Rationale and National Curriculum Coverage

The Primary Knowledge Curriculum aims to enable children to understand the world around them through a scientific lens. In doing so, this curriculum seeks to ensure that pupils are well-equipped to go forth into their secondary education and later life with curiosity, passion and a desire for discovery.

Pupils will be taught units of work that cover and go beyond the requirements of the National Curriculum. As a result, pupils gain a deep understanding of science as a unique discipline, constituting of the three strands of biology, chemistry and physics. Alongside this, pupils will also encounter a series of units that develop their understanding of Earth Science, developing their understanding of environment and sustainability. Pupils will build a body of key foundational science knowledge as they work through the curriculum, asking questions and developing a sense of curiosity about the world around us. The curriculum will build disciplinary literacy for pupils, enabling them to communicate scientific understanding through diagrams and written explanations in increasing depth and complexity as they progress through the primary phase.

The Primary Knowledge Curriculum builds knowledge incrementally. Pupils have multiple opportunities to secure and build upon their knowledge by revisiting subject content at carefully sequenced points throughout the curriculum. By building upon their knowledge in a cumulative manner, the curriculum ensures pupils secure greater breadth and depth in their understanding of scientific knowledge, skills and the discipline of science. The Human Body strand taught in all year groups is a prominent example of how pupils' understanding progresses over time to achieve this. This progression helps children to master the knowledge and concepts whilst simultaneously building up an extended subject-specific vocabulary that enables them to communicate their knowledge. This incremental approach helps teachers to identify knowledge gaps and easily look back at previous content to see what they need to address.

Pupils will be encouraged to use the knowledge they learn in science and apply it to investigations that test a hypothesis or set out to answer a question. The curriculum builds pupil understanding of disciplinary knowledge over time. Importantly, substantive scientific knowledge is taught first, before pupils are asked to undertake enquiry. This helps them to fully understand the elements of the enquiry first, and to make informed observations about the processes they see. Gathering information, recording data, graphing data and interpreting findings are all essential skills that pupils will apply to new contexts as they work through the curriculum. Each of these will develop the pupil's ability to clearly communicate their scientific understanding.

Disciplinary knowledge is developed through the working scientifically criteria laid out on the lesson plans. To compliment this, pupils will also develop their understanding of the five types of scientific enquiry: observing over time; pattern-seeking; identifying, classifying and grouping; comparative and fair testing; and researching using secondary sources. Scientific enquiries will provide children with a wealth of opportunities to explore what they have learnt. Most importantly, they will help to deepen pupil understanding of the nature, processes and methods of science as a discipline, and how it differs from other subjects they are studying.

Pupils will encounter people who have made significant contributions to the field of science over time, learning that science has been a quest for understanding for many years, and will continue to be so in the future. They learn that the people who have contributed to science, from Ancient Baghdad to Ancient Rome and beyond, are diverse and many voices make up the history of scientific enquiry. For example, pupils learn about the work of scientists such as Lewis Howard Latimer, who invented the carbon filament that allowed Edison's lightbulb to light up the world, and Jabir ibn Hayyan, who is thought to have invented a crucial tool for the distillation process: the alembic.

Working Scientifically Coverage

Working Scientifically KS1 Statutory	Year 1						Year 2					
	The Human Body	Animals and their Needs	Seasons and Weather	Taking Care of the Earth	Plants	Materials and Magnets	The Human Body	Living Things and their Environments	Electricity	Plants	Materials and Matter	Astronomy
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Notes and guidance (non-statutory)												
use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ask people questions and use simple secondary sources to find answers	✓		✓	✓		✓	✓		✓		✓	
use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out	✓		✓		✓	✓		✓	✓	✓	✓	
record and communicate their findings in a range of ways and begin to use simple scientific language (with help)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Working Scientifically Lower KS2 Statutory	Year 3						Year 4					
	The Human Body	Cycles in Nature	Plants	Light	Rocks	Forces and Magnets	The Human Body	Classification	Ecology	Sound	States of Matter and the Water cycle	Electricity
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	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
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.	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
Notes and guidance (non-statutory)												
recognise when a simple fair test is necessary and help to decide how to set it up			✓	✓	✓	✓	✓			✓	✓	✓
talk about criteria for grouping, sorting and classifying; and use simple keys	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
how to use new equipment, including thermometers and data loggers		✓			✓	✓	✓			✓	✓	✓
collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done									✓	✓		✓
recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	✓	✓	✓		✓			✓	✓		✓	
use relevant scientific language to discuss their ideas and communicate their findings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Working Scientifically Upper KS2 Statutory	Year 5						Year 6					
	Human Body	Materials	Living Things	Forces	Astronomy	Meteorology	The Human Body	Classification	Electricity	Light	Reproduction	Evolution
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Notes and guidance (non-statutory)												
plan the most appropriate type of scientific enquiry to use to answer scientific questions	✓	✓	✓	✓			✓		✓	✓	✓	
recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why	✓	✓		✓			✓		✓	✓	✓	
use and develop keys and other information records to identify, classify and describe living things and materials	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them		✓		✓			✓		✓	✓	✓	
choose the most appropriate equipment to make measurements and explain how to use it accurately		✓		✓		✓	✓		✓			
decide how to record data from a choice of familiar approaches	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
look for different causal relationships in their data and use relevant scientific language and illustrations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
use their results to identify when further tests and observations might be needed	✓	✓		✓			✓		✓	✓		
talk about how scientific ideas have developed over time	✓		✓		✓	✓	✓	✓	✓	✓		✓