

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1	Plants	Living Things and their habitats	Rocks and soils		Animals including humans	Living things and their habitats
Term 2			Plants	Habitats and eco-systems	Forces	Electricity
Term 3	Materials	Materials	Forces and magnets	States of Matter		Evolution and inheritance
Term 4		Plants	Animals including humans	Animals: food chains	Earth and Space	Light
Term 5	Seasonal changes			Electricity	Living things and their habitats	
Term 6	Animals including humans	Animals including humans	Light	Sound	Properties and changes of materials	Animals including humans






Overview of Working Scientifically Skills Progression and Coverage Across Our School

Black is statutory from NC. Blue is non-statutory from NC. Purple writing is additional guidance for teachers. Green writing from 30 to 50 month objectives.

“Opportunities for Working Scientifically should be provided across two years so the expectations can be met by the end of each two year time frame. Pupils are not expected to cover each aspect for every area of study.” Science National Curriculum Programme of Study

	Plan			Do		Review	
	Asking Questions 	Making Predictions 	Setting Up tests 	Observing and Measuring 	Recording Data 	Interpreting and communicating results 	Evaluating 
(Symbols from PSTT) EYFS	Ask simple questions about the world around them.	Make suggestions of what might happen before it occurs.		Describe what they can see. Measure whether something is bigger or smaller.	Draw a picture of what happened.	Talks about why things happen and how things work.	
KS1 Years 1 & 2	Asking simple questions and recognising that they can be answered in different ways. These questions could be stimulated by observations and exploration of their world.	Making predictions with some reasoning based on everyday life experiences and observations. E.g. The blue car will roll further than the red car because it has bigger wheels.	<i>Plan a simple enquiry. (e.g. I will test cotton, tin foil and plastic to see what protects a cuddly toy from rain)</i>	Observing closely, using simple equipment and take measurements (for example hand lenses, egg timers). Performing simple tests. Identifying and Classifying.	Gathering and recording data to help in answering questions. Present evidence in templates provided for them.	Using their observations and ideas to suggest answers to questions. Use evidence and draw on their everyday experience to help answer questions.	
Lower KS2 Years 3 & 4	Asking relevant questions and using different types of scientific enquiry to answer them.	Making more generalised, powerful predictions of patterns or trends. E.g. The higher the ramp, the further the toy car will roll.	Setting up simple practical enquiries, comparative and fair tests. Make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions.	Making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Learn how to use new equipment, such as data loggers, appropriately.	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Children create their own simple tables and notes. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Make predictions for new values within or beyond the data they have collected.
Upper KS2 Years 5 & 6	Explore ideas and raise different kinds of questions	Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Use basic scientific knowledge to justify predictions. E.g. The higher the ramp the further a car will roll because it is moving faster so when it gets to the end of the ramp it has more force behind it.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Choose appropriate equipment to make measurements and explain how to use it accurately.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. (They should decide how to record data from these familiar approaches).	Reporting 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 presentations. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas. Talk about how scientific ideas have developed over time.	Using test results to make predictions to set up further comparative and fair tests. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Overview of Progression in Types of Enquiry across our School

	Comparative and Fair Testing 	Research 	Observation Over Time 	Pattern-seeking 	Identifying, Grouping and Classifying 
<i>(Symbols from PSTT)</i> EYFS	Looks closely at similarities, differences, patterns and change. (40 – 60 month objective)	Comments and asks questions about aspects of their familiar world such as the natural world. Knows that information can be retrieved from computers. (30 – 50 month objectives)	Developing an understanding of growth, decay and changes over time. (30 to 50 month objective)	Looks closely at similarities, differences, patterns and change. (40 – 60 month objective)	Looks closely at similarities, differences, patterns and change. (40 – 60 month objective)
KS1 Years 1 & 2	Use simple features to compare objects, materials and living things.	Ask people questions and use simple secondary sources to find answers.	With help, observe changes over time.	With guidance, begin to notice patterns and relationships.	With help, decide how to sort and group objects, materials and living things.
Lower KS2 Years 3 & 4	Recognise when a simple fair test is necessary and help to decide how to set it up.	Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	Make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	Look for naturally occurring patterns and relationships and decide what data to collect to identify them.	Talk about criteria for grouping, sorting and classifying. Use simple keys.
Upper KS2 Years 5 & 6	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.	Make their own decisions about what observations to make, what measurements to take and how long to take them for.	Identify patterns that might be found in the natural environment.	Develop keys and information records to identify, classify and describe living things and materials.

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Topic / Key Question:	Topic / Key Question:	Topic / Key Question:	Topic / Key Question:	Topic / Key Question:	Topic / Key Question: XX
	(Topics in Reception follow the children's interests. In the past they have done under the sea, super heroes, weather, minibests, growing, into the woods, at different times throughout the year.)					
Reception	<p>Objectives Planned for to build up to Early Learning Goal <i>(Awareness of Early Learning Goal considered in terms 1 to 3 but progression towards achieving the Early Learning Goal is planned for during these terms, as opposed to planning for the Early Learning Goal itself).</i></p> <p>Understanding the world: The World 30 – 50 months</p> <ul style="list-style-type: none"> Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. <p>40 – 60 months</p> <ul style="list-style-type: none"> Looks closely at similarities differences, patterns and change. <p>Understanding the world: People and Communities 30 – 50 months</p>			<p>Early Learning Goal Understanding the World specifically planned for in terms 5 and 6:</p> <p>Expected</p> <ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. <p>NB: Unlikely to achieve this ELG unless they also achieve 'Speaking' and 'Understanding'</p> <p>Exceeding</p> <ul style="list-style-type: none"> Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts such as floating, sinking, and experimentation. 		

<ul style="list-style-type: none"> Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family. <p>Understanding the world: Technology 30 – 50 months</p> <ul style="list-style-type: none"> Knows how to operate simple equipment e.g. turns on CD player and uses remote control. Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones. 	
<p>In Reception children use a range of ‘Characteristics of Effective Learning’ in their independent learning. These can be seen as complementing ‘Working Scientifically’ skills, and include:</p> <ul style="list-style-type: none"> Playing and exploring – engagement Finding out and exploring; playing with what they know; being willing to ‘have a go’ Active learning – motivation Being involved and concentrating; keeping trying; enjoying achieving what they set out to do Creating and thinking critically – thinking Having their own ideas; making links; choosing ways to do things <p>Reception have a ‘Knowledge and Understanding’ table, which helps develop the foundations of many scientific skills, particularly asking questions, observing, and talking about why things happen and how things work. The provision on this table changes weekly or fortnightly according to the topic.</p> <p>Reception also have continuous provision which often includes exploration of floating and sinking in a water tray, consistency of materials in sand tray and mud kitchen, musical instruments where children can explore sounds, seeds to look at with magnifying glasses, animal patterns, habitats and atlases. Additionally small world play with props encourages children to talk about where animals live, how to look after them and different environments. Using dolls’ house characters and furniture children have opportunities to talk about families and changes.</p> <p>Spontaneous opportunities are also very important in Reception science provision. These are instigated by the children’s comments and observations. For example, spotting a rainbow, having a ladybird land on them, or snow falling.</p>	

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year One Seasonal Changes lesson within term (Autumn)	Theme: Community: Our school Science Topic: Plants	Theme: Compassion: Other people Science Topic: N/A	Theme: Courage: Brave superheroes Science Topic: Materials	Theme: Curiosity: Curious about transport Science Topic: N/A	Theme: Culture: Australia Science Topic: Seasonal changes	Theme: Celebration: Milestones Science Topic: Animals including humans
	Knowledge: Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of common flowering plants, including trees including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, and stem.	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth) and say which part of the body is associated with each sense.	Knowledge: Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Materials such as brick, paper, fabrics, elastic, foil. Describe the simple physical properties of a variety of everyday materials. Properties such as hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent. Compare and group together a variety of everyday materials on the basis of their simple physical properties	Knowledge: Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	Knowledge: Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores	

	<p>Skills:</p> <ul style="list-style-type: none"> Observe the growth of flowers and vegetables they have planted. Observing closely, perhaps with magnifying glasses, and comparing and contrasting familiar plants. Describe how to identify and group familiar plants. Draw diagrams to show the parts of different plants including trees. Keep records of how plants have changed over time, for example the falling of leaves and buds opening. Compare and contrast what they found out about different plants. 	<p> Compare and contrast animals at first hand or through videos/photos (simple secondary sources). Describe how they identify and group them.</p> <p> Group animals according to what they eat.</p> <p> Use their senses to observe and compare different textures, sounds and smells.</p>		<p>Skills:</p> <p> Pupils should explore, name, discuss and raise and answer questions about everyday materials and experiment with them by performing simple tests and record data to help answer questions.</p>	<p> Perform simple tests to explore questions for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</p>		<p>Skills:</p> <ul style="list-style-type: none"> Make tables and charts about the weather associated with the seasons. Observe and make displays of what happens in the world around them including day length as the seasons change. Ask questions about changes through the year. 	<p>Skills:</p> <ul style="list-style-type: none"> Use the local environment throughout the year to explore and ask questions about animals in their habitat. Recognise questions can be answered in different ways. Use their observations to suggest answers Take care of animals taken from their local environment, observe them closely identifying and classifying them, before returning them safely after study.
<p>Opportunity to develop skill: Ask questions (4) Making predictions (4) Observing and Measuring (8) Recording Data (9) Interpreting and communicating results (7)</p>								

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year Two	<p>Theme: Community: Our city Science Topic: Living things and their habitats</p>	<p>Theme: Compassion: Other places Science Topic: N/A Habitats cont?</p>	<p>Theme: Courage: Brave explorers Science Topic: Materials</p>	<p>Theme: Curiosity Science Topic: Plants</p>	<p>Theme: Culture: Poland Science Topic: N/A</p>	<p>Theme: Celebration: Achievements Science Topic: Animals including humans</p>
	<p>Knowledge:</p> <p>Explore and compare the differences between things that are living, dead and things that have never been alive.</p> <p>Identify that most living things live in habitats (a natural environment or home of a variety of plants and animals) to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other</p>	<p>Identify and name a variety of plants and animals in their habitats including micro-habitats (a very small habitat, for example for woodlice under stones, logs or leaf litter).</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>	<p>Knowledge:</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Some materials are used for more than one thing e.g. metal can be used for coins/cars/table legs. Also, different materials can be used for the same thing e.g. spoons can be made from plastic/wood/metal but not normally glass).</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Knowledge:</p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>(Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them).</p>		<p>Knowledge:</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>

	<p>Skills:</p> <p> Raise and answer questions that help them to become familiar with the life processes that are common to all living things.</p> <p> Raise and answer questions about the local environment that help them to identify and study a variety of plant and animals within their habitat.</p> <p> Observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals.</p> <p> Compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean in the rainforest.</p>	<p> Sorting and classifying things according to whether they are living, dead or were never alive, and record findings using charts. Then describe how they decided where to place things.</p> <p> Exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways to answer their questions.</p> <p> Construct simple food chains that include humans.</p> <p> Describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.</p>	<p>Skills:</p> <p> Research people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.</p> <p> Compare uses of everyday materials in and around school with materials in other places (at home, the journey to school, on visits, in stories/rhymes).</p> <p> Observing closely, identifying and classifying the uses of different materials, and recording their observations.</p>	<p>Skills:</p> <p> Use the local environment throughout the year to observe how different plants grow.</p> <p> Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb.</p> <p> Setting up a comparative test to show that plants need light and water to stay healthy.</p>		<p>Skills:</p> <p> Asking questions to recognise growth in animals using the following examples: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.</p> <p> Observe, through a video or first-hand observation and measurement, how different animals, including humans, grow.</p> <p> Asking questions about what things animals need for survival and what humans need to stay healthy. Suggest ways to find answers to their questions.</p>
<p>Opportunity to develop skill: Ask questions (6) Making predictions (5) Setting up tests (3) Observing and Measuring (9) Recording Data (5) Interpreting and communicating results (5)</p>						

Year Three

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	<p>Theme: Community: Shelter and food</p> <p>Science Topic: Rocks</p>	<p>Theme: Compassion: Environment</p> <p>Science Topic: Plants</p>	<p>Theme: Courage: Brave pirates</p> <p>Science Topic: Forces and Magnets</p>	<p>Theme: Curiosity: Curious Romans</p> <p>Science Topic: Animals, including Humans</p>	<p>Theme: Culture: China</p> <p>Science Topic: N/A</p>	<p>Theme: Celebration: Festivals</p> <p>Science Topic: Light</p>
	<p>Knowledge:</p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>Identify and describe the</p>	<p>Knowledge:</p> <p>Learn about the functions of different parts of flowering plants: roots, stem, leaves and flowers. (Introduce pupils to the relationship between structure and function: the idea that every part has a job to do).</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. <i>Note: Pupils can be introduced to the idea that plants can make their food, but at this stage they do not need to understand how this happens.</i></p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Knowledge:</p> <p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Knowledge:</p> <p>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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>		<p>Knowledge:</p> <p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes .</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object .</p> <p>Find patterns in the way that the size of shadows change.</p>
	<p>Skills:</p> <p> Observe rocks in local environment (buildings/gravestones) and explore how and why they may have changed over time.</p> <p> Use a hand lens or microscope to help identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in.</p> <p> Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.</p> <p> Explore different soils and identify similarities/differences. Include soils in their local environment.</p> <p> Investigate what happens when rocks are rubbed together and changes that occur when they are in water.</p> <p> Raise and answer questions about the way soils are formed.</p>	<p>Skills:</p> <p> Explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.</p> <p> Compare the effect of different factors on plant growth, for example, the amount of light or the amount of fertiliser.</p> <p> Discover how seeds are formed by observing the different stages of plant life cycles over a period of time.</p> <p> Look for patterns in the structure of fruits that relate to how the seeds are dispersed.</p> <p> Observe how water is transported in plants (e.g. using white carnations in coloured water).</p>	<p>Skills:</p> <p> Compare how different things move and group them.</p> <p> Raise questions and carry out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions.</p> <p> Explore the strength of different magnets and find a fair way to compare them.</p> <p> Sorting materials into those that are magnetic and those that are not.</p> <p> Look for patterns in the way that magnets behave in relation to each other and what might affect this (for example, the strength of the magnet or which pole faces another). Identify how these properties make magnets useful everyday items and suggest creative uses for different magnets.</p>	<p>Skills:</p> <p> Identify and group animals with and without skeletons and observing and comparing their movement.</p> <p> Exploring ideas about what would happen if humans did not have skeletons.</p> <p> Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.</p> <p> Research different food groups and how they keep us healthy and design meals based on what they find out.</p>		<p>Skills:</p> <p> Measure and record the brightness of light around school using data loggers.</p> <p> Look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.</p> <p> Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p>

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Opportunity to develop skill: Ask questions (6) Making predictions (10) Setting up tests (5) Observing and Measuring (13) Recording Data (15) Interpreting and communicating results (17) Evaluation (7)

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year Four	Theme: Community: What makes a home Science Topic: N/A	Theme: Compassion: What makes a family Science Topic: Living things and their habitats	Theme: Courage: Brave Vikings Science Topic: States of matter	Theme: Curiosity: Curious Egyptians Science Topic: Animals including humans	Theme: Culture: Brazil Science Topic: Electricity	Theme: Celebration: Music and expression Science Topic: Sound
		Knowledge: Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. Construct and interpret a variety of food chains, identifying producers, predators, prey. <i>(NC statement from Animals inc. humans area of study).</i>	Knowledge: Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). <i>(Note: Avoid using materials where heating is associated with chemical change, for example, through baking or burning).</i> Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Knowledge: Describe the simple functions of the basic parts of the digestive system in humans. (Mouth, tongue, teeth, oesophagus, stomach and small and large intestine). Identify the different types of teeth in humans and their simple functions. <i>Construct and interpret a variety of food chains, identifying producers, predators and prey. (covered in Habitats topic in T2)</i>	Knowledge: Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (They could use the circuits to create simple devices). 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage.	Knowledge: Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.
		Skills: Research examples of human impact (both positive and negative) on environments , for example the positive effects of nature reserves, ecologically planned parks, or garden ponds and the negative effects of population and development, litter or deforestation. Use and make simple keys to explore and identify local plants and animals. Make a guide to local living things.	Skills: Group and classify a variety of different materials. Develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Observe water as a solid, a liquid and as a gas and should note the changes to water when it is heated or cooled. Explore the effect of temperature on	Skills: Explore questions that help them understand the special functions of the main body parts associated with the digestive system. Compare the teeth of carnivores and herbivores and suggest reasons for the differences . Find out what damages teeth by setting up test for 'egg' model investigation and research how to look after them.	Skills: <i>Note: Pupils should be taught to take the necessary precautions for working safely with electricity.</i> Draw their circuits as a pictorial representation (not necessarily using conventional circuit symbols at this stage as this will be introduced in year 6). Observe patterns , for example, that bulbs get brighter if more cells are	Skills: Explore and identify the way sound is made through vibration in a range of different musical instruments from around the world. Find out how the pitch and volume of sounds can be changed in a variety of ways. Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.

	<p>Raising and answering questions based on their observations of animals and what they have found out about in their local environment and other animals that they have researched.</p>	<p>substances such as chocolate, butter, cream (e.g. make chocolate crispy cakes and ice-cream for a party).</p> <p> Research the temperature at which materials change state (e.g. when iron melts, or when oxygen condenses into a liquid).</p> <p> Observe and record evaporation over a period of time (e.g. a puddle in the playground or washing line).</p> <p> Investigate the effect of temperature on washing drying or snow melting.</p>	<p> Draw and discuss their ideas about the digestive system and compare them with models or images.</p>	<p>added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.</p> <p> Create their own switches using what they have learnt about conductor/insulators and circuits and set up tests to see if they work.</p>	<p> Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound.</p> <p> Set up a test to investigate how the length of string affects string telephones or how sound travels through different materials. Use data loggers to measure sound volume in decibels.</p> <p> Make and play their own instruments by using what they have found out about pitch and volume.</p>
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Opportunity to develop skill: Ask questions (12) Making predictions (12) Setting up tests (8) Observing and Measuring (11) Recording Data (16) Interpreting and communicating results (19) Evaluation (11)

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year Five	Theme: Community: Responsibilities Science Topic: Animals including humans	Theme: Compassion: Gender equality Science Topic: Forces	Theme: Courage: Brave Greeks Science Topic: N/A	Theme: Curiosity: Exploring space Science Topic: Space	Theme: Culture: Somalia Science Topic: Living things and their habitats	Theme: Celebration: Food Science Topic: Properties and changes of materials
	Knowledge: Describe the changes as humans develop from birth to old age (statutory). Pupils should draw a timeline to indicate stages in the growth and development of humans (non-statutory). They should learn about the changes experienced in puberty (non-statutory).	Knowledge: Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance (parachutes and sycamore seeds), water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.		Knowledge: Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. (The sun is a star at the centre of the solar system with eight planets; Pluto reclassified as a 'dwarf planet' in 2006). Describe the movement of the Moon relative to the Earth. (A moon is a celestial body that orbits a planet. Earth has one moon; Jupiter has four large moons and numerous smaller ones). Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Knowledge: Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.	Knowledge: 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. (Link y3 magnetism y4 electricity) Know some materials dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. 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.
	<p>Skills:</p> <p> Researching the gestation periods of other animals and comparing them with humans.</p> <p> Recording and recording the length and mass of a baby as it grows.</p> <p> Representing data in bar, scatter and line graphs, and interpreting these.</p>	<p>Skills:</p> <p> Raise questions about effects of air resistance. Observe how different objects, such as parachutes, sycamore seeds and cake cases fall. Design and make a variety of parachutes, carry out fair tests to determine most effective designs.</p> <p> Experience forces that make things begin to move, get faster or slow down. Explore the effects of friction on movement and find out how it slows or stops moving objects (e.g. observe a brake on a bicycle wheel).</p> <p> Explore resistance in water by making and testing boats of different shapes.</p> <p> Explore the effects of levers, pulleys and simple machines on movement. Then designing and making products that use levers, pulleys, gears and/or springs and explore their effects.</p> <p> Research how Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</p>		<p>Skills:</p> <p> Research how ideas of the solar system have developed, understanding the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.</p> <p> Compare the time of day at different places on the Earth through internet links and direct communication.</p> <p> Create simple models of the solar system. For example use a model of the Sun and Earth to describe day and night.</p> <p> Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day.</p> <p> Researching why some people think that structures such as Stonehenge might have been used as astronomical clocks.</p>	<p>Skills:</p> <p> Use the local environment to observe life-cycle changes in local plants and animals (e.g. in vegetable garden or birds) and compare to plants and animals around the world (e.g. rainforests).</p> <p> Asking pertinent questions about their local environment throughout the year and suggesting reasons for similarities and differences with other plants and animals around the world.</p> <p> Research work of naturalists and animal behaviourists such as David Attenborough and Jane Goodall.</p> <p> Grow new plants from different parts of the parent plant (e.g. seeds, stem and root cuttings, tubers, bulbs).</p> <p> Observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.</p>	<p>Skills:</p> <p> Research how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.</p> <p> Set up tests to answer questions, for example, 'Which materials would be most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'</p> <p> Observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes.</p> <p> Research and discuss how chemical changes have an impact on our lives, for example cooking, and then discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.</p> <p> Compare materials in order to make a switch in a circuit.</p>
Opportunity to develop skill: Ask questions (12) Making predictions (10) Setting up tests (8) Observing and Measuring (11) Recording Data (16) Interpreting and communicating results (19) Evaluation (11)						
Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6

Year Six

Theme: Community: Brilliant Bristol Science Topic: Living things and their habitats	Theme: Compassion: Identity and diversity Science Topic: Electricity	Theme: Courage: Anti-discrimination Science Topic: Evolution and inheritance	Theme: Curiosity: Magical Mysteries Science Topic: Light	Theme: Culture: Canada Science Topic: N/A	Theme: Celebration: Achievements Science Topic: Animals including humans
<p>Knowledge:</p> <p>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.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Knowledge:</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Knowledge:</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>Knowledge:</p> <p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>		<p>Knowledge:</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>
<p>Skills:</p> <p> Use classification systems and keys and direct observation to identify and classify animals and plants in the immediate environment (in more detail than year 4) including: the idea that broad groupings such as micro-organisms, plants and animals can be subdivided for example into invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).</p> <p> Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</p> <p> Research Carl Linnaeus, a pioneer of classification.</p>	<p>Skills:</p> <p><i>Note: Pupils should be taught to take the necessary precautions for working safely with electricity.</i></p> <p> Systematically ask questions and identify the effect of changing one component at a time (switches, bulbs, buzzers and motors) in a circuit. (Note: pupils are expected to learn only about series circuits).</p> <p> Design and make a set of traffic lights, a burgular alarm or some other useful circuit.</p>	<p>Skills:</p> <p> Make predictions using observations of fossil features (using images).</p> <p> Research and communicate findings about Mary Anning, Charles Darwin and Alfred Wallace.</p> <p> Observe and suggest inherited features of offspring of living things.</p> <p> Recording and represent data demonstrating how variation in offspring over time can make animals more or less able ot survive in particular environments in bar graphs, and interpreting these (Bird beak investigation).</p> <p> Compare how living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. Including observing and explaining adaptations of the resurrection plant.</p> <p> Observe and raise questions about local animals and how they are adapted to their environment.</p> <p> Analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, tendrils on climbing</p>	<p>Skills:</p> <p> Decide where to place rear-view mirrors on cars.</p> <p> Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.</p> <p> Investigate the relationship between light sources, objects and shadows by using shadow puppets.</p> <p> Extend their experience of light and observe a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur).</p>		<p>Skills:</p> <p> Listen to their hearts using stethoscope</p> <p> Measure and record lung capacity compared to people's height</p> <p> Design their own investigation to find out how exercise effects pulse rate.</p> <p> Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.</p>

		plants, brightly coloured and scented flowers.			
Opportunity to develop skill:  Ask questions (12)  Making predictions (8)  Setting up tests (4)  Observing and Measuring (13)  Recording Data (9)  Interpreting and communicating results (13)  Evaluation (6)					