

Working Scientifically Skills Progression – grouped by enquiry type

National Curriculum working scientifically statutory requirements in colour

Examples of ways these can be achieved in black



FAIR AND COMPARATIVE TESTING

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Plan	<ul style="list-style-type: none"> -talk about what they are exploring/trying to find out during play 	<ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways -recognise when a simple comparison/test is unfair -suggest how to collect the identified data needed -make a simple prediction when appropriate (based on something similar they have observed previously) 	<ul style="list-style-type: none"> • ask relevant questions and use different types of scientific enquiries to answer them -suggest ways of making the test fairer -suggest data needing to be collected -from a selection identify what equipment is needed -make predictions based on everyday experiences and knowledge 	<ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • use test results to make predictions to set up further comparative and fair tests -choose the to carry out a fair test when appropriate -list all the equipment needed -decide what and how much data to collect -predict based on scientific knowledge
Do	<ul style="list-style-type: none"> • Know about similarities and differences in relation to places, objects, materials and living things. • They make observations of animals and plants and explain why some things occur, and talk about changes. -observe closely using all senses -carry out a simple comparative test/exploration comparing 2 or 3 things by direct observation/comparison -repeat an exploratory action 	<ul style="list-style-type: none"> • observe closely, using simple equipment • perform simple tests -measure using simple measuring equipment in uniform non-standard units (e.g. straws) or simple standard units (Y2) such as metre sticks, kg masses, L jugs and second timers - read scale to the nearest labelled division (Y2) 	<ul style="list-style-type: none"> • set up (and carry out) simple practical enquiries, comparative and fair tests • make systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers -use simple standard measures :m, cm, mm, kg, g, minutes, seconds, Newton measuring to the nearest half unit -read scales to the nearest division even when unlabelled 	<ul style="list-style-type: none"> • take measurements, using a range of scientific equipment, with • increasing accuracy and precision, taking repeat readings when appropriate -select appropriate measuring equipment allowing for accurate measurement -use standard measures including fractions, decimals and mixed units -read scales with precision and accuracy
Record	<ul style="list-style-type: none"> -choose to record in own way talking about what the record shows 	<ul style="list-style-type: none"> • gather and recording data to help in answering questions -draw pictures/take photos/write simple sentences/complete simple charts such as two column tables -make practical block graphs (e.g. using Lego), pictograms with 1:1 scale -draw a block graph with a 1:1 scale (Y2) 	<ul style="list-style-type: none"> • gather, record, classify and present data in a variety of ways to help in answering questions • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables -choose an appropriate way to record results including choosing a two column table -draw bar charts with simple scales e.g. 1:2, 1:5, 1:10, 1:100 -plot line graphs (Y4) 	<ul style="list-style-type: none"> • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, -record data accurately and appropriately including tables allowing for repeat readings and averages -choose the appropriate type of graph -draw bar and line graphs with complex scales possibly involving decimals e.g. 1:2.5 or 1:1.5
Review	<ul style="list-style-type: none"> • They talk about the features of their own immediate environment and how environments might vary from one another. • They make observations of animals and plants and explain why some things occur, and talk about changes. -say what happened -say if something seems to have made a difference -make comparisons-order results (1st, 2nd, 3rd) 	<ul style="list-style-type: none"> • use their observations and ideas to suggest answers to questions -describe observations/data -say what they have found out -if initially predicted say whether what happened was what was expected 	<ul style="list-style-type: none"> • report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions • use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identify differences, similarities or changes related to simple scientific ideas and processes • use straightforward scientific evidence to answer questions or to support their findings. report -notice links between cause and effect 	<ul style="list-style-type: none"> • report and present findings from enquiries, including conclusions, causal relationships and explanations results, explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identify scientific evidence that has been used to support or refute ideas or arguments. -use graphs when spotting and interpreting trends and patterns -offer explanations for differences in repeat readings

GROUPING AND CLASSIFYING

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Plan		<ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways <p>-ask questions designed to help place things in groups based on similar observable or behavioural features</p>	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them <p>-ask questions relating to how things/ organisms should be grouped, what things/organisms are and if there are similar things/ organisms</p>	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions <p>-plan to use an identification key to identify an unknown organism -plan what to test and how to test and what evidence to collect in order to classify -predict which phylum (mammal, bird, reptile, amphibian, fish) a vertebrate belongs in from initial observation</p>
Do	<ul style="list-style-type: none"> Know about similarities and differences in relation to places, objects, materials and living things. <p>-match things/organisms that are the same -identify things/organisms that are similar -identify differences between things/organisms -sort using observations of similarities and differences using their own criteria</p>	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests identify and classify <p>-make comparisons then grouping similar things /organisms together -classify things into two groups, one group containing things/organisms that have an observable feature the other doesn't</p>	<ul style="list-style-type: none"> set up (and carry out) simple practical enquiries make systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers <p>-use results of simple tests to sort and group things by how they behave (e.g. waterproof or not) -use simple standard measures :m, cm, mm, kg, g, minutes, seconds, Newton measuring to the nearest half unit -read scales to the nearest division even when unlabelled</p>	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision <p>-use identification keys to identify unknown organisms -select appropriate measuring equipment allowing for accurate measurement -use standard measures including fractions, decimals and mixed units -read scales with precision and accuracy -use a variety of tests/pieces of evidence to identify and classify materials /organisms</p>
Record	<p>-place things in sorting hoops based on their own sorting criteria</p>	<ul style="list-style-type: none"> gather and recording data to help in answering questions <p>-record appropriately using tables, sorting circles and simple Venn diagrams to help distinguish sets of similar things/organisms</p>	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, and tables <p>-use Carroll and Venn diagrams to help sort and record groupings - make simple branching data bases/classification keys for a limited number of things (maximum 6) with easily observable differences</p>	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys and tables, <p>-make own keys and branching data bases</p>
Review	<ul style="list-style-type: none"> They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants <p>-explain why they have put things/organisms in the same group</p>	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions <p>-can identify which group an additional object / organism should be placed in -describe how things/organisms have been sorted</p>	<ul style="list-style-type: none"> report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings. <p>-describe alternative/ improved ways to sort /group/classify -use simple classification keys/branching data bases to identify unknown items that have easily observable differences in their features</p>	<ul style="list-style-type: none"> report and present findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments. <p>-explain that sorting/grouping/classifying is very useful to help predict where things/ organisms belong and how they will behave -evaluate how well keys work and suggest changes/improvements - Confirm or reject initial predictions around phylum a vertebrate belongs in based on more detailed observations</p>

MEASURING OVER TIME				
	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Plan	<p>-Notices a change and want to find out what will happen to something if it is left for a longer time</p>	<ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways <p>-recognise they will need to make observations/ measurements over a longer time</p> <p>-suggest how to collect the identified data needed</p> <p>- when appropriate (based on something similar they have observed) make a simple prediction about what will change over time</p>	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them <p>-decide to answer a question by observing/measuring changes over a longer period of time</p> <p>-suggest how long to make periodic observations or take measurements for</p> <p>-suggest any data needing to be collected</p> <p>-from a selection identify what equipment is needed</p> <p>-make prediction about a likely observable changes based on everyday experiences and knowledge</p>	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary use test results to make predictions to set up further comparative and fair tests <p>-know why an observation/measurement over time is appropriate to answer the question</p> <p>-list all the equipment needed</p> <p>-decide types, amount and frequency of data needed to be collected</p> <p>-predict changes expected based on scientific knowledge</p>
Do	<ul style="list-style-type: none"> Know about similarities and differences in relation to places, objects, materials and living things. They make observations of animals and plants and explain why some things occur, and talk about changes. <p>-observe changes closely using all senses</p> <p>-carry out a simple comparison to compare several results</p> <p>-change slightly what is done to see how the outcome is changed</p>	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests <p>-observe or measure changes using simple measuring equipment in uniform non-standard units (e.g. straws) or simple standard units (Y2) such as metre sticks, kg masses, L jugs and second timers</p> <p>- read scale to the nearest labelled division (Y2)</p>	<ul style="list-style-type: none"> set up (and carry out) simple practical enquiries make systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers <p>-use simple standard measures :m, cm, mm, kg, g, minutes, seconds, Newton measuring to the nearest half unit</p> <p>-read scales to the nearest division even when unlabelled</p>	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate <p>-select appropriate measuring equipment allowing for accurate measurement</p> <p>-use standard measures including fractions, decimals and mixed units</p> <p>-read scales with precision and accuracy</p>
Record	<p>-choose to record in own way talking about any changes that happened during the enquiry that the record shows</p>	<ul style="list-style-type: none"> gather and recording data to help in answering questions <p>-draw pictures/take photos/write simple sentences/complete simple charts such as sequential picture charts</p> <p>-make practical graphs (e.g. using ribbon to show the height of a sunflower each week)</p>	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables <p>-choose an appropriate way to record results including a table</p> <p>-draw bar charts and line graphs (Y4) with simple scales e.g. 1:2, 1:5, 1:10, 1:100</p>	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, <p>-record data accurately and appropriately including in tables</p> <p>- recognise line graphs as the appropriate type of graph</p> <p>-draw line graphs including those with complex scales possibly involving decimals e.g. 1:2.5 or 1: 1.5</p>
Review	<ul style="list-style-type: none"> They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. <p>-identify the changes</p>	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions <p>-describe /sequence simple changes</p> <p>-if initially predicted say whether the change was what was expected</p>	<ul style="list-style-type: none"> report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes <p>use straightforward scientific evidence to answer questions or to support their findings.</p> <p>-say whether the changes were what was expected explain any differences</p>	<ul style="list-style-type: none"> report and present findings from enquiries, including conclusions, causal relationships and explanations results, explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments. <p>-use graphs when spotting and interpreting how things change</p> <p>-explain the effect of changing the time and/or number of observations /measurements</p> <p>-suggest improvements in experimental method</p>

SEEKING PATTERNS

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Plan	<p>-talk about a pattern they think they have noticed and how they are exploring it further</p>	<ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways <p>-recognise they are looking for a pattern -suggest how to collect the identified data needed - when appropriate (based on something similar they have observed)make a simple prediction about a possible pattern</p>	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them <p>-identify that a fair test isn't the right type of enquiry but a pattern seeking enquiry is possible -suggest which two sets of data needing to be collected -from a selection identify what equipment is needed -make prediction about a likely pattern based on everyday experiences and knowledge</p>	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary use test results to make predictions to set up further comparative and fair tests <p>-understand why variables can't be controlled and suggest using a pattern seeking enquiry -list all the equipment needed -decide types and large amount of data needed to be collected to ensure a reasonable sample size -predict the pattern/trend based on scientific knowledge</p>
Do	<ul style="list-style-type: none"> Know about similarities and differences in relation to places, objects, materials and living things. They make observations of animals and plants and explain why some things occur, and talk about changes. <p>-observe closely using all senses -carry out a simple comparison to compare several results -change slightly what is done to see how the outcome is changed</p>	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests <p>-observe or measure using simple measuring equipment in uniform non-standard units (e.g. straws) or simple standard units (Y2) such as metre sticks, kg masses, L jugs and second timers - read scale to the nearest labelled division (Y2)</p>	<ul style="list-style-type: none"> make systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers set up (and carry out) simple practical enquiries, comparative tests <p>-use simple standard measures :m, cm, mm, kg, g, minutes, seconds, Newton measuring to the nearest half unit -read scales to the nearest division even when unlabelled</p>	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate <p>-select appropriate measuring equipment allowing for accurate measurement -use standard measures including fractions, decimals and mixed units -read scales with precision and accuracy</p>
Record	<p>-choose to record in own way talking about any patterns the record shows</p>	<ul style="list-style-type: none"> gather and recording data to help in answering questions <p>-draw pictures/take photos/write simple sentences/complete simple charts such as tally charts -make practical scatter graphs (e.g. using post its on wall where children have placed there investigating if taller children can stretch higher) /pictograms/ block graphs (Y2) with a 1:1 scale</p>	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables <p>-choose an appropriate way to record results including choosing a tally chart t -draw scatter graphs and bar charts with simple scales e.g. 1:2, 1:5, 1:10, 1:100</p>	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, <p>-record data accurately and appropriately including tally charts and tables allowing for repeat readings and averages -choose the appropriate type of graph -draw scatter graphs and frequency charts including those with complex scales possibly involving fractions or decimal e.g. 1:2 ½ or 1: 1.5</p>
Review	<ul style="list-style-type: none"> They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. <p>-identify the pattern</p>	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions <p>- describe simple patterns -say what they have found out -if initially predicted say whether the pattern found was what was expected</p>	<ul style="list-style-type: none"> report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings. <p>-notice links/patterns between the two sets of data -suggest ways the test could be improved</p>	<ul style="list-style-type: none"> report and present findings from enquiries, including conclusions, causal relationships and explanations results, explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments. <p>-use graphs when spotting and interpreting trends and patterns -recognise the effect of sample size on reliability -explain the relationship between two sets of data -suggest improvements in experimental method</p>

