

# Working Scientifically Progression

	OBSERVING OVER TIME	COMPARATIVE & FAIR TESTING	RESEARCH USING SECONDARY SOURCE	PATTERN SEEKING	IDENTIFYING, CLASSIFYING & GROUPING
<b>EYFS</b>	<ul style="list-style-type: none"> <li>•Use all their senses in hands-on exploration of natural materials (Nursery)</li> <li>•Explore collections of materials with similar and/or different properties (Nursery)</li> <li>•Talk about what they see, using a wide vocabulary (Nursery)</li> <li>•Join different materials and explore different textures (Nursery)</li> <li>•Explore the natural world around them (Reception)</li> <li>•Describe what they see, hear and feel whilst outside. (Reception)</li> <li>•Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps (ELG)</li> <li>•Explore the natural world around them, making observations and drawings pictures of animals and plants (ELG)</li> </ul>	<ul style="list-style-type: none"> <li>•Understand 'why' questions' (Nursery)</li> <li>•Start taking part in some group activities which they make up for themselves, or in teams (Nursery)</li> <li>•Choose the right resources to carry out their own plan (Nursery)</li> <li>•Collaborate with others to manage large items (Nursery)</li> <li>•Use one-handed tools and equipment (Nursery)</li> <li>• Explore how things work (Nursery)</li> <li>•Explore different materials freely, to develop their ideas about how to use them and what to make (Nursery)</li> <li>•Develop their own ideas and then decide which materials to use to express them (Nursery)</li> <li>• Ask questions to find out more (Reception)</li> <li>•Articulate ideas and thoughts in well-formed sentences (Reception)</li> <li>•Use talk to help work out problems and organise thinking and activities and to explain how things work and why they might happen (Reception)</li> <li>• Develop their motor skills so they can use a range of tools competently, safely and confidently (Reception)</li> <li>•Return to and build on their previous learning, refining ideas and developing their ability to represent them (Reception)</li> <li>•Create collaboratively, sharing ideas, resources and skills (Reception)</li> <li>• Offer explanations for why things might happen, making use of recently introduced vocabulary. (ELG)</li> <li>•Hold a pencil effectively in preparation for fluent writing (ELG)</li> <li>• Use a range of small tools, including scissors, paintbrushes and cutlery (ELG)</li> <li>•Safely use and explore and variety of materials, tools and techniques, experimenting with colour, design, texture, form and function (ELG)</li> </ul>	<ul style="list-style-type: none"> <li>•Learn new vocabulary (Reception)</li> <li>•Use new vocabulary throughout the day (Reception)</li> <li>•Engage in non-fiction books (Reception)</li> <li>•Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary (Reception)</li> </ul>	<ul style="list-style-type: none"> <li>• Say one number for each item in order: 1, 2, 3,4, 5 (Nursery)</li> <li>•Know that the last number reached when counting a small set of objects tells you how many there are in total (Nursery)</li> <li>•Link numerals with amounts (Nursery)</li> <li>•Compare quantities using language: 'more than', 'fewer than'.</li> <li>•Make comparisons between objects relating to size, length, weight and capacity (Nursery)</li> <li>•Talk about and identify patterns around them (Nursery)</li> <li>•Extend and create ABAB patterns (Nursery)</li> <li>•Notice and correct an error in a repeating pattern (Nursery)</li> <li>•Link numerals with its number value (Reception)</li> <li>•Count beyond 10 (Reception)</li> <li>•Compare numbers (Reception)</li> <li>•Continue, copy and create repeating patterns (Reception)</li> <li>•Subitise up to 5 (ELG)</li> <li>•Verbally count beyond 20, recognising the pattern of the counting system (ELG)</li> <li>•Compare quantities up to 10 in different contexts, recognising when one quantity is greater than less than or the same as the other quantity (ELG)</li> <li>•Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly (ELG)</li> </ul>	<ul style="list-style-type: none"> <li>•Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions. (Nursery)</li> <li>•Participate in small group, class and 1-2-1 discussions, offering their own ideas, using recently introduced vocabulary (ELG)</li> </ul>
<b>KEY STAGE ONE</b>	<ul style="list-style-type: none"> <li>• Observe changes in the local environment over the seasons</li> <li>• Use magnifying glasses to look closely at objects.</li> <li>• Answer questions about what was observed using simple scientific vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out regular experiments planned by teachers</li> <li>• Write a clear aim (Year 1) and aim and hypothesis (Year 2)</li> <li>•Use simple equipment with support</li> <li>• Record findings on tables and graphs provided by teachers</li> <li>• Communicate their findings in a range of ways, beginning to use simple scientific language.</li> </ul>	<ul style="list-style-type: none"> <li>•With support, generate simple questions about the world</li> <li>• Look in non-fiction books and maybe newspapers, magazines, and the internet to find answers.</li> <li>•Talk to 'experts' and, with support, think of simple questions to ask them.</li> </ul>	<ul style="list-style-type: none"> <li>•With support, begin to notice patterns and relationships</li> <li>• Gather data in the form of a simple tally chart (Year 1)</li> <li>• Create a tally chart and pictogram to collect and examine data (Year 2)</li> </ul>	<ul style="list-style-type: none"> <li>• Ask simple questions to find out about the world</li> <li>•Use simple equipment to examine objects closely.</li> <li>•Compare objects with support (sorting rings, tables etc.)</li> <li>•Think about different ways of sorting and grouping objects.</li> <li>•Begin to use simple scientific words to explain differences between groups</li> </ul>
<b>LOWER KEY STAGE TWO</b>	<ul style="list-style-type: none"> <li>• Make careful observations using simple equipment.</li> <li>• Think about how long to observe for and what equipment to use.</li> <li>• Decide how to record observations</li> <li>• Use simple scientific vocabulary to describe what is observed</li> <li>•Use recording techniques such as flow charts (Year 3) and explanation texts (Year 4) to explain processes and changes.</li> </ul>	<ul style="list-style-type: none"> <li>•Set up simple comparative and fair tests with support</li> <li>• Begin to recognise the difference, and which one is necessary</li> <li>•Take measurements using a range of equipment</li> <li>• Write a clear aim, hypothesis, method, equipment list (Year 3) and include considerations of variable and constant factors (Year 4)</li> <li>•Record results in standardised units, using tables provided by teachers</li> <li>• Begin to use data loggers</li> <li>•With support, identify what they have learned, including oral and written explanations.</li> <li>• Use simple scientific concepts to answer questions or to support their findings</li> </ul>	<ul style="list-style-type: none"> <li>• Ask questions based on prior learning and life experiences</li> <li>• Construct simple questions about the world based on our own ideas and look in books, newspapers, magazines, and the internet to find answers</li> <li>• Talk to experts and ask them simple questions</li> <li>• Record research using scientific diagrams and vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>•Look for naturally occurring patterns and relationships</li> <li>• With support, identify changes, similarities and differences and draw simple conclusions</li> <li>•Begin to answer questions and identify new questions for future questioning</li> <li>• Represent data on bar graph, explaining patterns illustrated (Year 3)</li> <li>• Collect and interpret both discrete and continuous data, using relevant scientific vocab (Year 4)</li> </ul>	<ul style="list-style-type: none"> <li>• Build upon their KS1 knowledge, asking more complex questions to find out about the world.</li> <li>•Independently sort objects according to their own criteria.</li> <li>•Group objects based on more than one variable, using devices such as a Venn Diagram</li> <li>•Explain how the objects were sorted</li> <li>•Understand terms such as properties and discuss why an object might belong in more than 1 group (Year 4)</li> <li>• Begin to use simple classification keys (Year 4)</li> </ul>
<b>UPPER KEY STAGE TWO</b>	<ul style="list-style-type: none"> <li>• Decide what to observe and why</li> <li>• Request appropriate equipment for observation and provide rationale</li> <li>• Decide measurements to take and how to record the data</li> <li>• Explain results in detail using precise scientific vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Write a clear aim, hypothesis, method, equipment list, considerations of variable and constant factors, safety and diagram</li> <li>• Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.</li> <li>• Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 6)</li> <li>• Use scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results (Year 6)</li> <li>• Use their results to make predictions and identify when further observations, comparative and fair tests might be needed (Year 6)</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct scientific research using a range of sources - books, newspapers, magazines, journals, and the internet –</li> <li>• Begin to understand that scientific ideas change over time and to ensure source include most recent and up-to-date research</li> <li>• Understand variable reliability of different sources and identify trusted sources</li> <li>• Identify scientific evidence that has been used to support or refute ideas or arguments</li> </ul>	<ul style="list-style-type: none"> <li>• Identify casual relationships in their data</li> <li>• Identify evidence that refutes or supports their ideas</li> <li>• Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and report conclusions, casual relationships and explanations</li> <li>• Consolidate understanding of line graphs, bar graphs and tables and begin to be able to describe the results they see.</li> <li>•Interpret a range of data and construct data</li> <li>• Ensure accuracy of measurements – using accurate equipment to nearest mm/1 decimal place</li> <li>•Repeat measurements – calculate mean, median and range</li> </ul>	<ul style="list-style-type: none"> <li>• Build on prior learning and wider general knowledge to generate scientific questions.</li> <li>• Learn about different types of classification and other information records to identify, classify and sort</li> <li>•Describe how objects have been sorted.</li> <li>• Understand that there may be more than one way to sort a group of objects and begin to independently decide which method will be most efficient.</li> <li>• Learn about the work of taxonomists such as Carl Linnaeus</li> <li>•Create and use classification keys.</li> </ul>