



Science Curriculum Two Year Rolling Programme

Working Scientifically

**To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
(Both Year A and Year B)**

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
	To use the following practical scientific methods, processes and skills with increasing confidence -	To use the following practical scientific methods, processes and skills –	To use the following practical scientific methods, processes and skills –
Questioning and enquiring Planning	<p>Ask questions about the world around us.</p> <p>Recognise that they can be answered in different ways (different types of enquiry including - observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests, finding things out from secondary sources).</p>	<p>Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Explore everyday phenomena and the relationships between living things and familiar environments.</p> <p>Begin to develop their ideas about functions, relationships and interactions.</p> <p>Raise their own questions about the world around them.</p> <p>Make some decisions about which types of enquiry will be the best way of answering questions including observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative and fair tests, finding things out using secondary sources.</p>	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically.</p> <p>Begin to recognise more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.</p> <p>Begin to recognise scientific ideas change and develop over time.</p> <p>Select the most appropriate ways to answer science questions using different types of scientific enquiry (including observing changes over different periods of time, noticing patterns, grouping and classifying, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information.</p>

<p>Observing and measuring Pattern seeking</p>	<p>Observe closely, using simple equipment.</p> <p>Use observations and ideas to suggest answers to questions.</p> <p>Observe changes over time and, with guidance, begin to notice patterns and relationships.</p> <p>Say what they are looking for and how they will measure.</p> <p>Use simple equipment safely.</p> <p>Use simple measurements and equipment with increasing independence (eg hand lenses and egg timers)</p> <p>Begin to progress from non-standard units, reading mm, cm, m, ml, l, °C</p>	<p>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.</p> <p>Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.</p> <p>Learn to use new equipment appropriately (eg data loggers).</p> <p>Observe and discuss patterns in results.</p> <p>Choose from a selection of equipment.</p> <p>Observe and measure accurately using standard units including time in minutes and seconds.</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.</p> <p>Identify patterns that might be found in the natural environment.</p> <p>Make 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 appropriate equipment and explain how to use it accurately.</p> <p>Interpret data and find patterns. Select equipment independently. Make a set of observations and say what the interval and range are.</p> <p>Use accurate and precise measurements – N, g, kg, mm, cm, mins, seconds, cm²V, km/h, m per sec, m/sec</p>
<p>Investigating</p>	<p>Perform simple tests.</p> <p>Discuss ideas about how to find things out.</p> <p>Say what happened in an investigation.</p>	<p>Set up simple practical enquiries, comparative and fair tests.</p> <p>Recognise when a simple fair test is necessary and help to decide how to set it up.</p> <p>Think of more than one variable factor.</p>	<p>Use test results to make predictions to set up further comparative and fair tests.</p> <p>Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.</p> <p>Suggest improvements to a method and give reasons.</p> <p>Decide when it is appropriate to do a fair test.</p>
<p>Recording and reporting findings</p>	<p>Gather and record data to help in answering questions.</p> <p>Record simple data.</p> <p>Record and communicate their findings in a range of ways.</p>	<p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.</p> <p>Report and present findings from enquiries.</p>

	<p>Show results in a table.</p>	<p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use notes, simple tables and standard units and help to decide how to record and analyse their data.</p> <p>Record results in tables and bar charts.</p>	<p>Decide how to record data from a choice of familiar approaches.</p> <p>Choose how best to present data.</p>
Identifying, grouping and classifying	<p>Identify and classify.</p> <p>Observe and identify, compare and describe.</p> <p>Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.</p>	<p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Talk about criteria for grouping, sorting and classifying and use simple keys.</p> <p>Compare and group according to behaviour or properties, based on testing.</p>	<p>Use and develop keys and other information records to identify, classify and describe living things and materials.</p>
Research	<p>Use simple secondary sources to find answers.</p> <p>Find information from books and computers with help.</p>	<p>Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.</p>	<p>Recognise which secondary sources will be most useful to research their ideas.</p>
Conclusions	<p>Talk about what they have found out and how they found it out.</p> <p>Say what happened in their investigations.</p> <p>Say whether they were surprised at the results or not.</p> <p>Say what they would change about an investigation.</p>	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, identify new questions arising from the data, make new predictions and find ways of improving what they have already done.</p>	<p>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.</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings.</p>

		<p>See patterns in results.</p> <p>Say what they found out, linking cause and effect.</p> <p>Say how it could be improved.</p> <p>Answer questions from their results and findings..</p>	
Vocabulary	<p>Use simple scientific language and some science words.</p> <p>Use comparative language – bigger, faster etc</p>	<p>Use some scientific language to talk and, later, write about what they have found out.</p> <p>Use relevant scientific language.</p> <p>Use comparative and superlative language</p>	<p>Read, spell and pronounce scientific vocabulary correctly.</p> <p>Use relevant scientific language. And illustrations to discuss, communicate and justify scientific ideas.</p> <p>Confidently use a range of scientific vocabulary.</p> <p>Use conventions such as trend, rogue result, support prediction and -er word generalisation.</p> <p>Use scientific ideas when describing simple processes.</p> <p>Use the correct science vocabulary.</p>
Understanding	<p>Talk about how science helps us in our daily lives eg. torches and lights help us see when it is dark.</p> <p>Begin to understand science can sometimes be dangerous.</p>	<p>Knows which things in science have made our lives better.</p> <p>Understand there is some risk in science.</p>	<p>Talk about how scientific ideas have changed over time.</p> <p>Explain the positive and negative effects of scientific development.</p> <p>Identify how science is useful in everyday life.</p> <p>Say which parts of our lives rely on science.</p>

**To develop scientific knowledge and conceptual understanding
through the specific disciplines of biology, chemistry and physics**

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Biology	<p><u>Year A</u> <u>Plants</u> Identify and name a variety of common trees including deciduous and evergreen Identify and describe the basic structure of a variety of common trees. Observe and describe how seeds grow into mature trees <u>Animals including humans</u> Identify and name a variety of mammals and amphibians <u>Living things and their habitats</u> identify that most living things live in habitats 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 Identify and name a variety of plants and animals in their habitats, including microhabitats</p>	<p><u>Year A</u> <u>Animals including humans</u> 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. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. <u>Living things and their habitats</u> 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.</p>	<p><u>Year A</u> <u>Living things and their habitats</u> 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. <u>Animals including humans</u> Describe the changes as humans develop to old age.</p>
	<p><u>Year B</u> <u>Plants</u> identify and name a variety of wild and garden plants identify and describe the basic structure of a variety of common</p>	<p><u>Year B</u> <u>Animals including humans</u> Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions</p>	<p><u>Year B</u> <u>Living things and their habitats</u> 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.</p>

	<p>flowering plants Observe and describe how seeds and bulbs grow into mature plants</p> <p><u>Animals including humans</u> Identify and name a variety of birds, fish and reptiles</p> <p><u>Living things and their habitats</u> Explore and compare the differences between things that are living, dead, and things that have never been alive. 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>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p><u>Plants</u> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. 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. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><u>Animals including humans</u> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p><u>Evolution and Inheritance</u> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Chemistry	<p><u>Year A</u> <u>Man-Made Materials</u> Distinguish between an object and the material from which it is made. Identify and name a variety of everyday man-made materials Describe the simple physical properties of a variety of everyday man-made materials Compare and group together a variety of everyday man-made materials on the basis of their simple physical properties. Identify and compare the suitability of a variety of everyday man-made</p>	<p><u>Year A</u> <u>States of matter</u> 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). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p><u>Year A</u> <u>Properties and changes of materials</u> 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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p>

	<p>materials for particular uses Find out how the shapes of solid objects made from some man-made materials can be changed by squashing, bending, twisting and stretching</p>		
	<p><u>Year B</u> <u>Natural Materials</u> Distinguish between an object and the material from which it is made. Identify and name a variety of everyday natural materials Describe the simple physical properties of a variety of everyday natural materials Compare and group together a variety of everyday natural materials on the basis of their simple physical properties. Identify and compare the suitability of a variety of everyday natural materials for particular uses Find out how the shapes of solid objects made from some natural materials can be changed by squashing, bending, twisting and stretching</p>	<p><u>Year B</u> <u>Rocks</u> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.</p>	<p><u>Year B</u> <u>Properties and changes of materials</u> 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>
	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Physics	<p><u>Year A</u> Seasonal Change Observe the changes across the four seasons</p>	<p><u>Year A</u> <u>Sound</u> 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</p>	<p><u>Year A</u> <u>Light</u> Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p>

		<p>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.</p> <p><u>Electricity</u> 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 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.</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. 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><u>Forces</u> 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, 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.</p>
	<p><u>Year B</u> Seasonal Change Observe and describe weather associated with the seasons and how the day length varies</p>	<p><u>Year B</u> <u>Forces and magnets</u> Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. 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. Describe magnets as having two poles. Predict whether two magnets will attract or repel</p>	<p><u>Year B</u> <u>Earth and Space</u> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth. 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.</p> <p><u>Electricity</u> Associate the brightness of a lamp or the volume</p>

		<p>each other, depending on which poles are facing.</p> <p><u>Light</u></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 an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p>	<p>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>
--	--	---	--