

## Haughton St Giles Science Progression Grid



The progression grid outlines the specific knowledge and skills which pupils are expected to learn in each phase, over a two year cycle, along with the specific vocabulary which supports this understanding. Each unit of work is gathered under the appropriate scientific discipline, and where possible progression grids are organised to support the order of the learning journey across school. Also below is a progression map which highlights the teaching sequence over the two year cycle. Units which appear in both year groups of a phase are sometimes taught together in one year of the cycle to ensure that learning is progressive and builds on experiences. Teachers may revisit parts of units or specific information from previous units with pupils to ensure their full understanding before embarking on the next phase of learning due to the two cycle, to ensure pupils have learnt and retained the knowledge needed.

### Scientific Enquiry – The skills every pupil needs to ensure they can be a scientist

<b>Skills</b>	<p><b>At EYFS:</b> Children know about similarities and differences in relation to places, objects, materials and living things Children talk about the features of their own immediate environment and how environments might vary from one another Children describe shapes, spaces, and measures</p>	<p><b>At Key Stage One:</b> <b>E1:</b> ask simple questions and recognise that they can be answered in different ways <b>E2:</b> observe closely, using simple equipment <b>E3:</b> perform simple tests <b>E4:</b> identify and classify <b>E5:</b> use their observations and ideas to suggest answers to questions <b>E6:</b> gather and record data to help in answering questions</p>	<p><b>At Lower Key Stage Two:</b> <b>E1:</b> ask relevant questions and use different types of scientific enquiries to answer them <b>E2:</b> set up simple practical enquiries, comparative and fair tests <b>E3:</b> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers <b>E4:</b> gather, record, classify and present data in a variety of ways to help in answering questions <b>E5:</b> record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables <b>E6:</b> report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions <b>E7:</b> use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions <b>E8:</b> identify differences, similarities or changes related to simple scientific ideas and processes <b>E9:</b> use straightforward scientific evidence to answer questions or to support their findings.</p>	<p><b>At Upper Key Stage Two:</b> <b>E1:</b> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary <b>E2:</b> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate <b>E3:</b> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs <b>E4:</b> using test results to make predictions to set up further comparative and fair tests <b>E5:</b> 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 <b>E6:</b> identify scientific evidence that has been used to support or refute ideas or arguments</p>
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### Being a Scientist – Exemplifying scientific behaviours which ensure pupils know more and remember more

<b>Skills</b>	<p><b>At EYFS:</b> Children make observations of animals and plants and explain why some things occur, and talk about changes Children use what they have learnt about media and materials in original ways, thinking about uses and purposes</p>	<p><b>At Key Stage One:</b> <b>B1:</b> Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. <b>B2:</b> They should be encouraged to be curious and ask questions about what they notice. <b>B3:</b> They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. <b>B4:</b> They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.</p>	<p><b>At Lower Key Stage Two:</b> <b>B1:</b> Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. <b>B2:</b> They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. <b>B3:</b> They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them <b>B4:</b> They should help to make decisions about what observations to make, how long to make</p>	<p><b>At Upper Key Stage Two:</b> <b>B1:</b> Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. <b>B2:</b> They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. <b>B3:</b> They should 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 the most</p>
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		<p>them for and the type of simple equipment that might be used.</p> <p><b>B5:</b> They should learn how to use new equipment, such as data loggers, appropriately.</p> <p><b>B6:</b> They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.</p> <p><b>B7:</b> With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.</p> <p><b>B8:</b> With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.</p> <p><b>B9:</b> They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p><b>B10:</b> Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.</p>	<p>appropriate equipment to make measurements and explain how to use it accurately.</p> <p><b>B4:</b> They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.</p> <p><b>B5:</b> They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p> <p><b>B6:</b> They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.</p>
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## Cycles of Learning

CYCLE ONE	Autumn One	Autumn Two	Spring One	Spring Two	Summer One	Summer Two
<b>Key Stage One</b>	Living Things and Their Habitats (Years 1 and 2)		Seasonal Change		Plants (Years 1 and 2)	Animals including Humans (Years 1 and 2)
<b>Lower Key Stage Two</b>	States of Matter (Year 4)		Animals including Humans (Year 3)	Rocks (Y3)	Light (Y3)	Living things and their Habitats (Year 4)
<b>Upper Key Stage Two</b>	Earth and Space (Year 5)	Forces (Year 5)	Properties and Changes of Materials (Year 5)	Animals including humans (Year 5)	Living things and their habitats (Year 5)	
<b>Upper Key Stage Two</b>	Electricity (Year 6)	Evolution and Inheritance (Year 6)	Animals including Humans (Year 6)		Living things and their habitats (Y6)	Light (Y6)

CYCLE TWO	Autumn One	Autumn Two	Spring One	Spring Two	Summer One	Summer Two
<b>Key Stage One</b>	Everyday Materials (Years 1 and 2)		Animals including Humans (Years 1 and 2)		Plants (Years 1 and 2)	
<b>Lower Key Stage Two</b>	Sound (Year 4)	Electricity (Year 4)	Animals including Humans (Year 4)		Plants (Year 3)	Forces and Magnets (Year 3)
<b>Upper Key Stage Two</b>	Earth and Space (Year 5)	Forces (Year 5)	Properties and Changes of Materials (Year 5)	Animals including humans (Year 5)	Living things and their habitats (Year 5)	
<b>Upper Key Stage Two</b>	Electricity (Year 6)	Evolution and Inheritance (Year 6)	Animals including Humans (Year 6)		Living things and their habitats (Y6)	Light (Y6)

**Biology – Animals including humans**

		<b>Key Stage One</b>		<b>Lower Key Stage Two</b>			<b>Upper Key Stage Two</b>	
<b>Knowledge</b>	<b>YEAR ONE:</b>	<ul style="list-style-type: none"> <li>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li> <li>identify, name, draw and label the basic parts of the human body and say which part of the body links with each sense.</li> </ul>		<b>YEAR THREE:</b>			<b>YEAR FIVE:</b>	
	<b>YEAR ONE:</b>	<ul style="list-style-type: none"> <li>use observations to compare and contrast animals at first hand or through videos and photographs</li> <li>describe how they identify and group animals</li> <li>group animals according to what they eat</li> <li>use their senses to compare different textures, sounds and smells.</li> <li>Take care of animals in the local environment</li> </ul>		<b>YEAR THREE:</b>			<b>YEAR FIVE:</b>	
	<b>YEAR TWO:</b>	<ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>		<b>YEAR FOUR:</b>			<b>YEAR SIX:</b>	
	<b>YEAR TWO:</b>	<ul style="list-style-type: none"> <li>observe, through video or first-hand observation and measurement, how different animals, including humans, grow</li> <li>ask questions about what things animals need for survival and what humans need to stay healthy</li> <li>suggest ways to find answers to their questions.</li> </ul>		<b>YEAR FOUR:</b>			<b>YEAR SIX:</b>	
<b>Working Scientifically</b>								
<b>Topic Vocabulary</b>	Head	Fur	Nutrition	Muscles	Rectum	Heart	Egg	
	Body	Beak	Nutrients	Skull	Anus	Pulse	Sperm	
	Eyes	Paws	Carbohydrates	Ribs	Colon	Blood vessels	Water	
	Ears	Offspring	Sugars	Spine	Saliva	Lungs	Veins	
	Mouth	Reproduction	Protein	Joints	Canine	Oxygen	Arteries	
	Teeth	Growth	Vitamins	Digestive System	Incisor	Carbon dioxide	Capillaries	
	Leg	Exercise	Minerals	Digestion	Molar	Nutrients	Oxygenated	
	Tail	Heartbeat	Fibre	Mouth	Premolar	Circulatory system	Deoxygenated	
	Wing	Hygiene	Fat	Teeth	Tongue	Diet		
	Claw	Germs	Water	Oesophagus	Herbivore	Exercise		
	Fin	Reptiles	Skeleton	Small intestine	Carnivore	Drugs		
	Scales	Mammals	Bones	Large intestine	Omnivore	Lifestyle		
	Feather	Amphibians		Stomach		Blood		

## Biology – Plants

	Key Stage One	Lower Key Stage Two	Upper Key Stage Two																																										
Knowledge	<p><b>YEAR ONE:</b></p> <ul style="list-style-type: none"> <li>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul>	<p><b>YEAR THREE:</b></p> <ul style="list-style-type: none"> <li>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>know 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</li> <li>observe and know the way in which water is transported within plants</li> <li>know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>																																											
Working Scientifically	<p><b>YEAR ONE:</b></p> <ul style="list-style-type: none"> <li>observe closely, perhaps using magnifying glasses, and compare and contrast familiar plants;</li> <li>describe how they were able to identify and group them, and draw diagrams showing the parts of different plants including trees.</li> <li>keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.</li> </ul>	<p><b>YEAR THREE:</b></p> <ul style="list-style-type: none"> <li>compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser</li> <li>discover how seeds are formed by observing the different stages of plant life cycles over a period of time</li> <li>look for patterns in the structure of fruits that relate to how the seeds are dispersed.</li> <li>observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.</li> </ul>																																											
Knowledge	<p><b>YEAR TWO:</b></p> <ul style="list-style-type: none"> <li>observe and describe how seeds and bulbs grow into mature plants</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>																																												
Working Scientifically	<p><b>YEAR TWO:</b></p> <ul style="list-style-type: none"> <li>observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth</li> <li>set up a comparative test to show that plants need light and water to stay healthy.</li> </ul>																																												
Topic Vocabulary	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Leaf</td> <td style="width: 50%;">Bud</td> </tr> <tr> <td>Flower</td> <td>Bulb</td> </tr> <tr> <td>Blossom</td> <td>Life cycle</td> </tr> <tr> <td>Petal</td> <td>Growth</td> </tr> <tr> <td>Fruit</td> <td>Grow</td> </tr> <tr> <td>Berry</td> <td>Light</td> </tr> <tr> <td>Root</td> <td>Shade</td> </tr> <tr> <td>Seed</td> <td>Sun</td> </tr> <tr> <td>Trunk</td> <td>Warm</td> </tr> <tr> <td>Branch</td> <td>Cool</td> </tr> <tr> <td>Stem</td> <td>Water</td> </tr> <tr> <td>Bark</td> <td>Healthy</td> </tr> <tr> <td>Stalk</td> <td></td> </tr> </table>	Leaf	Bud	Flower	Bulb	Blossom	Life cycle	Petal	Growth	Fruit	Grow	Berry	Light	Root	Shade	Seed	Sun	Trunk	Warm	Branch	Cool	Stem	Water	Bark	Healthy	Stalk		<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Photosynthesis</td> <td style="width: 50%;">Reproduction</td> </tr> <tr> <td>Pollen</td> <td></td> </tr> <tr> <td>Pollination</td> <td></td> </tr> <tr> <td>(insect, wind, seed, animal, water)</td> <td></td> </tr> <tr> <td>Dispersal</td> <td></td> </tr> <tr> <td>Nutrients</td> <td></td> </tr> <tr> <td>Reproduction</td> <td></td> </tr> <tr> <td>Transportation</td> <td></td> </tr> </table>	Photosynthesis	Reproduction	Pollen		Pollination		(insect, wind, seed, animal, water)		Dispersal		Nutrients		Reproduction		Transportation		
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**Biology – Living things and their habitats**

	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Knowledge			<p><b>YEAR FIVE:</b></p> <ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>describe the life process of reproduction in some plants and animals.</li> </ul>
Working Scientifically			<p><b>YEAR FIVE:</b></p> <ul style="list-style-type: none"> <li>observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times),</li> <li>ask pertinent questions and suggest reasons for similarities and differences.</li> <li>grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulb.</li> <li>observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.</li> </ul> <p align="right"><i>David Attenborough, Jane Goodall</i></p>
Knowledge	<p><b>YEAR TWO:</b></p> <ul style="list-style-type: none"> <li>The difference between living, dead and that which was never alive.</li> <li>What a habitat is, how these can be the same or different, and how some animals and plants suit one habitat better than another.</li> <li>The names of key plants and animals from a variety of habitats inc microhabitats.</li> <li>The adaptations these plants and animals have to survive these habitats.</li> <li>Know how these animals and plant depend on each other for survival.</li> <li>What a food chain is and why they are important.</li> <li>Understand interdependency and food chains, explained thorough diagrams, written and spoken presentations</li> <li>Understand what a food source is.</li> </ul>	<p><b>YEAR FOUR:</b></p> <ul style="list-style-type: none"> <li>recognise that living things can be grouped in a variety of ways</li> <li>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul>	<p><b>YEAR SIX:</b></p> <ul style="list-style-type: none"> <li>describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</li> <li>give reasons for classifying plants and animals based on specific characteristics.</li> </ul>
Working Scientifically	<p><b>YEAR TWO:</b></p> <ul style="list-style-type: none"> <li>Sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts.</li> <li>Describe how they decided where to place things, exploring questions such as: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.</li> <li>Construct a simple food chain that includes humans (e.g. grass, cow, human).</li> <li>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.</li> </ul>	<p><b>YEAR FOUR:</b></p> <ul style="list-style-type: none"> <li>use and make simple guides or keys to explore and identify local plants and animals</li> <li>make a guide to local living things</li> <li>raise and answer questions based on their observations of animals and what they have found out about other animals that they have researched.</li> <li>Explore the human impact within the local environment</li> </ul>	<p><b>YEAR SIX:</b></p> <ul style="list-style-type: none"> <li>use classification systems and keys to identify some animals and plants in the immediate environment.</li> <li>research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</li> </ul> <p align="right"><i>Carl Linnaeus</i></p>

Topic Vocabulary	Living Dead Suited Unsuited Basic needs Food Food chain Shelter	Adapt Herbivore Omnivore Carnivore Pond Woodland Microhabitat Local habitat	Vertebrates (fish, amphibians, reptiles, birds, mammals), Invertebrates, Flowering, Non-flowering Producer	Environment, Human impact Habitat Conditions Migrate Hibernate	Life Cycle, Mammal, Reproduction, Amphibian, Offspring Subdivision Seeds Consumer Decomposer	Classify class family genus stem sperm fertilises Producer	species characteristics flowering non-flowering Invertebrates Vertebrates metamorphosis
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Biology – Evolution and Inheritance			
	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Knowledge			<b>YEAR SIX:</b> <ul style="list-style-type: none"> <li>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul>
Working Scientifically			<b>YEAR SIX:</b> <ul style="list-style-type: none"> <li>observe and raising questions about local animals and how they are adapted to their environment</li> <li>compare how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels</li> <li>analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. <i>Charles Darwin, Alfred Wallace</i></li> </ul>
Topic Vocabulary			evolution adaption variation offspring fossil environment Conditions Classify Characteristics Reproduce Sexual reproduction Asexual reproduction Species Suited inherited

## Chemistry – Everyday Materials (Inc. Rocks)

	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Knowledge	<p><b>YEAR ONE:</b></p> <ul style="list-style-type: none"> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of a variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	<p><b>YEAR THREE – ROCKS:</b></p> <ul style="list-style-type: none"> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>recognise that soils are made from rocks and organic matter.</li> </ul>	<p><b>YEAR FIVE:</b></p> <ul style="list-style-type: none"> <li>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</li> <li>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>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.</li> </ul>
Working Scientifically	<p><b>YEAR ONE:</b></p> <ul style="list-style-type: none"> <li>performing 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?’</li> <li>Explore, name and discuss everyday material so that the children become familiar with the properties</li> </ul>	<p><b>YEAR THREE – ROCKS:</b></p> <ul style="list-style-type: none"> <li>observe rocks, including those used in buildings and gravestones, and explore how and why they might have changed over time;</li> <li>use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.</li> <li>research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.</li> <li>explore different soils, identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water.</li> <li>raise and answer questions about the way soils are formed.</li> </ul>	<p><b>YEAR FIVE:</b></p> <ul style="list-style-type: none"> <li>carrying out tests to answer questions, for example, ‘Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’</li> <li>compare materials in order to make a switch in a circuit</li> <li>observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes.</li> <li>research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.</li> </ul> <p style="text-align: right; color: red;"><i>Spencer Silver, Ruth Berierito</i></p>
Knowledge	<p><b>YEAR TWO:</b></p> <ul style="list-style-type: none"> <li>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<p><b>YEAR FOUR:</b></p> <ul style="list-style-type: none"> <li>compare and group materials together, according to whether they are solids, liquids or gases</li> <li>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)</li> <li>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	

Working Scientifically	<b>YEAR TWO:</b> <ul style="list-style-type: none"> <li>comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs)</li> <li>observe closely, identifying and classifying the uses of different materials, and recording their observations.</li> </ul>			<b>YEAR FOUR:</b> <ul style="list-style-type: none"> <li>grouping and classifying a variety of different materials;</li> <li>exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party).</li> <li>research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.</li> <li>observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.</li> </ul>						
	Topic Vocabulary	Rough, Smooth, Stretchy, Stiff, Bending, Twisting, Stretching,	Elastic, Foil, Fabrics, Reflective Non-reflective	Dull, Waterproof, Absorbent, Sustainable Unsustainable Opaque Transparent, Translucent	Fossils, Sandstone, Granite, Marble, Rock, Soil Porous Hard Soft	Pumice, Crystals, Absorbent, Sedimentary, Organic matter, Grains Permeable Igneous Metamorphic	Solid, Liquid, Gas, Evaporation, Condensation, Particles, melting	Freezing, solidify changing state, temperature, water cycle, water vapour	Thermal Electrical Insulator/conduct Change of state Mixture Dissolve Solution Soluble Insoluble	Change Reversible irreversible Burning Rusting New material Solubility Evaporation filtering

**Physics**

	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Knowledge		<p><b>YEAR THREE – FORCES AND MAGNETS</b></p> <ul style="list-style-type: none"> <li>compare how things move on different surfaces</li> <li>notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>describe magnets as having two poles</li> <li>predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>	<p><b>YEAR FIVE – FORCES AND MAGNETS</b></p> <ul style="list-style-type: none"> <li>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>
Working Scientifically		<p><b>YEAR THREE – FORCES AND MAGNETS</b></p> <ul style="list-style-type: none"> <li>compare how different things move and group them</li> <li>raise questions and carry out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions;</li> <li>explore the strengths of different magnets and find a fair way to compare them</li> <li>sort materials into those that are magnetic and those that are not;</li> <li>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</li> <li>identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</li> </ul>	<p><b>YEAR FIVE – FORCES AND MAGNETS</b></p> <ul style="list-style-type: none"> <li>explore falling paper cones or cup-cake cases, and design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective</li> <li>explore resistance in water by making and testing boats of different shapes</li> <li>design and make products that use levers, pulleys, gears and/or springs and explore their effects.</li> </ul> <p align="right"><i>Galileo Galilei, Isaac Newton</i></p>
Topic Vocabulary		<p>Magnetic, Force, Attract, Repel, Friction,</p>	<p>Poles, Magnetic Poles, Magnetism, Strength Magnetic force</p>
			<p>gravity air resistance water resistance friction, surface force, effect accelerate decelerate</p> <p>mechanism pulley lever gear spring theory of gravitation</p>
Knowledge	<p><b>YEAR ONE – SEASONAL CHANGES</b></p> <ul style="list-style-type: none"> <li>observe changes across the four seasons</li> <li>observe and describe weather associated with the seasons and how day length varies.</li> </ul>	<p><b>YEAR THREE – LIGHT</b></p> <ul style="list-style-type: none"> <li>recognise that they need light in order to see things and that dark is the absence of light</li> <li>notice that light is reflected from surfaces</li> <li>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>find patterns in the way that the size of shadows change.</li> </ul>	<p><b>YEAR SIX – LIGHT</b></p> <ul style="list-style-type: none"> <li>recognise that light appears to travel in straight lines</li> <li>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</li> <li>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</li> <li>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>

Working Scientifically	<b>YEAR ONE – SEASONAL CHANGES</b> <ul style="list-style-type: none"> <li>make tables and charts about the weather; and make displays of what happens in the world around them, including day length, as the seasons change.</li> <li>Observe and talk about the changes in weather and the seasons</li> </ul>	<b>YEAR THREE – LIGHT</b> <ul style="list-style-type: none"> <li>looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</li> </ul>		<b>YEAR SIX – LIGHT</b> <ul style="list-style-type: none"> <li>decide where to place rear-view mirrors on cars;</li> <li>design and making a periscope and use the idea that light appears to travel in straight lines to explain how it works.</li> <li>investigate the relationship between light sources, objects and shadows by using shadow puppets</li> <li>extend their experience of light by looking 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).</li> </ul>	
Topic Vocabulary	Seasons weather Summer, Spring, Autumn, Winter, Sunrise Sunset Day length	Reflective, Reflection, Shadow, Light Light source Dark Absence of light	Natural, Artificial, Transparent Translucent Opaque Sunlight Dangerous	Refraction, Reflection, Spectrum, Rainbow travels reflect straight lines	light source object shadows mirrors periscope filters light rays  <b>SEE ALSO YEAR FIVE EARTH AND SPACE</b>
Knowledge		<b>YEAR FOUR - ELECTRICITY</b> <ul style="list-style-type: none"> <li>identify common appliances that run on electricity</li> <li>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>		<b>YEAR SIX - ELECTRICITY</b> <ul style="list-style-type: none"> <li>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>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</li> <li>use recognised symbols when representing a simple circuit in a diagram.</li> </ul>	
Working Scientifically		<b>YEAR FOUR - ELECTRICITY</b> <ul style="list-style-type: none"> <li>observing patterns, for example, that bulbs get brighter if more cells are 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.</li> <li>construct a simple circuit and create a diagram of a circuit</li> </ul>		<b>YEAR SIX - ELECTRICITY</b> <ul style="list-style-type: none"> <li>systematically identify the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.</li> <li>Create detailed diagrams using recognised symbols</li> </ul>	
Topic Vocabulary		Cells, Switches, Buzzers, Motor, Bulb, Battery Wire Plug	Circuit, Conductors, Insulators complete circuit Components Positive Negative Short circuit	Circuit, Circuit diagram Cell Bulb Motor Voltage	Complete circuit Symbol Battery Buzzer Switch Component

Knowledge		<b>YEAR FOUR - SOUND</b> <ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating</li> <li>• recognise that vibrations from sounds travel through a medium to the ear</li> <li>• find patterns between the pitch of a sound and features of the object that produced it</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>	<b>YEAR FIVE – EARTH AND SPACE</b> <ul style="list-style-type: none"> <li>• describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>• describe the movement of the Moon relative to the Earth</li> <li>• describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>• use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>
Working Scientifically		<b>YEAR FOUR - SOUND</b> <ul style="list-style-type: none"> <li>• finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</li> <li>• make earmuffs from a variety of different materials to investigate which provides the best insulation against sound</li> <li>• make and play their own instruments by using what they have found out about pitch and volume.</li> </ul>	<b>YEAR FIVE – EARTH AND SPACE</b> <ul style="list-style-type: none"> <li>• compare the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system;</li> <li>• construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day</li> <li>• find out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</li> </ul>
Topic Vocabulary		Sound Source Vibrate Vibration Travel Pitch Volume Faint	Loud Insulation Earth Moon Sun Mercury Venus Mars Jupiter Saturn Uranus Neptune Pluto Dwarf planet Solar system Planet Phases of moon Orbit Axis Galaxy Milky way Universe Dark side New side