

# Plant Science

## Working Scientifically Progression Map Guidance



### Working Scientifically

The national curriculum science programme of study explains how 'working scientifically' skills might be taught by embedding them within topics, with a focus on the key features of scientific enquiry. Through an enquiry-led approach, pupils learn to use a variety of different enquiry skills to answer relevant scientific questions. The national curriculum states that these scientific enquiry skills should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.

Over the next pages, the progression of working scientifically (disciplinary) skills for the PlanIt scheme of learning has been laid out. The included tables show the progression across KS1, LKS2 and UKS2 in different areas of working scientifically.


We have taken statements from the national curriculum and split them into further statements (covering the statutory statements and using the non-statutory national curriculum guidance in addition to this). The five scientific enquiry types listed above are reflected in our PlanIt progression statements. We have grouped our progression statements into 'plan', 'do', 'record' and 'review'. The enquiry wheels found [here](#) explain further what is involved in the 'plan, do, record and review' cycle.

These statements also appear on the Progression Map Year 1–Year 6 spreadsheet, where they are mapped to each PlanIt lesson. You will also see these statements reflected in the working scientifically assessment statements found on our updated lesson plans and assessment spreadsheets.


Further scientific enquiry resources can be found for KS1 [here](#) and KS2 [here](#).



Scientific enquiry skills are now being identified throughout our content. Types of Scientific Enquiry Skills Coverage documents have been produced for each PlanIt unit and these skills are being highlighted in lessons – look out for these logos across our resources.


	KS1	LKS2	UKS2
<b>NC</b>	asking simple questions and recognising that they can be answered in different ways	asking relevant questions and using different types of scientific enquiries to answer them	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
<b>Plan</b> 	ask some simple scientific questions about the world around them	use their scientific experiences to raise questions about the world around them	explore and talk about their ideas and scientific experiences to raise enquiry questions about scientific phenomena
	begin to recognise ways in which they might answer scientific questions	start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions, e.g. recognising when a fair test is necessary	make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions
		help decide what observations or measurements they might make, how long they will make them for and the equipment they might use	make their own decisions about what observations to make, the most appropriate equipment to use, what measurements to take and for how long, and whether to repeat them
			recognise variables in comparative and fair tests and plan how they will control them
		help decide how to record and analyse data	decide how to record data from a choice of familiar approaches

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	KS1	LKS2	UKS2
<b>NC</b>	observing closely, using simple equipment performing simple tests identifying and classifying	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	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
<b>Do</b> 	observe the natural and humanly-constructed world around them	make systematic and careful observations	make systematic, careful and detailed observations
	use simple measurements (e.g. using comparisons or non-standard units), sometimes using simple equipment	take accurate measurements using standard units	take measurements, using a range of scientific equipment, with increasing accuracy and precision
	make careful observations in enquiries, sometimes using simple equipment	use a range of equipment, including thermometers and data loggers	
			take repeat readings where appropriate and understand the importance of this

	carry out enquiries that involve <b>observing over time</b>	set up and carry out enquiries that involve <b>observing over time</b>	set up and carry out enquiries that involve <b>observing over time</b> , including changes over different periods of time
	use simple secondary sources for <b>researching</b> answers to questions	use secondary sources for <b>researching</b> answers to questions, recognising how this allows them to answer questions that cannot be answered through practical investigations	use a wide range of secondary sources for <b>researching</b> answers to questions, deciding which sources will be most useful and reliable, and understanding the difference between fact and opinion.
	carry out simple <b>comparative tests</b>	set up and carry out simple <b>comparative and fair tests</b>	set up and carry out <b>comparative and fair tests</b> , including controlling variables
	carry out simple <b>pattern seeking</b> enquiries	set up and carry out <b>pattern seeking</b> enquiries	set up and carry out <b>pattern seeking</b> enquiries, choosing a reliable sample size
	identify some living and non-living things and their features ( <b>identifying, grouping and classifying</b> )		
	use simple features to compare objects, materials and living things ( <b>identifying, grouping and classifying</b> )	talk about criteria for <b>identifying, grouping and classifying</b>	<b>identify, group, classify</b> and describe a wide range of living things and materials, using their scientific knowledge to justify their choices
	decide how to sort and classify things into simple groups with some help ( <b>identifying, grouping and classifying</b> )	<b>identify, group and classify</b> things, using simple keys when appropriate	use and develop keys and other information records of increasing complexity to <b>identify, classify, group</b> and describe living things and materials

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	KS1	LKS2	UKS2
<b>NC</b>	gathering and recording data to help in answering questions	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	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
<b>Record</b> 	gather and record observations to help answer questions in a variety of ways, e.g. labelled diagrams or simple tables	gather, record and present observations in a variety of ways to help answer questions, e.g. written recordings using simple scientific language, drawings, labelled diagrams or tables	gather, record and present observations of increasing complexity, e.g. using scientific diagrams and labels
	gather and record measurements to help answer questions in a variety of ways, e.g. simple tables, pictograms, tally charts or block diagrams	gather, record and present measurements in a variety of ways to help answer questions, e.g. tables and bar charts	gather, record and present measurements in a variety of increasingly complex ways, e.g. using tables, scatter graphs, bar graphs or line graphs
	gather and record findings from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations	gather, record and present findings from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations	gather, record and present findings of increasing complexity from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations
	record classification tasks using simple tables or sorting diagrams	record classification tasks in a variety of ways to help answer questions, e.g. simple keys, tables or Venn diagrams	record classification tasks in a variety of ways to help answer questions, e.g. classification keys
	use and apply mathematical skills at a level consistent with their increasing maths knowledge at key stage 1	use and apply mathematical skills at a level consistent with their increasing maths knowledge at lower key stage 2	use and apply mathematical skills at a level consistent with their increasing maths knowledge at upper key stage 2

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	KS1	LKS2	UKS2
<b>NC</b>	using their observations and ideas to suggest answers to questions	<p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>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>using test results to make predictions to set up further comparative and fair tests</p> <p>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>identifying scientific evidence that has been used to support or refute ideas or arguments</p>
<b>Review</b> 	with support, begin to notice patterns and relationships	with support, identify changes, patterns and similarities and differences, (e.g. in their data, from observations or from research of scientific ideas) to help answer questions and draw conclusions	notice patterns in their results (including those found in the natural environment)
			analyse results to determine and then explain causal relationships
	begin to draw simple conclusions	use straightforward scientific evidence (from observations, measurements or secondary sources) to answer questions or support their conclusions	draw increasingly complex conclusions based on their data, observations and scientific knowledge, identifying if this refutes or supports their previous ideas
		make predictions for new values	

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		raise further questions which could be investigated	use their test results to make predictions to set up further comparative and fair tests
		suggest improvements to investigations	discuss the degree of trust they can have in a set of results, e.g. by considering measurement precision and accuracy, how variables were controlled and enquiry limitations.
	use a range of scientific vocabulary accurately. Read and spell some of these words at a level consistent with their increasing word reading and spelling knowledge at key stage 1	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge	read, spell and pronounce scientific vocabulary correctly
	communicate their findings to a variety of audiences in a variety of ways	report and present their results and conclusions to different audiences in written and oral forms with increasing confidence	report and present their results and conclusions to others in oral and written forms with confidence
			talk about how scientific ideas have developed over time, with reference to scientific evidence that has been used to support or refute ideas or arguments

## Using the Progression Map

This section of each year group's tab maps the working scientifically objectives, separated into our progression statements.

### National Curriculum Aims

National curriculum statutory working scientifically aims are provided here for reference.

Working Scientifically		Animals Including Humans	Seasonal Changes Autumn & Winter	Everyday Materials	Seasonal Changes Spring & Summer	Plants	Scientists and Inventors
Plan	<b>National Curriculum:</b> asking simple questions and recognising that they can be answered in different ways						
	ask some simple scientific questions about the world around them	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
Do	begin to recognise ways in which they might answer scientific questions	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	<b>National Curriculum:</b> observing closely, using simple equipment performing simple tests identifying and classifying						
	observe the natural and humanly-constructed world around them	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	use simple measurements (e.g. using comparisons or non-standard units), sometimes using simple equipment	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	make careful observations in enquiries, sometimes using simple equipment	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	carry out enquiries that involve <b>observing over time</b>	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	use simple secondary sources for <b>researching</b> answers to questions	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	carry out simple <b>comparative tests</b>	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	carry out simple <b>pattern seeking</b> enquiries	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	identify some living and non-living things and their features ( <b>identifying, grouping and classifying</b> )	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
Record	use simple features to compare objects, materials and living things ( <b>identifying, grouping and classifying</b> )	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	decide how to sort and classify things into simple groups with some help ( <b>identifying, grouping and classifying</b> )	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	<b>National Curriculum:</b> gathering and recording data to help in answering questions						
	gather and record observations to help answer questions in a variety of ways, e.g. labelled diagrams or simple tables	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	block diagrams	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	gather and record findings from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
Review	record classification tasks using simple tables or sorting diagrams	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	use and apply mathematical skills at a level consistent with their increasing maths knowledge at key stage 1	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	<b>National Curriculum:</b> using their observations and ideas to suggest answers to questions						
	with support, begin to notice patterns and relationships	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
Review	begin to draw simple conclusions	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	use a range of scientific vocabulary accurately. Read and spell some of these words at a level consistent with their increasing word reading and spelling knowledge at key stage 1	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8
	communicate their findings to a variety of audiences in a variety of ways	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6 7 8

### Working Scientifically Statements

We have broken down the national curriculum into further statements to assess progress in working scientifically skills.

### Lesson Numbers

When shaded, these numbers identify which lessons in the unit build upon the working scientifically progression statement.