

Curriculum Progression of Skills – Science (Grid 2)

Skill domains:	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>PLANNING AND TESTING</p> <p><i>UKS2 - Using different types of scientific enquiry making decisions about and explaining choices for testing.</i></p> <p><i>LKS2 - Making decisions about and setting up simple practical enquiries, comparative tests and fair test.</i></p> <p><i>KS1 - Performing simple tests.</i></p>	<ul style="list-style-type: none"> With help, <u>carry out a simple test/comparative test.</u> With help, make a simple prediction or suggestion about what might happen. Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection. <u>Talk</u> about ways of setting up a <u>test.</u> 	<ul style="list-style-type: none"> Carry out simple comparative tests as part of a group, following a <u>method with some independence.</u> Make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct). <u>With support, make suggestions on a method for setting up a simple comparative test.</u> Talk about a practical way to find answers to their questions. 	<ul style="list-style-type: none"> Help to decide about how to set up a simple <u>fair test</u> and begin to recognise when a test is not <u>fair.</u> Make a prediction based on everyday experience. With support/as a group, set up simple practical enquiries including comparative and fair tests e.g. <u>make a choice</u> from a list of a things (variables) to change when conducting a fair test. (e.g. <i>choose which magnets to compare and which method to use to test their strength</i>). <u>As a group, begin to make some decisions</u> about the best way of answering their questions. Find/suggest a practical way to compare things e.g. <i>rocks, magnets.</i> 	<ul style="list-style-type: none"> Carry out simple fair tests with <u>increasing confidence</u> investigating the effect of something on something else (linked to Y4 PoS). <u>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?)</u> Make a prediction based on the knowledge acquired from previous explorations /observations and apply it to a new situation. <u>Explain their planning decisions and choices.</u> <u>Make some of the planning decisions about what to change and measure/observe.</u> Begin to recognise when a fair test is necessary. 	<ul style="list-style-type: none"> Carry our fair tests and other investigations with increasing independence. Suggest more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the scientific concept. <u>Make decisions about which variables to change, measure and keep the same (linked to the appropriate units in the Y5 PoS).</u> Make most of the planning decisions for an investigation. Recognise when it is appropriate to carry out a fair test. 	<ul style="list-style-type: none"> Predict what a graph might look like before collecting results. 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. <u>Identify variables to change, measure and keep the same in order for a test to be fair.</u> Independently plan investigations and explain planning decisions. Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.
<p>USING EQUIPMENT AND MEASURES</p> <p><i>UKS2 - Increasing complexity and increasing accuracy and precision Make their own decisions about the data to collect.</i></p> <p><i>LKS2 - Making accurate measurements and gathering data.</i></p> <p><i>KS1 - Using simple equipment and gathering data to help in answering their questions.</i></p>	<ul style="list-style-type: none"> <u>Measure</u> using non-standard units e.g. <i>how many lolly sticks/cubes/handfuls, etc.</i> <u>Observe closely, using simple equipment</u>(e.g. hand lenses, egg timers). Use senses to compare different textures, sounds and smells. 	<ul style="list-style-type: none"> <u>Measure</u> using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy. Begin to make decisions about which equipment to use. <u>Correctly and safely use equipment provided to make observations and/or take simple measurements.</u> 	<ul style="list-style-type: none"> <u>Collect data from their own observations and measurements using notes/ simple tables/standard units.</u> Help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that might be used and how to work safely. <u>Make simple accurate measurements using whole number standard units, using a range of equipment.</u> Gather data in a variety of ways to help in answering questions. <u>Use equipment accurately to improve the detail of their measurements/observations</u>(e.g. <i>microscopes, measuring syringes, measuring cylinders, hand lenses</i>). 	<ul style="list-style-type: none"> Begin to identify where patterns might be found and use this to <u>begin to identify what data to collect.</u> <u>Make more of the decisions</u> about what observations to make, how long to make them for and the type of equipment that might be used. Recognise obvious risks and how to keep themselves and others safe. Learn how to use new equipment, such as <u>data loggers and measure temperature in degrees Celsius (°C) using a thermometer.</u> <u>Collect data from their own observations and measurements, using notes / simple tables / standard units.</u> 	<ul style="list-style-type: none"> <u>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).</u> Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units. Identify possible risks to themselves and others and suggest ways of reducing these. Choose the most appropriate equipment and make accurate measurements. 	<ul style="list-style-type: none"> <u>Decide whether to repeat any readings and justify the reason for doing so.</u> <u>Make their own decisions about what measurements to take (and begin to identify the ranges used).</u> Make, and act on, suggestions to control/ reduce risks to themselves and others. <u>Use equipment fit for purpose to take measurements which are increasingly accurate and precise.</u> Decide the most appropriate equipment to use to collect data.

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				<ul style="list-style-type: none"> • <u>Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales.</u> 		
<p>COMMUNICATING</p> <p><i>UKS2 / LKS2 / KS1 Reporting findings, recording data, presenting findings. Read, spell and pronounce scientific vocabulary correctly linked to the relevant year group.</i></p>	<ul style="list-style-type: none"> • Communicate their ideas to a range of audiences in a variety of ways. • Complete a pre-constructed table / chart using picture records or simple words. • Contribute to a class display. • <u>Add annotations to drawings or photographs.</u> • <u>Begin to use some simple scientific language from Y1 PoS.</u> • <u>Record simple visual representations of observations made.</u> 	<ul style="list-style-type: none"> • Record and communicate their findings in a range of ways to a variety of audiences. • <u>Use simple scientific language with increasing accuracy (from Y2 PoS).</u> • <u>Record simple data with some accuracy to help in answering questions;</u> • <u>With support or using frameworks, make decisions about how to complete a variety of tables/charts (e.g. a 2 column table, tally charts, Venn diagram, pictograms, block graphs with 1:1 scale).</u> • <u>Present findings in a class displays.</u> • <u>Sequence / annotate photographs of change over time.</u> • <u>Produced increasingly detailed drawings which are labelled/annotated.</u> 	<ul style="list-style-type: none"> • <u>Record and present findings using simple scientific language and vocabulary from the Y3 PoS,</u> • <u>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.</u> • <u>With scaffold / support record, and present data in a variety of ways to help in answering questions.</u> • Communicate their findings in ways that are appropriate for different audiences. (linked to Y3 PoS). 	<ul style="list-style-type: none"> • <u>Record findings using relevant scientific language and vocabulary (from Y4 PoS),</u> including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts <u>[where intervals and ranges agreed through discussion],</u> displays or presentations. • <u>Begin to select the most useful ways to collect, record, classify and present data from a range of choices.</u> • Make decisions on how best to communicate their findings in ways that are appropriate for different audiences. 	<ul style="list-style-type: none"> • <u>Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts (linked to Y5 PoS).</u> • <u>Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes.</u> • <u>Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models.</u> • Make decisions about the most appropriate way of recording data. 	<ul style="list-style-type: none"> • <u>Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings (linked to the Y6 PoS).</u> • Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models. • Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology).
<p>DESCRIBING RESULTS / LOOKING FOR PATTERNS</p> <p><i>UKS2 - Looking for patterns analysing functions, relationships and interactions more systematically. LKS2 - Describing their findings/ results. KS1 - Talk about what happened / what they noticed.</i></p>	<ul style="list-style-type: none"> • <u>Use recordings to talk about and describe what happened.</u> • Sequence photographs of an event/observation. 	<ul style="list-style-type: none"> • <u>With guidance, begin to notice patterns in their data e.g. order their findings, sequence best to worst, say what happened over time, etc.</u> • Recognise if results matched predictions (say if results were what they expected). • <u>Use their recordings to talk about and describe what has happened.</u> 	<ul style="list-style-type: none"> • With scaffold/support, describe and compare the effect of different factors on something (e.g. <i>we noticed that larger magnets are not always stronger</i>). • <u>With help, look for changes and simple patterns in their observations, data, chart or graph.</u> • <u>Use their results to consider whether they met their predictions.</u> 	<ul style="list-style-type: none"> • <u>Notice / find patterns in their observations and data. (Describe the effect of something on something else).</u> • (e.g. <i>as I lengthen the ruler I notice that the pitch gets lower</i>). • 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. <i>metals tend to be good conductors of electricity</i>). 	<ul style="list-style-type: none"> • Describe straightforward <u>patterns in results linking cause and effect e.g. using er or the word 'more'</u> • (e.g. <i>the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall</i>). • Look for / notice relationships between things and begin to describe these. • <u>Comment on the results and whether they support the initial prediction.</u> 	<ul style="list-style-type: none"> • Spot unexpected results that do not fit the pattern (anomalies). • <u>Identify patterns in results collected and describe them using the change and measure variables (causal relationships) (e.g. as we increased the number of batteries the brightness the bulb increased.</u>

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<p>EXPLAINING RESULTS</p> <p><i>UKS2 - Draw conclusions based on / supported by evidence. LKS2 - Reporting on findings saying why something happened. KS1 - Talk about what they found out.</i></p>	<ul style="list-style-type: none"> • <u>Begin to use simple scientific language (from Y1 PoS) to talk about what they have found out or why something happened.</u> 	<ul style="list-style-type: none"> • <u>Begin to use simple scientific language (from Y2 PoS) to explain what they have found out.</u> • <u>Give a simple, logical reason why something happened (e.g. I think ... because...).</u> 	<ul style="list-style-type: none"> • Use their experience and some evidence or results to <u>draw a simple conclusion</u> to answer their original question. • Write a simple explanation of why things happened (using the word 'because') and <u>using simple scientific language and vocabulary</u> from the Y3 PoS. 	<ul style="list-style-type: none"> • Begin to develop their ideas about relationships and interactions between things and explain them. • <u>Use relevant scientific language and vocabulary (from Y4 PoS) to begin to say / explain why something happened.</u> 	<ul style="list-style-type: none"> • <u>Use their scientific knowledge and understanding and appropriate scientific language and terminology (linked to Y5 PoS) to explain their findings and data and answer their initial question.</u> • <u>Draw a valid conclusion (explain why it happened) based on their data and observations (from Y5 PoS).</u> 	<ul style="list-style-type: none"> • Identify evidence that refutes or supports their ideas. • <u>Independently form a conclusion which draws on the evidence from the test (linked to Y6 PoS).</u> • <u>Use scientific language and terminology (linked to Y6 PoS) to explain why something happened.</u>
<p>TRUSTING RESULTS</p> <p><i>UKS2 - Comment on how reliable the data is. LKS2 - Suggest improvements for further tests. KS1 – Beginning to spot when</i></p>	<ul style="list-style-type: none"> • N/A in Y1. 	<ul style="list-style-type: none"> • <u>Begin to discuss if the test was unfair.</u> 	<ul style="list-style-type: none"> • Say whether what happened was what they expected and notice any results that seem odd. • <u>Begin to recognise when a test is not fair and suggest improvements</u> 	<ul style="list-style-type: none"> • <u>Use results to suggest improvements, new questions and/or predictions for setting up further tests.</u> • Compare their results with others and give reasons why results might be different. 	<ul style="list-style-type: none"> • <u>Begin to recognise how repeated readings improve the reliability of results.</u> • <u>Compare results with others and comment on how reliable they are.</u> 	<ul style="list-style-type: none"> • Be able to suggest reasons for unexpected results (anomalies). • <u>Describe how to improve planning to produce more reliable results.</u> • Say how confident they are that their results are reliable and give a reason.