



## Science

***Science is a way of thinking much more than it is a body of knowledge. – Carl Sagan***

***Thoughts without content are empty, intuitions without concepts are blind – Immanuel Kant***

### **Intent**

At Middlethorpe our science curriculum is designed to develop curiosity and fascination about the world around us and enable our children to generate theories based upon their knowledge. Our curriculum takes into account the experiences of our children, the content of the National Curriculum and the current scientific climate to ensure our children have the skills, understanding and knowledge in order to be inquisitive about their world and test their theories and ideas. The essential science knowledge has been carefully sequenced to ensure it builds within a year, across years and across subjects. Children investigate a variety of scientific concepts across all three genres – chemistry, physics, and biology.

We aim to develop the following essential characteristics of scientists:

- An extensive base of scientific knowledge and vocabulary
- The ability to thoroughly and objectively evaluate information
- The willingness to constantly try to prove or disprove their own theories in order to improve the validity of their findings
- To maintain the sense of wonder and curious questioning about the natural world
- To understand the scientific method which is about determining what is true by forming hypotheses and testing them through experiments
- To be critical thinkers and evaluate the credibility of information claimed to be scientific fact
- Fluency in scientific enquiry and the ability to explore possibilities
- The ability to express well-balance opinions rooted in very good knowledge and understanding about current issues in science
- A genuine interest in science and a real sense of curiosity about the world

### **Implementation**

Leaders have carefully selected the knowledge and skills children at Middlethorpe require to fulfil the aims of the subject. The long term plan takes into account the experiences of our children, the content of the National curriculum and has the flexibility to take into account current popular scientists. Key concepts have been identified that children encounter at different stages of their educational journey and then revisit repeatedly. The content has been mapped throughout the year. Each child receives two hours of science a week. Year 1 begins with children studying seasonal change throughout the year; with additional lessons on materials in the Autumn term, plants in the Spring term, and Animals including humans in the Summer term. Year 2's science is split into termly units of uses of everyday material; plants, living things and their habitats; and animals including humans. Year 3 begins the year by studying forces and magnets during the Autumn term, followed by half termly units of light, plants, rocks and animals including humans. Year 4 study half termly units of animals including humans, and states of matter during the Autumn term; followed by studying electricity during the Spring term; and finishing with half termly units on living things and their habitats, and sound. Year 5 begins the year by studying properties and changes of materials

during the Autumn term, followed by half termly units of forces, earth and space, all living things and their habitats, and animals including humans. Year 6 study half termly units of evolution and inheritance, light, living things and their habitats, and electricity during the Autumn and Spring terms; followed by a term long unit on animals including humans. Learning is sequenced and builds progressively and where possible links have been made to other subject areas. When children are not studying science, learning across other subject areas and the wider curriculum provides opportunities to apply their scientific knowledge and skills where ever possible.

Within a block of science the key knowledge, skills and vocabulary have been identified for teachers to ensure that content and concepts are progressive across the whole school. Knowledge organisers are designed to support children in their knowledge acquisition and are used continuously through units to support children in recalling and retaining the key knowledge and vocabulary. Low stakes quizzing is also used as a strategy to support children in knowing more and remembering more. All units begin with children investigating what key concepts are and what they are not. This is designed to support children in making links in their learning. Children then use a range of scientific skills to obtain and apply new and existing knowledge. Such skills include generating ideas, hypothesizing, creating methods to test ideas, creating fair tests, and summarising results. Opportunities are provided to present their scientific knowledge, learning and understanding in a range of ways. At Middlethorpe the local area is fully utilised to aid children's scientific understanding and there are extensive opportunities for learning outside the classroom embedded in practice. Where an area or concept can be seen in real life it is. Consideration is given to how children who grasp concepts more rapidly and those learners who need more support are catered for within science lessons.

## **Impact**

Our science curriculum is high quality, well thought out and is planned to demonstrate progressions of knowledge and skills. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:

- A reflection on standards achieved against the planned outcomes
- Tracking of knowledge and understanding through low stakes quiz
- Pupil discussions about their learning
- An end of unit task giving children the opportunity to apply the scientific knowledge they have gained throughout the unit

Outcomes in science books evidence a broad and balanced science curriculum and demonstrate children's acquisition and retention of identified key knowledge. The ultimate impact of our science curriculum is that our children will have a sound understanding of scientific enquiry and scientific knowledge upon which they can create theories to test.