

# Bathwick Progression of Scientific Skills 2021-22



## What does a Bathwick Year 6 leaver look like?

A Bathwick scientist is an **inquisitive and resilient learner** that feels confident to **explore and embrace the unknown** in the world around them. By the end of their primary education, they will have the tools to develop their own ideas and ways of working that enable them to **make informed decisions about new technologies, their health and the scientific opportunities around them**. Their critical thinking skills will equip them to **design and carry out their own investigations** and they will feel confident in using their results to **make conclusions and knowledgeable predictions**. Our Year 6 leavers will be **curious, life-long learners** who continue to have an **active role in science** and take inspiration from famous scientists and their discoveries.

Skill	Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Questioning</b></p> <p>UKS2 - Asking their own questions about scientific phenomena.</p> <p>LKS2 - Asking relevant questions.</p> <p>KS1 - Asking simple questions.</p>	<p>To demonstrate curiosity about the world around me.</p>	<p>To ask simple questions about what I notice about the world around me.</p> <p>To demonstrate curiosity by the questions I ask.</p>	<p>To raise my own logical questions based on or linked to things I have observed.</p> <p>With help/scaffolds, to begin to ask questions such as 'What will happen if...?'</p>	<p>To explore my own ideas about 'What if...?' scenarios e.g. humans did not have skeletons.</p> <p>To ask questions such as 'What if we tried...?' or 'What if we changed...?'</p> <p>To begin to understand that some questions can be tested in the classroom and some cannot.</p> <p>Within a group, to suggest questions that can be explored, observed, tested or investigated further.</p> <p>Within a group, to suggest relevant questions about what I observe and</p>	<p>To ask/raise my own relevant questions with increasing confidence and independence that can be explored, observed, tested or investigated further.</p> <p>To ask questions such as 'What will happen if...?' or 'What if we changed...?' (linked with Y4 PoS).</p> <p>To choose/select a relevant question that can be answered [by research or experiment / test].</p>	<p>To recognise scientific questions that do not yet have definitive Answers.</p> <p>To refine a scientific question so that it can be tested e.g. 'What would happen to... if we changed...?'</p> <p>To decide whether my questions can be answered by researching or by testing.</p> <p>To independently ask my own scientific questions taking some ownership for finding out the answers.</p>	<p>To recognise scientific questions that do not yet have definitive answers.</p> <p>To refine a scientific question to make it testable i.e. ask a testable question which includes the change and measure Variables</p> <ul style="list-style-type: none"> <li>- e.g. what would happen to...if we changed...?</li> <li>- e.g. What effect would we have on ... if we...?</li> <li>- e.g. How would exercise affect the pulse rate?</li> </ul> <p>To use observations to suggest a further (testable or research) question.</p>

				about the world around me.			To independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.
<p><b>Exploring/observing</b></p> <p>UKS2 - Developing a deeper understanding of a wide range of scientific ideas and encountering more abstract ideas.</p> <p>LKS2 - Developing their own ideas and their understanding of the world around them.</p> <p>KS1 - Observing closely Using their observations and ideas to suggest answers to questions</p>	<p>To use senses and simple equipment to explore the world around me, e.g. binoculars and magnifying glasses.</p>	<p>To begin to use simple scientific language to talk about or record what I have noticed.</p> <p>To use observations to make suggestions and/or ask questions.</p> <p>To look / observe closely and communicate changes over time.</p> <p>To look / observe closely and communicate the features or properties of things in the real world.</p> <p>To observe closely using my senses.</p>	<p>To use simple scientific language to talk about / record what I have noticed.</p> <p>To use observations to make suggestions and/or ask questions.</p> <p>To observe and describe simple processes/cycles/ changes with several steps (e.g. growth cycle, simple food chain, saying how living things depend on one another).</p> <p>To observe closely and communicate with increasing accuracy the features or properties of things in the real world.</p>	<p>To observe and record relationships between structure and function.</p> <p>To observe and record changes /stages over time.</p> <p>To explore / observe things in the local environment / real contexts and record observations.</p>	<p>To suggest my own ideas on a concept and compare these with what I observe / find out.</p> <p>To use observations to suggest what to do next.</p> <p>To discuss ideas and develop descriptions from my observations using relevant scientific language and Vocabulary.</p> <p>To observe and record relationships between structure and function or between different parts of a processes.</p> <p>To observe and record changes /stages over time.</p>	<p>To use my developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain my observations (e.g. friction, air resistance, forces, Earth and space, reversible and irreversible changes).</p> <p>To evaluate my observations and suggest a further test, offer another question or make a prediction.</p> <p>To observe (including changes over time) and suggest a reason for what I notice.</p>	<p>To use correct scientific knowledge and understanding and relevant scientific language to discuss my observations and explorations.</p> <p>To identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world.</p> <p>To explore more abstract systems / functions /changes / behaviours and record my understanding of these (e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels).</p>
<p><b>Grouping and classifying</b></p>		<p>To name/identify common examples and some common</p>	<p>To name / identify common</p>	<p>To decide ways and give reasons for</p>	<p>To make a simple guide to local living things.</p>	<p>To suggest reasons for similarities and differences.</p>	<p>To recognise the importance of</p>

<p>KS1 and KS2 - Compare and contrast a variety of examples.</p>		<p>features. With help, to decide how to sort and group objects, materials or living things.</p> <p>To name basic features of objects, materials and living things.</p> <p>To say how things are similar or different.</p> <p>To compare and contrast simple observable features / characteristics of objects, materials and living things.</p>	<p>examples, some common features or different uses.</p> <p>To sort and group objects, materials or living things by observable and/or behavioural features.</p> <p>To compare and contrast a variety of things [objects, materials or living things] - focusing on the similarities as well as the differences.</p>	<p>sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics.</p> <p>To 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>To record similarities as well as differences (e.g. what do all skeletons have? as well as the differences between skeletons).</p>	<p>To use guides or simple keys to classify / identify [animals, flowering plants and non-flowering plants].</p> <p>To use my observations to identify and classify.</p> <p>To begin to give reasons for these similarities and differences.</p> <p>To record similarities as well as differences and/or changes related to simple scientific ideas or processes or more complex groups of objects/living things/events (e.g. evaporation and condensation, different food chains, different electrical circuits).</p>	<p>To compare and contrast things beyond my locality and use these similarities and differences to help to classify (e.g. features of animals, life cycles of different living things, melting compared with dissolving, etc).</p> <p>To use secondary sources of information to identify and classify.</p> <p>To decide which sources of information (and/or equipment and/or test) to help identify and classify.</p>	<p>classification to the scientific world and form a conclusion from my sorting and classifying.</p> <p>To compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction).</p> <p>To construct a classification key / branching database using more than two items.</p> <p>To compare and contrast things beyond my locality and discuss advantages/disadvantages, pros/cons of the similarities and differences.</p> <p>To use research*to identify and classify things.</p> <p>To use classification systems, keys and other information records [databases] to help classify or identify things.</p>
<p><b>Research</b></p>		<p>To ask people questions (e.g. an</p>	<p>To talk about how useful the</p>	<p>To find things out using a range of</p>	<p>To make decisions about which</p>	<p>To find out how scientific ideas have</p>	<p>To research how scientific ideas have</p>

<p>UKS2 – Summarise research from a wide variety of sources and recognising that scientific ideas change and develop over time.</p> <p>LKS2 - Finding things out using a wide range of secondary sources of information.</p> <p>KS1 - Finding things out using secondary sources of information.</p>		<p>expert or hot-seating).</p> <p>To use simple primary and secondary sources (such as objects, books and photographs) to find things out.</p>	<p>information source was and express opinion about findings.</p> <p>To make suggestions about who to ask or where to look for information.</p> <p>To ask people questions to help me answer their questions.</p> <p>To use simple and appropriate secondary sources (such as books, photographs, videos and other technology) to find things out / find answers.</p>	<p>secondary sources of information(e.g. books, photographs, videos and other technology).</p>	<p>information to use from a wide range of sources and make decisions about how to present my research.</p> <p>To recognise when and how secondary sources might help me to answer questions that cannot be answered through practical investigations.</p>	<p>changed/developed over time.</p> <p>To articulate and explain findings from my research using scientific knowledge and understanding.</p> <p>To make decisions about which information to use from a wide range of sources.</p>	<p>developed over time and had an impact on our lives.</p> <p>To use evidence from a variety of sources to justify my ideas.</p> <p>To recognise which secondary sources will be most useful to research my ideas and begin to separate opinion from fact.</p> <p>To interview people to find out Information.</p>
<p><b>Planning and testing</b></p> <p>UKS2 - Using different types of scientific enquiry making decisions about and explaining choices for testing.</p> <p>LKS2 - Making decisions about and setting up simple practical enquiries, comparative tests and fair test.</p>	<p>To respond to prompts to say what happened to objects, living things or events.</p>	<p>With help, to carry out a simple test/comparative test.</p> <p>With help, to make a simple prediction or suggestion about what might happen.</p> <p>To begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection.</p>	<p>To carry out simple comparative tests as part of a group, following a method with some independence.</p> <p>To make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct).</p> <p>With support, to make suggestions on a method for</p>	<p>To help to decide about how to set up a simple fair test and begin to recognise when a test is not fair.</p> <p>To make a prediction based on everyday experience.</p> <p>With support/as a group, to set up simple practical enquiries including comparative and fair tests e.g. make a choice from a list of</p>	<p>To carry out simple fair tests with increasing confidence investigating the effect of something on something else.</p> <p>To start to make my 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</p>	<p>To carry our fair tests and other investigations with increasing independence.</p> <p>To suggest more than one possible prediction and begin to suggest which is the most likely.</p> <p>To justify their reason with some knowledge and understanding of the scientific concept.</p>	<p>To predict what a graph might look like before collecting results.</p> <p>To make a hypothesis where I say how one thing will affect another and give a reason for my suggestion with a developing understanding of the scientific concept.</p> <p>To identify variables to change, measure</p>

<p>KS1 - Performing simple tests.</p>		<p>To talk about ways of setting up a test.</p>	<p>setting up a simple comparative test.</p> <p>To talk about a practical way to find answers to their questions.</p>	<p>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, to begin to make some decisions about the best way of answering their questions.</p> <p>To find/suggest a practical way to compare things e.g. rocks, magnets.</p>	<p>investigate their question?)</p> <p>To make a prediction based on the knowledge acquired from previous explorations /observations and apply it to a new situation.</p> <p>To explain my planning decisions and choices.</p> <p>To make some of the planning decisions about what to change and measure/observe.</p> <p>To begin to recognise when a fair test is necessary.</p>	<p>To make decisions about which variables to change, measure and keep the same.</p> <p>To make most of the planning decisions for an investigation.</p> <p>To recognise when it is appropriate to carry out a fair test.</p>	<p>and keep the same in order for a test to be fair.</p> <p>To independently plan investigations and explain planning decisions.</p> <p>To decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.</p>
<p><b>Using equipment and measures (cross-curricular links: Maths)</b></p> <p>UKS2 - Increasing complexity and increasing accuracy and precision. Make their own decisions about the data to collect.</p>	<p>To use senses and simple equipment to explore the world around me, e.g. binoculars and magnifying glasses.</p>	<p>To measure using non-standard units e.g. how many lolly sticks/cubes/handfuls, etc.</p> <p>To observe closely, using simple equipment(e.g. hand lenses, egg timers).</p> <p>To use senses to compare different textures, sounds and smells.</p>	<p>To measure using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy.</p> <p>To begin to make decisions about which equipment to use.</p> <p>To correctly and safely use equipment provided to make</p>	<p>To collect data from their own observations and measurements using notes/ simple tables/standard units.</p> <p>To help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that</p>	<p>To begin to identify where patterns might be found and use this to begin to identify what data to collect.</p> <p>To 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>To make my 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>To take measurements using a range of scientific equipment with</p>	<p>To decide whether to repeat any readings and justify the reason for doing so.</p> <p>To make my own decisions about what measurements to take (and begin to identify the ranges used).</p> <p>To make, and act on, suggestions to</p>

<p>LKS2 – Making accurate measurements and gathering data.</p> <p>KS1 - Using simple equipment and gathering data to help in answering their questions.</p>			<p>observations and/or take simple measurements.</p>	<p>might be used and how to work safely.</p> <p>To make simple accurate measurements using whole number standard units, using a range of equipment.</p> <p>To gather data in a variety of ways to help in answering questions.</p> <p>To use equipment accurately to improve the detail of my measurements/ observations (e.g. microscopes, measuring syringes, measuring cylinders, hand lenses).</p>	<p>To recognise obvious risks and how to keep myself and others safe.</p> <p>To learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius (°C) using a thermometer.</p> <p>To collect data from their own observations and measurements, using notes / simple tables / standard units.</p> <p>To make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales.</p>	<p>increasing accuracy and using more complex scales / units.</p> <p>To identify possible risks to myself and others and suggest ways of reducing these.</p> <p>To choose the most appropriate equipment and make accurate measurements.</p>	<p>control/ reduce risks to themselves and others.</p> <p>To use equipment fit for purpose to take measurements which are increasingly accurate and precise.</p> <p>To decide the most appropriate equipment to use to collect data.</p>
<p><b>Communicating</b></p> <p>UKS2 / LKS2 / KS1 Reporting findings, recording data, presenting findings. Read, spell and pronounce scientific vocabulary correctly linked to the relevant year group.</p>		<p>To communicate my ideas to a range of audiences in a variety of ways.</p> <p>To complete a pre-constructed table / chart using picture records or simple words.</p>	<p>To record and communicate my findings in a range of ways to a variety of audiences.</p> <p>To use simple scientific language with increasing accuracy.</p>	<p>To record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations,</p>	<p>To record findings using relevant scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations,</p>	<p>To use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts.</p> <p>To present and explain my findings</p>	<p>To articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings.</p> <p>To record data and results of increasing</p>

		<p>To contribute to a class display.</p> <p>To add annotations to drawings or photographs.</p> <p>To begin to use some simple scientific language.</p> <p>To record simple visual representations of observations made.</p>	<p>To record simple data with some accuracy to help in answering questions;</p> <p>With support or using frameworks, to 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).</p> <p>To present findings in a class displays.</p> <p>To sequence / annotate photographs of change over time.</p> <p>To produce increasingly detailed drawings which are labelled/annotated.</p>	<p>labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations.</p> <p>With scaffold / support, to record, and present data in a variety of ways to help in answering questions.</p> <p>To communicate their findings in ways that are appropriate for different audiences.</p>	<p>labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations.</p> <p>To begin to select the most useful ways to collect, record, classify and present data from a range of choices.</p> <p>To make decisions on how best to communicate their findings in ways that are appropriate for different audiences.</p>	<p>through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes.</p> <p>To record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models.</p> <p>To make decisions about the most appropriate way of recording data.</p>	<p>complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models.</p> <p>To 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><b>Describing results/looking for patterns</b></p> <p>UKS2 - Looking for patterns analysing functions, relationships and interactions more systematically.</p>	<p>To talk to an adult about what has been found/found out.</p>	<p>To use recordings to talk about and describe what happened.</p> <p>To sequence photographs of an event/observation.</p>	<p>With guidance, to begin to notice patterns in their data e.g. order their findings, sequence best to worst, say what happened over time, etc.</p>	<p>With scaffold/support, to describe and compare the effect of different factors on something (e.g. we noticed that larger magnets are not always stronger).</p>	<p>To notice / find patterns in their observations and data. (To describe the effect of something on something else). (e.g. as I lengthen the ruler I notice that the pitch gets lower).</p>	<p>To 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</p>	<p>To spot unexpected results that do not fit the pattern (anomalies).</p> <p>To identify patterns in results collected and describe them using the change and measure variables (causal</p>

<p>LKS2 - Describing their findings/ results.</p> <p>KS1 - Talk about what happened / what they noticed.</p>			<p>To recognise if results matched predictions (say if results were what they expected).</p> <p>To use my recordings to talk about and describe what has happened.</p>	<p>With help, to look for changes and simple patterns in my observations, data, chart or graph.</p> <p>To use my results to consider whether they met their predictions.</p>	<p>With some independence, to 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>longer it takes the spinner to fall).</p> <p>To look for / notice relationships between things and begin to describe these.</p> <p>To comment on the results and whether they support the initial prediction.</p>	<p>relationships) (e.g. as we increased the number of batteries the brightness the bulb increased.</p>
<p><b>Explaining results</b></p> <p>UKS2 - Draw conclusions based on / supported by evidence.</p> <p>LKS2 - Reporting on findings saying why something happened.</p> <p>KS1 - Talk about what they found out.</p>	<p>With support, to can talk about what I have found out or what I think might happen next/change based on my own experiences.</p> <p>With support or prompting, I can talk about what I think might happen based on my own experiences.</p>	<p>To begin to use simple scientific language to talk about what I have found out or why something happened.</p>	<p>To begin to use simple scientific language to explain what I have found out.</p> <p>To give a simple, logical reason why something happened (e.g. I think ... because...).</p>	<p>To use my experience and some evidence or results to draw a simple conclusion to answer my original question.</p> <p>To write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary.</p>	<p>To begin to develop my ideas about relationships and interactions between things and explain them.</p> <p>To use relevant scientific language and vocabulary to begin to say / explain why something happened.</p>	<p>To use my scientific knowledge and understanding and appropriate scientific language and terminology to explain my findings and data and answer their initial question.</p> <p>To draw a valid conclusion (explain why it happened) based on my data and observations.</p>	<p>To identify evidence that refutes or supports my ideas.</p> <p>To independently form a conclusion which draws on the evidence from the test.</p> <p>To use scientific language and terminology to explain why something happened.</p>
<p><b>Trusting results</b></p> <p>UKS2 - Comment on how reliable the data is.</p> <p>LKS2 - Suggest improvements for further tests.</p>	<p>N/A in EYFS.</p>	<p>N/A in Y1.</p>	<p>Begin to discuss if the test was unfair.</p>	<p>To say whether what happened was what they expected and notice any results that seem odd.</p> <p>To begin to recognise when a test is not fair and</p>	<p>To use results to suggest improvements, new questions and/or predictions for setting up further tests.</p> <p>To compare my results with others</p>	<p>To begin to recognise how repeated readings improve the reliability of results.</p> <p>To compare results with others and comment on how reliable they are.</p>	<p>To be able to suggest reasons for unexpected results (anomalies).</p> <p>To describe how to improve planning to produce more reliable results.</p>



KS1 – Beginning to spot when a method is not fair.				suggest improvements.	and give reasons why results might be different.		To say how confident I am that my results are reliable and give a reason.
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<p><b>Collaborating</b></p> <p>Non-Statutory (<i>OFSTED may ask- Why have you chosen to add these? What impact will this have on science teaching? Will they see it if they go in to lessons?</i>)</p> <p>Interacting effectively as part of a group.</p>		<p>To share ideas in a group and listen to the ideas of others.</p> <p>To work with others on a science task.</p>	<p>To share ideas in a group and listen to the ideas of others.</p> <p>To work cooperatively with others on a science task making some choices.</p>	<p>To begin to make some decisions about an idea within a group from a list of choices (e.g. let's put them all in a pile first OR I think we should try...).</p> <p>With help; support, listen to and acknowledge others in the group (e.g. Yes. I prefer that one too).</p> <p>To build on / add to someone else's idea. (e.g. we could use x as well as y).</p> <p>To begin to understand that it is ok to disagree with my peers and offer a reason for my opinion.</p>	<p>To make some decisions about an idea within a group (e.g. I think we should find out by testing...)</p> <p>Increasingly support, to listen to and acknowledge others in the group.</p> <p>To build on / add to someone else's idea to improve a plan.</p> <p>To understand that it is ok to disagree with my peers and offer reasons for my opinion.</p>	<p>To propose my own ideas and make decisions with agreement in a group.</p> <p>To support, listen to and acknowledge others in the group e.g. Yes. I prefer that one too.</p> <p>To check the clarity of each other's suggestions e.g. are you saying you think this one is a herbivore?</p> <p>To build on / add to someone else's idea to improve a plan or suggestion.</p> <p>To understand that it is ok to disagree with my peers and offer a reasons for my opinion.</p>	<p>To propose my own ideas and make decisions with agreement in a group.</p> <p>To support, listen to and acknowledge others in the group.</p> <p>To check the clarity of each other's suggestions</p> <p>To build on / add to someone else's idea to improve a plan or suggestion.</p> <p>To understand that it is ok to disagree with my peers and offer reasons for my opinion.</p>
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<p><b>Modelling</b></p> <p>Non-Statutory (<i>OFSTED may ask- Why have you</i></p>		With help, to follow movements (dance / drama) to act out my science.	To act out something to represent something else about the world	To act out or make a model of something to represent something in the real world using	To make a visual representation or a model of something to	To perform / create simple models to exemplify scientific ideas using scientific terminology where	To make / perform and use my own versions of simple models to describe and explain scientific
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<p><i>chosen to add these? What impact will this have on science teaching? Will they see it if they go in to lessons?)</i></p> <p>Using dance, drama or a visual aid to represent science in the real world.</p>			<p>around us (e.g. a life cycle).</p>	<p>appropriate scientific vocabulary verbally.</p>	<p>represent something I have seen or a process that is difficult to see.</p> <p>To suggest my own ideas on a concept and compare these with models or images.</p>	<p>appropriate (e.g. spheres to represent movements of the Sun and Earth, solar system models, shadow clocks, a simple lever or mechanism).</p>	<p>ideas (e.g. circulatory system drama, periscopes to explain how light travels, burglar alarm to explain components in a circuit).</p>
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