


Progression of Skill and Knowledge

Subject: Science (Working scientifically)

Topics	Year 3	Year 4	Year 5	Year 6
<p>Questioning</p>  <p>Questioning</p>	<p>Explore their own ideas about 'what if....?' scenarios e.g. humans did not have skeletons.</p> <p>Ask questions such as 'What if we tried....?' or 'What if we changed...?'</p> <p>Begin to understand that some questions can be tested in the classroom and some cannot.</p> <p>Within a group suggest questions that can be explored, observed, tested or investigated further.</p> <p>Within a group suggest relevant questions about what they observe and about the world around them.</p>	<p>Ask questions such as 'What will happen if...?' or 'What if we changed...?'</p> <p>Choose / select a relevant question that can be answered [by research or experiment / test]</p> <p>Ask / raise their own relevant questions with increasing confidence and independence that can be explored, observed, tested or investigated further.</p>	<p>Refine a scientific question so that it can be tested e.g. 'What would happen to... if we changed...?'</p> <p>Decide whether their questions can be answered by researching or by testing.</p> <p>Independently ask their own scientific questions taking some ownership for finding out the answers.</p> <p>Recognise scientific questions that do not yet have definitive answers</p>	<p>Use observations to suggest a further (testable or research) question.</p> <p>Refine a scientific question to make it testable i.e. ask a testable question which includes the change and measure variables, e.g. what would happen to if we changed...? e.g. What effect would we have on ... if we...? e.g. How would exercise affect the pulse rate?</p> <p>Independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.</p> <p>Recognise scientific questions that do not yet have definitive answers.</p>

Refer to LO/SC doc and Knowledge Organisers for further breakdown and specific examples




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<p>Approach and testing</p>  <p>Approach and Testing</p>	<p>Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair.</p> <p>Make a prediction based on everyday experience.</p> <p>With support / as a group, set up simple practical enquiries including comparative and fair tests e.g. make a choice from a list of a things (variables) to change when conducting a fair test. (e.g. choose which magnets to compare and which method to use to test their strength).</p> <p>As a group, begin to make some decisions about the best way of answering their questions.</p> <p>Find / suggest a practical way to compare things e.g. rocks, magnets.</p>	<p>Carry out simple fair tests with increasing confidence investigating the effect of something on something else.</p> <p>Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions (is a fair test the best way to investigate their question?)</p> <p>Make a prediction based on the knowledge acquired from previous explorations / observations and apply it to a new situation.</p> <p>Explain their planning decisions and choices.</p> <p>Make some of the planning decisions about what to change and measure / observe.</p> <p>Begin to recognise when a fair test is necessary.</p>	<p>Carry our fair tests and other investigations with increasing independence.</p> <p>Suggest more than one possible prediction and begin to suggest which is the most likely.</p> <p>Justify their reason with some knowledge and understanding of the scientific concept.</p> <p>Make decisions about which variables to change, measure and keep the same.</p> <p>Make most of the planning decisions for an investigation.</p> <p>Recognise when it is appropriate to carry out a fair test.</p>	<p>Predict what a graph might look like before collecting results.</p> <p>Make a hypothesis where they say how one thing will affect another and give a reason for their suggestion with a developing understanding of the scientific concept.</p> <p>Identify variables to change, measure and keep the same in order for a test to be fair.</p> <p>Independently plan investigations and explain planning decisions.</p> <p>Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.</p>

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<p>Observe and measure</p>  <p>Observe and Measure</p>	<p>Decide ways and give reasons for sorting, grouping, classifying, identifying things / objects, living things, processes or events based on specific characteristics.</p> <p>Compare and contrast and begin to consider the relationships between different things (e.g. structures of plants, functions of plant parts, diets, skeletons of humans and other animals, changes over time, etc.).</p> <p>Record similarities as well as differences (e.g. what do all skeletons have? as well as the differences between skeletons).</p> <p>Collect data from their own observations and measurements using notes / simple tables / standard units.</p> <p>Help to make some decisions about what observations to make, how long to make them for, the type of simple</p>	<p>Suggest their own ideas on a concept and compare these with what they observe / find out.</p> <p>Use observations to suggest what to do next. Discuss ideas and develop descriptions from their observations using relevant scientific language and vocabulary.</p> <p>Observe and record relationships between structure and function or between different parts of a processes.</p> <p>Observe and record changes / stages over time.</p> <p>Begin to identify where patterns might be found and use this to begin to identify what data to collect. Recognise obvious risks</p>	<p>Use their developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain their observations (incl. more abstract ideas).</p> <p>Evaluate their observations and suggest a further test, offer another question or make a prediction. Observe (including changes over time) and suggest a reason for what they notice.</p> <p>Make their own decisions about what observations to make or measurements to use and how long to take them for (recognising the need for repeat readings on some occasions).</p> <p>Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units.</p> <p>Identify possible risks to themselves and others and suggest ways of reducing these.</p>	<p>Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations and explorations.</p> <p>Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world.</p> <p>Explore more abstract systems / functions / changes / behaviours and record their understanding of these (e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels).</p> <p>Decide whether to repeat any readings and justify the reason for doing so.</p> <p>Make their own decisions about what measurements to take (and begin to identify the ranges used).</p>

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	<p>equipment that might be used and how to work safely.</p> <p>Make simple accurate measurements using whole number standard units, using a range of equipment.</p> <p>Gather data in a variety of ways to help in answering questions.</p> <p>Use equipment accurately to improve the detail of their measurements / observations (e.g. microscopes, measuring syringes, measuring cylinders, hand lenses).</p>	<p>and how to keep themselves and others safe.</p> <p>Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used.</p> <p>Collect data from their own observations and measurements, using notes / simple tables / standard units.</p> <p>Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales. Learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius ($^{\circ}\text{C}$) using a thermometer.</p>	<p>Choose the most appropriate equipment and make accurate measurements</p>	<p>Use equipment fit for purpose to take measurements which are increasingly accurate and precise.</p> <p>Decide the most appropriate equipment to use to collect data. Make, and act on, suggestions to control / reduce risks to themselves and others.</p>

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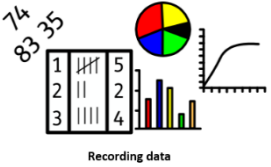


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<p>Recording data</p> 	<p>Record and present findings using simple scientific language and vocabulary from the Y3 curriculum, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations.</p> <p>With scaffold / support record, and present data in a variety of ways to help in answering questions.</p> <p>Communicate their findings in ways that are appropriate for different audiences.</p>	<p>Record findings using relevant scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations.</p> <p>Begin to select the most useful ways to collect, record, classify and present data from a range of choices.</p> <p>Make decisions on how best to communicate their findings in ways that are appropriate for different audiences.</p>	<p>Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models.</p> <p>Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes.</p> <p>Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts.</p> <p>Make decisions about the most appropriate way of recording data.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models.</p> <p>Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology).</p> <p>Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings.</p>

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<p>Evaluating</p>  <p>Evaluating</p>	<p>With help, look for changes and simple patterns in their observations, data, chart or graph.</p> <p>With scaffold / support, describe and compare the effect of different factors on something (e.g. we noticed that larger magnets are not always stronger).</p> <p>Use their results to consider whether they met their predictions.</p> <p>Use their experience and some evidence or results to draw a simple conclusion to answer their original question.</p> <p>Write a simple explanation of why things happened.</p>	<p>Notice / find patterns in their observations and data. (Describe the effect of something on something else). (e.g. as I lengthen the ruler I notice that the pitch gets lower).</p> <p>With some independence, analyse results / observations by writing a sentence that matches the evidence i.e. deciding the important aspect of the result and summarising in a conclusion (e.g. metals tend to be good conductors of electricity).</p> <p>Begin to develop their ideas about relationships and interactions between things and explain them.</p> <p>Use results to suggest improvements, new questions and / or predictions for setting up further tests.</p> <p>Compare their results with others and give reasons why results might be different.</p>	<p>Describe straightforward patterns in results linking cause and effect e.g. using er or the word 'more' (e.g. the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall).</p> <p>Look for / notice relationships between things and begin to describe these.</p> <p>Comment on the results and whether they support the initial prediction.</p> <p>Use their scientific knowledge and understanding and appropriate scientific language and terminology to explain their findings and data and answer their initial question.</p> <p>Begin to recognise how repeated readings improve the reliability of results.</p> <p>Compare results with others and comment on how reliable they are.</p>	<p>Identify patterns in results collected and describe them using the change and measure variables. Spot unexpected results that do not fit the pattern (anomalies).</p> <p>Identify evidence that refutes or supports their ideas.</p> <p>Independently form a conclusion which draws on the evidence from the test.</p> <p>Use scientific language and terminology to explain why something happened.</p> <p>Be able to suggest reasons for unexpected results (anomalies).</p>

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	<p>Say whether what happened was what they expected and notice any results that seem odd.</p> <p>Begin to recognise when a test is not fair and suggest improvements.</p>			<p>Describe how to improve planning to produce more reliable results.</p> <p>Say how confident they are that their results are reliable and give a reason.</p>

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