Beechwood Primary School's Statement of Intent for Science

At Beechwood, the Science curriculum is rooted in the school's underlying aims, ethos and values. It is carefully designed to equip our pupils with the scientific knowledge, skills, understanding and attitudes that will both prepare them for the next stage in their education and enable them to live successful lives in the future. The curriculum enhances the existing SMSC provision at Beechwood by allowing children to develop a sense of awe and wonder, develop their awareness of the changing world around them, understand the consequences of their actions and develop personal qualities and social skills through group and practical work (see separate document: 'SMSC at Beechwood Primary School' for more information). We aim to inspire all of our students to make informed decisions and think in scientific ways through our enquiry skills and approaches, so that they become increasingly confident in asking and answering questions. We want all children to see themselves as scientists!

Aims

The Beechwood science curriculum aims 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 scientific enquiry;
- Ensure that pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future;
- Use specialist terminology accurately and precisely, progressively building up a vocabulary to describe and explain scientific characteristics, processes and concepts;
- Cultivate a questioning, critical attitude and a curiosity about the world.

Key Concepts and Ideas

Key concepts and ideas that are revisited throughout school are:

Physical and Chemical Processes: different substances have particular properties and react and combine together in different ways.
Forces: different forces, such as heat, light, sound, gravity and electricity, affect objects in different ways.
Life Processes: living organisms have specific life processes and relate to their environment in different ways.
Scientific methodology: hypothosising, predicting, investigating and drawing conclusions from different sources of evidence is the basis for the advancement of scientific knowledge and understanding.

Rationale for the order of teaching

EYFS – In Nursery and Reception, children are introduced to key scientific principals through their play-based learning and topic work. Through their Autumn topics, children learn about themselves and become more aware of their bodies. In Spring, children explore concepts of creating mixtures and exploring different materials, the key building blocks of chemistry. The children learn about New Life and are introduced to simple life cycles and classification. This prepares them for Year One, where they will learn more about vertebrates and identifying plants and their parts. In EYFS, the children learn about animals and plants in our immediate area and in other countries. This involves lots of hands-on exploration and creates a solid foundation for biology work in the future. Principals of physics are introduced through 'Understanding the World' work, learning about forces and technology through exploration of the World around them.

Year 1 – Throughout the year, students build on their EYFS knowledge of the seasons, looking at the changing world around them and to use language related to this. Children also continue to develop a sense of themselves. They are taught about the human body, naming body parts and senses and comparing humans with other animals. They name objects and identify what they are made of. They are encouraged to explore the properties of everyday materials in the local area and explore flowering plants and trees. Children carry out investigations using their own flowering plants to look at what helps plants grow.

Year 2 – Children's sense of themselves and world around them is extended to include the investigation, classification and exploration of different groups of animals. They find out about the habitats of different plants and animals and how they are suited to them. Children identify and describe food chains in different ecosystems and learn how to live healthy lifestyles. They continue to explore the properties of everyday materials with in depth investigations into the suitability of materials for different uses.

Year 3 – Children's understanding of living processes and organisms is widened significantly at the beginning of Key Stage Two through the investigation of different plants and animals in a local ecosystem, plant lifecycles and what plants need to be healthy, including nutrition and water transport. Children learn how the muscles help the body move and about the

importance healthy eating. More in depth investigations about the human body take place. The children begin to investigate the properties of rocks and soils, including fossils. Exploration of how light behaves and investigations into shadows take place.

Year 4 – Now that the children are developing an understanding of how light behaves, the Forces element of the curriculum is broadened even further with the introduction of sound, including pitch, volume and how sounds are made. They also build up further understanding of healthy lifestyles by learning about how our bodies get nutrition from food and they identify and describe parts of the human digestive system. More complex food chains are introduced which build from their learning from Year Two. The children explore food chains, identifying producers, predators and prey, use classification keys to group, identify and name organisms in local and more distant habitats. Knowledge of properties of materials is developed through the exploration heating and cooling of different materials and the water cycle. Electricity is introduced here with investigations into electricity, including: identifying electrical appliances, constructing circuits using a variety of components and exploring conductors and insulators.

Year 5 – Continuing living processes and organisms, children investigate the lifecycles of a range of vertebrates and invertebrates. They describe the changes as humans develop to old age. Their knowledge of forces is built up further as the children explore how light travels, explaining how we see and the behaviour of shadows. They investigate how manipulating variables affects the properties of a variety of components in a circuit. The topic of Earth, Sun and Moon is introduced and concept of day/night and seasons of the year are investigated.

Year 6 – The teaching of science at the end of Key Stage Two enables children to consolidate their understanding of different strands of the science curriculum. They investigate how drugs, smoking and exercise affect the body which leads to more complex understanding of how the human circulatory system works, recognising the impact of diet, exercise and lifestyle on how the human body functions. Children classify groups and subsets of animals and plants based on specific characteristics and create more developed classification webs. Evolution and adaptation are introduced including learning from the fossil record (building on their knowledge of fossils in Year Three). Knowledge of electricity is widened as children construct and investigate different types of circuits and learn about different ways electricity can be generated and examples of these in today's world. They explore more complex properties of materials as well as reversible and irreversible changes such as burning.

Relevance to School Curriculum Aims

A key role for research and enquiry

Pupils are given the opportunity to develop/explore their ideas on an individual level e.g. by suggesting areas that they would like to investigate and find answers to and how they would like to display their results.

Learning is meaningful, relevant and enjoyable

The science curriculum is constantly being reviewed to ensure it is stimulating and fun for children. Many units of work are now embedded within the TSUs for each year group ensuring greater relevance to their learning as a whole.

An extended concept of curriculum provision

Across all year groups, parts of the science curriculum are delivered by visiting experts and a great emphasis is placed on external visits and practical first-hand experiences. For example: Harlow Carr in Reception; Eureka in Year 1; the Yorkshire Wildlife Park in Year 2; Meanwood Valley Farm, Magna and the residential to Ilkley in Year 3; the residential to the Lake District in Year 4 and the Science museum visit on the London residential in Year 6.

Beechwood Primary School Science Team

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