Science Curriculum

Intent and Implementation



Our School Vision:

Recognising the unique light that shines in every individual, we strive to 'encourage one another and build each other up' (1 Thessalonians 5:11) to ensure that all can thrive. Through our core Christian values of Love, Hope and Justice, we inspire learning for life, empowering everyone to flourish and make a positive difference in the world.

Curriculum Intent:

- To develop articulate, resilient and empowered citizens who make a difference to others
- To provide a coherent and ambitious curriculum that leads to a greater depth of understanding for all
- To inspire pupils with purposeful and interconnected learning experiences

Intent

At Preston Candover CE Primary, our vision is to give children an ambitious science curriculum that inspires our pupils to explore and discover the world around them. We aim to nurture children's curiosity through a curriculum that uses purposeful exploration, observation, questioning and investigation to develop both scientific knowledge and an understanding of how science helps us to explain the world around us. Through these experiences, children develop a secure and connected body of scientific knowledge alongside an understanding of how scientific knowledge is developed, tested and refined, while nurturing a lifelong interest in science.

Key scientific concepts are carefully sequenced, revisited, consolidated and connected across the key stages, enabling pupils to build increasingly secure and sophisticated explanations of the world around them. Through and alongside this substantive knowledge, pupils progressively develop the disciplinary knowledge needed to work scientifically and understand how scientific knowledge is developed. Pupils develop their understanding through a range of scientific enquiry, including observing over time, identifying and classifying, pattern seeking, comparative and fair testing, and researching using secondary sources. They learn how to make careful observations and measurements, use scientific equipment, record and represent data, identify patterns, use evidence to draw conclusions and develop scientific explanations. Practical and fieldwork experiences are used purposefully to deepen scientific understanding and develop pupils' knowledge of how scientists gather and use evidence.

Our children will leave Preston Candover CE Primary with a secure understanding of the key scientific ideas they have studied and an increasingly sophisticated understanding of what it means to think and work scientifically. They will be able to use their scientific knowledge, evidence and vocabulary to describe, explain and ask questions about the world around them, developing the scientific literacy needed to engage confidently with science in their everyday lives.

Implementation

Our science curriculum is based on the National Curriculum Science programme of study. We use the Hampshire Science Learning Journeys from HIAS to support our curriculum planning. These break down the National Curriculum objectives into Substantive and Disciplinary knowledge which are both taught within every unit of study. These break down the National Curriculum objectives into substantive and disciplinary knowledge, both of which are deliberately taught within every unit of study. Substantive knowledge (Key Ideas) is organised into knowledge blocks within each unit. Teachers progress through these knowledge blocks in a carefully sequenced order, explicitly building on pupils' prior learning and making connections between key ideas so that pupils develop increasingly secure and connected scientific understanding. Teachers use pupils' prior knowledge and understanding to identify potential misconceptions and adapt teaching where necessary, ensuring that pupils develop increasingly accurate scientific explanations.

Across the key stages, pupils encounter a range of enquiry approaches, including observing over time, identifying and classifying, pattern seeking, comparative and fair testing, and research using secondary sources. Through these enquiries, pupils develop both their scientific knowledge and their understanding of how science works. Rather than simply completing practical activities, pupils are explicitly taught the knowledge of how and why scientists work in particular ways. This corresponds directly to the 'Working Scientifically' expectations of the National Curriculum but further refines these expectations into four categories, 'knowledge of scientific methods', 'knowledge of apparatus and techniques', 'knowledge of data analysis and presentation', 'knowledge of how science uses evidence to develop explanations'.

Practical and fieldwork experiences are planned with a clear learning purpose. Teachers select practical activities because of the substantive or disciplinary knowledge they enable pupils to develop, ensuring that practical work deepens scientific understanding rather than becoming an end in itself.

The science curriculum is planned over a two-year cycle through long- and medium-term planning, ensuring that pupils encounter the full breadth of the National Curriculum while following a coherent progression of substantive and disciplinary knowledge. The mixed-age structure is carefully considered when sequencing learning so that pupils build on prior knowledge and experience appropriate progression in their scientific knowledge and understanding. Science is taught every week.

Important scientific knowledge is regularly revisited and consolidated through questioning, discussion and retrieval opportunities, enabling pupils to retain key ideas and make connections with new learning.

Teachers use Oak National Academy science resources alongside the Hampshire Science Learning Journeys to support planning and teaching. These resources provide an evidence-informed foundation which teachers adapt and supplement to reflect our curriculum sequence, pupils' prior knowledge and identified needs, ensuring appropriate depth and challenge.

Explorify is used purposefully to stimulate curiosity, elicit prior knowledge and misconceptions, develop scientific vocabulary and provide opportunities for pupils to observe, question, predict, reason and explain. Activities are selected and linked to the intended scientific learning rather than used as stand-alone enrichment.

Science teaching and learning at Preston Candover CE Primary School uses our local environment where possible to provide authentic contexts for observation, investigation and fieldwork**,** alongside a range of scientific resources to meet the needs of the curriculum. An annual STEM week provides additional opportunities for pupils to apply scientific knowledge and disciplinary thinking in unfamiliar and meaningful contexts, making connections between science, technology, engineering and mathematics

Science for every child

We seek to ensure that all pupils make good progress in their science learning and develop the knowledge and understanding needed to engage confidently with the subject. This is achieved in a variety of different ways.

Science lessons begin with a clear revisit and review of substantive knowledge already taught. This provides regular opportunities for pupils to retrieve, consolidate and strengthen their understanding, particularly where further practice is needed to support long-term retention. Teachers use assessment during lessons to identify gaps in knowledge and misconceptions and adapt teaching where necessary.

During science lessons, pupils are provided with appropriate scaffolding where needed. Careful task design keeps the focus on the key scientific learning and ensures that pupils are able to engage with the intended knowledge without unnecessary barriers. Pupils are supported to develop both their substantive and disciplinary knowledge, including the vocabulary, concepts and procedures they need to work scientifically.

We ensure that the teaching of science does not disadvantage pupils with SEND by maintaining ambitious curriculum expectations while adapting teaching and support to meet individual needs. Supportive resources, visual representations and concrete examples are used where appropriate to help pupils access and understand scientific ideas. Pupils are not routinely given a reduced or less ambitious science curriculum.

Key scientific vocabulary, referred to as our Preston Words, is clearly displayed and explicitly taught, modelled and referred to throughout science lessons. Pupils have opportunities to discuss their ideas with others, explain their thinking and refine their understanding through purposeful scientific talk.

Through these approaches, we aim to ensure that all pupils, including those with SEND, have regular opportunities to build, practise, remember and apply scientific knowledge and to develop the disciplinary knowledge needed to work scientifically.

Assessment

Assessment of pupils' learning in science takes different forms and is used to check that pupils are developing, remembering and applying the intended substantive and disciplinary knowledge.

Formative assessment is used regularly by the class teacher throughout lessons to monitor pupils' scientific understanding, knowledge and ability to work scientifically. Teachers use questioning, discussion, observation of pupils' practical work and responses to tasks to identify gaps in knowledge, misconceptions and areas where pupils require further support or challenge. This assessment is used to inform subsequent teaching, scaffolding and opportunities for pupils to consolidate and extend their learning.

Every science unit of study begins with a form of retrieval activity; this may be a mindmap for example. This provides teachers with an opportunity to identify pupils' prior knowledge, misconceptions and starting points, allowing teaching to be adapted where necessary. Throughout the unit, teachers revisit and assess both substantive knowledge and disciplinary knowledge, checking not only what pupils know but also whether they can use their knowledge to work scientifically.

Summative assessment is also conducted at the end of each unit of study in each class/year group. This takes the form of a booklet containing questions based on the key ideas taught. Assessment also provides opportunities to revisit previously taught scientific knowledge, enabling teachers to check what pupils remember over time rather than assessing only the most recently taught content.

The results of these assessments are used by teachers and the subject leader to identify pupils who require further support or challenge, as well as scientific knowledge or concepts that are not yet securely embedded. Assessment information is used to inform future planning, teaching and curriculum development.

Through this approach, teachers can build a picture of what pupils know, remember and can apply in science, including their developing disciplinary knowledge and ability to work scientifically. This helps us to ensure that pupils are not simply covering the science curriculum, but are developing increasingly secure, connected and retained scientific knowledge.

What makes a Preston Candover Scientist?

End of KS1: A Preston Candover scientist knows how to ask questions about the world, make careful observations, carry out simple tests and enquiries, record what they find, and use their observations to notice patterns and suggest answers.

End of KS2: A Preston Candover scientist knows how to ask relevant questions, plan and carry out different types of scientific enquiry, make careful and accurate measurements, record and present data, identify patterns, and use evidence and scientific ideas to draw and communicate conclusions.