

Science *Working Scientifically* Progression Map



Rationale

This document has been produced in conjunction with the National Curriculum (DfE, 2013) and Statutory framework for the early years foundation stage (DfE, 2021)

Statements have been taken directly from the above documents, and have been categorised to coordinate specifically with the detail in the 'nature, processes and methods of science' section of the science curriculum.

Areas in grey indicate a 'non-statutory' element of the curriculum. Their inclusion allows a coherent, fluid transition between year groups, and thus ensures transparent and coherent progression throughout. Care has been taken to ensure that statements align as closely as possible to allow a clear view of progression. Consideration has been offered towards impact throughout – categories represent key areas of planning that a science teacher will consider when writing a single or unit of science lessons. For example, categories such as 'Setting up enquiries', 'Observing over time' and 'Testing and Gathering data' are directly relatable to elements of a science lesson. Key 'working scientifically' skills can therefore be identified, and attached to appropriate planning.

Where Ofsted (2011) identified ways in which primary schools can improve teaching standards from 'satisfactory' to 'outstanding' in science, it was highlighted that 'the most important focus for schools is to ensure that pupils are engaged and challenged by their work in science, particularly in scientific investigation and how science works'. Where a lack of understanding in 'working scientifically' progression may exist across primary schools in England, this document represents an important tool in raising this understanding, and identifying patterns in progression across the years at Barley Croft Primary School.

	EYFS	KS1		LKS2		UKS2	
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ask questions and plan enquiry		While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).	While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).	The children consider their prior knowledge when asking questions. What if... What will happen if... I know X so that must mean...	The children consider their prior knowledge when asking questions. What if... What will happen if... I know X so that must mean...	Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work. The children select from a range of practical	Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work. The children select from a range of practical resources to gather evidence to answer their questions.

						resources to gather evidence to answer their questions.	
Observing and measure		Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.	Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.	The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data	The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).

						(closer to the true value).	
Set up Enquiry		The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.	The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.	The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.

						Children present the same data in different ways in order to help with answering the question.	Children present the same data in different ways in order to help with answering the question.
Identifying and classifying		Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.	They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.	Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that	Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered.

						they have gathered. They talk about how new discoveries change scientific understanding.	They talk about how new discoveries change scientific understanding.
Interpreting and reporting		The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and bar charts. They classify using simple prepared tables and sorting rings.	The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and bar charts. They classify using simple prepared tables and sorting rings.	The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings).	The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings).	They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data. They communicate their findings to an audience using relevant scientific language and illustrations.	They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data. They communicate their findings to an audience using relevant scientific language and illustrations.

Evaluate		Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.	Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.	They draw conclusions based on their evidence and current subject knowledge. They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry	They draw conclusions based on their evidence and current subject knowledge. They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge . Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.	In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
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				They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.			
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