

# Progression of Working Scientifically Skills: Science



|  | <b>Reception</b>   | <b>Year 1</b>   | <b>Year 2</b>   | <b>Year 3</b>   | <b>Year 4</b>   | <b>Year 5</b>  | <b>Year 6</b>  |
|--|--|---|---|---|---|--|--|
| <b>Questioning</b>                             | <p>They are beginning to ask a range of questions.</p> <p>They can answer how or why questions about their environment.</p> <p>They can answer how and why questions about their experiences</p> <p>They can ask appropriate questions about what they have heard.</p> | <p>Ask some simple questions using everyday language and begin to use some simple scientific words.</p> <p>Begin to recognise that questions can be answered in different ways such as: observing changes over time, grouping and classifying, simple tests, researching using secondary sources and noticing patterns.</p>                                   | <p>Ask simple questions using everyday language and year 2 scientific language.</p> <p>Recognise that questions can be answered in different ways such as: observing changes over time, grouping and classifying, simple tests, researching using secondary sources and noticing patterns.</p>  | <p>Begin to ask some relevant questions using scientific language.</p> <p>Begin to make some decisions about which type of enquiry will be the best way of answering questions including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.</p>   | <p>Ask a range of relevant questions using scientific language.</p> <p>Make some decisions about which type of enquiry will be the best way of answering questions including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.</p>   | <p>Begin to ask some significant scientific questions based on scientific concepts.</p> <p>Begin to plan different types of scientific enquiries to answer questions: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations, including recognising and controlling variables); and researching using secondary sources.</p> | <p>Ask a range of significant scientific questions based on scientific concepts.</p> <p>Plan the most appropriate type of scientific enquiry to answer questions including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations, including recognising and controlling variables); and researching using secondary sources.</p> |
| <b>Observing using equipment and measuring</b> | <p>They can make more detailed observations of objects and living things (e.g. "This flower has little spots on it and it has a green leaf").</p>  | <p>Observe closely using senses and simple equipment such as magnifying glasses, sand timers, bug viewers. With support, begin to suggest some ideas regarding which equipment to use out of a small selection.</p> <p>With support, say what I am looking for and what I am measuring.</p> <p>Measure using non-standard units (e.g lolly sticks, cubes,</p> | <p>Observe closely, using simple equipment such as rulers, simple digital timers, measuring beakers, and a thermometer with support.</p> <p>Begin to make decisions about which equipment to use and begin to use it correctly.</p> <p>To say what I am looking for and what I am measuring.</p> <p>Measure using simple standard units (of time, cm, g, ml, °c with support)</p> | <p>Begin to make careful and systematic observations using a range of equipment, including thermometers, measuring cylinders, pipettes, timers.</p> <p>Make some decisions about which equipment to use and use equipment correctly.</p> <p>Make some decisions about what to observe and how long to make observations for.</p> <p>Begin to take accurate measurements using a range of standard units (m, cm, mm, g, l, ml, °c, dB) and</p> | <p>Make careful and systematic observations using a range of equipment including, thermometers and data loggers. Decide which equipment to use and use it correctly.</p> <p>Make more decisions about what observations to make, how long to make them for.</p> <p>Take accurate measurements using a range of standard units (m, cm, mm, g, l, ml, °c, dB) and</p> | <p>Begin to choose the most appropriate equipment from a range of scientific equipment, including newton meters, filter paper, funnels, scales.</p> <p>Make their own decisions about what to observe and length of observations.</p> <p>Begin to take measurements with increasing accuracy and precision, and know when it is appropriate to take repeat readings and justify this.</p>                  | <p>Choose the most appropriate equipment, explain how to use it accurately and how to get a precise and accurate measure from different equipment.</p> <p>Make their own decisions about what to observe and length of observations.</p> <p>Take measurements with increasing accuracy and precision, and know when it is appropriate to take repeat readings and justify this.</p>                              |

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|                          |   | hands) and with support begin to use standard units (minutes, cm and ml).  |  | standard units (of time, m, cm, mm, g, l, ml, °c).   | begin to record using decimal numbers.   | precision, taking repeat readings when appropriate. Begin to decide on the best unit of measure to record data in.  | Decide on the most appropriate unit of measure and explain why it is the most appropriate.  |
|--------------------------|---|--|--|--|--|---|---|
|                          |   | Year 1   | Year 2   | Year 3   | Year 4   | Year 5  | Year 6  |
| Investigating            | They are familiar with basic scientific concepts such as floating, sinking and melting experimentation. | With support, follow instructions to complete a simple test (comparative test).<br><br>Talk about how they will set up a test and how they will find things out. | As a group, follow instructions to perform simple tests/comparative tests and begin to recognise when something is unfair.<br><br>With support, suggest some ideas regarding the method. | With support, set up simple comparative and fair tests. Make a choice from a list of things (variables) to change when conducting a fair test.<br><br>Begin to identify the main parts of a method and the order of steps. | Begin to make decisions of when to set up a simple comparative test or fair tests. Begin to decide what to change and measure/observe.<br><br>Identify the main parts of a method and the order of steps and begin to explain their decisions. | With increasing independence, plan and carry out practical enquiries, including recognising and controlling variables. Recognise when it is appropriate to set up a fair test.<br><br>Identify the full method and explain their decisions. Begin to suggest improvements to a method.<br><br>Independently record how to set up and complete investigations (question, predictions, variables, equipment, method). | Independently, select, plan and carry out a variety of practical enquiries including, recognising and controlling variables and explaining why these variables needs to be controlled.<br><br>Identify the full method, suggest improvements to it and give reasons for the method and these improvements.<br><br>Independently record how to set up and complete a range of investigations (question, predictions/hypotheses, variables, equipment, method). |
| Recording and presenting | They give their own ideas during discussions.<br><br>They use recently introduced vocabulary correctly. | With support, gather and record simple data in a pre-constructed table/chart using picture records or simple charts), to help in answering                       | Gather and record simple data, using a variety of pre-constructed tables/charts (pictograms, bar charts, tally charts), to help in answering   | Begin to record findings using simple scientific language, drawings, labelled diagrams, bar charts (using scales chosen by teacher), and tables.   | Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts (scale agreed through  | Begin to record data and results of increasing complexity using relevant scientific language; scientific diagrams and labels; tables, bar and line  | Record data and results of increasing complexity using relevant scientific language; scientific diagrams and labels; classification keys; tables,   |

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|                     |   | <p>words. Record simple visual images of observations made. With support, annotate drawings or photographs with simple labels. With support, sequence pictures of observations over time.</p> <p>Begin to say what happened in the test and what they found out.</p> | <p>questions. Record observations using simple scientific language taught in year 2. Annotate drawings or photographs with more detailed labels. Sequence pictures of observations over time.</p> <p>Talk about findings using simple scientific language from year 2.</p> | <p>Gather, record and present data to help in answering questions.</p> <p>With support, briefly report on findings from enquiries, including oral and written explanations (in note form or with writing frames).</p>  | <p>whole class discussions), and tables.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions and with support select the most useful way to do this.</p> <p>Report on findings from enquiries in more detail, including oral and written explanations, displays or presentations.</p> | <p>graphs (scale agreed through group discussions).</p> <p>Begin to decide how to record data and results from a range of familiar approaches.</p> <p>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>scatter graphs, bar and line graphs (scale agreed independently).</p> <p>Choose the most effective way to record data and results from a range of choices.</p> <p>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 presentations.</p> |
|---------------------|---|--|--|--|--|---|--|
|                     |   | Year 1   | Year 2   | Year 3   | Year 4   | Year 5  | Year 6   |
| Drawing conclusions | <p>They can use a wide range of vocabulary (e.g. describing or interesting words) in order to explain or justify.</p> | <p>With support, begin to say why something happened, using simple scientific language from Year 1.</p>  | <p>Give a simple, logical reason why something happened (I think...because...) using year 2 scientific language.</p>   | <p>State why something happened using the word 'because', linking cause and effect and using simple scientific language from year 3.</p> <p>Begin to look for differences, similarities, changes and simple patterns in their observations, data, charts or graph.</p> | <p>Explain why something happened using the word 'because', linking cause and effect and using simple scientific language from year 4.</p> <p>Look for differences, similarities, changes and simple patterns in their observations, data, charts or graph.</p>  | <p>Explain why something happened, identifying causal relationships and using relevant scientific language from year 5.</p> <p>Identify patterns in their data/charts and begin to look for causal relationships in data. Begin to spot unexpected results which don't fit the pattern.</p>   | <p>Explain in detail why something happened, identifying causal relationships and using relevant scientific language from year 6.</p> <p>Identify patterns in their data/charts and look for causal relationships in data. Spot unexpected results that don't fit the pattern and suggest reasons for this.</p>  |

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|                                    |   |   |  | evidence to support findings and to answer questions.<br><br>Begin to say what could be changed in the investigation and whether the test was unfair. | straightforward scientific evidence to support findings and to answer questions.<br><br>With support, use results to make predictions for new values and raise further questions.<br><br>Begin to recognise when a test is unfair and suggest improvements. | support or refute ideas or arguments.<br><br>Use results to make predictions for new values and raise further questions.<br><br>Recognise when a test is unfair and use results to suggest improvements. | Identify scientific evidence that has been used to support or refute ideas or arguments.<br><br>Begin to use test results to make a prediction to set up a further comparative or fair test.<br><br>Compare their results with others and comment on how reliable they are. |
|------------------------------------|---|---|--|---|---|--|---|
|                                    |   | Year 1  | Year 2   | Year 3  | Year 4  | Year 5   | Year 6  |
| <b>Identifying and classifying</b> | They understand what it means for something to be different. They are developing an understanding of what it means for something to be similar. They can identify simple differences between familiar objects, environments and living things. They can confidently identify differences between environments, objects, living things and materials. They can compare this season to a previous one | Begin to identify and classify with some support. Begin to use simple features to compare and with help begin to decide how to sort and group things. | Identify and classify a range of things. Use simple features to compare and decide how to sort and group things. | . Begin to talk about criteria for grouping, sorting, and classifying.  | To talk about criteria for grouping, sorting, and classifying and begin to use classification keys.   | Compare and group according to a range of properties and justify classifications and groupings.  | Use and develop a range of classification keys.   |