

Working Scientifically statutory requirements

During Early Years foundation stage, pupils should be taught to use the following practical scientific methods, processes and skills through their own enquiry and interests:

- ask questions about the world around them
- make observations
- draw pictures of their observations-recording what they can see
- with support, carry out experiments
- with support, find answers to their questions
- say what they think might happen
- use simple equipment safely e.g. magnifying glass and magnets

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.

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.

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 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.

Working Scientifically assessment grid years 1 & 2

End of year 1 & 2 expectations	Asking simple questions and recognising that they can be answered in different ways	Observe 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
Year 1 (with support)	<ul style="list-style-type: none"> • Show curiosity by asking simple questions stimulated by their exploration of their world • Draw on their everyday experience to help answer questions 	<ul style="list-style-type: none"> • Use their senses and simple equipment to make observations • Observe changes over a period of time • Begin to use simple 	<ul style="list-style-type: none"> • Use simple equipment safely. • Share their own ideas and listen to the ideas of others • Perform simple test 	<ul style="list-style-type: none"> • Use everyday terms to describe simple features or actions of objects, living things or events they observe • With help decide how 	<ul style="list-style-type: none"> • Respond to prompts to say what happened • Say what has changed when observing objects, living things or events 	<ul style="list-style-type: none"> • Present evidence they have collected in simple templates provided for them • Communicate simple features or components of objects, living things

	<ul style="list-style-type: none"> Talk about what they think is going to happen Respond to prompts by making some simple suggestions about how to find an answer or make observations 	scientific vocabulary to describe their ideas and observations	with support	to sort and group materials, objects and living things or events they observe <ul style="list-style-type: none"> Recognise basic features of objects, living things or events 	<ul style="list-style-type: none"> Respond to suggestions to identify some evidence (in the form of information, observations or measurements) that has been used to answer a question 	or events they have observed in appropriate forms
Year 2	<ul style="list-style-type: none"> Show curiosity by asking questions stimulated by their exploration of their world Make some suggestions about how to find things out or how to collect data to answer a question or idea they are investigating Respond to prompts by using simple texts and electronic media to find information Recognise that questions can be answered in different ways. 	<ul style="list-style-type: none"> Use simple scientific vocabulary to describe their ideas and observations Correctly use equipment provided to make observations and measurements Make measurements, using standard or non-standard units as appropriate Say what happened in their experiment or investigation 	<ul style="list-style-type: none"> Work together on an experiment or investigation and recognise contributions made by others Perform simple tests 	<ul style="list-style-type: none"> Sort and group objects, living things or events on the basis of what they have observed 	<ul style="list-style-type: none"> Identify things to measure or observe that are relevant to the question or idea they are investigating Respond to suggestions to identify some evidence (in the form of information, observations or measurements) needed to answer a question 	<ul style="list-style-type: none"> Present their ideas and evidence in appropriate ways using given templates Say whether what happened was what they expected, acknowledging any unexpected outcomes Respond to prompts to suggest different ways they could have done things

Working Scientifically assessment grid years 3 & 4

End of year 3 & 4 expectations	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.
Year 3	<ul style="list-style-type: none"> Make some suggestions about how to 	<ul style="list-style-type: none"> Identify one or more control variables from 	<ul style="list-style-type: none"> Make some accurate observations or 	<ul style="list-style-type: none"> Present simple scientific data in more than 	<ul style="list-style-type: none"> Use scientific forms of language when 	<ul style="list-style-type: none"> Describe what they have found out in experiments 	<ul style="list-style-type: none"> Begin to draw straightforw 	<ul style="list-style-type: none"> Identify straightforward patterns in 	<ul style="list-style-type: none"> Use straightforward scientific

	<p>find things out to answer a question.</p> <ul style="list-style-type: none"> Make suggestions about how to collect data to answer a question or idea they are investigating 	<p>those provided</p> <ul style="list-style-type: none"> Select equipment or information sources from those provided to address a question or idea under investigation 	<p>whole number measurements relevant to questions or ideas under investigation</p>	<p>one way, including tables and bar charts (sometimes using given templates)</p>	<p>communicating simple scientific ideas, processes or phenomena</p>	<p>or investigations,</p>	<p>and conclusions from data</p> <ul style="list-style-type: none"> Suggest improvements to their investigations Answer 'What would happen if..?' 'What would happen next..?' 	<p>observations or in data presented in various formats, including tables pie and bar charts</p>	<p>evidence to answer questions, or to support their findings</p>
Year 4	<ul style="list-style-type: none"> Respond to ideas given to them to answer questions or suggest solutions to problems Ask their own questions about what they observe 	<ul style="list-style-type: none"> Decide when it is appropriate to carry out fair tests in investigations Select appropriate equipment or information sources to address specific questions or ideas under investigation 	<ul style="list-style-type: none"> Make sets of observations or measurements, identifying the ranges and intervals used 	<ul style="list-style-type: none"> Decide on appropriate ways of presenting scientific data 	<ul style="list-style-type: none"> Use appropriate scientific forms of language to communicate scientific ideas, processes or phenomena 	<ul style="list-style-type: none"> Describe what they have found out in experiments or investigations, linking cause and effect. 	<ul style="list-style-type: none"> raise further questions Make predictions for new values Draw straightforward conclusions from data presented in various formats Suggest improvements to their investigations, giving reasons 	<ul style="list-style-type: none"> Identify patterns in data presented in various formats including line graphs 	<ul style="list-style-type: none"> Identify scientific evidence that is being used to support or refute ideas or arguments

Working Scientifically assessment grid years 5 & 6

End of year 5 & 6 expectations	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 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.
Year 5	<ul style="list-style-type: none"> Plan different types of scientific enquiries to answer questions Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Select appropriate equipment or information sources to address specific questions or ideas under investigation Identify possible risks to themselves and others 	<ul style="list-style-type: none"> Make sets of observations or measurements where appropriate, identifying the ranges and intervals used 	<ul style="list-style-type: none"> Select appropriate ways of presenting scientific data Use scientific and mathematical conventions when communicating information or ideas 	<ul style="list-style-type: none"> Use previous test results to make predictions 	<ul style="list-style-type: none"> Identify patterns in data presented in various formats, including line graphs Suggest improvements to their working methods, giving reasons. Draw straightforward conclusions from data presented in various formats Identify scientific evidence they have used in drawing conclusions 	<ul style="list-style-type: none"> Use scientific ideas when describing simple processes or phenomena Use simple models to describe scientific ideas Identify scientific evidence that is being used to support or refute ideas arguments Describe some simple positive and negative consequences of scientific and technological developments

<p>Year 6</p>	<ul style="list-style-type: none"> Recognise significant variables in investigations, selecting the most suitable to investigate Explain why particular pieces of equipment or information are appropriate for the questions or ideas under investigation Make, and act on, suggestions to control obvious risks to themselves and others Plan different types of scientific enquiries to find answers to their own questions 	<ul style="list-style-type: none"> Repeat sets of observations or measurements where appropriate, selecting suitable ranges and intervals 	<ul style="list-style-type: none"> Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas 	<ul style="list-style-type: none"> Use their test results to identify when further tests and observations might be needed 	<ul style="list-style-type: none"> Interpret data in a variety of forms, recognising obvious inconsistencies Provide straightforward explanations for differences in repeated observations or measurements Draw valid conclusions that utilise more than one piece of supporting evidence, including numerical data and line graphs Evaluate the effectiveness of their working methods, making practical suggestions for improving them Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected 	<ul style="list-style-type: none"> Explain processes or phenomena, suggest solutions to problems or answer questions by drawing on abstract ideas or models Identify the use of evidence and creative thinking by scientists in the development of scientific ideas Describe different viewpoints a range of people may have about scientific or technological developments
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