



Great Sankey Primary School



Working Scientifically Skills Progression EYFS – UKS2

The National Curriculum for Science is broken down into three key aspects for the teaching of Science in primary schools. A heavy emphasis is placed on children 'Working Scientifically' as they progress through the years from EYFS, as well as on 'Scientific Knowledge and Understanding' and 'Spoken Language'. This document aims to set out the progression of skills that children are taught under the 'Working Scientifically' strand from EYFS – to UKS2 and can act as a guide when assessing pupils against these objectives. These skills, although discrete, will be taught to the children throughout and within science topics across the year.

The National Curriculum for Science

Scientific Knowledge and Conceptual Understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

Nature / Processes and Methods of Science –

'Working Scientifically'

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken Language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

<u>Working Scientifically</u>	EYFS
Questioning and Enquiring	<p>Children show curiosity about objects, events and people: Playing and Exploring</p> <p>Question why things happen: Speaking – 30/50 months</p> <p>Engage in open-ended activity: Playing and Exploring</p> <p>Take risks, engage in new experiences and learn by trial and error: Playing and Exploring</p>
Investigating & Recording Report Findings and Draw Conclusions	<p>Find ways to solve problems / find new ways to do things / test their ideas: Creating & Thinking Critically</p> <p>Develop ideas of grouping, sequences, cause and effect: Creating & Thinking Critically</p> <p>Know about similarities and differences in relation to places, objects, materials and living things: ELG The world</p> <p>Comment and ask questions about aspects of their familiar world, such as the places they live, or the natural world: ELG The World (30-50 months)</p> <p>Closely observe what animals, people and vehicles do: ELG The World (8-20 months)</p> <p>Use senses to explore the world around them: Playing and Exploring</p>
Observing, Measuring and Pattern Seeking	<p>Make links and notice patterns in their experience: Creative & Thinking Critically</p> <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>Create simple representations of events, people and objects: Being Imaginative: 40-60 months+</p>
Identifying, Grouping and Classifying	<p>Answer how and why questions about their experiences: ELG – Understanding</p> <p>Make observations of animals & plants and explain why some things occur. Talk about changes: ELG The World</p> <p>Develop their own narratives and explanations by connecting ideas or events: ELG Speaking</p> <p>Build up vocabulary that reflects the breadth of their experience: Understanding – 30/50 months</p>

<u>Working Scientifically</u>	Year 1 (Adult Supported)	Year 2
Questioning and Enquiring	<p>Ask simple questions about the world around us</p> <p>Begin to recognise that questions can be answered in different ways</p> <p>Use simple secondary resources to find answers</p>	<p>Ask questions about the world around us.</p> <p>Recognise that they can be answered in different ways (changes over time, noticing patterns, grouping and classifying, comparative and fair tests, research)</p> <p>Find information using computers and books</p>
Investigating & Recording Report Findings and Draw Conclusions	<p>Carry out simple tests with support</p> <p>Begin to say what might happen in an investigation</p> <p>Begin to say what has happened in an investigation</p> <p>Gather and record information with adult support</p> <p>Begin to record simple data</p> <p>Begin to talk about what they have found out and how</p> <p>Begin to explain whether or not they were surprised by the results of an investigation.</p>	<p>Carry out simple tests</p> <p>Begin to make predictions and give a reason</p> <p>Say and write what has happened in an investigation</p> <p>Gather and record data</p> <p>Record and communicate findings in a range of ways – use simple tables</p> <p>Talk about what they have found out and how they found it out</p> <p>Say what happened in an investigation and explain whether or not the results surprised them</p> <p>Begin to say what they might change in an investigation</p>
Observing, Measuring and Pattern Seeking	<p>Talk about what they can see</p> <p>Use simple equipment with support</p>	<p>Observe closely using simple equipment (magnifiers)</p> <p>Observe changes over time and begin to notice patterns or relationships</p> <p>Understand and be able to use simple equipment safely (egg timers, magnifiers)</p> <p>Begin to record measurements using standard units (cm)</p>
Identifying, Grouping and Classifying	<p>Identify and classify with some support</p> <p>Begin to observe and identify – compare and describe</p> <p>With support, describe how to group objects and materials</p>	<p>Identify and classify</p> <p>Decide how to sort and group objects, materials and living things</p>
Vocabulary	<p>Use some simple scientific language</p> <p>Begin to use some simple scientific words</p> <p>Use comparative language with support – e.g. longer and shorter</p>	<p>Use simple scientific language and use some scientific words correctly.</p> <p>Use comparative language confidently E.g. faster, larger</p>
Understanding	<p>Begin to talk about how elements of science can help us in our daily lives. E.g. A torch helps us to see in the dark.</p> <p>Begin to understand how some aspects of science can be dangerous. E.g. We shouldn't mess around with plug sockets.</p>	<p>Be able to talk about how science can help us in our daily lives.</p> <p>Be able to understand how some aspects of science can be dangerous. E.g. We shouldn't play near electricity and water.</p>

<u>Working Scientifically</u>	Year 3	Year 4
Questioning and Enquiring	<p>Ask some relevant questions and use different types of scientific enquiry to answer them.</p> <p>Begin to make decisions about which type of scientific enquiry will be the best to answer a question.</p> <p>Begin to decide when and how to use secondary sources and carry out research.</p>	<p>Ask increasingly relevant scientific questions and use different types of scientific enquiry to answer them.</p> <p>Make some 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 fair / comparative tests.</p> <p>To decide when and how research could help – being able to carry out research on their own.</p>
Investigating & Recording Report Findings and Draw Conclusions	<p>Set up some simple, practical enquiries, comparative and fair tests.</p> <p>Begin to recognise when a fair test is necessary and help to decide how to set it up.</p> <p>Make predictions with reasons.</p> <p>Gather record and begin to classify data in a variety of ways.</p> <p>Begin to record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.</p> <p>Begin to use results to draw simple conclusions, make predictions, suggest improvements and raise further questions.</p> <p>With help, look for changes, patterns, similarities and differences in data.</p>	<p>Set up practical enquiries, comparative and fair tests.</p> <p>Recognise when a fair test is necessary and decide how to set it up.</p> <p>Make predictions drawing on previous knowledge and experience.</p> <p>Gather record and classify data in a variety of ways.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, bar charts, keys and tables.</p> <p>Record findings using oral and written explanations.</p> <p>Use results to draw simple conclusions, make further prediction, suggest some improvements and raise some further questions.</p> <p>Can spot some patterns in results and look for some similarities and differences.</p> <p>Can explain what they have found out and be able to suggest some improvements to an investigation with support.</p>
Observing, Measuring and Pattern Seeking	<p>Begin to make systematic and careful observations, and where appropriate – take accurate measurements using a range of equipment. (Data loggers and thermometers.</p> <p>Learn to use some new measuring equipment – including data loggers.</p> <p>Begin to measure accurately using standard units, including time in minutes and seconds.</p>	<p>Make systematic and careful observations, and where appropriate – take accurate measurements using standard units of measure by using a range of equipment. E.g. Thermometers and data loggers.</p> <p>Help make decisions about what observations to make, how long to make them for and the types of equipment that could be used.</p> <p>Select and choose from a range of given equipment.</p>
Identifying, Grouping and Classifying	<p>Begin to identify differences, similarities, or changes related to simple scientific ideas or processes.</p> <p>Begin to talk about criteria for grouping, sorting and classifying.</p> <p>Begin to compare and group according to behaviour or properties.</p>	<p>Identify similarities and differences or changes related to simple scientific ideas or processes.</p> <p>Talk about criteria for grouping, sorting and classifying – using simple keys. Compare and group according to properties or behaviours.</p>
Understanding	<p>Begin to know and explain which things in Science have made our lives better. (Medicines, computers etc.)</p> <p>Can begin to understand risk in Science.</p>	<p>Know and explain which things in Science have made our lives better. (Medicines, computers, hospitals etc.)</p> <p>Can understand there is some risk in Science.</p>

<u>Working Scientifically</u>	Year 5	Year 6
Questioning and Enquiring	Raise different kinds of questions about scientific phenomena Begin to select and plan the most appropriate ways to answer science questions, using a range of enquiry. (Observation over time, pattern seeking, grouping, classifying, comparative and fair testing, research using primary and secondary sources. Begin to recognise which sources will be most useful.	Use their scientific experiences to explore ideas and raise questions. Select and plan the most appropriate ways to answer a scientific question and use different types of scientific enquiry. (Observation over time, pattern seeking, grouping and classifying, comparative and fair testing and use of primary and secondary sources for research) Recognise and understand the reliability of sources.
Investigating & Recording Report Findings and Draw Conclusions	Set up comparative and fair tests to begin to decide which variables to control. Make and explain predictions. Begin to record data and results using scientific diagrams and labels, classification keys, tables, bar and line graphs. Begin to report and present findings that include conclusions, and explanations about accuracy of results. Begin to use evidence to justify ideas and conclusions. Begin to use test results to make prediction and set up further comparative tests.	Decide which variables to control and why. (What we will change and keep the same?) Make and explain predictions using scientific language – begin to support with scientific evidence. Record data and results of increasing complexity using a range of diagrams, keys, tables and graphs) Report and present findings using detailed and appropriate scientific language. Decide how to record data and the best way to present it. Use evidence to justify ideas and conclusions. Use test results to make further predictions / explore further.
Observing, Measuring and Pattern Seeking	Begin to take measurements using a range of scientific equipment with increasing accuracy and precision. (use a range of standard measurements – N, KG, G, mm, cm) Begin to make their own decisions about observations to make, how long to make them for and when to repeat. Choose the most appropriate equipment and use it correctly / safely.	Take measurements using a range of scientific equipment, with increasing accuracy and precision. Be able to take repeat readings where needed / appropriate. Make their own decisions about making observation and choose the most appropriate equipment. Use equipment safely and accurately. Measure using a range of standard units (N, KG, mm etc)
Grouping and Classifying	Begin to use and develop keys and other information records to identify, classify and describe living things & materials.	Use and develop keys and other information records to identify, classify and describe living things & materials.
Vocabulary	Begin to report and present findings using scientific language. Begin to read, spell and pronounce scientific vocabulary. Use appropriate scientific language to describe simple processes.	Report and present findings from scientific enquiries using more detailed and specific scientific language. Confidently use a wider range of scientific vocabulary. Use scientific ideas when describing simple processes – and select the most appropriate terminology.
Understanding	Begin to talk about how scientific ideas have changed over time. Begin to explain the positive and negative effects of scientific development. Begin to know how science is useful in everyday life, and which parts of our lives rely on science.	Can talk about how scientific ideas have changed and developed over time. Can explain some examples of positive and negative effects of science development. Can see how science is useful in everyday life and understand which parts of our life rely upon science.