



Progression of Skills: Working Scientifically

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EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2	Key Stage 3
	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During KS3 , through the content across all three disciplines, pupils should be taught to:
<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help know about similarities and differences in relation to places, objects, materials and living things → make observations of animals and plants → explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories talk about the features of their own immediate environment and how environments might vary from one another → explain why some things occur and talk about changes 	<ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways; observing closely, using simple equipment; performing simple tests; identifying and classifying; using their observations and ideas to suggest answers to questions; gathering and recording data to help in answering questions. 	<ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiries to answer them; setting up simple practical enquiries, comparative and fair tests; making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers; 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; reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; identifying differences, similarities or changes related to simple scientific ideas and processes; 	<ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs; using test results to make predictions to set up further comparative and fair tests; 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; identifying scientific evidence that has been used to support or refute ideas or arguments. 	<p>Scientific attitudes:</p> <ul style="list-style-type: none"> Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility Understand that scientific methods and theories develop as scientists modify earlier explanations to take account of new evidence and ideas, together with the importance of publishing results and peer review Evaluate risks <p>Experimental skills and investigations:</p> <ul style="list-style-type: none"> Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Make and record observations and measurements using a range of methods for different investigations; Evaluate the reliability of methods and suggest possible improvements. Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. Apply sampling techniques

		<ul style="list-style-type: none"> using straightforward scientific evidence to answer questions or to support their findings. 		<ul style="list-style-type: none"> Make predictions using scientific knowledge and understanding Analysis and Evaluation: <ul style="list-style-type: none"> Present observations and data using appropriate methods, including tables and graphs Apply mathematical concepts and calculate results Evaluate data, showing awareness of potential sources of random and systematic error Identify further questions arising from their results Present reasoned explanations, including explaining data in relation to predictions and hypotheses Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions Measurement: <ul style="list-style-type: none"> Understand and use SI units and IUPACC chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques
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	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Vocabulary	question answer observe observing equipment identify classify	sort group record – diagram, chart, map data compare, contrast describe biology chemistry physics	research – relevant questions scientific enquiry comparative and fair test systematic, careful observation accurate measurements equipment – thermometer, data logger data – gather, record classify, present record – drawings, labelled diagrams, keys, bar charts, tables	oral and written explanations conclusion predictions differences, similarities, changes evidence improve secondary sources guides, keys construct interpret	plan variables measurements accuracy precision repeat readings record data – scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs predications further comparative and fair test	report and present – conclusions, casual relationships, explanations, degree of trust, oral and written display and presentation. evidence – support, refute ideas or arguments identify, classify and describe patterns systematic
Asking Questions and Carrying Out Practical Work	KS1 Science National Curriculum Asking simple questions and recognising that they can be answered in different ways. Performing simple tests. Children can:		Lower KS2 Science National Curriculum Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Children can:		Upper KS2 Science National Curriculum Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests.	

	<p>a explore the world around them, leading them to ask some simple scientific questions about how and why things happen;</p> <p>b begin to recognise ways in which they might answer scientific questions;</p> <p>c ask people questions and use simple secondary sources to find answers;</p> <p>d carry out simple practical tests, using simple equipment;</p> <p>e experience different types of scientific enquiries, including practical activities;</p> <p>f talk about the aim of scientific tests they are working on;</p> <p>g with support, start to recognise a fair test.</p>	<p>a start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p>c recognise when a fair test is necessary;</p> <p>d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;</p> <p>e set up and carry out simple comparative and fair tests.</p>	<p>Children can:</p> <p>a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p>c explore and talk about their ideas, raising different kinds of scientific questions;</p> <p>d ask their own questions about scientific phenomena;</p> <p>e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;</p> <p>f 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;</p> <p>g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary;</p> <p>h use their test results to identify when further tests and observations may be needed;</p> <p>i use test results to make predictions for further tests.</p>
Observing and Measuring Changes	<p>KS1 Science National Curriculum Observing closely, using simple equipment.</p> <p>Children can:</p> <p>a observe the natural and humanly constructed world around them;</p> <p>b observe changes over time;</p> <p>c use simple measurements and equipment;</p> <p>d make careful observations, sometimes using equipment to help them observe carefully.</p>	<p>Lower KS2 Science National Curriculum 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>Children can:</p> <p>a make systematic and careful observations;</p> <p>b observe changes over time;</p> <p>c use a range of equipment, including thermometers and data loggers;</p> <p>d ask their own questions about what they observe;</p> <p>e where appropriate, take accurate measurements using standard units using a range of equipment.</p>	<p>Upper KS2 Science National Curriculum Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Children can:</p> <p>a choose the most appropriate equipment to make measurements and explain how to use it accurately;</p> <p>b take measurements using a range of scientific equipment with increasing accuracy and precision;</p> <p>c take repeat readings when appropriate;</p> <p>d understand why we take an average in repeat readings.</p>
Identifying, Classifying, Recording and Presenting Data	<p>KS1 Science National Curriculum Identifying and classifying.</p> <p>Gathering and recording data to help in answering questions.</p> <p>Children can:</p> <p>a use simple features to compare objects, materials and living things;</p> <p>b decide how to sort and classify objects into simple groups with some help;</p> <p>c record and communicate findings in a range of ways with support;</p> <p>d 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>Lower KS2 Science National Curriculum Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can:</p> <p>a talk about criteria for grouping, sorting and classifying;</p> <p>b group and classify things;</p> <p>c collect data from their own observations and measurements;</p> <p>d present data in a variety of ways to help in answering questions;</p> <p>e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;</p> <p>f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p>	<p>Upper KS2 Science National Curriculum Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can:</p> <p>a independently group, classify and describe living things and materials;</p> <p>b use and develop keys and other information records to identify, classify and describe living things and materials;</p> <p>c decide how to record data from a choice of familiar approaches;</p> <p>d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.</p>

Drawing Conclusions, Noticing Patterns and Presenting Findings	KS1 Science National Curriculum Using their observations and ideas to suggest answers to questions. Children can: <ul style="list-style-type: none"> a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways. 	Lower KS2 Science National Curriculum 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. Children can: <ul style="list-style-type: none"> a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence. 	Upper KS2 Science National Curriculum 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. Children can: <ul style="list-style-type: none"> a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms.
Using Scientific Evidence and Secondary Sources of Information		Lower KS2 Science National Curriculum Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Children can: <ul style="list-style-type: none"> a make links between their own science results and other scientific evidence; b use straightforward scientific evidence to answer questions or support their findings; c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. 	Upper KS2 Science National Curriculum Identifying scientific evidence that has been used to support or refute ideas or arguments. Children can: <ul style="list-style-type: none"> a use primary and secondary sources evidence to justify ideas; b identify evidence that refutes or supports their ideas; c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; e talk about how scientific ideas have developed over time.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Maths Progression	Frequency chart, counting	Continue with all previously taught methods + Venn diagrams, labels, simple tables	Continue with all previously taught methods + Tally charts, picture graphs, pictograms, Carroll diagrams	Continue with all previously taught methods + Introduce bar graphs	Continue with all taught methods Introduce time graphs, classification keys, line graphs	Choose and explain method used Introduce finding percentages, use decimals	Choose and explain method used Use 'mean' as an average and decide when it is appropriate to use. Introduce Scatter graphs, pie charts and ratios.