

Progression of Skills – Working Scientifically (National Curriculum)

Based on STEM's Progression of Enquiry Skills - an organised summary of the statutory requirements and non-statutory notes and guidance for Working Scientifically from Years 1 to 6, drawing links from the Early Learning Goals and "Development Matters" for Foundation Stage

Green writing shows end of KS Teacher Assessment Frameworks

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ask questions	<p>Show curiosity about objects, events and people Playing & Exploring Questions</p> <p>Question why things happen Speaking: 30-50 months</p> <p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world The World: 30-50 month</p>	<p>Explore the world around them and raise their own simple questions</p> <p>Ask people questions and use simple secondary sources to find answers</p>		<p>Raise their own relevant questions about the world around them</p> <p>With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done</p>		<p>Use their science experiences to explore ideas and raise different kinds of questions</p> <p>Talk about how scientific ideas have developed over time</p>	
Observe and measure	<p>Engage in open-ended activity Playing & Exploring</p> <p>Closely observes what animals, people and vehicles do The World 8-20 months</p> <p>Use senses to explore the world around them Playing & Exploring</p> <p>Answer how and why questions about their experiences ELG: Understanding</p> <p>Make observations of animals and plants and explain why some things occur, and talk about changes</p>	<p>Begin to recognise different ways in which they might answer scientific questions</p> <p>Observe closely using simple equipment. With help, observe changes over time</p> <p>With guidance, they should begin to notice patterns and relationships</p>		<p>Make systematic and careful observations 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>Take accurate measurements using standard units</p>		<p>Make their own decisions about what observations to make, what measurements to use and how long to make them for</p>	

	ELG: The World			
Plan and set up enquiries	Take a risk, engage in new experiences and learn by trial and error Playing & Exploring	Experience different types of science enquiries, including practical activities	Should be given a range of scientific experiences including different types of science enquiries to answer question Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer question	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions
Identify and classify	Develop ideas of grouping, sequences, cause and effect Creating & Thinking Critically Know about similarities and differences in relation to places, objects, materials and living things ELG: The World	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)	Talk about criteria for grouping, sorting and classifying; and use simple keys Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them	Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment
Perform tests	Find ways to solve problems / find new ways to do things / test their ideas Creating & Thinking Critically	Carry out simple tests	Set up simple practical enquiries, comparative and fair tests Recognise when a simple fair test is necessary and help to decide how to set it up	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why
Gather and record data	Create simple representations of events, people and objects Being Imaginative: 40-60+ months	Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data Record simple data	Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	Look for different causal relationships in their data and identify evidence that refutes or supports their idea Recognise which secondary sources will be most useful to re-search their ideas and begin to separate opinion from fact 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

				Identify scientific evidence that has been used to support or refute ideas or argument
Use equipment	<p>Choose the resources they need for their chosen activities ELG: Self Confidence & Self Awareness</p> <p>Handle equipment and tools effectively ELG: Moving & Handling</p>	<p>Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data</p>	<p>learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately</p> <p>Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data</p>	<p>Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate</p>
Report/present/communicate findings	<p>Make links and notice patterns in their experience Creating & Thinking Critically</p> <p>Develop their own narratives and explanations by connecting ideas or events ELG: Speaking</p> <p>Builds up vocabulary that reflects the breadth of their experience Understanding: 30-50 months</p>	<p>Use their observations and ideas to suggest answers to questions Talk about what they have found out and how they found it out</p> <p>With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language</p>	<p>With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions</p> <p>Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusion</p>	<p>Use relevant 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 result</p> <p>Use their results to make predictions and identify when further observations, comparative and fair tests might be needed</p>
		KS1 teacher assessment framework – working scientifically	KS2 teacher assessment framework – working scientifically	
		<p>The pupil can, using appropriate scientific language from the national curriculum:</p> <ul style="list-style-type: none"> ask their own questions about what they notice use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions: 	<ul style="list-style-type: none"> describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources) 	

		<ul style="list-style-type: none">- observing changes over time- noticing patterns- grouping and classifying things- carrying out simple comparative tests- finding things out using secondary sources of information• communicate their ideas, what they do and what they find out in a variety of ways	<ul style="list-style-type: none">• use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate• record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs• draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways• raise further questions that could be investigated, based on their data and observations.
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