



Disciplinary Knowledge - Working Scientifically Skills Progression

	EYFS	Key stage 1	Lower Key stage 2	Upper Key stage 2
Asking scientific questions.	<p>Show curiosity and ask questions</p> <p>Nursery Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"</p> <ul style="list-style-type: none"> • While playing and exploring, the children demonstrate their curiosity. • While playing and exploring, the children begin to ask 'I wonder ...' questions. • With support, the children think of ideas for answering their questions. <p>Reception Ask questions to find out more and to check they understand what has been said to them. (Communication and language)</p> <ul style="list-style-type: none"> • While playing and exploring, the children ask 'I wonder...' questions. • With support, the children develop their ideas for answering their questions. 	<p>Asking simple questions and recognising that they can be answered in different ways. While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.</p> <p><u>Links to Topic</u> Year 1 – Animals including Humans, Materials, Plants Year 2 – Animals including Humans, Everyday Materials, Plants</p> <p>The children answer questions developed with the teacher often through a scenario.</p> <p><u>Links to Topic</u> Year 1 - Animals including Humans, Materials, Plants, My Body Year 2 – Animals including Humans, Everyday Materials, Plants</p> <p>The children are involved in planning how to use resources provided to answer the questions using different types of enquiry.</p> <p><u>Links to Topic</u> Year 1 – Animals including Humans, Materials Year 2 – Everyday Materials,</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher</p> <p><u>Links to Topic</u> Year 3 – Animals including Humans, Rocks and Soils, Plants, Magnets & Forces, Light Year 4 – Animals including human, States of Matter, Living things & their habitats, Sound and Electricity.</p> <p>Given a range of resources, the children decide for themselves how to gather evidence to answer the question They identify the type of enquiry that they have chosen to answer their question.</p> <p><u>Links to Topic</u> Year 3 - Year 4 –States of Matter, Digestive system Teeth and Sound</p>	<p>Planning different types of scientific enquiries to ask and answer questions, including recognising and controlling variables where necessary.</p> <p>Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry.</p> <p><u>Links to Topic</u> Year 5 –Properties and changes of Materials, Forces, Year 6 -Animals and humans, Electricity, Light</p> <p>Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.</p> <p><u>Links to Topic</u> Year 5 -Forces, Living things and their habitats. Year 6 - Animals including humans, Evolution and inheritance, Living things and their habitats.</p> <p>The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.</p> <p><u>Links to Topic</u> Year 5 -Properties and the changes in materials, Forces Year 6 -Electricity, Light, Animals including humans</p>



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<p>Observing closely, using simple equipment</p>	<p>Make observations using their senses and simple equipment Make direct comparisons Identify, sort and group</p> <p>Nursery</p> <ul style="list-style-type: none"> • With support, explore the natural and man made world using their senses. • With support, the children use magnifying glasses or tablets with magnifiers to make observations. • The children explore using beakers/scoops etc. • Make comparisons between objects (“This leaf is bigger than that one.”) and quantities (“There are more flowers on this one.”). <p>Reception</p> <p>Explore the natural and man-made world using their senses.</p> <ul style="list-style-type: none"> • The children use magnifying glasses or tablets with magnifiers to make observations. • The children use smaller pieces of equipment such as syringes and pipettes. • With support, make comparisons, using hands and feet and other non-standard measures e.g. building blocks and beakers. • While playing and exploring, the children, try out using resources to answer a question. 	<p>Observing closely, using simple equipment Children explore the world around them.</p> <p><u>Links to Topic</u> Year 1 - Materials, Plants, Animals & Humans Year 2 – Everyday Materials, Living things and Habitats, Plants</p> <p>They make careful observations to support identification, comparison and noticing change.</p> <p><u>Links to Topic</u> Year 1 - Materials, Plants, My Body Year 2 – Everyday Materials, , Animals including Humans, Plants</p> <p>They begin to take measurements, initially by comparisons, then using non-standard units.</p> <p><u>Links to Topic</u> Year 1 – Materials, Plants, Seasonal Changes, My Body Year 2 –Living things and its Habitats:</p> <p>Compare objects based on obvious, observable features e.g. size, shape, colour, texture etc.</p> <p><u>Links to Topic</u> Year 1 – Materials, Plants, My Body Year 2 – Everyday Materials, Plants</p> <p>Choose equipment such as magnifying glasses to use and decide what to observe or measure to answer the question.</p> <p><u>Links to Topic</u> Year 1 – What are Materials, Plants, My Body Year 2 – Animals including Humans, Plants, Everyday Materials</p> <p>Identifying and classifying Children use their observations and testing to compare objects, materials and living things. They sort and group these things</p> <p>They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.</p> <p><u>Links to Topic</u> Year 1 – Animals & Humans, Plants, Materials Year 2 – Living things and Habitat</p>	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers. The children make systematic and careful observations.</p> <p><u>Links to Topic</u> Year 3 – Animals including Humans, Magnets and Forces Year 4 – States of Matter, Sounds</p> <p>They use a range of equipment for measuring length, time, temperature, and capacity.</p> <p><u>Links to Topic</u> Year 3 - Year 4 - States of Matter, Sounds</p> <p>They use standard units for their measurements (according to age-related mathematics) where not all the numbers are marked on the scale and take repeat readings where necessary.</p> <p><u>Links to Topic</u> Year 3 - Year 4 - States of Matter, Sounds</p>	<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meters with a suitable scale</p> <p><u>Links to Topic</u> Year 5 -Forces Year 6 -Animals including humans</p> <p>During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time)</p> <p><u>Links to Topic</u> Year 5 -Properties and changes in Materials, Forces Year 6 -Animals including humans, Electricity</p>
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<p>Planning and setting up tests</p>		<p>Performing simple tests. The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.</p> <p><u>Links to Topic</u> Year 1 – Seasonal Changes, Plants, What are Materials? Year 2 – Animals including Humans, Everyday Materials, Plants</p>	<p>Setting up simple practical enquires comparative and fair tests.</p> <p>They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.</p> <p><u>Links to Topic</u> Year 3 - Light, Magnets and Forces, Rocks and Soils, Year 4 –Animals including humans, Sound , States of Matter, Electricity</p> <p>The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher i.e. using KWL grids?</p> <p><u>Links to Topic</u> Year 3 – Animals including Humans, Rocks and Soils, Light Year 4 - Sound , States of Matter, Electricity</p>	<p>Planning different types of scientific enquiries to answer questions, including enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>The children select from a range of practical resources to gather evidence to answer questions. They carry out fair tests, recognizing and controlling variables.</p> <p><u>Links to Topic</u> Year 5 – Forces, Properties and changes in Materials Year 6 -Electricity, Light</p> <p>They decided what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.</p> <p><u>Links to Topic</u> Year 5 – Properties and changes in Materials. Year 6 - Electricity,</p>
<p>Recording and presenting evidence</p>	<p>Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets</p> <p>Nursery With support, the children talk about what they have observed. • They sometimes draw and make marks to record their observations. • With support, they use sorting rings and boxes</p> <p>Reception</p> <p>The children, sometimes, draw and write simple labels to record their observations . • With support, they record their observations and comparisons e.g. using simple prepared tables, taking photographs, using sorting rings and boxes</p>	<p>Gathering and recording data to help in answering questions The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They classify using simple prepared tables and sorting rings.</p> <p><u>Links to Topic</u> Year 1 - Animals & Humans, Seasonal Changes, Plants Year 2 –</p> <p>They can record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.</p> <p><u>Links to Topic</u> Year 1 - Year 2 – Animals including Humans, Living things and its Habitats:</p>	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagram</p> <p><u>Links to Topic</u> Year 3 – Light, Animals including Humans, Rocks and Soils, Year 4 – States of Matter, Sound and Electricity</p> <p>Children are supported to present the same data in different ways in order to help with answering the question.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. The children decide how to record and present evidence.</p> <p><u>Links to Topic</u> Year 5 -Animals including humans, Properties and changes in Materials, Earth and Space Year 6 -Living things and their habitats, Electricity</p> <p>They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements, e.g. using tables, tally charts, bar charts, line graphs and scatter graphs.</p> <p><u>Links to Topic</u> Year 5 -Earth and Space, Properties and changes in Materials, Year 6 -Animals including humans, Electricity, Evolution and Inheritance.</p> <p>They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.</p>



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				<p><u>Links to Topic</u> Year 5 -Animals including humans, Properties and changes in Materials Year 6 -Animals including humans, Living things and their habitats,</p>
<p>Answering questions and concluding.</p>	<p>Use their observations to help them to answer their questions</p> <p>Nursery With support, the children demonstrate and talk about what they have done and noticed. • With support, the children notice how they made a difference to an outcome, e.g. “My car went further when I pushed it harder.”, and answer the question, where appropriate. • With support, the children make comparisons between objects e.g. “My plant is taller than Sarah’s.”</p> <p>Reception The children talk about what they have observed. • The children demonstrate and talk about what they have found out. • They, sometimes, talk about what they have found out from secondary sources, including non-fiction texts. • The children notice and talk about how they made a difference to an outcome e.g. “My car went further when I pushed it harder.” • The children make direct comparisons or use their recorded observations to communicate what they have found out and answer the question, where appropriate.</p>	<p>Using their observations and ideas to suggest answers to questions. Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise ‘biggest and smallest’, ‘best and worst’ etc. from their data.</p> <p><u>Links to Topic</u> Year 1 – Seasonal Changes, Materials Year 2 – Animals including Humans, Everyday Materials, Plants</p>	<p>Using straightforward scientific evidence to answer questions or to support their findings. Children answer their own and others’ questions based on observations they have made, measurements they have taken or information they have gained from secondary sources.</p> <p><u>Links to Topic</u> Year 3 – Year 4 – Sound, Animals including humans, States of Matter, Electricity</p> <p>The answers are consistent with the evidence.</p> <p>Identifying differences, similarities or changes related to simple scientific ideas processes. Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.</p> <p><u>Links to Topic</u> Year 3 – Plants, Light, Rocks & Soil Year 4 – States of Matter, Electricity, Sound</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Children answer their own and others’ questions based on observations they have made, measurements they have taken or information they have gained from secondary sources.</p> <p><u>Links to Topic</u> Year 5 -Properties and changes in materials, Forces Year 6 -Animals including humans, Electricity, Light</p> <p>When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer.</p> <p><u>Links to Topic</u> Year 5 - Year 6 - Living things + habitats</p> <p>Discuss how new discoveries change scientific understanding.</p> <p><u>Links to Topic</u> Year 5 - Year 6 -Evolution</p>



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<p>Interpreting and communicating results</p>			<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>They communicate their findings to an audience both orally (e.g. plenary) and in writing, using appropriate scientific vocabulary.</p> <p><u>Links to Topic</u> Year 3 - Light, Magnets & Forces, Rock and Soil Year 4 – Animals including Humans, Sound, States of Matter, Electricity</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>In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.</p> <p><u>Links to Topic</u> Year 5 -Properties and changes in Materials, Forces, Earth and Space Year 6 -Animals including humans, Evolution and Inheritance</p> <p>They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used.</p> <p><u>Links to Topic</u> Year 5 - Year 6 - Electricity</p> <p>They identify any limitations that reduce the trust they have in their data. They communicate their findings to an audience using relevant scientific language and illustrations.</p> <p><u>Links to Topic</u> Year 5 -Properties and changes in Materials, Forces Year 6 -Animals including humans, Electricity, Light</p>
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<p>Evaluating and reflecting on the success of the enquiry approach and identifying further questions for enquiry.</p>			<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions.</p> <p>They draw conclusions based on their evidence and current subject knowledge.</p> <p><u>Links to Topic</u> Year 3 - Year 4- Animals including Humans, Sound, States of Matter, Electricity</p> <p>They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry</p> <p><u>Links to Topic</u> Year 3 - Magnets & Forces, Plants, Light, Year 4- Sound, Electricity</p>	<p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests</p> <p><u>Links to Topic</u> Year 5 -Forces, Properties and changes in materials Year 6 -Electricity, Animals including humans</p>
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