Disciplinary Knowledge Progression Map: Science

Research using secondary sources						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To make comments and ask questions about aspects of their familiar world (such as the place where they live) or the natural world.	To begin to use simple secondary sources to find answers. To begin to find information to help me from books and computers with help	To use simple secondary sources to find answers. To find information to help me from books and computers with help.	To begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	To recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	To begin to recognise which secondary sources will be most useful to research their ideas.	To recognise which secondary sources will be most useful to research their ideas.
Questioning and Planning						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	To ask simple questions about the world around us. To begin to recognise that they can be answered in different ways.	To ask questions about the world around us. To recognise that they can be answered in different ways..	To ask some relevant questions and use different types of scientific enquiries to answer them.	To ask relevant questions and use different types of scientific enquiries to answer them.	To begin to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
To show curiosity about objects, events and people			To begin to explore everyday phenomena and the relationships between living things and familiar environments. To begin to develop their ideas about functions, relationships and interactions.	To explore everyday phenomena and the relationships between living things and familiar environments. To begin to develop their ideas about functions, relationships and interactions.	To begin to explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically	To explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically.
To questions why things happen			To begin to raise their own questions about the world around them.	To raise their own questions about the world around them.	To begin to recognise some more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.	To recognise more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.

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					To begin to recognise scientific ideas change and develop over time.	To recognise scientific ideas change and develop over time.
					To begin to select the most appropriate ways to answer science questions using different types of scientific enquiry.	To select the most appropriate ways to answer science questions using different types of scientific enquiry.
Observing, Measuring and Pattern Seeking						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To use senses to explore the world around them.						
To closely observe what animals, people and vehicles do.	To begin to observe closely, using simple equipment.	To observe closely, using simple equipment.	To begin to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	To make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	To begin to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.	To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.
	To use simple observations and ideas to suggest answers to questions.	To use simple observations and ideas to suggest answers to questions.				
To make links and notice patterns and their experiences.	To observe simple changes over time and, with guidance, begin to notice patterns.	To observe changes over time and, with guidance, begin to notice patterns.	To begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.	To look for naturally occurring patterns and relationships and decide what data to collect to identify them.	To begin to identify patterns that might be found in the natural environment.	To identify patterns that might be found in the natural environment.
	To begin to say what I am looking for and what I am measuring.	To say what I am looking for and what I am measuring.				
	To begin to know how to use simple equipment safely.	To know how to use simple equipment safely.	To start to use help to make decisions about what observations to make, how long to make them for and the type of simple	To use help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	To begin to make their own decisions about what observations to make, what measurements to use and how long to make	To make their own decisions about what observations to make, what measurements to use and how long to make them for and

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			equipment that might be used.		them for and whether to repeat them	whether to repeat them
	To use simple measurements and equipment with support (e.g. hand lenses and egg timers)	To use simple measurements and equipment with increasing independence (e.g. hand lenses and egg timers).	To learn to use new equipment appropriately with support (e.g. data loggers).	To learn to use new equipment appropriately (e.g. data loggers).	To begin to choose the most appropriate equipment and explain how to use it accurately.	To choose the most appropriate equipment and explain how to use it accurately.
			To begin see a pattern in my results.	To see a pattern in my results.	To begin interpret data and find patterns.	To interpret data and find patterns.
			To begin to choose from a selection of equipment.	To choose from a selection of equipment.	To start to select equipment on my own.	To select equipment on my own.
					To start to make a set of observations and say what the interval and range are.	To make a set of observations and say what the interval and range are.
	To be able to read mm, cm, m, ml, l, °C with support.	To be able to read mm, cm, m, ml, l, °C	To begin to observe and measure accurately using standard units including time in minutes and seconds.	To observe and measure accurately using standard units including time in minutes and seconds.	To begin to take accurate and precise measurements – N, g, kg, mm, cm, mins, seconds, cm^2V, km/h, m per sec, m/ sec Graphs – pie, line	To make accurate and precise measurements – N, g, kg, mm, cm, mins, seconds, cm^2V, km/h, m per sec, m/ sec Graphs – pie, line, bar
Investigating						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To find ways to solve problems / find new ways to do things / test their ideas.	To perform simple tests with support.	To perform simple tests.	To set up some simple practical enquiries, comparative tests.	To set up simple practical enquiries, comparative tests	To begin to use test results to make predictions to set up further comparative tests.	To use test results to make predictions to set up further comparative tests
To engage in open-ended activity.						
	To begin to use prior understanding to predict the outcomes of an investigation with support.	To begin use prior understanding to predict the outcomes of an investigation	To use prior understanding to predict the outcomes of an investigation.	To use prior understanding to hypothesise the outcomes of an investigation.	To begin to make informed predictions and justify them using scientific knowledge.	To make informed predictions and justify them using scientific knowledge.

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	To begin to discuss my ideas about how to find things out.	To discuss my ideas about how to find things out.	To begin to recognise which independent, dependent and controlled variables are necessary to test my ideas.	To recognise which independent, dependent and controlled variables are necessary to test my ideas.	To begin to recognise when and how to set up comparative tests and explain which variables need to be controlled and why.	To recognise when and how to set up comparative tests and explain which variables need to be controlled and why.
			To begin to think of more than one variable factor.	To think of more than one variable factor.		
Recording and Reporting Findings						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To choose the resources they need for their chosen activities	To gather and record data with some adult support, to help in answering questions	To gather and record data to help in answering questions	To gather, record, and begin to classify and present data in a variety of ways to help in answering questions.	To gather, record, classify and present data in a variety of ways to help in answering questions.	To begin to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.	To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.
	To begin to record simple data.	To record simple data.				
	To begin to record and communicate their findings in a range of ways.	To record and communicate their findings in a range of ways.				
	To show my results in a simple table that my teacher has provided.	To show my results in a table that my teacher has provided	To begin to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables		
			To begin to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	To begin to report and present findings from enquiries.	To report and present findings from enquiries.
			To begin to use notes, simple tables and standard units and help to decide how to	To use notes, simple tables and standard units and help to decide how to record and analyse their data.	To begin to decide how to record data from a choice of familiar approaches.	To decide how to record data from a choice of familiar approaches.

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			record and analyse their data.			
			To begin to record results in tables and bar charts.	To record results in tables and bar charts.	To begin to choose how best to present data.	To choose how best to present data
Drawing Conclusions						
Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To answer how and why questions about their experiences.	To begin to talk about what they have found out and how they found it out	To talk about what they have found out and how they found it out.	To begin to use results to draw simple conclusions, hypothesise for new values, suggest improvements and raise further questions.	To use results to draw simple conclusions, hypothesise for new values, suggest improvements and raise further questions.	To begin to report and present 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.	To report and present 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.
To make observations of animals and plants and explain why some things occur, and talk about changes.	To begin to say what happened in my investigation.	To say what happened in my investigation.				
To build up vocabulary that reflects the breadth of their experience Understanding.	To begin to say whether I was surprised at the results or not.	To say whether I was surprised at the results or not.				
	To begin to say what I would change about my investigation.	To say what I would change about my investigation.				
			To begin to use straightforward scientific evidence to answer questions or to support their findings.	To use straightforward scientific evidence to answer questions or to support their findings.	To begin to identify scientific evidence that has been used to support or refute ideas or arguments.	To identify scientific evidence that has been used to support or refute ideas or arguments.
			To begin to look for changes, patterns, similarities and differences in their data in order to draw simple conclusions, with support.	To look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions, with support.	To begin to draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings	To draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings

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			To begin to identify new questions arising from the data, make new predictions and find ways of improving what they have already done, with support.	To identify new questions arising from the data, make new predictions and find ways of improving what they have already done, with support.	To begin to use test results to make predictions to set up further comparative tests	To use test results to make predictions to set up further comparative tests
			To begin to identify a pattern in my results.	To identify a pattern in my results.	To begin to look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	To look for different causal relationships in their data and identify evidence that refutes or supports their ideas.
			To begin to identify what I discovered, linking cause and effect.	To identify what I discovered, linking cause and effect.		
			To begin to answer questions from what I have discovered.	To answer questions from what I have discovered.	To begin to use test results to make predictions to set up further comparative tests.	To use test results to make predictions to set up further comparative tests.
					To use their results to identify when further tests and observations are needed	To use their results to identify when further tests and observations are needed
					To begin to draw conclusions and identify scientific evidence.	To draw conclusions and identify scientific evidence.
					To begin to use simple models (e.g. flow charts, classification tree)	To use simple models (e.g. flow charts, classification tree)

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Identifying, Grouping and Classifying

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To answer how and why questions about their experiences.	To identify and classify with some support.	To identify and classify	To begin to identify differences, similarities or changes related to simple scientific ideas and processes.	To identify differences, similarities or changes related to simple scientific ideas and processes.	To begin to use and develop keys and other informational records to identify, classify and describe living things and materials.	To use and develop keys and other informational records to identify, classify and describe living things and materials.
	To begin to observe and identify, compare and describe.	To observe and identify, compare and describe.				
To develop ideas of grouping, sequences, cause and effect	To begin to use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.	To use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.	To begin to talk about criteria for grouping, sorting and classifying and use simple keys	To talk about criteria for grouping, sorting and classifying and use simple keys		
To know about similarities and differences in relation to places, objects, materials and living things			To begin to compare and group according to behaviour or properties, based on testing.	To compare and group according to behaviour or properties, based on testing.		

Vocabulary

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	properties observe test magnifying glass object record equipment		prediction measurement enquiry independent variable dependent variable controlled variable comparative test theory hypothesis		line graph relationship outlier	angle of incidence angle of reflection refraction spectrum translucent medium periscope

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National Curriculum Aims			
Early Learning Goals	KS1	KS2	
▪ 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. ▪ Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	▪ 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.	▪ 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.	▪ 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.