Science

Vision: 'Every child a Scientist!'

"Everybody starts out as a scientist. Every child has the scientist's sense of wonder and awe."
Carl Sagan

At Binfield, our aim is to enthuse and inspire children to develop a lifelong love of Science.

Our vision is to provide an exciting and engaging Science curriculum which enables pupils to explore and discover the world around them. This enables our children to have a deeper understanding of the world we live in. We do this through exciting, practical, hands-on experiences, which encourage curiosity and foster learning both indoors and outdoors. We want children to leave our school understanding the fundamental role that Science plays in the past, present and future.

Intent: What do we hope to achieve by teaching Science?

During their time at Binfield C.E. Primary School (V.A.) we aim for all pupils to experience being and developing the characteristics needed to be a competent Scientist.

We believe that the 'Essential Characteristics' of a scientist are:

• The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.

• Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.

• Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.

• High levels of originality, imagination or innovation in the application of skills.

• The ability to undertake practical work in a variety of contexts, including fieldwork.

• A passion for science and its application in past, present and future technologies.

Implementation: How is Science organised and taught.

The Science curriculum is based upon the Early Years Foundation Stage Curriculum (2021) and the National Curriculum (2014). In YR, Science is mainly integrated within the 'Knowledge and Understanding of the World' specific area of learning. In Years 1-6, we follow the White Rose Curriculum.

Children will be building scientific knowledge of fundamental foundations which will then enable children to then apply these skills involving some degree of decision making. It is our aim that children will then be able to develop a deep cognitive demand that involves non-standard, non-routine, inter-connected, multi-step thinking in problems with more than one possible solution, with reasoning and justification.

All Science lessons need to provide opportunities for Scientific enquiry and these skills should progress as children move through each Key Stage. Children in each year group are provided with knowledge planners to support and deepen their understanding of new topics and these will include links to prior and future learning, key learning and key scientific vocabulary.

At Binfield, we are fortunate to have an outdoor learning resource; the Binfield Outside Learning Environment (BOLE) which naturally lends itself to develop children's understanding of the natural world and to the study of living things. The BOLE also provides a rich resource for the study of patterns and long and short-term change. Children from YR to Year 6 have use of the BOLE twice weekly providing regular opportunities for children to make links, explore and observe over time.

Spiritual, Moral, Social and Cultural (SMSC) Development through Science

Science is a subject full of 'awe and wonder' and encourages the spiritual, moral, social and cultural development of children.

Spiritual Development

Science provides a wealth of opportunities for children to develop spiritually. They explore, through the Science curriculum, the wonders of nature, of themselves and of the world around them. Their learning evokes curiosity about the workings of the world, of life itself and of how and why things are the way they are. Through Science, children learn to consider and respect different ideas and come to their own conclusions.

Moral Development

Through learning about their environment, we encourage children to question their impact on our planet, both individually and globally. Exploring everyday materials allows children to learn about alternative uses for materials, considering sustainability and thinking about which materials we can recycle. Children are expected to respect their school environment and take responsibility for keeping it tidy, recycling food (to liase with the kitchen) and materials and not wasting water or energy. Children are also encouraged to consider their responsibility for keeping themselves healthy and the impact that various choices, including diet, exercise, drugs and lifestyle, might have on this. In addition to this, we have Eco Warrior representatives throughout the school which enables children to feel empowered, consider environmental issues and understand that they can make a difference in the world they live in.

Social Development

At Binfield, working together, in pairs or groups and supporting others is a key part of Science lessons. Children are encouraged to listen to different opinions, participate cooperatively and make

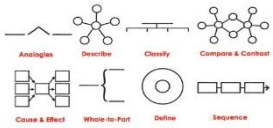
their own choices. This helps them to develop the ability and opportunity to take active roles within a group, such as making suggestions about ways to investigate or research a topic or idea. Throughout any discussions, children are encouraged to explore and respect the values and beliefs of different people.

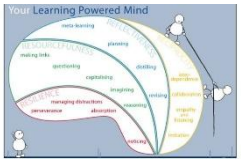
Cultural Development

Children are encouraged, as they learn about Science, to consider the uses and impact that scientific discovery has had on our lives, from the everyday objects we use, to energy sources and how Scientific knowledge and techniques have changed our lives.

Children are helped to understand the importance of creativity and risk taking and to look at scientific development from around the world and a wide range of male and female scientists. Children are also given opportunities to understand diversity through finding and discussing similarities and differences within plants and animals, including humans. Later, children will learn about inheritance of characteristics from parents to offspring and how this provides differences between and within communities.

'Power Tools for Learning





'Power Tools for Learning' are at the heart of our school's curriculum and we are a recognised 'Advanced Thinking School' (Exeter University). 'Power Tools' are a range of skills, attributes and tools taught from Year R upwards, which support pupils in becoming more independent, thinkers and learners. They include: De Bono's Thinking Hats, Hyerle's Thinking Maps, Claxton's Learning Muscles. Furthermore, within our curriculum, Bloom's Taxonomy (a model/hierarchy of thinking which starts at a simple level and becomes more complex) is integral, ensuring that deeper thinking and learning is required as pupils advance through each stage of learning.

Furthermore, within our curriculum and, Bloom's taxonomy (a model/hierarchy of thinking which starts at a simple level and becomes more complex) is integral, ensuring that deeper 'thinking and learning' is required as pupils advance through each stage. Together, these support staff in ensuring that suitable cognitive challenges are integrated across the curriculum and that pupils are equipped with the skills to learn independently, beyond school. We aim to ensure that all pupils are well prepared for the next stage of their educational careers by the time they leave us in Year 6.

Impact: What difference does it make and how do we know?

In determining the impact of the Science curriculum, we are essentially asking the question, 'How well have pupils developed the essential characteristics of a Scientist (as defined above in our **Intent**)?'

We use 2 main methods to determine this: *1. Assessment (quantitative)* and 2. *Feedback from the pupils, their parents and other stakeholders (qualitative).*

Assessment

At Binfield C.E. Primary School (VA), we assess YR pupils using the EYFS 'Development Matters Framework'. For Years 1-6, we use our own 'bespoke assessment' based on a 'best fit' model of what a typical child should achieve in each subject area. Assessment in an ongoing process and is used whilst teaching to support pupil learning - revising and revisiting knowledge as necessary, ensuring that pupils 'keep up' rather than 'catch up'. Enquiry questions are used as a tool at the beginning of a unit to inform staff and pupils of the intended learning and are answered at the end as a way of assessing learning.

A summative assessment is made for each child against the typical/expected standard and a determination made as to whether they have met the standard or not is recorded on the school's tracking system.

In YR, pupils are assessed using on-going observation and questioning from staff. Evidence is used to build up a picture of the child's achievements and level of independence over time and summative assessments are made each term. At the end of YR, a determination is made as to whether the child has met the Early Learning Goal.

Feedback

We also value the feedback from the pupils themselves and from other stakeholders. These are captured informally (during lessons, after concerts/performances) but also more formally too e.g. through questionnaires and comments submitted to the school.