Science Curriculum

Intent

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of, 'The National Curriculum programmes of study for Science 2014' and, 'Understanding of the World' in the Early Years Foundation Stage. Science teaching at St Paul's is inclusive of all pupils' needs. It is our intention to develop a lifelong curiosity and interest in the science. We intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the school, they build upon core skills in working scientifically, which underpins our approach to science. Alongside this, children build upon scientific knowledge. Children will develop independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. Where possible, Science can be linked to wider curriculum topics. Teachers plan around our established skills progression map to suit the interests and current events relating to the current cohort and academic year.

Science in Early Years aims to enable children to:

Three and Four-Year-Olds Communication and Language

- Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"

Physical Development

- Make healthy choices about food, drink, activity and toothbrushing.

Understanding the World

- Use all their senses in hands-on exploration of natural materials.
- Explore collections of materials with similar and/or different properties.
- Talk about what they see, using a wide vocabulary.
- Begin to make sense of their own life-story and family's history.
- Explore how things work
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant and an animal.
- Begin to understand the need to respect and care for the natural environment and all living things.
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice.

Reception

Communication and Language

- Learn new vocabulary.
- Ask questions to find out more and to check what has been said to them.
- Articulate their ideas and thoughts in well-formed sentences.
- Describe events in some detail.
- Use talk to work out problems and organise thinking and activities.
- Explain how things work and why they might happen.
- Use new vocabulary in different contexts.

Physical Development

Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian

Understanding the World

- Explore the natural world around them.
- Describe what they see, hear and feel while they are outside.
- Recognise some environments that are different to the one in which they live.
- Understand the effect of changing seasons on the natural world around them.
- ELG Communication and Language Listening, Attention and Understanding.
- Make comments about what they have heard and ask questions to clarify their understanding. Personal, Social and Emotional Development Managing Self
- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
- Understanding the World The Natural World
- 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.

Science in Years 1- 6 aims to enable children to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- ensure children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Implementation

As a school within Bishop Hogarth Catholic Education Trust, we teach a scheme of work designed by a transition team of our primary school staff working with subject specialists from our secondary schools. This means our curriculum has been designed to ensure clear progression, in the acquisition of knowledge and key skills, building on pupil's prior learning.
Our curriculum covers the National Curriculum and is underpinned by the building blocks of Scientific Threshold Concepts.
Threshold Concepts are emphasised and reinforced across the curriculum in KS1 and 2, with further progression streamlined into KS3. Our curriculum is designed to ensure concepts are systematically revisited; current learning is linked to previous learning to allow children to build strong schema within their long-term memories. This ensures that pupils know more and remember more as they move through primary school, ensuring that they can draw from prior learning experiences.

Our threshold concepts are:

	Animals, humans and plants are made up of complex interacting systems in order to function.		The particle theory of matter is the idea that helps us to develop an understanding of why **materials** behave as they do
	Organisms require a supply of energy to carry out the **basic functions of life** and to grow.		**Energy** is a powerful and unifying abstract idea which is difficult to define.
	The **Earth** is a complex of interacting rock, water, air and life.		**Forces** change the state of rest or motion of a body. They hold matter together and interplay between all objects.

The acquisition and application of key scientific knowledge is an integral part of our science lessons at St Paul's. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. Our Progression of Skills document details carefully mapped objectives which aim to build upon and revisit key concepts with regularity in order to embed key scientific knowledge and vocabulary. Each lesson has a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. Children complete investigations and practical activities to embed scientific knowledge through kinaesthetic learning. Lessons are sequenced to embed scientific knowledge and skills, with each lesson building on previous learning. Regularly review opportunities arise through each topic taught to evaluate children's understanding and adapt future learning. Activities are effectively differentiated so that all children have an appropriate level of support and challenge.

Teachers have flexibility to deliver lessons in a way most suited to their cohort's learning needs, overarching themes and interests. All science curriculum units are taught as outlined on our Curriculum Map. Teachers may choose to block science sessions or to deliver sessions weekly.

Impact

Children who feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations, recognising the importance of science in the real world.

Science impact is measured in the following ways.

- short-term - an informal part of every lesson checking pupil understanding to inform teaching progression and address misconception.
- medium-term –Mini assessments / end of unit work will assess pupil learning at a topic end point. Progress will be recorded at the end of each unit on our core objective tracker situated in pupil books.
- long-term - End of year information will be reported to parents and the child's next teacher at the end of each academic year.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.
- A richer vocabulary which will enable children to articulate their understanding of taught concepts.
- High aspirations and the firm foundations of the science curriculum which will see them through to further study at Key Stage 3 and beyond.