

# Nettlesworth Primary School

## Working Scientifically

Progression of Skills



### EYFS

Children at the expected level of development will:

#### **Communication & Language – Listening, Attention & Understanding:**

- Make comments about what they have heard and ask questions to clarify their understanding.

#### **Personal, Social & Emotional Development – Managing Self:**

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

#### **Understanding the World – The Natural World:**

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

### Key Stage 1 National Curriculum Working Scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;
- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

### Lower Key Stage 2 National Curriculum Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them;
- setting up simple practical enquiries, comparative and fair tests;
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers;
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions;
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables;
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions;
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;
- identifying differences, similarities or changes related to simple scientific ideas and processes;
- using straightforward scientific evidence to answer questions or to support their findings.

### Upper Key Stage 2 National Curriculum Working Scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary;
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate;
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;
- using test results to make predictions to set up further comparative and fair tests;
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations;
- identifying scientific evidence that has been used to support or refute ideas or arguments.

	Class 2 and 3 KS1	Class 4 LKS2	Class 5 UKS2
<b>Asking Questions and Carrying Out Fair and Comparative Tests</b>	<p><b>KS1 Science National Curriculum</b> Asking simple questions and recognising that they can be answered in different ways.</p> <p>Performing simple tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a explore the world around them, leading them to ask some simple scientific questions about how and why things happen;</li> <li>b begin to recognise ways in which they might answer scientific questions;</li> <li>c ask people questions and use simple secondary sources to find answers;</li> <li>d carry out simple practical tests, using simple equipment;</li> <li>e experience different types of scientific enquiries, including practical activities;</li> <li>f talk about the aim of scientific tests they are working on.</li> </ul>	<p><b>Lower KS2 Science National Curriculum</b> Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</li> <li>b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</li> <li>c recognise when a fair test is necessary;</li> <li>d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;</li> <li>e set up and carry out simple comparative and fair tests.</li> </ul>	<p><b>Upper KS2 Science National Curriculum</b> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;</li> <li>b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</li> <li>c explore and talk about their ideas, raising different kinds of scientific questions;</li> <li>d ask their own questions about scientific phenomena;</li> <li>e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;</li> <li>f make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them;</li> <li>g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary;</li> <li>h use their test results to identify when further tests and observations may be needed;</li> <li>i use test results to make predictions for further tests.</li> </ul>

<b>Observing and Measuring Changes</b>	<p><b>KS1 Science National Curriculum</b> Observing closely, using simple equipment.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a observe the natural and humanly constructed world around them;</li> <li>b observe changes over time;</li> <li>c use simple measurements and equipment;</li> <li>d make careful observations, sometimes using equipment to help them observe carefully.</li> </ul>	<p><b>Lower KS2 Science National Curriculum</b> Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a make systematic and careful observations;</li> <li>b observe changes over time;</li> <li>c use a range of equipment, including thermometers and data loggers;</li> <li>d ask their own questions about what they observe;</li> <li>e where appropriate, take accurate measurements using standard units using a range of equipment.</li> </ul>	<p><b>Upper KS2 Science National Curriculum</b> Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a choose the most appropriate equipment to make measurements and explain how to use it accurately;</li> <li>b take measurements using a range of scientific equipment with increasing accuracy and precision;</li> <li>c make careful and focused observations;</li> <li>d know the importance of taking repeat readings and take repeat readings where appropriate.</li> </ul>
<b>Identifying, Classifying, Recording and Presenting Data</b>	<p><b>KS1 Science National Curriculum</b> Identifying and classifying.</p> <p>Gathering and recording data to help in answering questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a use simple features to compare objects, materials and living things;</li> <li>b decide how to sort and classify objects into simple groups with some help;</li> <li>c record and communicate findings in a range of ways with support;</li> <li>d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.</li> </ul>	<p><b>Lower KS2 Science National Curriculum</b> Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a talk about criteria for grouping, sorting and classifying;</li> <li>b group and classify things;</li> <li>c collect data from their own observations and measurements;</li> <li>d present data in a variety of ways to help in answering questions;</li> <li>e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;</li> <li>f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> </ul>	<p><b>Upper KS2 Science National Curriculum</b> Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a independently group, classify and describe living things and materials;</li> <li>b use and develop keys and other information records to identify, classify and describe living things and materials;</li> <li>c decide how to record data from a choice of familiar approaches;</li> <li>d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Drawing Conclusions, Noticing Patterns and Presenting Findings</b></p>	<p><b>KS1 Science National Curriculum</b> Using their observations and ideas to suggest answers to questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a notice links between cause and effect with support;</li> <li>b begin to notice patterns and relationships with support;</li> <li>c begin to draw simple conclusions;</li> <li>d identify and discuss differences between their results;</li> <li>e use simple and scientific language;</li> <li>f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1;</li> <li>g talk about their findings to a variety of audiences in a variety of ways.</li> </ul>	<p><b>Lower KS2 Science National Curriculum</b> Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a draw simple conclusions from their results;</li> <li>b make predictions;</li> <li>c suggest improvements to investigations;</li> <li>d raise further questions which could be investigated;</li> <li>e first talk about, and then go on to write about, what they have found out;</li> <li>f report and present their results and conclusions to others in written and oral forms with increasing confidence.</li> </ul>	<p><b>Upper KS2 Science National Curriculum</b> Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a notice patterns;</li> <li>b draw conclusions based in their data and observations;</li> <li>c use their scientific knowledge and understanding to explain their findings;</li> <li>d read, spell and pronounce scientific vocabulary correctly;</li> <li>e identify patterns that might be found in the natural environment;</li> <li>f look for different causal relationships in their data;</li> <li>g discuss the degree of trust they can have in a set of results;</li> <li>h independently report and present their conclusions to others in oral and written forms.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Using Scientific Evidence and Secondary Sources of Information</b></p>	<p><b>Lower KS2 Science National Curriculum</b> Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a make links between their own science results and other scientific evidence;</li> <li>b use straightforward scientific evidence to answer questions or support their findings;</li> <li>c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;</li> <li>d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</li> </ul>	<p><b>Upper KS2 Science National Curriculum</b> Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Children can:</p> <ul style="list-style-type: none"> <li>a use primary and secondary sources evidence to justify ideas;</li> <li>b identify evidence that refutes or supports their ideas;</li> <li>c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;</li> <li>d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</li> <li>e talk about how scientific ideas have developed over time.</li> </ul>	



