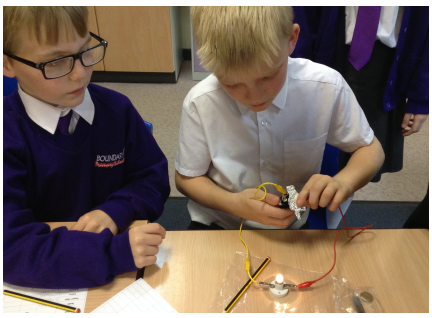
## Science at Boundary Primary School

# "The Science of today is the technology of tomorrow" – Edward Teller



**Intent**

Science teaches an understanding of the world that we live in and aims to stimulate a child's curiosity to find out how and why things happen in the way they do. It teaches methods of enquiry and investigation to encourage creative thought. Children learn to ask scientific questions and are encouraged to engage in questioning and discussion about science-based issues which affect their lives, the society in which they live and the world as a whole.

The objectives of teaching science are to enable children to:

- ask and answer scientific questions;
- actively explore the environment;
- plan and carry out scientific investigations;
- know and understand the life processes of living things;
- know and understand the physical processes of materials, electricity, light, sound, and natural forces;
- know about the nature of the solar system, including the earth;
- evaluate evidence, and present their conclusions clearly and accurately.

**Implementation**

Starting in Foundation, our children are given lots of opportunities to explore and investigate, through first hand exploration. We aim to develop lively, enquiring minds. Science is taught through the areas of learning in accordance with the EYFS document and the National Curriculum for KS1 and KS2. We focus on the development of key concepts over a child's time in Boundary. The detail of substantive and disciplinary knowledge is mapped out and children learn the way in which these are linked.

We use a variety of teaching and learning styles in science lessons, ensuring that cover the fields of enquiry; observing over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing and researching using secondary sources. Our principal aim is to develop children's knowledge, skills, and understanding and to encourage our children to ask questions and plan enquiries. Core vocabulary is mapped out and taught to enable pupils to talk about the phenomena they are learning about.

We encourage the children to ask, as well as answer, scientific questions in order to make sense of the world and develop their understanding of the scientific processes that are vital to all of our lives and to the future well-being and prosperity of the world we live in. Experiences of science in the wider world, such as museum visits build background knowledge for children and area used to support classroom learning. Boundary has a strong link with the local secondary school's science department and Years 3, 4,5 and 6 all experience a science lesson there during the year. During a child's time at Boundary, they will experience a range of educational visits and visitors to further develop their scientific knowledge, skills and understanding. Boundary celebrates an annual 'science day' which involves conducting a range of fun and interesting investigations to inspire and motivate the children in developing their scientific knowledge and understanding.

The National Curriculum programmes of study for science are set out year-by-year for Key Stages 1 and 2. We are however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, school has the flexibility to introduce content earlier or later than set out in the programme of study and may introduce key stage content during an earlier key stage if appropriate and revisit them at a later stage. Teachers will base their planning on the programmes of study, as set out in our Science Curriculum Overview. Teachers use a range of resources to support the planning of science:

- STEM
- Pzaz
- Hamilton Trust
- ASE
- The Ogden Trust
- Explorify
- https://wowscience.co.uk
- https://pstt.org.uk/resources/curriculum-materials

Children use a range of technology in science lessons to enhance their learning. They take part in role-play and discussions, and present information to the rest of the class. We encourage co-operation, sensitivity and tolerance of each other in a wide variety of problem-solving activities within the classroom. We encourage children to express their views and evaluate decisions about science related matters. 'Flashbacks' are used to revisit key aspects of learning (activation of prior knowledge) at the beginning of every lesson.

Scientist are taught which are closely related to the content pupils are learning about. A range of scientists are mapped out that tackle stereotypes and avoid the children forming narrow conceptions of what a scientists looks like.

**Science Curriculum Overview:**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Nursery | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World |
| Reception | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | UUnderstanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World | Understanding the World<br>ELG: The Natural World |
| Year 1 | Animals including Humans (Humans)<br>Seasonal Changes | Everyday Materials<br>Season Changes | Animals including Humans (Animals)<br>Seasonal Changes | Living Things and their Habitats<br>Seasonal Changes | Plants<br>Seasonal Changes | Consolidation<br>Season Changes |
| Year 2 | Living things and their Habitats<br>Seasonal Changes | Use of everyday Materials<br>Seasonal Changes | Electricity<br>Seasonal Changes | Animals including Humans | Plants<br>Seasonal Changes | Consolidation<br>Season Changes |
| Year 3 | Forces and Magnets | Rocks | Animals including Humans | Light | Plants | Consolidation<br>Season Changes |
| Year 4 | States of Matter | Animals including Humans | Electricity | Living Things and thier Habitats | Sound | Consolidation<br>Season Changes |
| Year 5 | Earth and Space | Properties and changes of Materials | Animals including Humans | Forces | Living things and their Habitats | Consolidation<br>Season Changes |
| Year 6 | Light | Electricity | Living Things and their Habitats | Evolution and inheritance | Animals including Humans | Consolidation<br>Season Changes |

**Assessment**

Pre-assessments are carried out in the form of a 'Flashback'. This includes revisiting prior learning from previous years groups and addressing any misconceptions or missed knowledge before moving on. Discovering prior knowledge allows the teacher to present

new information at an appropriate level for the children. Formative assessment continues throughout the learning process, so lessons can be adjusted according to children's need. At the end of a unit, a short quiz is taken to assess substantive knowledge, and the teacher uses this information as a focus for the consolidation unit during summer 2. The consolation unit is an opportunity to revisit the science which has been taught throughout the year and reassess the children. Disciplinary knowledge is assessed throughout the half term.

During the unit, misconceptions are addressed and rectified before moving on to new learning.

From the formative assessment , teachers make a judgement at the end of each term on O'track (assessment tracking programme) to show if the child is working towards, is at or is above the expected standard.

**EYFS**

Science at Foundation Stage (reception and nursery) is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

Early Years Science also helps children with skills in other Foundation Stage areas of the National Curriculum, such as Physical Development and Expressive Arts and Design. During the early years at school, children will explore creatures, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. For example, they may look at an egg whisk, sand, paper and water to learn about things that are natural and manmade and their different functions. They will also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. They will make observations of animals and plants and explain why some things occur and talk about changes.

The children are encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels, or opening a mechanical toy to see how it works. The children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

**Impact**

- Children gain knowledge and an understanding about the world around them and how and why things work
- Children can use Scientific vocabulary accurately.
- Children show enjoyment enthusiasm for science
- Children are showing an increasing independence in investigations
- Children are developing and improving their scientific and enquiry skills
- A progressive curriculum building on what children already know
- Improved science outcomes: End of KS2 84%, End of KS1 76.5%