they need light in order to see things • To recognise that dark is the absence of light • To notice that light is reflected from surfaces • To recognise that light from the sun can be dangerous and that there are ways to protect their eyes • To recognise that shadows are formed when the light from a light source is blocked by an opaque object • To find patterns in the way that the size of shadows change 			<ul style="list-style-type: none"> • To 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 • To recognise that light appears to travel in straight lines • To 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 • To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Forces and magnets	<ul style="list-style-type: none"> • To compare how things move on different surfaces • To notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • To observe how magnets attract or repel each other and attract some materials and not others • To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • To describe magnets as having 2 poles • To predict whether 2 magnets will attract or repel each other, depending on which poles are facing 		<ul style="list-style-type: none"> • To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • To identify the effects of friction • To identify the effects of air resistance • To identify the effects of water resistance • To recognise levers allow a smaller force to have a greater effect • To recognise that gears allow a smaller force to have a greater effect • To recognise pulleys allow a smaller force to have a greater effect 	

Rocks	<ul style="list-style-type: none"> • To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • To describe in simple terms how fossils are formed when things that have lived are trapped within rock • To recognise that soils are made from rocks and organic matter 			
Electricity		<ul style="list-style-type: none"> • To identify common appliances that run on electricity • To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • To identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • To recognise some common conductors and insulators, and associate metals with being good conductors 		<ul style="list-style-type: none"> • To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • To compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • To use recognised symbols when representing a simple circuit in a diagram
Sound		<ul style="list-style-type: none"> • To identify how sounds are made, associating some of them with something vibrating • To recognise that vibrations from sounds travel through a medium to the ear • To find patterns between the pitch of a sound and features of the object that produced it • To find patterns between the volume of a sound and the strength of the vibrations that produced it 		

		<ul style="list-style-type: none"> • To recognise that sounds get fainter as the distance from the sound source increases 		
Earth and space			<ul style="list-style-type: none"> • To describe the movement of the Earth and other planets relative to the sun in the solar system • To describe the movement of the moon relative to the Earth • To describe the sun, Earth and moon as approximately spherical bodies • To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky 	
Properties and changes of materials			<ul style="list-style-type: none"> • To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • To demonstrate that dissolving, mixing and changes of state are reversible changes 	

			<ul style="list-style-type: none"> To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda 	
State of matter		<ul style="list-style-type: none"> To compare and group materials together, according to whether they are solids, liquids or gases To observe that some materials change state when they are heated or cooled To measure or research the temperature at which changing state happens in degrees Celsius (°C) To identify the part played by evaporation and condensation in the water cycle To associate the rate of evaporation with temperature 		

Year 3 appendix

Substantive knowledge	Cornerstones Guidance	Suggested lesson ideas	Vocabulary
Plants	Tribal Tales: Harvest time Predator: Parasitic plants What are flowers for? Do plants have legs? Why are trees tall? Companion project: Plant Nutrition and Reproduction	Pull apart flowers and stick onto A3 sheet. Children to identify different parts of flower with labels. Photos for books. Observe what happens to plants over time when the leaves or roots are removed. Observe flowers being visited by pollinators e.g. bees and butterflies in the summer/ Observe flowers carefully to identify the pollen. Record findings Seeds in different places in the classroom which will grow the most and why? What would they like to know now? Link to water transportation lesson- use results to make prediction about this lesson	Pollen, insect/wind pollination , seed formation , seed dispersal (wind dispersal, animal dispersal, water dispersal)

		<p>Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space</p> <p>Research different types of seed dispersal with secondary sources</p> <p>Classify seeds in a range of ways, including by how they are dispersed</p> <p>Create a new species of flowering plant</p> <p>Observe the effect of putting cut white carnations or celery in coloured water. (Labelled diagram) prediction, at the beginning, 6 hours later, 24 hours later). Children to record what they think would happen in other plants. What would they like to know now? Link to requirements lesson - use results to make prediction about this lesson</p>	
<p>Animals including humans</p>	<p>Predator: Why do we have a skeleton? Predator: Scientific terminology; Dietary needs; Consequences; Frog food chain; Step 10. What do owls eat? Predator: Why do we have a skeleton?</p> <p>How do worms move? What are our joints for? How do worms move? What are our joints for? What do owls eat?</p> <p>Companion project: Animal Nutrition and the Skeletal System</p>	<p>Children given a bone quiz – as a pre and post assessment.</p> <p>Children to make a split pin skeleton to physically see all the parts of the human body</p> <p>Labelling the bones in the human body – with scientific/technical language word bank</p> <p>Compare, contrast and classify skeletons of different animals</p> <p>Circle which muscles they think they will be using (prediction) and circle afterwards which muscles they used (results)</p> <p>Practical lesson</p> <p>Investigate patterns asking questions such as: Can people with longer legs run faster? Can people with bigger hands catch a ball better?</p> <p>Children to research different food groups- what food group is cheese etc. Secondary sources</p> <p>Create pizza- research into which food groups they have used and what they do for our body</p>	<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>

		<p>Given a range of different food types. Children to add them into the healthy eating pie chart (carbohydrates, fruit and veg, protein, fats, dairy) Classify food in a range of ways</p> <p>Use food labels to explore the nutritional content of a range of food items</p> <p>Use secondary sources to find out the types of food that contain the different nutrients. Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks?</p> <p>Plan a daily diet to contain a good balance of nutrients</p> <p>Explore the nutrients contained in fast food</p>	
Light	<p>Tribal Tales: Identification and classification lesson Tribal tales: Staying safe lesson Tribal Tales: Phenomena Lesson Tribal Tales: Bronze Age monuments Light and Shadows (companion project)</p>	<p>Man made and natural light sources- grouping activity pictures of each Drawing in book of light reflected from a flat shiny surface going into the eye. Children to use mirrors and torches to investigate this</p> <p>Explore how objects with different surfaces (e.g. shiny vs matt) are more or less visible</p> <p>UV beads covered in different materials investigation. Results in a bar chart</p> <p>Staying healthy in the sun poster</p> <p>Discussion as part of a lesson that light is caused from the absence of dark. Link to each lesson and reinforce throughout. Investigating which material lets through the most light</p> <p>Ipads to record the light passed through (app for data logging)</p> <p>Graph to show which material lets through the most light</p> <p>Shadow puppet theatre production</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>

		<p>Shadow investigation on a sunny day, using bodies to block the light and form a shadow.</p> <p>Create artwork using shadows</p> <p>Explore how shadows vary as the distance between a light source and an object or surface is changed</p> <p>Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground</p> <p>Shadow investigation outside – size of the shadow at different points in the day.</p> <p>Physically do this by drawing round a child’s body over time.</p> <p>Line graph to show results.</p>	
Forces and magnets	<p>Mighty magnets: Magnetic object hunt; Step 10</p> <p>Mighty magnets: North or South?</p> <p>Attract or repel?</p> <p>Forces and Magnets (companion project)</p> <p>Can you block magnetism?</p> <p>How mighty are magnets?</p> <p>Can you block magnetism?</p> <p>How mighty are magnets?</p> <p>Why do magnets attract and repel?</p>	<p>Different magnets given. Children to predict which will be the strongest to pick up the most amount of paper clips and why</p> <p>Simple conclusion as to why the children thought that happened</p> <p>Given magnets and different materials. Children group together as they think</p> <p>Physically explore a magnet, working out that north and north repel and north and south attract</p> <p>Physically explore a magnet, working out that north and north repel and north and south attract</p> <p>Maglev trains</p>	<p>Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole</p>
Rocks	<p>Rocks, Relics and Rumbles: Soil testing</p> <p>Rocks, Relics and Rumbles: How rocks are used</p> <p>Predator: Predators from the past.</p> <p>Rocks, Relics and Rumbles: Fossils</p> <p>How do fossils form?</p>	<p>Soils from three different places. Children to add water to and let settle to see what is inside the soil. Children to work out where they think the soil has come from and why. Record labelled diagrams of each soil after it has been left to settle.</p> <p>Classify soils in a range of ways based on their appearance</p> <p>Devise a test to investigate the water retention of soils</p> <p>Observe how soil can be separated through sedimentation</p>	<p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p>

		<p>Children given different types of rock- children to tick the properties that match each rock type</p> <p>Sedimentary, igneous and metamorphic rocks given. Children to look at the three different groups and notice similarities between all sedimentary rock etc. Make classification key</p> <p>Devise a test to investigate the hardness of a range of rocks</p> <p>Devise a test to investigate how much water different rocks absorb.</p> <p>Observe how rocks change over time e.g. gravestones or old building. Research how a fossil is made</p> <p>Put into practise when making a fossil- jelly sweets and bread. Cartoon strip of findings</p> <p>Research the work of Mary Anning</p>	
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Year 4 appendix

Animals including humans	<p>Burps, Bottoms and Bile: Types of teeth; Dental impressions; Chop, tear and grind.</p> <p>How does toothpaste protect teeth? What is spit for?</p>	<p>Tights demonstration of intestine</p> <p>Literacy link – explanation text unit to explain the digestive system</p> <p>Diary entry of a piece of food Research the function of the parts of the digestive system and write a diary about that piece of food</p> <p>Create a model of the digestive system using household objects</p> <p>Label diagram of different types of teeth and their function</p> <p>Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing)</p> <p>Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls</p>	<p>Herbivore, Carnivore, Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer</p>
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<p>Living things and their habitats</p>	<p>Blue Abyss: Sorting and grouping; Classifying creatures, Oceanic food chains, Oceanic food chains, A great threat! Misty Mountain, Winding River: Our changing environment; Step 6</p> <p>How does pollution affect habitats? Are all creatures the same?</p> <p>Companion project: Grouping and Classifying</p>	<p>Pictures to group</p> <p>Hunt for local wildlife (tree's leave for example)- record findings using website below to classify type of leaf found. Children to create own classification key with own questions when back in the classroom http://www-saps.plantsci.cam.ac.uk/trees/index.htm</p> <p>Hunt for invertebrates with pooters/magnifying glasses etc. Children to record and use secondary sources to find out what each creature is. Could create own classification key with new knowledge back in the classroom</p> <p>- Idial Woodland trust for classifying</p> <p>-Create own classification keys in the classroom. Model first. Give children pictures. Children to create own question and write on post it notes, links made with straws. Children to move around different groups, partner to think of different creature and answer questions, other partner to work out what creature they were thinking of. Children to then create own (few examples) using data gathered from outside and knowledge of other animals (could do some research using secondary sources for this)</p> <p>Explorify to spark interest in this. 15 minutes challenge time 'What if' questions. What if we ate insects, what if ?? did not eat trees, odd one out. https://explorify.wellcome.ac.uk/en/activities</p> <p>Wildlife survey. Create a bar chart to show what creatures have been found around school. Using bar chart identify the producer, predators and prey from findings.</p> <p>Children to choose own research project. Plastic pollution, palm oil, additional houses, etc etc. Children to choose own thing that poses a danger to living thing. Own line of enquiry to create leaflet, poster or</p>	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p>

		<p>any way they like of displaying presentation to the class. Look at positives and negatives</p> <p>Use fieldwork to explore human impact on the local environment e.g. litter, tree planting</p> <p>Use secondary sources to find out about how environments may naturally change</p>	
Electricity	Road Trip USA!: Electrical amenities, Illuminated Models; Smoke Signals, Lights! Conductors and insulators	<p>Venn diagram to sort different appliances</p> <p>Investigating different circuits to see if they'll light the bulb. Child led</p> <p>Designing own lantern with working switch. DT lesson link – to investigate switches</p> <p>Explore how to connect a range of different switches and investigate how they function in different ways</p> <p>Choose switches to add to circuits to solve particular problems, such as a pressure switch for a burglar alarm</p> <p>Apply their knowledge of conductors and insulators to design and make different types of switch</p> <p>Investigating which materials will conduct or insulate. Create a simple switch and see which conduct to make the light bulb light up</p> <p>DT link lesson 2 from Plan Bee scheme</p> <p>Explore which materials can be used instead of wires to make a circuit</p> <p>Classify the materials that were suitable/not suitable for wires</p> <p>Investigating which materials will conduct or insulate. Create a simple switch and see which conduct to make the light bulb light up</p>	<p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p> <p>N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.</p>
Sound	Road trip USA!: Phenomena lesson Road trip USA!: Pattern Seeking Lesson Misty Mountain, Winding River: Phenomena lesson	<p>Whole science topic- music festival/band or building a sound proof music room: building up to producing musical instrument and sound mufflers for music festival or music studio at the end of the sound unit.</p>	<p>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>

Rice on a drum, tuning fork in water practical demonstration
<https://www.stem.org.uk/resources/elibrary/resource/35351/sound-listen> link to all of the lessons with lesson plans, presentations etc.

Classify sound sources

Explore making sounds with a range of objects, such as musical instruments and other household objects

Explore how string telephones or ear gongs work

- <http://www.bbc.co.uk/education/clips/zkbygk7>

String and cup telephones experiment

Children to have an investigate sheet describing the sound of each item. They could record the sound using a data logger and then try to find a pattern between material or location of instrument and volume or pitch. Children to explain vibrations



Objectives: To explore different kinds of sound and sources of sound.
To begin to understand that sounds are made when something shakes or vibrates.

Resources: A collection of 'junk' materials of all kinds, some that make sounds when they are hit or shaken, and some that don't.
String. Beaters to tap the 'junk' with.

Activity Notes: The children experiment with the 'junk' materials, banging, tapping and shaking them. Ones that make a sound should be saved. When each child has a collection of several objects ask them to hit them on a table, in their hand and hanging from a piece of string. Focus their observations on the quality and volume of the sound.
Objects placed on something will make a duller sound than when they are freely suspended because they cannot vibrate so freely. Help the children to suspend several objects on string and play on them. Focus their attention on the sort of sounds (high/soft/loud) made by different sizes and shapes of objects, and objects of different materials. They then 'play' the objects with different kinds of beaters.

Key Questions:
Which objects make a loud sound?
Which objects make a soft sound?
Can you make high and low sounds?
What happens to the sound if you change the beater?

Recording Opportunities: The suspended 'instruments' could be left on display along with an assortment of beaters for other children, and adults, to play. The children could make labels encouraging people to 'have a go'.

Investigate sheet describing the sound of each. Record the sound using a data logger and then try to find a pattern between amount of liquid and pitch. Could use wine glasses rather than bottles (different sizes/different amount of liquid?) Explanation: Your finger is sliding and sticking as it goes round the glass. This causes the glass to vibrate, which makes the air inside the glass vibrate. The vibrations travel up to your ear through the air, and your ear hears the vibrating air as a sound

Make a musical instrument – straw panpipes

Explain the diagram of sound that it is the wave to a simple mid-volume, mid-pitch sound made on a recorder – then play such a sound. Now make a louder sound of the same pitch and explain how

		<p>the wave would change (the amplitude would be larger but the wave length would remain the same). Draw it over a laminated example with a whiteboard pen. Repeat, but this time change the pitch. Ask children to draw what they think the wave might look like- practise on whiteboards. Ask them to explain the new wave they have drawn. Children to do with different instruments- draw diagrams into books and identify patterns</p> <p>https://www.stem.org.uk/resources/elibrary/resource/315610/what-factors-affect-pitch-and-volume-sound</p> <p>Sound circus- planning and examples included https://www.stem.org.uk/system/files/elibrary-resources/2017/02/Sound%20circus.pdf Have a look at the variables table (the children could work as a group to decide on the variables themselves). The outcomes on the last page are quite useful too. Data logger could be used for this to record sound. Get the children to design this investigation themselves One lesson making predictions/ setting up investigation One lesson recording results One lesson finding trends/patterns and drawing conclusions</p> <p>Best material for muffling sounds investigation. Afterwards present their findings to the class- which material/design would be best. Children could have a celebrity panel (using celeb masks) to decide on the best one to use at a music festival/ for the music room. Children to use scientific language for findings/conclusions/trends. Dragon den scenario</p> <p>Measure sounds over different distances</p>	
<p>State of matter</p>	<p>Misty Mountain, Winding River: Investigating the water cycle.</p> <p>How do smells get up your nose?</p> <p>Companion project: States of matter</p>	<p>Children to act out particles of solids liquids and gases</p> <p>Three identical balloons filled with ice, water and air is a great way of observing water as a solid, liquid and gas. This would lead into to a discussion about the properties of each state</p> <p>Witch's hand experiment When grouping materials into solids, liquids and gases it is a good idea to have items, which are more difficult to place- e.g. toothpaste, jelly and foam. These items will promote discussion and really get</p>	<p>solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle</p>

children thinking about the properties of materials. When comparing and grouping materials, include some materials such as a sand, flour, sugar which will provoke discussion. They may be harder to place as they behave like a liquid but are in fact very small pieces of a solid. Try including a sponge and see where children place it. It is a solid with air trapped inside its many holes.

Raisins in fizzy drink to see the gas

Create lava lamp using oil, water and food colouring to show properties of liquids

Create poster to detail understanding of s,l and g (by Professor Matter)

Ask children to observe what happens when a sweet is dropped into a fizzy drink. The resulting explosion may be explained as follows: the sweet helps the gas form more bubbles in the drink as the sweet sinks to the bottom of the container so the gas bubbles must rise through the liquid. If there is enough gas trying to escape, it forces some of the liquid (the drink) out of the bottle

Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind

Speeding up the ice melting process for the kitchen staff investigation. Record results in table (location, prediction, actual time to melt)

At what temperature does chocolate melt or cool investigation

Observe a range of materials melting e.g. ice, chocolate, butter

Investigate how to melt ice more quickly

Observe the changes when making rocky road cakes or ice-cream

Investigate the melting point of different materials e.g. ice, margarine, butter and chocolate

		<p>Explore freezing different liquids e.g. tomato ketchup, oil, shampoo</p> <p>Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration)</p> <p>Diary extract as a rain drop</p> <p>Use secondary sources to find out about the water cycle</p> <p>https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/28374-Thewatercycle.pdf lots of ideas to demonstrate and fair testing investigation. Link to water cycle too</p> <p>Observe water evaporating and condensing e.g. on cups of icy water and hot water</p> <p>Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers</p>	
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Year 5 appendix

Animals including humans	<p>Time Traveller: My timeline; Human development; Retirement</p> <p>Do we slow down as we get older?</p> <p>Companion project: Human Reproduction and Ageing</p>	<p>Photograph lesson. Children to look at their own baby photographs and notice differences/ similarities</p> <p>Drawing diagrams and labels of differences (humans)</p> <p>Explanation text writing link</p> <p>Invite nurse to answer questions</p>	<p>Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional</p>
Living things and their habitat	<p>Beast Creator: Stick Insects, Metamorphosis; Comparing life cycles</p> <p>Sow, Grow and Farm: Plant life cycles; Dissection; Animal Life cycles</p> <p>Time traveller: Sexual reproduction</p> <p>How do worms reproduce?</p>	<p>Drawing diagrams and labels of differences (plants)</p> <p>Grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes.</p> <p>Take cuttings from a range of plants e.g. African violet, mint.</p>	<p>life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, bulbs, cuttings</p>

	<p>Why do birds lay eggs?</p>	<p>Plant bulbs and then harvest to see how they multiply.</p> <p>Use secondary sources to find out about pollination Butterflies and egg hatching</p> <p>Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals</p> <p>Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth</p> <p>Look for patterns between the size of an animal and its expected life span</p>	
<p>Forces and magnets</p>	<p>Stargazers: Life in space Scream Machine: Resisting motion; investigating pulleys</p> <p>Why do planets have craters? Why are zip wires so fast? How do levers help us? What do pulleys do?</p>	<p>Using newton measurer. How many newtons are acting on different object? Link between newtons and grams 1N=100g</p> <p>Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation</p> <p>Create a timer that uses gravity to move a ball</p> <p>Paper spinners/helicopters. Record how long it takes for different spinners to fall to the ground</p> <p>Making boats out of playdough. Link between the shape of the boat and whether it floats or not</p> <p>Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water</p> <p>Cars on ramps made of different materials</p> <p>Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter</p> <p>Using large gears. Larger gears take longer than smaller. Link between different size of teeth and how they are spaced out</p>	<p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>

		<p>Plastic wallet attached to string and over a pulley. Measure the amount of newtons needed to lift the bag without the pulley. Measure force needed with one pulley. Measure force needed with two pulleys</p> <p>Notice the difference. Try with different objects⁴</p> <p>Making own pulley- https://nustem.uk/activity/levers-pulleys-and-gears-key-stages-1-2/</p> <p>Ruler acting as a lever on the table. How much weight (effort) is needed to lift the load? Move the lever's pivot and see difference of the effort needed to lift the same load</p> <p>Rube Goldberg creation to include gear, lever and pulley</p>	
Space	<p>Stargazers: Facts about the moon; Day and night; size and scale</p> <p>How does the moon move?</p> <p>Can we track the sun?</p> <p>How do we know the earth is round?</p>	<p>Documents with different people's ideas. Children to use these ideas to see if they agree or disagree. Look at the evidence to refute the argument too. Twinkl docs.</p> <p>Play in a Day (costs attached to this)</p> <p>Use secondary sources to help make a model to show why day and night occur</p> <p>Make first-hand observations of how shadows caused by the Sun change through the day</p> <p>Model moving on globe</p> <p>Outside- chalks for distance from the moon and speed</p> <p>Make a sundial</p> <p>Research time zones</p> <p>Fruit to show size of planets</p>	<p>Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit</p>
Properties and changes of materials	<p>Sow, Grow and Farm: Identification and classification lesson; Properties and uses lesson</p> <p>Stargazers: Step 5</p> <p>How do rockets lift off?</p>	<p>Different materials on tables for children to sort in different ways- venn diagrams</p> <p>Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>

	<p>Companion project: Properties and Changes of Materials</p>	<p>Best cup to keep a drink warm lesson (insulator)</p> <p>Best cloth for the kitchen staff (absorbency)</p> <p>Salt dissolving into hot water Volcanoes- bicarbonate of soda and vinegar</p> <p>Burning a candle</p> <p>Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton)</p> <p>Salt dissolving into hot water. Investigate rates of dissolving by carrying out comparative and fair test</p> <p>Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate</p> <p>Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning</p> <p>Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</p> <p>Mixed up materials, children to separate using different sieves, tweezers, filter paper etc.</p> <p>Design own investigations</p>	
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Year 6 appendix

<p>Animals including humans</p>	<p>Blood Heart: Unhealthy substances; Step 7; Components of blood; Animations Heart Dissection; Parts of the circulatory system; Fact Files</p>	<p>Carry out a range of pulse rate investigations: Fair test – effect of different activities on my pulse rate Pattern seeking – exploring which groups of people may have higher or lower resting pulse rates Observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate)</p>	<p>Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary,</p>
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	<p>How does blood flow? What can your heart rate tell you? What's in blood?</p> <p>Companion project: Circulatory System</p>	<p>Pattern seeking – exploring recovery rate for different groups of people. (these could also be used for the heart objective too)</p> <p>Secondary research research the negative effects of drugs (e.g. tobacco) and the benefits of a healthy diet and regular exercise by asking an expert or using carefully selected secondary sources</p> <p>Hamilton Trust Gummy bear: Children to predict first, write down what they thought happened and then research to find out what definitely happened? Gummy bears in different liquids</p> <p>Create a role play model for the circulatory system</p> <p>Focused assessment on the server (heartrate)</p> <p>1st lesson- Children to be biomedical scientists. What do you think happens to your heart when you do a headstand? Ask children to think about other factors that could change their pulse rate. List their ideas and discuss why pulse rate increases during exercise: emphasise that blood carries oxygen around the body and that when you exercise the muscles in your body need more oxygen so your heart works harder to supply more oxygen. Discuss with the children how to plan and carry out a test into headstands or similar. Consider how long the headstand should last, how many measurements should be made, whether one child or several children should be tested, how to carry out the tests safely. Ask the children to carry out the test and record results as a group (tables or graphs). Focus individual recording on explanation of what their data shows, their explanations, degree of trust in results and further predictions</p> <p>2nd lesson- What happens to your pulse when you hold your hands above your head? Use your results to make further predictions</p> <p>Do you think a giraffe has a smaller or greater pulse than you? Find pulse rates of other animals on websites. Or link to healthy living</p> <p>Blood smoothie- sprinkles represent platelets, pineapple represents the plasma, marshmallows represent the white blood cells and raspberries represent the red blood cells.</p> <p>Heart- My journey starts here...</p>	<p>digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.</p>
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		Heart rate investigation- what affects the heart rate? Does... e.g. temperature affect the heart rate. Heart dissection	
Evolution and inheritance	<p>Darwin's Delights: Exploring variation in pigeons; Inheritance! Artificial selection; Unique Creatures; Step 2, Step 3, Step 10, Frozen Kingdoms: Adaptations; Step 3</p> <p>How do animals stay warm? Where do wild animals grow? Why is holly prickly? How have eyes evolved? How does inheritance work? Can we slow cooling down?</p>	<p>Children given two different pictures of dogs. Children to identify what their offspring would look like and why- draw and label plus an explanation.</p> <p>Photo analysis of themselves/mums and dads/grandparents- compare</p> <p>Sorting diagram of children in the class linked to characteristics</p> <p>Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs</p> <p>BBC terrific science investigation (feet) https://www.bbc.co.uk/programmes/articles/6vbVc7sqyVXgx5yYk9XJ7K/terrific-scientific-feet-live-lesson</p> <p>Horse and giraffe evolution- cartoon strip. Children to create own super human to life in a fantasy environment</p> <p>Focused assessment on the server (egg) Prior activity: why does a hen sit on her eggs? Why do they not break? Try 'squashing' eggs horizontally and vertically / standing on a tray of eggs. So we know they can be fragile – and strong. How strong? What would be a scientific way of finding out how strong a chicken egg is? Children (in groups) set up a suitable test to measure strength and consider accuracy of measurements. Access to a range of weights/books, newton meters, lids, cling film (to protect books), card/lool roll (to make egg stand), plasticine, egg per group to test to destruction. Compare the results from different groups. Link with Maths lesson on averages and/or graphs</p> <p>Survival of the fittest linked to evolution. Darwin's theory or finches Which beak is the best for this eco system?</p> <p>Compare the ideas of Charles Darwin and Alfred Wallace on evolution</p> <p>Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution</p>	<p>offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, evolve, evolution</p>

		<p>Children examine 3 plants - the dandelion, cactus, and Venus fly trap - and identify 3 adaptations for each Children to design a plant to survive in a given environment</p> <p>Focused assessment on the server (fossil) Provide children with photos (or better still real or resin) fossils (trilobite, ammonite, ichthyosaurus). Discuss what the animals could have looked like- back up with evidence using secondary sources. Discuss what they could have eaten (link to teeth) or where they could have lived (provide details of where fossils found)</p> <p>Children to design a habitat that the animal could have survived in when it was alive millions of years ago. Draw and label the creature in its habitat</p> <p>Make comparisons to modern creatures. e.g. whales- sea living prehistoric creatures, birds to many prehistoric creatures.</p> <p>Research palaeontologists Top trumps of fossils Explanation writing about fossil formation</p> <p>Research the work of Mary Anning and how this provided evidence of evolution</p> <p>Make observations of fossils to identify living things that lived on Earth millions of years ago</p>	
<p>Living things and their habitats</p>	<p>Dawin's Delights: Collecting Specimens Frozen Kingdoms: Classification; Classification keys; Step 4</p> <p>How many worms are underground? ID: Identification! Where do wild plants grow? Why are things classified?</p>	<p>Children to classify themselves using branch diagrams. Use same branch diagrams to classify fictitious animals</p> <p>Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important</p> <p>Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys</p> <p>Use information about the characteristics of an unknown plant to assign it to a group</p> <p>Use first-hand observation to identify characteristics shared by the animals in a group</p>	<p>vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, warm-blooded, cold-blooded, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers</p>

		<p>Use secondary sources to research the characteristics of animals that belong to a group</p> <p>Focused assessment on the server (environment)</p> <p>Explain that their task is to research different invertebrates (show examples). Mind map – how will you share what you have found out? - films, posters, models (playdough), write, drama, hot-seating, etc.</p> <p>Children to work in small (mixed ability) groups and should be given a different invertebrate group to focus on (annelids, molluscs, insects, arachnids, crustaceans and myriapods). Each group must give an example and describe the features which make it a member of its classification group.</p> <p>The one here needs to be very child led and challenging as the Year 4s do something similar but with more structure. invertebrates, insects, spiders, microorganisms, etc.</p> <p>Research different plants around the school at LLS and their features or in own school field- use quadrant</p> <p>Children to design their own species of living thing that would fit in with one of the classification groups</p> <p>Create an imaginary animal which has features from one or more groups</p>	
Light	<p>Hola Mexico: The feathered serpent</p> <p>What colour is a shadows? How have eyes evolved?</p>	<p>Y6- light (ASE PLAN work)</p> <p>Give a length of hose pipe with a piece of coloured acetate over one end acting as a filter. Light from a torch is shone down the hose pipe onto a table. With the hose pipe bent no coloured light comes out of the end of the hose pipe. With the hose pipe straight, coloured light is seen on the table, which has come from within the hose pipe. Children to investigate for themselves</p> <p>Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card</p> <p>Children given two contradicting statements. Using torches, children have to investigate which statement is correct. Prediction and conclusion linked to this. Explore the uses of the behaviour of light, reflection and shadows, such as in periscope design, rear view mirrors and shadow puppets</p> <p>Focused assessment on the server (light)or Objects and their shadows PDF</p>	<p>(see year 3 as revision) straight lines, light rays</p>

		<p>Introduce the investigation by shining a light on an object and asking how the shadow of the object could be changed. List potential investigation questions. Ask children to select a question and carry out the investigation. Focus on recording of results.</p> <p>Ask children how the angle of the light affects the shadow. Ask children to use their graph to make further predictions and test them.</p> <p>Research use of and limitations of sundials</p>																																														
Electricity	Electricity: Modelling lesson; Forces lesson; Phenomena lesson	<p>Children to predict, test and record. See Twinkl sheets as a guide</p> <table border="1" data-bbox="922 440 1292 612"> <tbody> <tr><td>Bulb</td><td>0V</td><td>1.5V</td><td>3.0V</td><td>4.5V</td></tr> <tr><td>Prediction</td><td></td><td></td><td></td><td></td></tr> <tr><td>Results</td><td></td><td></td><td></td><td></td></tr> <tr><td>Bulb</td><td>0V</td><td>1.5V</td><td>3.0V</td><td>4.5V</td></tr> <tr><td>Prediction</td><td></td><td></td><td></td><td></td></tr> <tr><td>Results</td><td></td><td></td><td></td><td></td></tr> <tr><td>Bulb</td><td>0V</td><td>1.5V</td><td>3.0V</td><td>4.5V</td></tr> <tr><td>Prediction</td><td></td><td></td><td></td><td></td></tr> <tr><td>Results</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>Focused assessment on the server- this could take a number of lessons investigating the different components (electricity_bulb_brightness)</p> <p>Set up a context requiring the need for light e.g. working late in winter/car headlights/torch light etc. Challenge each group to make a quick simple circuit to provide this light. There should be a variety of different circuits produced according to the resources, presenting an opportunity to compare and discuss differences in brightness and construction of circuitry (AfL).</p> <p>Introduce the main task: to investigate how they can change the brightness of the bulb using the full range of equipment available. In pairs/groups, generate a list of variables which could be changed in their circuit. Each group/pair select the variable they wish to change and how they will measure the effect of this change and use this to form a scientific question. Draw the test circuit. Each group report their question and list their variables (what to measure, what to change, what to keep the same) to the class for feedback</p> <p>Make circuits to solve particular problems, such as a quiet and a loud burglar alarm</p> <p>Carry out fair tests exploring changes in circuits</p>	Bulb	0V	1.5V	3.0V	4.5V	Prediction					Results					Bulb	0V	1.5V	3.0V	4.5V	Prediction					Results					Bulb	0V	1.5V	3.0V	4.5V	Prediction					Results					<p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage</p> <p>N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words “cells” and “batteries” are now used interchangeably</p>
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