

**Progression of Disciplinary Knowledge (Working Scientifically) in Science at Pitmaston Primary School**  
**[Asking questions, measuring and recording, concluding, evaluating and research]**



EYFS	Nursery Pupils will know how to:	Reception Pupils will know how to:
<b>Understanding of the World</b>	<ul style="list-style-type: none"> <li>• Use all their <b>senses</b> in hands-on exploration of natural materials.</li> <li>• Explore collections of <b>materials</b> with similar and/or different properties.</li> <li>• Talk about what they see, using a wide vocabulary.</li> <li>• Explore and talk about different <b>forces</b> they can feel.</li> <li>• Talk about the differences between <b>materials</b> and <b>changes</b> they notice.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore the <b>natural world</b> around them.</li> </ul>
<b>Expressive Arts and Design</b>	<ul style="list-style-type: none"> <li>• Explore different <b>materials</b> freely, develop their ideas about how to use them and what to make.</li> <li>• Develop their own ideas and then decide which materials to use to express them.</li> <li>• Join different materials and explore different textures.</li> </ul>	
<b>Mathematics</b>	<ul style="list-style-type: none"> <li>• Make <b>comparisons</b> between objects relating to <b>size, length, weight and capacity</b></li> <li>• Compare <b>quantities</b> using language: 'more than', 'fewer than'.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Count</b> objects, actions and sounds.</li> <li>• <b>Compare length, weight and capacity.</b></li> </ul>
<b>Literacy</b>	<ul style="list-style-type: none"> <li>• Engage in extended conversations about stories, learning new <b>vocabulary</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Write short sentences with words with known letter-sound correspondences using a capital letter and full stop.</li> <li>• Re-read what they have written to check that it makes sense.</li> </ul>
<b>Communication &amp; Language</b>	<ul style="list-style-type: none"> <li>• Understand 'why' <b>questions</b></li> <li>• Start a <b>conversation</b> with an adult or a friend and continue it for many turns.</li> <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.</li> </ul>	<ul style="list-style-type: none"> <li>• Learn new <b>vocabulary</b>.</li> <li>• Articulate their <b>ideas</b> and thoughts in well-formed sentences</li> <li>• Use talk to help work out problems and organise thinking and activities, and to explain <b>how things work and why they might happen</b>.</li> </ul>
<b>Personal, Social and Emotional Development</b>	<ul style="list-style-type: none"> <li>• Make <b>healthy choices</b> about food, drink, activity and tooth brushing.</li> </ul>	<ul style="list-style-type: none"> <li>• Show resilience and perseverance in the face of challenge.</li> <li>• Think about the perspectives of others.</li> </ul>
<b>Physical Development</b>	<ul style="list-style-type: none"> <li>• Choose the right <b>resources</b> to carry out their own plan.</li> <li>• Use one-handed <b>tools</b> and <b>equipment</b>...</li> <li>• Start taking part in some group activities which they make up for themselves, or in teams.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop their small motor skills so that they can use a <b>range of tools</b> competently, safely and confidently.</li> </ul>

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		Year 1	Year 2 (TAF)
<b>Working scientifically</b>	Asking questions	Pupils will be able to: <ul style="list-style-type: none"> <li>• Ask simple questions and recognise that they can be answered in different ways.</li> </ul>	Pupils can, using appropriate scientific language from the national curriculum: <ul style="list-style-type: none"> <li>• Ask their own questions about what they notice.</li> </ul>
	Measuring and recording	Pupils will be able to: <ul style="list-style-type: none"> <li>• Observe closely using simple equipment.</li> <li>• Perform simple tests.</li> <li>• Gather and record data to help in answering questions.</li> </ul>	Pupils can 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"> <li>• Observing changes over time.</li> <li>• Noticing patterns.</li> <li>• Grouping and classifying things.</li> <li>• Carry out simple comparative tests.</li> <li>• Finding things out using secondary sources of information.</li> </ul>
	Concluding	Pupils will be able to: <ul style="list-style-type: none"> <li>• Identify and classify.</li> <li>• Use their observations and ideas to suggest answers to questions.</li> </ul>	Pupils can: <ul style="list-style-type: none"> <li>• Group and classify.</li> <li>• Use their observations and ideas to suggest answers to questions.</li> </ul>
	Evaluating	Pupils will be able to: <ul style="list-style-type: none"> <li>• Explain what happened in an investigation and compare this with what was predicted.</li> </ul>	Pupils can: <ul style="list-style-type: none"> <li>• Communicate their ideas, what they do and what they find out in a variety of ways.</li> </ul>
Research	Pupils will be able to: <ul style="list-style-type: none"> <li>• <b>Find information</b> using given sources. e.g. <i>animals</i>.</li> </ul>	Pupils can: <ul style="list-style-type: none"> <li>• <b>Select information</b> from a range of given sources.</li> </ul>	

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		Year 3	Year 4
<b>Working scientifically</b>	Asking questions	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Ask relevant questions and use different types of scientific enquiries to answer them.</li> <li>Set up simple practical enquiries, comparative and fair tests.</li> </ul>	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Ask relevant questions and use different types of scientific enquiries to answer them.</li> <li>Set up simple practical enquiries, comparative and fair tests.</li> </ul>
	Measuring and recording	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> <li>Gather, record, classify and present data in a variety of ways to help in answering questions.</li> </ul>	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and table.</li> <li>Gather, record, classify and present data in a variety of ways to help in answering questions.</li> </ul>
	Concluding	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Identify differences, similarities or changes related to simple scientific ideas and processes.</li> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations or results and conclusions.</li> <li>Use straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Identify differences, similarities or changes related to simple scientific ideas and processes.</li> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations or results and conclusions.</li> <li>Use straightforward scientific evidence to answer questions or to support their findings.</li> </ul>
	Evaluating	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> </ul>	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> </ul>
	Research	<p><b>Research</b> using given sources. e.g. <i>research different food groups and how they keep us healthy</i></p>	<p><b>Select information</b> to support findings. e.g. <i>research animals</i></p>

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		Year 5	Year 6
<b>Working scientifically</b>	Asking questions	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</li> </ul>	<p>Pupils can, using appropriate scientific language from the national curriculum:</p> <ul style="list-style-type: none"> <li>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 secondary sources)</li> </ul>
	Measuring and recording	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</li> <li>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</li> </ul>	<p>Pupils can:</p> <ul style="list-style-type: none"> <li>Use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.</li> <li>Record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</li> </ul>
	Concluding	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Identify scientific evidence that has been used to support or refute ideas or arguments.</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, on oral and written forms such as displays and other presentations.</li> </ul>	<p>Pupils can:</p> <ul style="list-style-type: none"> <li>Draw conclusions, communicating these in a variety of ways (oral &amp; written)</li> <li>Identify evidence that has been used to support or refute ideas or arguments.</li> <li>Report and present findings from enquiries, identify causal relationships and explanations of and degree of trust in results, on oral and written forms such as displays and other presentations.</li> </ul>
	Evaluating	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Use test results to make predictions to set up further comparative and fair tests.</li> </ul>	<p>Pupils can:</p> <ul style="list-style-type: none"> <li>Use test results to explain and evaluate their methods and findings and communicating these in a variety of way.</li> <li>Raise further questions that could be investigated, based on their data and observations.</li> </ul>
	Research	<p>Pupils will be able to:</p> <ul style="list-style-type: none"> <li>Explore how scientific ideas have developed over time.</li> </ul>	<p>Pupils can:</p> <ul style="list-style-type: none"> <li>Explore how scientific ideas have developed over time.</li> </ul>