

5 types of scientific enquiry: *\*observing over time* *\*identifying and classifying* *\*pattern seeking* *\*research* *\*comparative and fair testing*

A combination of these types of enquiry should be carried out throughout the year across all year groups

	Year 1						Year 2						Year 3						Year 4						Year 5						Year 6					
	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2
Plan	Ask simple questions when prompted and suggest ways of answering						Ask simple questions and recognise that they can be answered in different ways						Ask relevant questions when prompted Use different types of scientific enquiry to answer them						Ask relevant questions Use different types of scientific enquiry to answer them						With support, plan different types of scientific enquiries to answer questions						Plan own types of scientific enquiry to answer questions					
	With support, say what they think might happen						Say and record what they think might happen  With support, start to recognise what is a fair/unfair test.						With support, set up simple and practical enquiries for comparative and fair testing and begin to recognise and explain why it is a fair test.						Set up practical enquiries for comparative and fair testing						With prompting, recognise and control variables where necessary (fair testing)  Make predictions based on scientific knowledge and understanding						Recognise and control variables where necessary (fair testing)  Make predictions based on scientific knowledge and understanding					
Do	Make relevant observations using simple equipment Conduct simple tests with support						Observe closely, using simple equipment and begin to select from a limited range Perform simple tests						Make systematic and careful observations using simple equipment (e.g. measuring length and capacity)						Make systematic and careful observations selecting and using a range of equipment, including thermometers and data loggers						Select, with prompting, and use appropriate equipment to take readings						Select and use a range of scientific equipment to take measurements					
	Identify and classify with guidance						Identify and classify						Use standard units when taking measurements e.g. length, capacity, time						Take accurate measurements using standard units, where appropriate e.g. length, temperature, force, time						Take precise measurements using standard units (e.g. volume, temperature, time, capacity, length) Begin to understand the need for repeat readings						Take measurements with increasing accuracy and precision Take repeat readings where appropriate					

	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2
Record	Gather and record simple data and talk about what they have found out						Gather and record data to help answer questions, using standard/non standard measures where appropriate.						With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions						Gather, record, classify and present data in a variety of ways to help to answer questions Record findings using simple scientific language, drawings and labelled diagrams						Begin to take and process repeat readings Record data and results						Begin to take and process repeat readings, showing understanding of which ones need to be repeated to give more reliable data					
	Use drawing, labelling, simple writing and/or using ICT ( <i>block graphs</i> )						Record and communicate their findings in a range of ways, including ICT ( <i>block graphs and bar charts</i> ) and begin to use simple scientific language						With prompting, use various ways of recording, grouping and displaying evidence e.g. <i>drawings, tables, bar charts</i> , tables and ICT where appropriate						Record findings using simple scientific language, drawings and labelled diagrams Record findings using <i>keys, bar charts, tables and classification keys</i> (branching databases)						Record data using labelled diagrams, keys, <i>tables and charts</i> . With support, use <i>line and scatter graphs</i> to record data						Record data and results of increasing complexity using scientific diagrams and labels, <i>classification keys, tables, bar charts, scatter and line graphs</i>					
Review	Use their observations and ideas to suggest answers to simple questions and explain what they did						Use their observations and ideas to suggest answers to simple questions, explain what they did and, in some cases, what their observations show and whether it was what they expected (draw simple conclusions)						Suggest how findings could be reported and, with prompting, suggest conclusions from enquiries, beginning to use straightforward scientific evidence to answer questions or support findings.						Report on findings from enquiries using displays or presentations.  Use results to draw simple conclusions, using straightforward scientific evidence to answer questions or to support their findings,						Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships.  Decide whether results support prediction.						Report and present findings from enquiries, including: -conclusions and causal relationships - in oral and written forms such as displays and other presentation. - explanations of, and degree of trust in result					
													Make generalisations and begin to identify simple patterns in results, suggesting explanations for some.						Identify differences, similarities or changes related to simple scientific ideas and processes						Recognise and make predictions from patterns in data.						Identify patterns and anomalies where appropriate and provide possible explanations.					

	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2	A1	A2	Sp1	Sp2	S1	S2
													Suggest possible improvements or further questions to investigate						Make predictions for new values, suggest improvements and raise further questions						With support, present findings from enquiries orally and in writing. Suggest further comparative or fair tests  Begin to evaluate repeated results;						Identify scientific evidence that has been used to support or refute ideas or arguments. Use test results to make predictions to set up further comparative and fair tests, to make comparisons; to evaluate repeated results;					

Knowledge progression:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Plants</b>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>			
<b>Animals, including humans</b>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>Describe the changes as humans develop to old age.</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>

<p><b>Everyday materials</b></p>	<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>				
<p><b>Seasonal Changes</b></p>	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>					
<p><b>Living things and their habitats</b></p>		<p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>		<p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>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>Give reasons for classifying plants and animals based on specific characteristics.</p>
<p><b>Rocks</b></p>			<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>			

<p><b>Light</b></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 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>Recognise that light appears to travel in straight lines.</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>
<p><b>Forces and magnets</b></p>			<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	
<p><b>States of matter</b></p>				<p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>		

<p>Sound</p>				<p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>		
<p>Electricity</p>				<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>
<p>Properties and changes of materials</p>					<p>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.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p>	

					<p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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>	
Earth and Space					<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	
Evolution and inheritance					<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	