



## Grimsargh St Michael's CE Primary School

### Science (working scientifically) Progression of Skills- KS2



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

Areas of study	Year 3	Year 4	Year 5	Year 6
<b>WORKING SCIENTIFICALLY (AT 1)</b>  <b>Sort/group/compare/classify/identify</b>	Compare and contrast functions, diets, teeth, changes over time. Record similarities and differences. Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics.	Make a simple guide to local living things. Use guides or simple keys to classify / identify [local small invertebrates]. Use their observations] to identify and classify. 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.	Compare and contrast things beyond their locality. Compare more complex processes, systems, functions (e.g. life cycles of different living things, organ systems of different animals). Suggest reasons for similarities and differences.	Compare and contrast things beyond their locality and analyse advantages/disadvantages, pros/cons of their findings. Use and develop classification systems, keys and other information records [databases] to classify or identify. Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction).
<b>Research</b> <i>finding things out using a wide range of secondary sources of information and recognising that scientific ideas change and develop over time</i>	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.
<b>Modelling</b>	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.	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 system, shadow clocks, magnetic compasses for navigation).	Identify some positives and some limitations of models used to describe/explain scientific ideas]. Use and make own versions of simple models to describe and explain scientific ideas (e.g. periscopes, simple lever, burglar alarm).
<b>Recording of 'Explore / Observe'</b>	Observe and record relationships between structure and function (Y3/4).	Suggest their own ideas on a concept and compare these with what they observe / find out.	Read, spell and pronounce scientific vocabulary correctly (Y5/6).	Encounter more abstract ideas and begin to recognise how these ideas help

<p><i>developing a deeper understanding of a wide range of scientific ideas encountering more abstract ideas</i></p>	<p>Observe and record changes /stages over time (Y3/4). Explore / observe things in the local environment / real contexts and record observations (Y3/4). Record observations/explorations/ processes using simple scientific language.</p>	<p>Develop simple descriptions from their observations use relevant scientific language to discuss their ideas. Observe and record relationships between structure and function (Y3/4). Observe and record changes /stages over time (Y3/4). / observe things in the local environment / real contexts and record observations (Y3/4).</p>	<p>Use their developing scientific knowledge and understanding and relevant scientific language to discuss, communicate and explain their findings. Explore more abstract systems/functions/changes and record their understanding of these (e.g. circulatory system). Observe changes over different periods of time.</p>	<p>them to understand and predict how the world operates. Use correct scientific knowledge and understanding and relevant scientific language to explain their findings and justify their scientific ideas. 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; burning, rusting; reflection and refraction of light; friction, air resistance, gravity). Read, spell and pronounce scientific vocabulary correctly.</p>
<p><b>Questioning</b> <i>asking their own questions about scientific phenomena</i></p>	<p>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.</p>	<p>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 what they observe and about the world around them.</p>	<p>Raise different kinds of questions (Y5/6) Refine a scientific question so that it can be investigated. Ask pertinent questions.</p>	<p>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).</p>
<p><b>Planning</b> <i>using different types of scientific enquiry making decisions about and explaining choices for testing</i></p>	<p>Help to decide about how to set up a simple fair test and begin to recognise when a test 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>Investigate the effect of something on something else. 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]. 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>Explain which variables need to be controlled and why. Make most of the 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>Plan enquiries, including recognising and controlling variables where necessary. Select and plan the most appropriate type of science enquiry to use to answer scientific questions.</p>

<p><b>Equipment and measurement</b> <i>increasing complexity with increasing accuracy and precision make their own decisions about the data to collect</i></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 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>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. Learn how to use new equipment, such as data loggers &amp; 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>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]. 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>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 equipment, with increasing accuracy and precision. Choose and use the most appropriate equipment to support observation, make measurements and collect data. Record data and results of increasing complexity (Y5/6) Follow [and suggest] safety guidelines.</p>
<p><b>Communicating</b> <i>Recording recording data, reporting findings, presenting findings</i></p>	<p>Record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations, 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>Record findings using simple 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. 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>Record data and results of increasing complexity using tables, bar and line graphs, and models. Report findings from 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>Make decisions on the most appropriate format to present scientific data. Record data and 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>

<b>Describe results</b> <i>Looking for patterns analysing functions, relationships and interactions more systematically</i>	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 meet predictions.	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 their data.	Identify patterns that might be found in the natural environment. Look for patterns and notice relationships between things [and describe these).	Look for different causal (cause and effect) relationships in their data (something effecting something else) and (describe the pattern succinctly). 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).
<b>Explain results</b> <i>Draw conclusions based on evidence</i>	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).
<b>Trusting my results</b>	Say whether what happened was what they expected and notice any odd results that seem odd. Begin to recognise when a test is not fair and suggest improvements.	Use results to suggest improvements, new questions and predictions for setting up further tests. With help, pupils should look for similarities and differences in their data [between different groups of results].	Use test results to make predictions to set up further comparative and fair tests. Comment on how reliable their data is.	Use their results to identify when further comparative tests and observations might be needed. Be able to explain differences in repeated measurements/readings or unexpected results. Recognise the limitations of some data.
<b>Collaborating</b>	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.		