



Science- 'Working Scientifically'

Disciplinary Knowledge & Skills– Nov'21 (3rd revision)

Themes developed from Association for Science Education (ASE)

	Skill Theme 1 Scientific Attitudes	Skill Theme 2 Experimental skills and investigations	Skill Theme 3 Analysis and evaluation	Skill Theme 4 Measurement
Early Years (Reception)	<p>1a Show an interest in finding out about the world around them</p> <p>1b Ask simple scientific questions about how things work</p> <p>1c Understand that a scientist has to find out fairly how something works by testing it out</p>	<p>2a Find out how things work by observations and experimentation</p> <p>2b Understand that a scientific test has to be careful and fair to get a useful result</p>	<p>3a Make observations about objects, events and animals and answer questions</p> <p>3b Look at simple results from a scientific investigation and suggest what they mean</p>	<p>4a Sort objects into different groups or categories</p> <p>4b Use simple physical measurements eg strides, foot steps, arm lengths</p> <p>4c Understand that there are tools like tape measures, rulers, weighing scales etc which help us to measure how much</p>
End of Key Stage 1 (Year 2)	<p>1.1 Ask simple scientific questions showing curiosity about the world around them</p> <p>1.2 Access simple research sources to find out more about a topic of choice</p> <p>1.3 Apply their own knowledge of the world around them</p>	<p>2.1 Observe closely, using simple equipment including magnifiers and microscopes</p> <p>2.2 Perform simple tests gathering and recording data to help answer questions</p> <p>2.3 Present findings in a clear and effective way including labelling</p>	<p>3.1 Use their observations and ideas to suggest answers</p> <p>3.2 Make simple conclusions from data in tables, graphs and charts</p> <p>3.3 Identify and classify objects, materials and living things.</p> <p>3.4 Make sensible predictions</p>	<p>4.1 Use and select from a range of equipment to take measurements</p> <p>4.2 Know why accurate measurements are important</p> <p>4.3 Be able to use standard and non-standard units</p> <p>4.4 Be able to make observations over time.</p>
End of Lower Key Stage 2 (Year 4)	<p>1.4 Ask relevant questions</p> <p>1.5 Suggest and use different types of scientific enquiries to find answers.</p> <p>1.6 Access appropriate research sources to find out more about a topic of choice</p> <p>1.7 Decide for themselves how to gather evidence to answer the question</p> <p>1.8 Use accurate scientific language in discussion, and explain ideas to a peer</p>	<p>2.4 Set up simple practical enquiries following a plan they have helped develop</p> <p>2.5 Make systematic and careful observations taking accurate measurements using a range of equipment, including thermometers and data loggers</p> <p>2.6 Gathering, recording, classifying and presenting data in a variety of ways</p> <p>2.7 Use concepts of 'fair test' and comparative test and begin to explain them</p> <p>2.8 Present findings in a clear and effective way including labelling, diagrams, keys, bar charts, and tables – and explain the purpose of the presentation</p>	<p>3.5 Recording findings using simple scientific language, drawings, labelled</p> <p>3.6 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>3.7 Use results to draw simple conclusions</p> <p>3.8 Make predictions for new values, and begin to justify them from scientific knowledge</p> <p>3.9 Suggest improvements and raise further questions for investigation</p> <p>3.10 Be able to recognise and explain patterns in results</p>	<p>4.5 Make systematic and careful observations</p> <p>4.6 Taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>4.7 Be able to make and record detailed observations over time.</p> <p>4.8 Evaluate and discuss which measuring equipment is best suited for an investigation</p> <p>4.9 Be able to explain and justify which units of measurement are most appropriate for an investigation</p>
When we leave the school. Year 6	<p>1.9 Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>1.10 Access a range of appropriate research sources to find out more about a topic of choice</p> <p>1.11 Be able to make informed decisions about the veracity of scientific websites</p> <p>1.12 Use a range of accurate scientific language in discussion, and explain ideas to the class</p>	<p>2.9 Know why to take repeat readings when appropriate</p> <p>2.10 Use and understand concepts of 'fair test' and comparative test, drawing on their prior knowledge</p> <p>2.10 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>2.11 Make choices about how to present findings and explain the reasons for the choice of presentation</p> <p>2.12 Consistently present findings in a clear and effective way including labelling, diagrams, keys, bar charts, line graphs, and scientific tables</p>	<p>3.11 Use test results to make sensible predictions for related investigations</p> <p>3.12 Suggest how to set up further comparative and fair tests to find out more</p> <p>3.13 Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>3.14 Identify scientific evidence that has been used to support or refute ideas or arguments</p> <p>3.15 Recognise patterns in results, including data, and make informed explanations about them</p>	<p>4.10 Solve problems involving the calculation and conversion of units of measure,</p> <p>4.11 Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa.</p> <p>4.12 Take measurements, using a range of scientific equipment, with increasing accuracy and precision,</p> <p>4.13 Understand why and when it is appropriate to take repeat readings, and how to use simple averages and concepts of 'best fit' to make sense of data.</p>

Key subject specific skills vocabulary (Tier 3 vocab) to be embedded and revisited during the study of science in Little Melton: observe, equipment, identify, classify, group, record, data, compare, contrast, research, comparative test, fair test, systematic, labelled, conclusion, prediction, interpret, construct, variables, precision, evidence, refute, quantitative, qualitative

We believe these skills are important for life because:

- We want children to have the scientific knowledge to understand much of the world around them and the practical skills to enable them to investigate and explore to find out more
- We want children to be curious scientists, interested in the world around them, with a desire to question, investigate and reason scientifically, making links between different parts of the knowledge they have gained.