

Our Science Curriculum

Intention:

Our Vision for Science at Hartlip is:

For all our pupils to develop a sense of excitement and curiosity about natural phenomena which supports their scientific learning in to secondary education and beyond - *Living to Learn*

For our pupils to have a deep understanding of the uses and significance of Science to society and their own lives, including the significant contribution science has made in the past as well as value the continuing importance of science in solving global challenges - *Learning to Live*

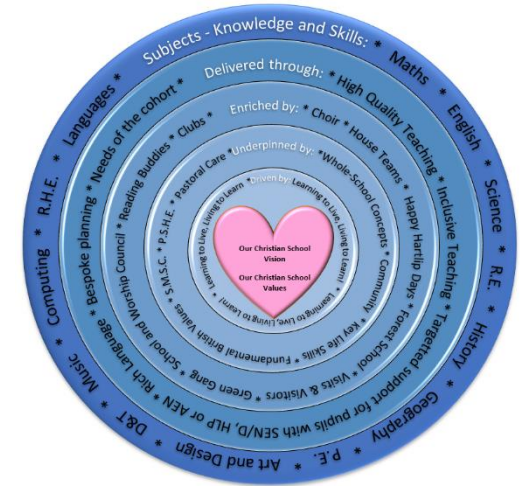
For our pupils to understand how science can lead to a range of diverse and valuable careers that are crucial for economic, environmental and social development.

Implementation: Each Science topic has been carefully mapped out over the course of a 2-year cycle, ensuring coverage and progression. The full Primary National Curriculum is covered for both knowledge as well as scientific enquiry skills – Substantive knowledge and disciplinary knowledge. These areas of knowledge are taught together within a topic and disciplinary knowledge is taught fully with regard to objectives rather than merely absorbed through the teaching of substantive knowledge. Within both substantive and disciplinary knowledge, procedural and conceptual aspects are taught, for example knowing how/being able to (procedural) and knowing facts (conceptual).

Scientific concepts are returned to over time to build pupil’s knowledge step by step and support pupil’s learning and memory. These concepts are: *Patterns, Observations, Grouping and Classifying, Using equipment and fair testing, Answering questions with data, Solving problems and Research.* As well as these concepts, the three areas of science are highlighted to pupils: *Biology, Chemistry and Physics.* (Chemistry is mostly taught through scientific enquiry skills and disciplinary knowledge). Additionally, our curriculum provides pupils with insight in to wider challenges such as *climate change and environmental issues.*

The Enquiry-Based approach to Science further ensures pupil’s ask and answer questions using and developing their skills in ‘working scientifically.’

Science topics are linked, only where possible, to our ‘Learning to Live, Living to Learn’ whole school concepts. Links are not made at any cost to the specific scientific knowledge and skills objectives, however, links are made where it is possible to do so. For example, topics may link to themes in other subject areas, such as maths, materials and D&T structures.





Year R follow their own Early Years curriculum, but, as Year 1 and Year R are mixed, aspects of this curriculum will be taught to Year R, providing an understanding of KS1 Science concepts from the very start of school, along with the educational programme for EYFS.

Impact:

Our pupils receive an engaging curriculum which includes carefully chosen activities matching the specific curriculum intent. They engage in practical activities which form part of a wider instructional sequence, giving pupils time to connect theory to observation – supporting their learning over time. Our pupils learn that science is a body of established knowledge but is also a discipline of enquiry. Our pupils have a passion for science and a keen interest which leads to them knowing and remembering more for their futures.

Science Curriculum Map

Science Curriculum Map							
Terms:		Autumn: Our Locality		Spring: Our UK		Summer: Our World	
		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
'Learning to Live, Living to Learn' Concepts and Skills:		<ul style="list-style-type: none"> ➤ Our Christian School Vision ➤ Get Heartsmart ➤ Creativity ➤ Democracy 	<ul style="list-style-type: none"> ➤ People and community ➤ Friendship ➤ Too much selfie isn't healthy ➤ Empathy ➤ Founder's Day 	<ul style="list-style-type: none"> ➤ Resilience ➤ Trust ➤ Don't forget to let love in ➤ Rule of Law 	<ul style="list-style-type: none"> ➤ Forgiveness ➤ Problem-solving ➤ Don't hold on to what is wrong ➤ Tolerance 	<ul style="list-style-type: none"> ➤ Communication ➤ Environment ➤ Thankfulness ➤ Fake is a mistake ➤ Mutual Respect 	<ul style="list-style-type: none"> ➤ Peace ➤ No way through isn't true ➤ Thinking ➤ Individual Liberty ➤ World sporting events
Year	Cycle	Skills, Knowledge and objectives					
Yr 1 (and YrR)	A	Summer and Autumn: Changes in Hartlip <i>Observation</i> <i>Answering questions</i> <i>Biology</i>	Autumn and Winter: Changes in Hartlip <i>Observation</i> <i>Answering questions</i> <i>Biology</i>	Winter and Spring: Changes around places in the UK <i>Extreme UK Weather and its impact</i> <i>Observation</i> <i>Patterns</i> <i>Biology</i>	Everyday Materials: Materials in the UK, materials for a tower, materials for a natural sculpture <i>Grouping and Classifying</i> <i>Using equipment</i> <i>Observation</i> <i>Physics</i>	Plants: <i>Looking after our Environment</i> , plants Christopher Columbus brought to the UK <i>Grouping and Classifying</i> <i>Research</i> <i>Observation</i> <i>Biology</i>	Spring and Summer: Changes around Europe <i>Observation</i> <i>Patterns</i> <i>Answering Questions</i> <i>Biology</i>
		<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i> ➤ <i>I can ask questions and know they I can be answered in different ways.</i> 		<ul style="list-style-type: none"> ➤ I can tell the difference between an object and the material from which it is made. ➤ I can name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ➤ I can describe some everyday materials. 		<ul style="list-style-type: none"> ➤ I can name some common wild and garden plants, including deciduous and evergreen trees ➤ I can name and describe the basic structure of a variety of common flowering plants, including trees ➤ <i>I can name and group.</i> ➤ <i>I can look closely, using equipment. (magnifying glass)</i> 	
		<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i> ➤ <i>I can collect and record data to help answer questions.</i> 				<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i> ➤ <i>I can collect and record data to help answer questions.</i> 	



				<ul style="list-style-type: none"> ➤ I can make groups of materials based on what they are like. ➤ <i>I can name and group</i> ➤ <i>I can look closely, using equipment (measurements, mass)</i> 		<ul style="list-style-type: none"> ➤ <i>I can look closely, using equipment.</i>
B	<p>Summer and Autumn - Changes in Hartlip <i>Observation</i> <i>Answering questions</i> <i>Biology</i></p>	<p>Animals inc. Humans – Our senses <i>Answering questions</i> <i>Grouping and Classifying</i> <i>Observation</i> <i>Biology</i></p>	<p>Winter and Spring – Changes around places in the UK <i>Extreme UK Weather and its impact</i> <i>Observation</i> <i>Patterns</i> <i>Biology</i></p>	<p>Everyday Materials –Manmade Materials in the UK <i>Grouping and Classifying</i> <i>Using equipment</i> <i>Observation</i> <i>Physics</i></p>	<p>Animals Inc. Humans – carnivores and herbivores around the world <i>Endangered animals</i> <i>Grouping and Classifying</i> <i>Research</i> <i>Biology</i></p>	<p>Spring and Summer – Changes around Europe <i>Observation</i> <i>Patterns</i> <i>Answering Questions</i> <i>Biology</i></p>
	<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i> ➤ <i>I can ask questions and know they I can be answered in different ways.</i> 	<ul style="list-style-type: none"> ➤ I can name, draw and label the basic parts of the human body and say which part of the body is to do with each sense. ➤ <i>I can ask questions and know they I can be answered in different ways.</i> ➤ <i>I can use my observations and ideas to suggest answers to questions</i> 	<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i> ➤ <i>I can ask questions and know they I can be answered in different ways.</i> 	<ul style="list-style-type: none"> ➤ I can tell the difference between an object and the material from which it is made. ➤ I can name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ➤ I can describe some everyday materials. ➤ I can make groups of materials based on what they are like. ➤ <i>I can name and group</i> ➤ <i>I can look closely, using equipment. (measurements, mass)</i> 	<ul style="list-style-type: none"> ➤ I can spot and name a variety of common animals. ➤ I can group animals according to what they eat. ➤ I can spot and name a variety of common animals that are carnivores, herbivores and omnivores. ➤ I can describe and compare the structure of a variety of common animals ➤ <i>I can name and group</i> 	<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. ➤ <i>I can use my observations and ideas to suggest answers to questions</i>
Yr 2	A&B	<p>Uses of Everyday Materials: Everyday materials in our home and classrooms, materials for structures and sculptures, materials used in Tudor times. <i>Reduce, reuse and Recycle</i> <i>Research</i> <i>Solving problems</i> <i>Answering questions</i> <i>Grouping and Classifying</i> <i>Physics</i></p>	<p>Living things: around the UK <i>Grouping and Classifying</i> <i>Patterns</i> <i>Research</i> <i>Biology</i></p>	<p>Plants: plants used for cooking, plants used for design (Morris), what plants need to be healthy <i>Answering questions</i> <i>Observation</i> <i>Patterns</i> <i>Using equipment and Fair tests</i> <i>Biology</i></p>	<p>Animals Inc. Humans: Springtime babies around the world, growth and nutrition <i>Food and water deprivation</i> <i>Grouping and Classifying</i> <i>Patterns</i> <i>Research</i> <i>Answering questions</i> <i>Biology</i></p>	
		<ul style="list-style-type: none"> ➤ I can say why I would choose a material for a particular job. ➤ I can explain how objects made from some materials I can be changed. ➤ <i>I can communicate my ideas, what I do, and what I find out in a variety of ways.</i> 	<ul style="list-style-type: none"> ➤ I can explain the differences between things that are living, dead and things that have never been alive 	<ul style="list-style-type: none"> ➤ I can explain how seeds and bulbs grow into plants. ➤ I can describe how plants need water, light and a 	<ul style="list-style-type: none"> ➤ I can explain that animals, including humans, have babies which grow into adults ➤ I can explain the needs of animals, including humans, for survival. ➤ I can explain the importance of exercise, eating healthily and keeping clean. 	



		<ul style="list-style-type: none"> ➤ I can use my observations and ideas to suggest answers to questions. ➤ I can ask questions and know they I can be answered in different ways. ➤ I can name and group 	<ul style="list-style-type: none"> ➤ I can explain that most living things live in habitats which suit them and depend on each other ➤ I can name some plants and animals in their habitats including micro-habitats ➤ I can explain how animals get their food from plants and other animals using a simple food chain ➤ I can name and group 	<p>suitable temperature to grow and stay healthy</p> <ul style="list-style-type: none"> ➤ I can watch closely using equipment (thermometer) ➤ I can collect and record data to help answer questions ➤ I can set up simple practical enquiries, and fair tests ➤ I can communicate my ideas, what I do, and what I find out in a variety of ways. 	<ul style="list-style-type: none"> ➤ I can name and group ➤ I can ask questions and know they I can be answered in different ways. 		
Yr 3/4	A	<p>Animals inc Humans (yr3 unit): skeleton, muscles, nutrition <i>Patterns</i> <i>Grouping and Classifying</i> <i>Biology</i></p>	<p>Animals inc Humans (yr4 unit): digestive system, teeth, food chains <i>Grouping and Classifying</i> <i>Patterns</i> <i>Biology</i></p>	<p>Forces and Magnets (yr3 unit): magnetic materials, <i>Observation</i> <i>Answering questions</i> <i>Solving problems</i> <i>Grouping and Classifying</i> <i>Using equipment</i> <i>Physics</i></p>	<p>Light (yr3 unit): how light is reflected, sunlight, invention of the lightbulb (Victorian) <i>Solar energy</i> <i>Observation</i> <i>Patterns</i> <i>Using equipment</i> <i>Solving problems</i> <i>Physics</i></p>	<p>Living Things: <i>changes in environment</i>, living things local and worldwide <i>Grouping and Classifying</i> <i>Solving problems</i> <i>Research</i> <i>Biology</i></p>	<p>Sound (yr4 unit): sound travelling, vibrations <i>Using equipment</i> <i>Answering questions</i> <i>Solving problems</i> <i>Physics</i></p>
		<ul style="list-style-type: none"> ➤ I can identify that animals, including humans, need the right types and amount of nutrition, and that they I cannot make their own food; they get nutrition from what they eat. ➤ I can explain why humans and some other animals have skeletons and muscles. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes 	<ul style="list-style-type: none"> ➤ I can explain some parts of the digestive system in humans. ➤ I can explain the different types of teeth in humans and what they do. ➤ I can describe and explain a variety of food chains, naming producers, predators and prey. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. 	<ul style="list-style-type: none"> ➤ I can compare how things move on different surfaces. ➤ I can see that some forces need contact between two objects, but magnetic forces I can act at a distance. ➤ I can observe how magnets attract or repel each other and attract some materials and not others. ➤ I can compare and group some materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. ➤ I can describe magnets as having two poles. ➤ I can predict whether two magnets will attract or repel each other, depending on which poles are facing. ➤ I can ask relevant questions and use different types of scientific enquiries to answer them 	<ul style="list-style-type: none"> ➤ I can explain that I need light in order to see things and that dark is the absence of light ➤ I can explain that light from the sun I can be dangerous and that there are ways to protect eyes ➤ I can show that light is reflected from surfaces. ➤ I can show how shadows are formed when the light from a light source is blocked by a solid object. ➤ I can show that there are patterns are in the way that the size of shadows change. ➤ I can ask relevant questions and use different types of scientific enquiries to answer them ➤ I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. ➤ I can report on findings from enquiries, including spoken 	<ul style="list-style-type: none"> ➤ I can show that living things I can be grouped together in various ways ➤ I can explore and use classification keys to help group, identify and name a variety of living things ➤ I can explain that environments I can change and that this sometimes means that living things are put in danger. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. ➤ I can use scientific evidence to answer questions or to support my findings 	<ul style="list-style-type: none"> ➤ I can explain how sounds are made, and show that some of them are linked to vibrations. ➤ I can explain that vibrations from sounds travel through a medium to the ear. ➤ I can find patterns between the pitch of a sound and features of the object that produced it ➤ I can show that there is a pattern between the volume of a sound and the strength of the vibrations that produced it. ➤ I can ask relevant questions and use different types of scientific enquiries to answer them ➤ I can set up practical enquiries, comparative and fair tests. ➤ I can gather, record, classify and present data in a variety of ways to help in answering questions



			<ul style="list-style-type: none"> ➤ I can set up practical enquiries, comparative and fair tests. ➤ I can gather, record, classify and present data in a variety of ways to help in answering questions ➤ I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<p>and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"> ➤ I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 		<ul style="list-style-type: none"> ➤ I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. ➤ I can report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions ➤ I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
B	<p>Rocks: fossils, comparing rocks <i>Observation</i> <i>Grouping and Classifying</i> <i>Biology, Chemistry</i></p>	<p>States of Matter: solids, liquids and gases, changes in cooking <i>Climate change</i> <i>Using equipment</i> <i>Patterns</i> <i>Solving problems</i> <i>Answering questions</i> <i>Chemistry, Physics</i></p>	<p>Electricity: circuits, conductors. Insulators <i>Alternative forms of energy</i> <i>Solving problems</i> <i>Answering questions</i> <i>Using equipment</i> <i>Physics</i></p>	<p>Plants: various plants around the world, plants near mountains <i>Plants as food and where this is difficult</i> <i>Grouping and Classifying</i> <i>Patterns</i> <i>Research</i> <i>Biology</i></p>		
	<ul style="list-style-type: none"> ➤ I can examine and do practical experiments on various types of rocks in order to group them on the basis of their appearance and simple physical properties. ➤ I can simply describe how fossils are formed when things that have lived are trapped within rock. ➤ I can explain that soils are made from rocks and organic matter. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. 	<ul style="list-style-type: none"> ➤ I can group materials together, according to whether they are solids, liquids or gases including tricky ones like gels, foams, mists and pastes. ➤ I can demonstrate and explain 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 can correctly talk about the part played by evaporation and condensation in the water cycle and I can show a link between the rate of evaporation and temperature. ➤ I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. ➤ I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. ➤ I can report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions 	<ul style="list-style-type: none"> ➤ I can talk about common appliances that run on electricity. ➤ I can construct and draw with labels a simple series electrical circuit which includes cells, wires, bulbs, switches and buzzers. ➤ I can predict if a lamp will light or not in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. ➤ I can explain that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ➤ I can show that some materials are conductors and some are insulators, and I can explain that metals are good conductors. ➤ I can explain differences, similarities or changes 	<ul style="list-style-type: none"> ➤ I can explain what different parts of flowering plants do ➤ I can explore the requirements of plants for life and growth and how they vary from plant to plant. ➤ I can investigate the way in which water is transported within plants. ➤ I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. 		



					<p><i>related to simple scientific ideas and processes.</i></p> <ul style="list-style-type: none"> ➤ <i>I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i> ➤ <i>I can report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions</i> 	
Yr 5/6	A	<p>Evolution and Inheritance: fossils, adaptation to environment, living things changing over time</p> <p><i>Environmental changes</i> <i>Grouping and Classifying</i> <i>Observation</i> <i>Patterns</i> <i>Research</i> <i>Biology</i></p>	<p>Animals Inc. Humans (yr5 unit): aging <i>Observation</i> <i>Biology</i></p>	<p>Animals Inc. Humans (yr6 unit): circulatory system, nutrition, <i>war impact on nutrition</i> <i>Patterns</i> <i>Answering questions</i> <i>Research</i> <i>Biology</i></p>	<p>Forces: gravity, resistance, mechanisms <i>Using equipment</i> <i>Observation</i> <i>Answering questions</i> <i>Physics</i></p>	<p>Earth and Space: the moon, rotation, solar system <i>The Oxone layer</i> <i>Solving problems</i> <i>Answering questions</i> <i>Research</i> <i>Physics</i></p>
		<ul style="list-style-type: none"> ➤ I can explain that the kinds of living things that live on the earth now are different from those that inhabited the Earth millions of years ago and that fossils provide this information. ➤ I can explain that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ➤ I can give examples of how animals and plants are adapted to suit their environment in different ways and I can explain that adaptation may lead to evolution ➤ <i>I can group and classify things and recognise patterns.</i> ➤ <i>I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources.</i> ➤ <i>I can find things out using a wide range of secondary sources of information.</i> 	<ul style="list-style-type: none"> ➤ I can describe the changes as humans develop to old age ➤ <i>I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources.</i> 	<ul style="list-style-type: none"> ➤ I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ➤ I can recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions. ➤ I can describe the ways in which nutrients and water are transported within animals, including humans ➤ <i>I can group and classify things and recognise patterns.</i> ➤ <i>I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources.</i> ➤ <i>I can find things out using a wide range of secondary sources of information.</i> 	<ul style="list-style-type: none"> ➤ I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. ➤ I can demonstrate the effects of air resistance, water resistance and friction, that act between moving surfaces ➤ I can show that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. ➤ <i>I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i> ➤ <i>I can use test results to make predictions to set up further comparative and fair tests.</i> ➤ <i>I can take accurate measurements, using a range of scientific equipment taking repeat readings when appropriate</i> 	<ul style="list-style-type: none"> ➤ I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. ➤ I can describe the movement of the Moon relative to the Earth ➤ I can describe the Sun, Earth and Moon as approximately spherical bodies ➤ I can explain day and night and the apparent movement of the sun across the sky using the idea of the Earth's rotation. ➤ <i>I can 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</i> ➤ <i>I can find things out using a wide range of secondary sources of information.</i>



				<ul style="list-style-type: none"> ➤ I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. ➤ I can use scientific language and ideas to explain, evaluate and communicate my methods and findings. 	
B	<p>Properties and changes of Materials – comparing, dissolving <i>Grouping and Classifying</i> <i>Using equipment</i> <i>Answering questions</i> <i>Physics, Chemistry</i></p>	<p>Light – straight lines; <i>Observation</i> <i>Using equipment</i> <i>Patterns</i> <i>Physics</i></p>	<p>Electricity – symbols, voltage <i>Electricity vs other fuels</i> <i>Using equipment</i> <i>Patterns</i> <i>Observation</i> <i>Physics</i></p>	<p>Living things (yr5 unit) - life cycles and processes <i>Research</i> <i>Grouping and Classifying</i> <i>Patterns</i> <i>Biology</i></p>	<p>Living things (yr6 unit) – classification <i>Grouping and Classifying</i> <i>Answering questions</i> <i>Research</i> <i>Biology</i></p>
	<ul style="list-style-type: none"> ➤ I can 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 ➤ I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ➤ I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. ➤ I can demonstrate that dissolving, mixing and changes of state are reversible changes. ➤ I can 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. ➤ I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. ➤ I can use test results to make predictions to set up further comparative and fair tests. ➤ I can take accurate measurements, using a range of scientific equipment taking repeat readings when appropriate ➤ I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. ➤ I can use scientific language and ideas to explain, evaluate and communicate my methods and findings. 	<ul style="list-style-type: none"> ➤ I can show that light appears to travel in straight lines. ➤ I can explain that light travels in straight lines and that objects are seen because they give out or reflect light into the eye. ➤ I can demonstrate and 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. ➤ I can demonstrate that light travels in straight lines to show why shadows have the same shape as the objects that cast the shadow ➤ I can use scientific language and ideas to explain, evaluate and communicate my methods and findings. ➤ I can 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"> ➤ I can show that the brightness of a lamp or the volume of a buzzer depends on the number and voltage of cells used in the circuit ➤ I can 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. ➤ I can draw a diagram using recognised symbols to represent a simple circuit. ➤ I can use scientific language and ideas to explain, evaluate and communicate my methods and findings. ➤ I can 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"> ➤ I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. ➤ I can describe how some animals and plants reproduce. ➤ I can group and classify things and recognise patterns. ➤ I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources. ➤ I can find things out using a wide range of secondary sources of information. 	<ul style="list-style-type: none"> ➤ I can describe how plants, animals and micro-organisms are classified into broad groups according to common observable characteristics and based on similarities and differences. ➤ I can give reasons for classifying plants and animals based on specific characteristics. ➤ I can group and classify things and recognise patterns. ➤ I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources. ➤ I can find things out using a wide range of secondary sources of information.



Skills and Knowledge Progression Sequence						
	Pre-Requisite	Year R	Year 1	Year 2	Year 3 and 4 (over 2-years)	Year 5 and 6 (over 2-years)
Vocabulary – working scientifically	<ul style="list-style-type: none"> ➤ Talk about what they see, using a wide vocabulary. 		<ul style="list-style-type: none"> ➤ question, answer, sort, group, compare, differences, similarities, describe, measurements, test, results, chart 	<ul style="list-style-type: none"> ➤ question, answer, observe, observing, equipment, identify, sort, group, compare, differences, similarities, describe, measurements, test, results, diagram, chart 	<ul style="list-style-type: none"> ➤ oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret research – relevant question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts, tables 	<ul style="list-style-type: none"> ➤ plan, variables, measurements, accuracy, precision, repeat readings, predictions, further comparative and fair test, identify, classify and describe, patterns, systematic, quantitative measurements report data – scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs report and present – conclusions, casual relationships, explanations, degree of trust, oral and written display and presentation evidence – support, refute, ideas or arguments biology, physics, chemistry
Working Scientifically	<ul style="list-style-type: none"> ➤ Use all their senses in hands-on exploration of natural materials. ➤ Explore how things work. 	<ul style="list-style-type: none"> ➤ Describe what they see, hear and feel whilst outside. ➤ Explore the natural world around them. 	<ul style="list-style-type: none"> ➤ I can ask questions and know they I can be answered in different ways. ➤ I can do tests. ➤ I can use my observations and ideas to suggest answers to questions 	<ul style="list-style-type: none"> ➤ I can ask questions and know they I can be answered in different ways. ➤ I can set up simple practical enquiries, and fair tests. ➤ I can use my observations and ideas to suggest answers to questions. 	<ul style="list-style-type: none"> ➤ I can ask relevant questions and use different types of scientific enquiries to answer them ➤ I can set up practical enquiries, comparative and fair tests. ➤ I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 	<ul style="list-style-type: none"> ➤ I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. ➤ I can use test results to make predictions to set up further comparative and fair tests. ➤ I can take accurate measurements, using a range of scientific equipment taking repeat readings when appropriate



		<ul style="list-style-type: none"> ➤ I can collect and record data to help answer questions. 	<ul style="list-style-type: none"> ➤ I can collect and record data to help answer questions 	<ul style="list-style-type: none"> ➤ I can gather, record, classify and present data in a variety of ways to help in answering questions 	<ul style="list-style-type: none"> ➤ I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
		<ul style="list-style-type: none"> ➤ I can name and group. 	<ul style="list-style-type: none"> ➤ I can name and group 	<ul style="list-style-type: none"> ➤ I can explain differences, similarities or changes related to simple scientific ideas and processes. 	<ul style="list-style-type: none"> ➤ I can group and classify things and recognise patterns.
		<ul style="list-style-type: none"> ➤ I can look closely, using equipment. 	<ul style="list-style-type: none"> ➤ I can watch closely using equipment. 	<ul style="list-style-type: none"> ➤ I can record findings using simple scientific language, drawings, labelled diagrams, keys bar charts, and tables. 	<ul style="list-style-type: none"> ➤ I can use scientific language and ideas to explain, evaluate and communicate my methods and findings.
			<ul style="list-style-type: none"> ➤ I can communicate my ideas, what I do, and what I find out in a variety of ways. 	<ul style="list-style-type: none"> ➤ I can report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions 	<ul style="list-style-type: none"> ➤ I can 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"> ➤ I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<ul style="list-style-type: none"> ➤ I can describe and evaluate my own and other people's scientific ideas using evidence from a range of sources.
				<ul style="list-style-type: none"> ➤ I can use scientific evidence to answer questions or to support my findings 	<ul style="list-style-type: none"> ➤ I can find things out using a wide range of secondary sources of information.
Seasonal Changes	<ul style="list-style-type: none"> ➤ Understand the effect of changing seasons on the natural world around them. 	<ul style="list-style-type: none"> ➤ I can explain changes through autumn, winter, spring and summer ➤ I can describe the weather in autumn, winter, spring and summer and that the days get longer and shorter. 			



		<ul style="list-style-type: none"> ➤ season, spring, summer, autumn, winter, month, year, day, night, sun, moon, light, dark 			
<p>Materials / States of Matter</p>	<ul style="list-style-type: none"> ➤ Explore collections of materials with similar and/or different properties. ➤ Talk about the differences between materials and changes they notice. 	<ul style="list-style-type: none"> ➤ I can tell the difference between an object and the material from which it is made. ➤ I can name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ➤ I can describe some everyday materials. ➤ I can make groups of materials based on what they are like. ➤ wood, plastic, glass, paper, metal, rock, hard, soft, rough, smooth, shiny, dull, bendy, stiff 	<ul style="list-style-type: none"> ➤ I can say why I would choose a material for a particular job. ➤ I can explain how objects made from some materials I can be changed. ➤ property, solid, waterproof, absorbent, opaque, transparent, squash, bend, flexible, twist, stretch push, pull, roll, slide, bounce 	<ul style="list-style-type: none"> ➤ I can group materials together, according to whether they are solids, liquids or gases including tricky ones like gels, foams, mists and pastes. ➤ I can demonstrate and explain 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 can correctly talk about the part played by evaporation and condensation in the water cycle and I can show a link between the rate of evaporation and temperature. ➤ solid, liquid, gas, evaporation, condensation, particle, temperature, freezing, heating 	<ul style="list-style-type: none"> ➤ I can 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 ➤ I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ➤ I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. ➤ I can demonstrate that dissolving, mixing and changes of state are reversible changes. ➤ I can 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. ➤ hardness, transparency, conductivity (electrical, thermal) solubility, solution dissolve, filter, evaporate, sieve, reversible, irreversible,



						temperature, freezing, heating
Plants	<ul style="list-style-type: none"> ➤ Plant seeds and care for growing plants. ➤ Understand the key features of the life cycle of a plant and an animal. ➤ Begin to understand the need to respect and care for the natural environment and all living things. 	<ul style="list-style-type: none"> ➤ Explore the natural world around them. ➤ Recognise some environments that are different from the one in which they live. <p>ELGs</p> <ul style="list-style-type: none"> ➤ Explore the natural world around them, making observations and drawing pictures of animals and plants ➤ Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class ➤ Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 	<ul style="list-style-type: none"> ➤ I can name some common wild and garden plants, including deciduous and evergreen trees ➤ I can name and describe the basic structure of a variety of common flowering plants, including trees ➤ deciduous, evergreen, tree, leaf, flower (blossom), petals, fruit, bulb, seed, roots, stem, trunk, branches 	<ul style="list-style-type: none"> ➤ I can explain how seeds and bulbs grow into plants. ➤ I can describe how plants need water, light and a suitable temperature to grow and stay healthy ➤ growth, germinate, light, temperature reproduce, lifecycle 	<ul style="list-style-type: none"> ➤ I can explain what different parts of flowering plants do ➤ I can explore the requirements of plants for life and growth and how they vary from plant to plant. ➤ I can investigate the way in which water is transported within plants. ➤ I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. ➤ air, water, transportation, nutrients, soil, reproduction, seed formation, seed dispersal, pollination 	
Animals, inc. Humans			<ul style="list-style-type: none"> ➤ I can spot and name a variety of common animals. ➤ I can group animals according to what they eat. ➤ I can spot and name a variety of common animals that are carnivores, herbivores and omnivores. ➤ I can describe and compare the structure of a variety of common animals ➤ I can name, draw and label the basic parts of the human body and say which part of the body is to do with each sense. ➤ amphibians, fish, reptiles, mammals, birds (+ 1 example of each) herbivore, omnivore, carnivore head, nose, ear, neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot wing, beak, tail, fin sight, smell, touch, taste, hearing 	<ul style="list-style-type: none"> ➤ I can explain that animals, including humans, have babies which grow into adults ➤ I can explain the needs of animals, including humans, for survival. ➤ I can explain the importance of exercise, eating healthily and keeping clean. ➤ survival, water, air, food reproduce, adult, baby, offspring, kitten, calf, puppy food chain, prey, predator, camouflage, protection exercise, hygiene, balanced diet 	<ul style="list-style-type: none"> ➤ I can identify that animals, including humans, need the right types and amount of nutrition, and that they I cannot make their own food; they get nutrition from what they eat. ➤ I can explain why humans and some other animals have skeletons and muscles. ➤ I can explain some parts of the digestive system in humans. ➤ I can explain the different types of teeth in humans and what they do. ➤ I can describe and explain a variety of food chains, naming producers, predators and prey. ➤ skeleton, skull, bones, muscles, movement, support, protection, nutrition ➤ mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, nutrients, absorb, canine, incisor, molar producer, consumer, apex predator 	<ul style="list-style-type: none"> ➤ I can describe the changes as humans develop to old age ➤ I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ➤ I can recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions. ➤ I can describe the ways in which nutrients and water are transported within animals, including humans ➤ womb, foetus, embryo, gestation, baby, toddler, teenager, elderly growth, development, puberty function, circulatory system, heart, valve, blood vessel, vein, artery transport, oxygenated, deoxygenated lifestyle, drug



<p>Living things and their habitats</p>		<ul style="list-style-type: none"> ➤ I can explain the differences between things that are living, dead and things that have never been alive ➤ I can explain that most living things live in habitats which suit them and depend on each other ➤ I can name some plants and animals in their habitats including micro-habitats ➤ I can explain how animals get their food from plants and other animals using a simple food chain ➤ Habitats, living, food chain, micro-habitat, alive, dead, 	<ul style="list-style-type: none"> ➤ I can show that living things I can be grouped together in various ways ➤ I can explore and use classification keys to help group, identify and name a variety of living things ➤ I can explain that environments I can change and that this sometimes means that living things are put in danger. ➤ vertebrates, invertebrates (+ 1 example of each) environment, habitat, classification key ➤ life process, reproduction, offspring, 	<ul style="list-style-type: none"> ➤ I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. ➤ I can describe how some animals and plants reproduce. ➤ I can describe how plants, animals and micro-organisms are classified into broad groups according to common observable characteristics and based on similarities and differences. ➤ I can give reasons for classifying plants and animals based on specific characteristics. ➤ characteristic, classification, organism, micro-organism
<p>Forces</p>	<ul style="list-style-type: none"> ➤ Explore and talk about different forces they can feel. 		<ul style="list-style-type: none"> ➤ I can compare how things move on different surfaces. ➤ I can see that some forces need contact between two objects, but magnetic forces I can act at a distance. ➤ I can observe how magnets attract or repel each other and attract some materials and not others. ➤ I can compare and group some materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. ➤ I can describe magnets as having two poles. ➤ I can predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> ➤ I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. ➤ I can demonstrate the effects of air resistance, water resistance and friction, that act between moving surfaces ➤ I can show that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.



				<ul style="list-style-type: none"> ➤ force, contact, surface, magnetic, attract, repel, poles 	<ul style="list-style-type: none"> ➤ air resistance, water resistance, friction, gravity lever, gear, pulley, Newtons
Light				<ul style="list-style-type: none"> ➤ I can explain that I need light in order to see things and that dark is the absence of light ➤ I can explain that light from the sun I can be dangerous and that there are ways to protect eyes ➤ I can show that light is reflected from surfaces. ➤ I can show how shadows are formed when the light from a light source is blocked by a solid object. ➤ I can show that there are patterns in the way that the size of shadows change. ➤ light source, mirror, reflect, reflective, reflection shadow, blocked transparent, translucent, opaque 	<ul style="list-style-type: none"> ➤ I can show that light appears to travel in straight lines. ➤ I can explain that light travels in straight lines and that objects are seen because they give out or reflect light into the eye. ➤ I can demonstrate and 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. ➤ I can demonstrate that light travels in straight lines to show why shadows have the same shape as the objects that cast them ➤ refraction, reflection, spectrum, rainbow
Sound				<ul style="list-style-type: none"> ➤ I can explain how sounds are made, and show that some of them are linked to vibrations. ➤ I can explain that vibrations from sounds travel through a medium to the ear. ➤ I can find patterns between the pitch of a sound and features of the object that produced it ➤ I can show that there is a pattern between the volume of a sound and the strength of the vibrations that produced it. ➤ I can show that sounds get fainter as the distance from the sound source increases. ➤ vibration, wave, volume, pitch, tone, insulation 	



<p>Electricity</p>			<ul style="list-style-type: none"> ➤ I can talk about common appliances that run on electricity. ➤ I can construct and draw with labels a simple series electrical circuit which includes cells, wires, bulbs, switches and buzzers. ➤ I can predict if a lamp will light or not in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. ➤ I can explain that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ➤ I can show that some materials are conductors and some are insulators, and I can explain that metals are good conductors. ➤ appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator 	<ul style="list-style-type: none"> ➤ I can show that the brightness of a lamp or the volume of a buzzer depends on the number and voltage of cells used in the circuit ➤ I can 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. ➤ I can draw a diagram using recognised symbols to represent a simple circuit. ➤ circuit - series, parallel voltage, volts, amps
<p>Rocks</p>			<ul style="list-style-type: none"> ➤ I can examine and do practical experiments on various types of rocks in order to group them on the basis of their appearance and simple physical properties. ➤ I can simply describe how fossils are formed when things that have lived are trapped within rock. ➤ I can explain that soils are made from rocks and organic matter. ➤ sandstone, granite, marble, pumice absorbent, crumble sedimentary, layer, sediment igneous, magma, lava, gas bubbles (tiny holes/spaces) metamorphic, change, squeeze, pressure, soils, organic matter, fossil, crystal 	
<p>Evolution and Inheritance</p>				<ul style="list-style-type: none"> ➤ I can explain that the kinds of living things that live on the earth now are different



				<p>from those that inhabited the Earth millions of years ago and that fossils provide this information.</p> <ul style="list-style-type: none"> ➤ I can explain that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ➤ I can give examples of how animals and plants are adapted to suit their environment in different ways and I can explain that adaptation may lead to evolution ➤ adaptation, evolution, characteristic, reproduction, genetics, survival
Earth and Space				<ul style="list-style-type: none"> ➤ I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. ➤ I can describe the movement of the Moon relative to the Earth ➤ I can describe the Sun, Earth and Moon as approximately spherical bodies ➤ I can explain day and night and the apparent movement of the sun across the sky using the idea of the Earth's rotation. ➤ Earth, sun, moon, solar system, axis of rotation, day, night, phases of the moon, star, constellation

Bold statements are NC Key Stage End Points, Blue shows Vocabulary.



Cycle Pathways Progression

