

Working Scientifically		EYFS
Skills		<ol style="list-style-type: none"> 1. Learn and talk about what they see using a wide, new vocabulary. 2. Understand 'Why' questions 3. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. 4. Engage in non-fiction books to extend their knowledge of the world. 5. Choose the right resources to carry out their plan 6. Explore the world around them, using all their senses in hands-on exploration 7. Use equipment and tools carefully. 8. Show resilience and perseverance in the face of challenge. 9. Compare size, length, weight and capacity. 10. Describe what they see, feel and hear. 11. Notice changes as well as similarities and differences.

Working Scientifically		KS1	Lower KS2	Upper KS1
Skills	Asking Questions and Carrying out Fair and Comparative tests.	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Explore the world around them leading them. Ask some simple questions about how or why things happen; Begin to recognise ways in which they might answer scientific questions (different types of enquiry – observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests) Ask people questions. Carry out simple practical tests, using simple equipment. Talk about the aim of the scientific test they are working on.</p>	<p>Asking relevant questions and using different types of scientific enquiry to answer them</p> <p>Begin to raise their questions about the world around them in response to a range of scientific experiences. Start to make their own 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). Recognise when a fair test is necessary. Help decide how to set up a fair tests and comparative tests, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Set up and carry out simple comparative and fair tests.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Raise their own relevant questions about the world around them in response to a range of scientific experiences. Make their own decisions about the most appropriate type of enquiry they might use to answer questions. Explore and talk about their ideas, raising different kinds of scientific questions. Ask their own questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan and set up comparative and fair tests, including recognising and controlling variables where necessary. Use test results to identify when further tests are needed, Use test results to make predictions for further tests</p>
	Observing and Measuring Changes	<p>Observing closely using simple equipment.</p> <p>Observe the natural and humanly constructed world around them. Observe changes over times. Use simple measurements and equipment Make careful observations, sometimes using simple equipment to help them Begin to progress form non standard units (Year 1 : cm, m, l, degrees Celsius) (Year 2 : cm, mm, m, ml, l, degrees Celsius) To be able to say what I am looking for and what I am measuring.</p>	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Make systematic and careful observations. Observe changes over time. Use a range of equipment, including thermometers and data loggers. Choose from a selection of equipment Ask their own questions about what they observe; Learn to use new equipment appropriately (e.g. data loggers) Observe and measure accurately using standard units including time in minutes and seconds.</p>	<p>Taking measurement, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Choose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision; Make careful and focused observations; Know the importance of taking repeat readings and take repeat readings where appropriate.</p>

		KS1	Lower KS2	Upper KS1
Skills	Identifying, classifying, Recording and Presenting Data	<p>Identifying and classifying. Gathering and recording data to help in answering questions.</p> <p>Identify and compare objects, materials and living things using simple features. Decide how to sort and classify objects into simple groups with some help. Record and communicate findings in a range of ways with support (for example, in a table provided by the teacher). Sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.</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>Talk about criteria for grouping, sorting and classifying. Group and classify living things and materials. Collect data from their own observations and measurements. Present data in a variety of ways to help in answering questions. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Decide how to record data from a choice of familiar approaches; record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs</p>

Scientific Enquiry		KS1	Lower KS2	Upper KS1
Skills	Drawing Conclusions, Noticing Patterns and Presenting Findings.	<p>Using their observations and ideas to suggest answers to questions.</p> <p>Notice links between cause and effect with support. Begin to notice patterns and relationships with support. Begin to draw simple conclusions. Identify and discuss differences between their results. Use simple and scientific language. Read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1. Talk about their findings to a variety of audiences in a variety of ways.</p>	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Draw simple conclusions from their results; make predictions. Suggest improvements to investigations. Raise further questions which could be investigated; first talk about, and then go on to write about, what they have found out. Report and present their results and conclusions to others in written and oral forms with increasing confidence.</p>	<p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Notice patterns. Draw conclusions based in their data and observations. Use their scientific knowledge and understanding to explain their findings. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Look for different causal relationships in their data. Discuss the degree of trust they can have in a set of results. Separate opinion from fact. Independently report and present their conclusions to others in oral and written forms. Begin to use abstract models to explain ideas.</p>

Scientific Enquiry		KS1	Lower KS2	Upper KS1
Skills	Using Scientific evidence and Secondary Sources of Information.	<p>Begin to use secondary sources to find and gather information.</p>	<p>Using Scientific Evidence and Secondary Sources of Information Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Make links between their own science results and other scientific evidence. Use straightforward scientific evidence to answer questions or support their findings. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Use primary and secondary sources evidence to justify ideas. Identify evidence that refutes or supports their ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas. Talk about how scientific ideas have developed over time.</p>

	KS1	Lower KS2	Upper KS1
Vocabulary - Scientific enquiry	<p>Research , question, answer, plan, observe, equipment, Identify, classify, sort, group, test, measure</p> <p>Record, describe, pattern, compare, changes, chart, map, table, data, label, list</p>	<p>As KS1 +</p> <p>relevant questions, predict, predictions, scientific enquiry, comparative test, fair test, systematic, careful observation, accurate measurements, differences, similarities, changes, evidence</p> <p>improve, secondary sources, reliable, repeatable</p> <p>aim, purpose, method, conclusion</p> <p>drawings, labelled diagrams, keys, bar charts, line graphs, construct, interpret, analyse, relationship</p> <p>trend</p> <p>apparatus, thermometer, data logger</p> <p>data, gather, record, present</p>	<p>As KS1, LKS2 +</p> <p>control variable, independent variable, dependent variable, relationship, accuracy, precision, repeat readings, model, evaluation</p> <p>scientific diagrams, classification keys, scatter graphs, bar graph, line graph, line of best fit, quantitative</p> <p>conclusions, causal relationships, explanations, degree of trust</p> <p>support, refute ideas or arguments</p>