## SCIENCE CURRICULUM



### INTENT

At Beech Grove Primary, we encourage children to be inquisitive throughout their time at our school and beyond, extending their horizons. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for living organisms and the physical environment. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire, develop and link the key knowledge and scientific vocabulary that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on, are focused on in depth and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

#### SCIENTIFIC KNOWLEDGE

Our science curriculum follows the national curriculum with additions bespoke to the needs of our children. To support our school values of being respectful and kind we place an emphasis on understanding climate change. For instance, the Year 4 national curriculum objective - to recognise that environments can change and that this can sometimes pose dangers to living things is further developed in In Year 6 were we discuss how climate change is affecting the environment and how as a responsible citizen, we can make a difference. Bespoke additions have also been included as a bridge for more complex learning. For example, in Year 3 children learn the planet names through their topic 'Gods and Mortals' as pre-learning for more complex conceptual learning about space in Year 5.

Time to revisit knowledge in different contexts is built into our curriculum to embed learning in long-term memory. For instance in the spring term of Year 4, children observe the changing of state by heating and cooling. This knowledge is then revisited and further developed in the summer term where they learn about the water cycle. In Year 6, as part of their Frozen Kingdom topic, children learn how animals are adapted to their environment. This is further examined in the context of evolution when learning about Charles Darwin and how species have evolved for survival later in the year.

Carefully designed Beech Grove Primary Science Road Maps have been developed to sequence knowledge for each scientific discipline: biology, chemistry and physics. These are used by teachers to skilfully make links to prior and future learning of scientific knowledge explicit in their teaching.

#### WORKING SCIENTIFICALLY

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. Progression in scientific enquiry has been carefully considered and sequenced. Scientific enquiry objectives have been diligently mapped across year groups and planned investigations have been assigned an objective to focus on in depth. All children explore and investigate through an exciting and engaging practical experiment but focus their learning on a specific scientific enquiry strand. For instance children may be asked to focus on looking for patterns in their results or considering a conclusion rather than writing a list of equipment and a method every time. We believe that by focussing on one or two aspects of scientific enquiry,

children will be able to think more deeply about what/why and how they are investigating. This is backed up by OFSTEDs latest look at science which implied that often children remember the experiment over learning skills/developing and relating knowledge.

Bespoke investigation templates have been designed for each key stage enabling children to express their learning in a consistent, age appropriate manner. The templates include progressive scientific enquiry vocabulary such as 'hypothesis and control variable', which considers curriculum end points and expectations in Year7 (at the very end of Year 6 children are introduced to independent variables.)

## IMPLEMENTATION

At KS1 and EYFS, implementation of science is through sensory experiences, play based activities and real life situations, e.g. using The Secret Garden to observe life cycles, seasonal changes and weather patterns. Animal visits and educational visits to various settings i.e. Newham Grange Farm and Saltcombe RSPB centre are all integrated into the science curriculum. At KS2, learning becomes increasingly iterative exploring the children's own hypotheses. The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time for instance Year 6 learn about Charles Darwin. Opportunities to work on STEM projects to build scientific aspirations are integrated into curriculum time. Respect for living organisms and the physical environment is underpinned through fiction and non fiction texts, encouraging environmental awareness, recycling and looking after the planet. Children apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. Each year group conducts six investigations a year. Scientific knowledge is taught thoroughly before an investigation is conducted to enable its application to a conclusion.

## IMPACT

- Children develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- They 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
- Children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Children enjoy science and are inquisitive and curious about the world.