

Grimsargh St Michael's CE Primary School

Progression of skills

Science (working scientifically)

This progression of skills document details how each key skill develops sequentially in Science (working scientifically) throughout school.

| Areas of study | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| WORKING SCIENTIFICALLY (AT 1) Sort Group Compare Classify Identify | <p>Talk about and draw pictures about what they have seen.</p> <p>Find things that are similar and different.</p> <p>Sort uses senses and match.</p> <p>Ask a question.</p> <p>Talk to people about what they do. Talk to people about how things work.</p> <p>Work with others on a science task.</p> <p>With help follow movements to act out the science they are learning about. Come up with new things to try/test. Use simple equipment to make observations.</p> <p>With prompts say</p> | <p>Name/identify common examples and some common features (Y1/2).</p> <p>With help, decide how to sort and group objects, materials or living things.</p> <p>Say/identify how different things change objects, materials or living things.</p> <p>Make comparisons between simple observable features/characteristics of objects, materials and living things.</p> <p>Say how things are similar or different.</p> <p>Recognise basic features of objects, materials and living things.</p> | <p>Compare and contrast... a variety of things - focusing on the similarities as well as the differences] including how different things change over different periods of time [objects, materials or living things].</p> <p>Sort and classify things according to a variety of different features (e.g. "I know it is living because it .. and it...).</p> <p>Decide how to sort and group objects, materials or living things.</p> <p>Name/identify a variety of common features and/or uses for objects,</p> | <p>Compare and contrast functions, diets, teeth, changes over time.</p> <p>Record similarities and differences.</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>Make a simple guide to local living things.</p> <p>Use guides or simple keys to classify / identify [local small invertebrates].</p> <p>Use their observations] to identify and classify.</p> <p>Record similarities, differences or changes related to simple scientific ideas or processes or more complex groups of objects/living things/events and begin to give reasons for these.</p> | <p>Compare and contrast things beyond their locality.</p> <p>Compare more complex processes, systems, functions (e.g. life cycles of different living things, organ systems of different animals).</p> <p>Suggest reasons for similarities and differences.</p> | <p>Compare and contrast things beyond their locality and analyse advantages/disadvantages, pros/cons of their findings.</p> <p>Use and develop classification systems, keys and other information records [databases] to classify or identify.</p> <p>Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction).</p> |

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| | what they have seen/what has happened. Build up resilience and try different ideas. | | materials or living things. Name/Identify common examples and some common features. | | | | |
| Research <i>finding things out using a wide range of secondary sources of information and recognising that scientific ideas change and develop over time</i> | | Find out about the work of famous scientists (historical & modern day) (Y1/2). Use simple and appropriate secondary sources (such as books, photographs and videos) to find things out / find answers. (Y1/2). Ask people questions (Y1/2). | Find out about the work of famous scientists - historical & modern day (Y1/2). Use simple and appropriate secondary sources (such as books, photographs and videos) to find things out / find answers. (Y1/2). Ask people questions (Y1/2). | Create/invent design something based on what they have found out applying both research and/or practical experiences (Y3/4). Find out about the work of famous scientists historical and modern day (Y3/4). Finding things out using secondary sources of information (Y3/4). | Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Create/invent/ design something based on what they have found out applying both research and/or practical experiences. (Y3/4). Find out about the work of famous scientists (historical & modern day) (Y3/4). | Research the work of famous scientists (historical and modern day) and use this to find out how scientific ideas have changed over time. Find things out using a wide range of secondary sources of information. | Research the work of famous scientists (historical & modern day) and use this to] explain how scientific ideas have developed over time and had an impact on our lives. Interview people to find out information and collect data. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. |
| Modelling | | | | Act out something to represent something else about the world around us. | Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see. Suggest their own | Create simple models to describe scientific ideas (e.g. circulatory system). Use simple models to describe scientific ideas (e.g. of movements of the Sun and Earth, solar | Identify some positives and some limitations of models used to describe/explain scientific ideas]. Use and make own versions of simple |

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| | | | | | ideas on a concept and compare these with models or images. | system, shadow clocks, magnetic compasses for navigation). | models to describe and explain scientific ideas (e.g. periscopes, simple lever, burglar alarm). |
| <p>Recording of 'Explore Observe'</p> <p><i>developing a deeper understanding of a wide range of scientific ideas encountering more abstract ideas</i></p> | | <p>Begin to communicate and record their findings using simple scientific language.</p> <p>Begin to use simple scientific language to talk about what they have.</p> <p>Use their own ideas to offer answers to questions.</p> <p>Observe and discuss / talk about / draw/ keep records of changes over different periods of time.</p> <p>Observe closely and discuss / talk about / draw /record the features/properties of things in the real world.</p> | <p>Record and communicate their findings using simple scientific language.</p> <p>Use their own ideas and their observations to offer answers to questions.</p> <p>Observe and describe simple processes/cycles with several steps e.g. growth cycle, simple food chain, saying how living things depend on one another.</p> <p>Recognise and describe a series of changes over time (e.g. growth).</p> <p>Observe, and record make drawings to represent things in</p> | <p>Observe and record relationships between structure and function (Y3/4).</p> <p>Observe and record changes /stages over time (Y3/4).</p> <p>Explore / observe things in the local environment / real contexts and record observations (Y3/4).</p> <p>Record observations/explorations/ processes using simple scientific language.</p> | <p>Suggest their own ideas on a concept and compare these with what they observe / find out.</p> <p>Develop simple descriptions from their observations use relevant scientific language to discuss their ideas.</p> <p>Observe and record relationships between structure and function (Y3/4).</p> <p>Observe and record changes /stages over time (Y3/4).</p> <p>/ observe things in the local environment / real contexts and record observations (Y3/4).</p> | <p>Read, spell and pronounce scientific vocabulary correctly (Y5/6).</p> <p>Use their developing scientific knowledge and understanding and relevant scientific language to discuss, communicate and explain their findings.</p> <p>Explore more abstract systems/functions/changes and record their understanding of these (e.g. circulatory system).</p> <p>Observe changes over different periods of time.</p> | <p>Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.</p> <p>Use correct scientific knowledge and understanding and relevant scientific language to explain their findings and justify their scientific ideas.</p> <p>Explore more abstract systems/functions /changes/behaviours and record their understanding of these (e.g. the relationship between diet, exercise, drugs,</p> |

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| | | | the real world with some accuracy. | | | | lifestyle and health; evolutionary changes; burning, rusting; reflection and refraction of light; friction, air resistance, gravity). Read, spell and pronounce scientific vocabulary correctly. |
| Questioning <i>asking their own questions about scientific phenomena</i> | | Ask simple questions stimulated by the world around them. Demonstrate curiosity by the questions they ask. | Raise their own questions based on or linked to things they have observed. | Explore their own ideas about 'what if....?' scenarios e.g. humans did not have skeletons. Begin to understand that some questions are testable/ can be tested in the classroom and some cannot. Within a group suggest relevant questions about what they observe and about the world around them. | Choose/select a relevant question that can be answered [by research or experiment/test]. Ask/raise their own relevant questions with increasing confidence and independence about at they observe and about the world around them. | Raise different kinds of questions (Y5/6) Refine a scientific question so that it can be investigated. Ask pertinent questions. | Recognise scientific questions that do not yet have definitive answers. Use observations/data gathered to construct a further (testable or research) question. Raise different kinds of questions (Y5/6). |
| Planning <i>using different types of scientific</i> | | Begin to choose/suggest ways to find answers. Perform simple | Set up a comparative test. In a group choose/suggest | Help to decide about how to set up a simple fair test and begin to recognise when a test | Investigate the effect of something on something else. Start to make their | Explain which variables need to be controlled and why. Make most of the | Plan enquiries, including recognising and controlling variables |

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| <p><i>enquiry making decisions about and explaining choices for testing</i></p> | | <p>tests/comparative tests. Talk about ways of answering their questions. Use different types of scientific enquiry. Experiment with a wide variety of things.</p> | <p>ways in which they might answer scientific questions. Suggest a [practical way] to find answers to their questions [and listen to the suggestions of others. Use different types of scientific enquiry to answer their own questions.</p> | <p>is not fair. As a group, begin to make some decisions about the best way of answering their questions. With support/as a group, set up simple practical enquiries incl. comparative and fair tests e.g. make a choice from a list of at least one variable that needs to be kept the same when conducting a fair test. Find/suggest a way to compare things e.g. materials, magnets.</p> | <p>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]. Recognise when a test is necessary. Carry out simple fair tests [with increasing confidence and make some of the planning decisions about what to change and measure/observe].</p> | <p>planning decisions about] and carry out fair tests. Recognise when it is appropriate to carry out a fair test and plan how to set it up</p> | <p>where necessary. Select and plan the most appropriate type of science enquiry to use to answer scientific questions.</p> |
| <p>Equipment and measurement <i>increasing complexity with increasing accuracy and precision make their own decisions about the data to collect</i></p> | | <p>Observe using non-standard units e.g. how many lolly sticks/cubes/handfuls, etc. Observe closely, using simple equipment (e.g. hand lenses, egg timers). Observe closely using their senses (Y1).</p> | <p>Observe more accurately by measuring non-standard and standard units. Use their senses, simple measurements and equipment to gather data with increasing independence. Gather data to help in answering</p> | <p>Collect data from their own observations and measurements, using notes/ simple tables/standard units. Help to make some decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Make simple accurate measurements using</p> | <p>Begin to identify where patterns might be found and use this to begin to identify what data to collect. 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>Recording data and results of increasing complexity (Y5/6). Follow safety guidelines (Y5/6). Make their own decisions about what observations to make or measurements to use and how long to make them for [recognising the need for repeat readings on some occasions].</p> | <p>Recognise that data might be unreliable and describe how to make it more reliable. Make their own decisions about what measurements to take [and identify the ranges and intervals used]. Take measurements, using a range of</p> |

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| | | | <p>questions.</p> | <p>whole number standard units, using a range of equipment. Gathering data in a variety of ways to help in answering questions. Learn how to use new equipment, e.g. data loggers. Explore observe with increased accuracy using a hand lens or microscope.</p> | <p>Learn how to use new equipment, such as data loggers & measure temperature in degrees Celsius (°C) using a thermometer. Understand precautions for working safely. Collect and record data from their own observations and measurements, using notes/simple tables/standard units, to help to make decisions. Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment.</p> | <p>Decide how to record data from a choice of familiar approaches. Choose the most appropriate equipment to make measurements. Explain how to use equipment accurately.</p> | <p>equipment, with increasing accuracy and precision. Choose and use the most appropriate equipment to support observation, make measurements, collect data. Record data and results of increasing complexity (Y5/6) Follow [and suggest] safety guidelines.</p> |
| <p>Communicating Recording <i>recording data, reporting findings, presenting</i></p> | | <p>Present their findings in a range of ways using templates where necessary e.g. talk/discuss; write/describe; draw</p> | <p>Record and communicate their findings in a range of ways with increasing independence e.g.</p> | <p>Record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations,</p> | <p>Record findings using simple scientific language and vocabulary, including discussions, oral and written explanations,</p> | <p>Record data and results of increasing complexity using tables, bar and line graphs, and models. Report findings from</p> | <p>Make decisions on the most appropriate format to present scientific data. Record data and</p> |

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| <i>findings</i> | | <p>pictures; annotated photographs; video; make/construct tables, charts and displays. Communicate their ideas to a range of audiences in a variety of ways. Begin to use some simple scientific language.</p> | <p>talk/discuss; write/describe; draw pictures; take photographs; video; make/construct a variety of tables, charts [including simple, bar charts produced as a group and displays. Make some choices on how to communicate their ideas to a range of audiences in a variety of ways. Use simple scientific language in their recording. Record simple data with some accuracy. Record data to help in answering questions.</p> | <p>notes, drawings annotated, pictorial representations, labelled diagrams, simple tables, bar charts [using ranges and intervals (scales) chosen for them] displays or presentations. Record, classify and present data in a variety of ways to help in answering questions. Communicate their findings in ways that are appropriate for different audiences. (Y3/4).</p> | <p>notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations. Begin to select the most useful ways to record, classify and present data from a range of choices. Make decisions on how best to] communicate their findings in ways that are appropriate for different audiences. (Y3/4)</p> | <p>enquiries using discussion, drawings [annotated], oral and written explanations of results, and conclusions. Present findings in written form, displays and other presentations (Y5/6)</p> | <p>results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models. Report findings from enquiries using discussion, drawings [annotated], oral and written explanations of results, explanations involving causal relationships, and conclusions. Present findings in written form, displays and other presentations (Y5/6).</p> |
| Describe results <i>Looking for patterns analysing functions, relationships and</i> | | <p>Sequence photographs of an event/observation. Observe changes over different periods of time and discuss/talk/record about what has happened.</p> | <p>With guidance, begin to notice patterns and relationships. Order their findings. Recognise if results matched predictions. Talk/ discuss/</p> | <p>Describe and compare the effect of different factors on something. With help, look for changes and patterns in their observations and data. Use their results to consider whether they</p> | <p>Notice/find patterns in their observations and data. Describe the effect of something/different factors on something else. Help to make decisions about how to analyse</p> | <p>Identify patterns that might be found in the natural environment. Look for patterns and notice relationships between things [and describe these).</p> | <p>Look for different causal (cause and effect) relationships in their data (something effecting something else) and (describe the pattern succinctly).</p> |

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| <i>interactions more systematically</i> | | Talk/ discuss/ describe/record about what they have seen/ what has happened. | describe/record with some accuracy what they have seen/ what has happened. | meet predictions. | their data. | | Identify patterns that might be found in the natural environment over long periods of time and describe how these have been used to develop scientific theories (e.g. evolution). |
| Explain results <i>Draw conclusions based on evidence</i> | | Read and spell scientific vocabulary (Y1/2). Suggest how things happen. Use their observations and ideas to suggest answers to questions. Begin to use simple scientific language to talk about what they have found out. Talk about what they have found out. | Begin to explain how they know...use the word because "it is because..." (Y2) / suggest how and/or why things happen. Draw on use their results and their own experience to answer their questions. Begin to use simple scientific language to describe or explain what they have found out. Read and spell scientific vocabulary. | Read and spell scientific vocabulary correctly and with confidence (Y3/4). Use their own experience and some evidence or results to draw simple conclusions and answer questions. Talk about and record their findings using simple scientific language. Explain why things have happened. | Begin to develop their ideas about relationships and interactions. Reporting on findings from enquiries [beginning to identify the scientific facts in their data]. Use relevant scientific language to discuss, communicate, report their findings. Read and spell scientific vocabulary correctly and with confidence (Y3/4). | Use their developing scientific knowledge and understanding and relevant scientific language to explain their findings. Draw conclusions based on their data and observations. Read, spell and pronounce scientific vocabulary correctly (Y5/6). | Identify evidence that refutes or supports their ideas (Y5/6). Use their evidence to justify their ideas. Use correct scientific knowledge and understanding and relevant scientific language to explain their findings. Read, spell and pronounce scientific vocabulary correctly (Y5/6). |
| Trusting my results | | | | Say whether what happened was what they expected and | Use results to suggest improvements, new questions and | Use test results to make predictions to set up further comparative | Use their results to identify when further comparative |

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| | | | | notice any odd results that seem odd. Begin to recognise when a test is not fair and suggest improvements. | predictions for setting up further tests. With help, pupils should look for similarities and differences in their data [between different groups of results]. | and fair tests. Comment on how reliable their data is. | tests and observations might be needed. Be able to explain differences in repeated measurements/readings or unexpected results. Recognise the limitations of some data. |
| Collaborating | | | Listen to the suggestions of others. | Act out something to represent something else about the world around us. | Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see. Suggest their own ideas on a concept and compare these with models or images. | | |