Rationale and National Curriculum Coverage

The PKC Science curriculum aims to equip children with the foundations for understanding the world through a scientific lens. Pupils will be taught units of work that cover and go beyond the requirements of the National Curriculum in the specific disciplines of biology, chemistry and physics. Pupils will encounter people who have made significant contributions to the field of science over time, understanding that science has been a quest for understanding for many years, and will continue to be so in the future. 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.

Following the PKC Science curriculum will give children an introduction to fascinating content such as the inner workings of the human body, animals and the environments they live in, plants and their features, forces in nature, what lies beyond the visible and what lies beyond the planet we live on. Over time their knowledge will deepen moving from recognising and naming parts of the human body to understanding how our muscles work, how our blood moves around our body and how our nervous system helps us to interact with the world.

Pupils will be encouraged to use the knowledge they learn in Science and apply it to investigations that test a theory or set out to answer a question. 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. Enquiries include observing over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing and researching using secondary sources. Scientific enquiries provide children with a wealth of opportunities, but first and foremost they will help to deepen understanding of the nature, processes and methods of science as a discipline and how it differs from other subjects they are studying. Pupils will gain an understanding of the purpose and uses of science both today and in the future.

Throughout the science curriculum, children are taught that scientific discoveries have been made since time began around the world. The children 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. In Year 5 children learn about Jabir ibn Hayyan who is thought to have invented a crucial tool for the distillation process: the alembic. In Year 1 children learn about their senses and reflect upon the challenges faced by Helen Keller who achieved a university degree despite being blind and deaf from her early childhood. Importantly in Science, over time, children learn about scientists and their search for the truth. 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 story of science.

Our science curriculum builds knowledge incrementally. Pupils have multiple opportunities to secure and build on their knowledge and understanding as subject content is revisited at points throughout the curriculum. This helps children to master the knowledge and concepts whilst building up an extended specialist vocabulary. This incremental approach helps teachers to identify knowledge gaps and look back at previous content if they need to close gaps in knowledge or understanding. Our curriculum enables children to understand the important role that science plays in the sustainability of life on earth. We want children following this curriculum to be equipped to go forth into their secondary education with curiosity, passion and a desire for discovery.

National Curriculum Coverage

Working Scientifically KS1	Year 1							Year 2				
	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
Statutory												
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												
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)		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓

National Curriculum Coverage

Working Scientifically Lower KS2	Year 3						Year 4					
Statutory	**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												
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	✓		✓		✓		✓					
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			✓		✓				✓			
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						✓			✓	✓		
use relevant scientific language to discuss their ideas and communicate their findings		✓				✓		✓		✓	✓	✓

National Curriculum Coverage

Working Scientifically Upper KS2	Year 5							Year 6				
Statutory	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												
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 identify evidence that refutes or supports their ideas	✓	✓		✓	✓				✓			
use their results to identify when further tests and observations might be needed	✓	✓		✓			✓		✓			
talk about how scientific ideas have developed over time	✓				✓					✓		