KEY KNOWLEDGE PROGRESSION DOCUMENT – Science (Working Scientifically)

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Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Scientific attitudes	• WSN.1 know how to talk about what they see **(P)**	• WSR.1 know how to ask questions to find out more **(P)** • WSR.2 know how to articulate ideas in full sentences **(P)**	• WS1.1 know how to ask simple questions **(P)** • WS1.2 know how to talk about what they have found out using simple scientific language **(P)**	• WS2.1 know how to ask simple questions about what they notice **(P)** and recognise that they can be answered in different ways **(D)** • WS2.2 know how to communicate their ideas in a variety of ways to others using simple scientific vocabulary **(D)**	• WS3.1 know how to draw simple conclusions and use some scientific language to talk about what they have found out **(D)** • WS3.2 know how to decide which types of scientific enquiry are likely to be the best ways of answering questions through conversations with others **(D)**	• WS4.1 know how to draw simple conclusions and use some scientific language to write about what they have found out **(D)** • WS4.2 know how to decide independently which types of scientific enquiry are likely to be the best ways of answering questions **(D)**	• WS5.1 know how to answer scientific questions using different types of scientific enquiry **(D)**	• WS6.1 know how to answer scientific questions using different types of scientific enquiry in the most appropriate ways **(D)**	• WS7.1 know how scientific theories change over time **(S)**
	• WSN.2 know how to use simple scientific vocabulary in their talk **(D)**	• WSR.3 know how to use scientific vocabulary in their talk **(D)**	• WS1.3 know how to read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Year 1 **(S)**	• WS2.3 know how to read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Year 2 **(S)**	• WS3.3 know how to read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge at Year 3 **(S)**	• WS4.3 know how to read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge at Year 4 **(S)**	• WS5.2 know how to read, spell and pronounce scientific vocabulary correctly at Year 5 **(S)**	• WS6.2 know how to read, spell and pronounce scientific vocabulary correctly at Year 6 **(S)**	• WS7.2 know and use the terms: accuracy, precision, repeatability and reproducibility **(D)**
Planning	• WSN.3 know how to ask simple who, what and why questions **(P)**	• WSR.4 know how to use and understand questions such as 'who; why; when; where and how' **(P)**	• WS1.4 know how to ask simple scientific questions **(P)**		• WS3.4 know how to ask relevant questions and decide with others which different types of scientific enquiries could be used to answer them **(D)**	• WS4.4 know how to ask relevant questions and decide independently which different types of scientific enquiries could be used to answer them **(D)**			• WS7.3 develop lines of enquiry **(D)** • WS7.4 make predictions using scientific understanding **(D)**

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					• WS3.5 know how to set up simple practical enquiries, comparative and fair tests with others **(D)**	• WS4.5 know how to set up simple practical enquiries, comparative and fair tests independently **(D)**	• WS5.3 know how to plan different types of scientific enquiries to answer questions, including recognising variables **(D)**	• WS6.3 know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary **(D)**	• WS7.5 identify independent, dependent and controlled variables **(D)**
Observing and measuring during practical activities		• WSR.5 know some simple scientific equipment **(S)**	• WS1.5 know how to use simple equipment safely with appropriate support **(P)**	• WS2.4 know how to use simple equipment safely with reduced support **(P)**					
		• WSR.6 know some simple ways of recording information, (e.g. bug hunt) **(S)**	• WS1.6 know how to gather and record data (with appropriate support) to help in answering questions **(P)** • WS1.7 know how to identify and classify findings with appropriate support **(D)**	• WS2.5 know how to gather and record data (with reduced support) to help in answering questions **(D)** • WS2.6 know how to identify and classify findings with reduced support **(D)**	• WS3.6 know how to make systematic and careful observations and, where appropriate, take measurements (with support), using standard units, a range of equipment safely, including thermometers **(P)** • WS3.7 know how to gather, record and classify data in a variety of ways to help in answering questions **(D)**	• WS4.6 know how to make systematic and careful observations and, where appropriate, take measurements, using standard units, a range of equipment safely, including thermometers and data loggers **(P)** • WS4.7 know how to gather, record and classify and present data in a variety of ways to help in answering questions **(D)**	• WS5.4 know how to take measurements, using a range of scientific equipment safely, with increasing accuracy and precision, taking repeat readings where appropriate **(P)** • WS5.5 know how to record data and results of increasing complexity using scientific diagrams and labels, scatter graphs, bar graphs **(P)**	• WS6.4 know how to take measurements, using a range of scientific equipment safely, with accuracy and precision, taking repeat readings where appropriate **(P)** • WS6.5 record data and results of increasing complexity using classification keys, tables, line graphs **(P)**	• WS7.6 choose and use appropriate techniques and wider range of scientific equipment **(D)** • WS7.7 use a wide range of methods to make and record measurements **(D)** • WS7.8 apply sampling techniques **(D)**

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			• WS1.8 know how to perform simple tests with appropriate support **(P)**	• WS2.7 know how to perform simple tests with reduced support **(P)**					• WS7.9 have a knowledge of risk assessments during practical work **(D)**
Analysis	• WSN.4 know how to talk about what is happening **(P)**	• WSR.7 know how to make simple observations, explain why some things occur, and talk about changes **(D)** • WSR.8 know how to describe events in order **(P)**	• WS1.9 know how to use their observations and ideas to suggest answers to questions **(D)** • WS1.10 know how to explain what they have found **(D)**	• WS2.8 know how to use their observations and ideas to suggest answers to questions and what they could do next **(D)** • WS2.9 know how to explain what they have found and how they found it **(D)**	• WS3.8 know how to report on findings from enquiries, including oral and written explanations **(D)** • WS3.9 know how to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions with the support of others **(D)**	• WS4.8 know how to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions **(D)** • WS4.9 know how to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions independently **(D)**	• WS5.6 know how to report and present findings from enquiries, including conclusions and causal relationships, in oral and written forms such as displays and other presentations **(D)**	• WS6.6 know how to report and present findings from enquiries, including conclusions and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations **(D)**	• WS7.10 know how to explain data using scientific understanding **(D)** • WS7.11 know how to use simple statistical techniques, including means of data **(P)**
					• WS3.10 know how to use straightforward scientific evidence to answer questions or to support their findings **(D)**				

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					• WS3.11 know how to record findings using simple scientific language, drawings, labelled diagrams and tables **(P)**	• WS4.10 know how to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables **(P)**	• WS5.7 know how to present data using a variety of scatter graphs and line graphs **(P)**	• WS6.7 know how to present data using a variety of graphs **(P)**	• WS7.12 know how to present data in appropriate methods (tables, bar charts, line graphs) **(P)** • WS7.13 know how to identify patterns in data to draw conclusions **(D)**
					• WS3.12 know how to identify differences, similarities or changes related to simple scientific ideas and processes **(D)**		• WS5.8 know how to support or refute ideas or arguments using scientific evidence **(D)**		
Evaluating					• WS3.13 know how to use results to suggest improvements and raise further questions with the support of others **(D)**	• WS4.11 know how to use results to suggest improvements and raise further questions independently **(D)**	• WS5.9 know how to use test results to make predictions to set up further comparative and fair tests **(D)** • WS5.10 know how to discuss the degree of trust in results **(D)**		• WS7.14 evaluate data, including potential random and systematic errors **(D)** • WS7.15 identify further questions arising from results **(D)**
Measurements	• WSN.5 know the words; full, empty, long, short, fast, slow **(S)**	• SWR.9 know the difference between; full, empty, long, short, fast, slow	• WS1.11 use standard units appropriate for Year 1 **(P)**	• SW2.11 use standard units appropriate for Year 2	• WS3.14 use standard units appropriate for Year 3 **(P)**	• WS4.12 use standard units appropriate for Year 4 **(P)**	• WS5.11 use standard units appropriate for Year 5 **(P)**	• WS6.8 use standard units appropriate for Year 6 **(P)**	• WS7.16 using a range of standard units when measuring **(P)**

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Curriculum End Points The KKPDs are the input to the curriculum. The curriculum end points are the output. Curriculum end points capture the knowledge, skills and understanding that children should have at the end of each year. They build progressively over time so that children leave Year 6 well-prepared for the next stage of education as competent and capable scientist. For subject leaders, they provide a clear overview of the end of year expectations for each year group, which will support the planning and assessment of the curriculum. For teachers, they provide further clarity around what children should be able to do at the end of each year, using the knowledge they have gained from being taught the KKPDs. They support teachers to plan activities that help to develop children as effective scientists. They should be used to check what children know and how well they can apply this knowledge across the curriculum. For children, they ensure that they receive an equitable curriculum which gives them the substantive, procedural and disciplinary knowledge needed to be successful in their future studies. End points are taken from the National Curriculum Teacher Assessment Framework for Key Stage 1 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1125249/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_1.pdf) and Key Stage 2 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1119094/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_2.pdf).									

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	Children should be able to:	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**	**Children should be able to:**
	Recall the knowledge specified within the KKPDs for Nursery Use simple scientific vocabulary Ask 'who', 'what' and 'why' questions about what they see Communicate orally what is happening	Recall the knowledge specified within the KKPDs for Reception Use a wider range of scientific vocabulary Make simple observations and explain why things occur talking about changes Ask questions such as 'who; why; when; where and how' Make simple recordings of data	Recall the knowledge specified within the KKPDs for Year 1 Use appropriate scientific language from the Year 1 national curriculum Ask their own simple questions. Observe changes over time and with some support gather and record data Use simple equipment with some support where appropriate, to answer questions Notice patterns, with support, through scientific enquiry Group and classify things with support Carry out simple comparative tests with some support Find things out using secondary sources of information with some support	Recall the knowledge specified within the KKPDs for Year 2 Use appropriate scientific language from the Year 2 national curriculum Ask their own simple questions about what they observe Observe and explain changes over time and gather and record data Use simple equipment to answer questions Notice patterns through scientific enquiry with reduced support Group and classify things with reduced support Carry out simple comparative tests with reduced support Find things out using secondary sources of information with reduced support	Recall the knowledge specified within the KKPDs for Year 3 Use appropriate scientific language from the Year 3 national curriculum Ask their own questions about the scientific phenomena that they are studying and select the most appropriate enquiry to answer this with support Observe and explain changes over different periods of time with some support Make observations to notice patterns or to group things with increasing independence Find things out using secondary sources Use scientific equipment with support to take measurements or readings, Gather and record data and results to	Recall the knowledge specified within the KKPDs for Year 4 Use appropriate scientific language from the Year 4 national curriculum Independently, ask their own questions about the scientific phenomena that they are studying and select the most appropriate enquiry to answer their own scientific questions Observe changes over different periods of time with reduced support Through independent observations, notice patterns to group and classify things Carry out comparative and fair tests (considering change and continuity) Find things out independently using a wide range of secondary sources Use a wide range of scientific equipment to take	Recall the knowledge specified within the KKPDs for Year 5 Use appropriate scientific language from the Year 5 national curriculum Describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time) using evidence from a range of sources Confidently generate their own questions about the scientific phenomena that they are studying and select the most appropriate enquiry to answer their own questions, recognising variables where necessary Independently observe changes over different periods of time, noticing patterns or to group and classify things	Recall the knowledge specified within the KKPDs for Year 6 Use appropriate scientific language from the Year 6 national curriculum Competently generate their own scientific questions select the most appropriate enquiry to answer their own scientific questions., recognising and controlling variables where necessary Competently observe changes over different periods of time to notice patterns or group and classifying things Carry out comparative and fair tests (considering change and continuity) Find things out independently using a wide range of secondary sources Use a wide range of scientific equipment confidently to take accurate and	Recall the knowledge specified within the KKPDs for Year 7 Use appropriate scientific language from the Year 7 national curriculum Describe and evaluate how scientific theories change over time. Generate their own lines of scientific enquiry, identifying the dependent and independent variables Choose and accurately use appropriate techniques and a wider range of scientific equipment Present data using the most appropriate method and explain data using

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			Communicate their ideas, what they do and what they find out in a variety of ways with some support	Communicate their ideas, what they do and what they find out in a variety of ways with reduced support	answer a scientific question Draw simple conclusions (including cause and consequence), and communicate verbally using scientific language	measurements or readings Gather and record data and results in a variety of ways to answer a scientific question Draw simple conclusions (including cause and consequence and change and continuity) and communicate them in a written form Raise further questions that could be investigated, based on their data and observations	Carry out comparative and fair tests (considering change and continuity) Use a wide range of scientific equipment confidently to take increasingly accurate and precise measurements or readings, with repeat readings where appropriate Record data and results with increasingly complexity such as scientific diagrams and labels, scatter graphs and bar graphs Draw conclusions, and explain their methods and findings, communicating these in a variety of ways (including comments on cause and consequence, change and continuity and similarity and difference)	precise measurements or readings, with repeat readings where appropriate Record data and results with increasing complexity such as classification keys, tables and line graphs Draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways (including comments on cause and consequence, change and continuity and similarity and difference)	scientific understanding Evaluate data, and method and identify potential random and systematic errors