Science

'It is through science that we prove, but through intuition that we discover.' – Jules Henri Poincare

Subject Vision and Values

At the Nightingale Federation, we actively encourage children to be inquisitive and foster a healthy curiosity about the world of science. We aim to develop children's ideas and ways of working that enable them to answer questions confidently and to make sense of the world around them. We nurture their enthusiasm when they notice changes and patterns and expect all children to treat the living and non-living environment surrounding them with respect and sensitivity. All children will be given the opportunities to be able to problem solve and explore ideas and concepts through their scientific skills. They will take part in weekly (minimum) science lessons and ensure the subject is linked to other areas of learning wherever possible. Science and Eco representatives collaborate with one another to ensure that we, as a school, make positive contributions to tackle climate change. We hope the children will gain interest, knowledge and fascination across the sciences and open a new generation's eyes to the possibilities of a career in Science, Technology, Engineering and Maths (STEAM).

The aims and objectives of Science are in line with the National Curriculum and enable children:

- develop lively, enquiring minds and the ability to question
- learn scientific skills and knowledge
- build on their natural curiosity, so they are able to problem solve and investigate ideas
- develop understanding of the nature, processes and methods of science through different types of science enquiry that help them to answer scientific questions about the world around them
- be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Intent

Science lessons are delivered as part of the curriculum offer. Objectives for lessons are underpinned by the National Curriculum, with the Ark Curriculum+ scheme used to support planning. Science lessons are well planned and structured to ensure that new skills are learnt and demonstrated throughout the effective teaching of a sequence of lessons, developing pupils' curiosity and offering pupils a practical experience to explore concepts in a range of different topics. Teachers have access to science resources in school, but can also request The Science Network (TSN) 'science boxes' to offer supplementary resources. Children revisit units in order to develop their understanding and scientific enquiry and skills learnt may also be utilised during cross-curricular links to other subjects.

Implementation

In Early Years: Science is taught as an integral part of the topic work. This is done through continuous provision, enhancements to the provision to extend learning and follow children's lines of enquiries and regular forest school sessions. We relate the scientific aspect of the children's work to the objectives set out in the Early Learning Goals included in Understanding the World (UTW) and Communication and Language (C&L).

- UTW: The Natural World – Explore the natural world around them, making observations and drawing pictures of animals and plants
- UTW: The Natural World – Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class
- UTW: The Natural World – Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
- C&L: Listening, Attention and Understanding – Listen attentively and respond to what they hear with relevant questions
- C&L: Listening, Attention and Understanding – Make comments about what they have heard and ask questions to clarify their understanding
- C&L: Speaking – Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary
- C&L: Speaking – Offer explanations for why things might happen, making use of recently introduced vocabulary

Key Stage One & Key Stage Two are taught to work scientifically by:

- Questioning
- Scientific enquiry – comparative and fair testing, researching, observation over time, pattern-seeking, identifying, grouping and classifying and problem solving
- Drawing conclusions based on data and observations

- Using evidence to justify ideas
- Using scientific knowledge to explain findings

In Key Stage One pupils are taught scientific knowledge and skills related to the following units:
Year One/Two: Everyday Materials, Seasonal Changes, Animals Including Humans, Plants, Animals and Survival, Uses of Materials, Living Things and Their Habitats, Protecting our Environment, Plants and Growth.
In Lower Key Stage Two pupils are taught scientific knowledge and skills related to the following units:
Year Three/Four: Skeletons and Muscles, Rocks and Fossils, Light and Shadows, Plants: Need for Survival, Forces and Magnets, Teeth and Digestion, States of Matter, Classification and Environments, Sound, Electricity.
In Upper Key Stage Two pupils are taught scientific knowledge and skills related to the following units:
Year Five/Six: Earth and Space, Forces, Properties and Changes of Materials, Life Cycles, Getting Older, Light and Perception, Classification, Evolution and Inheritance, Electricity and Circuits, Circulation and Lifestyles.

Impact

Through our science curriculum we aim to ensure children will:

- Be able to extend their scientific vocabulary and use this to make comments, predictions and question ideas whilst reflecting on knowledge and explaining understanding
- Work collaboratively and practically to research, explore and investigate, observe and experiment
- Gain a wide variety of skills linked to both scientific knowledge and understanding, and scientific enquiry / investigative skills

As an inclusive school, we recognise the need to tailor our approach to support children with special educational needs as well as those who would benefit from further challenge. We recognise that there are children of widely ranging abilities and we strive to provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child.

Spiritual Development

As wonder is the beginning of wisdom, children becoming scientists at the Nightingale Federation will be provided with opportunities to be struck with awe and wonder and ‘see feelingly’. They will ask questions, take risks, reflect and learn from what they do. Children will demonstrate curiosity and open mindfulness when exploring questions and will be able to use their own deep thinking and ideas when connecting knowledge to their practical lessons.

Cultural Capital links with Subject

- Scientific literacy
- Science-related attitudes, values and dispositions
- Knowledge about the transferability of science (that science 'opens doors' to many careers)
- Science media consumption
- Participation in out-of-school science learning contexts
- Family science skills, knowledge and qualifications
- Knowing people in science-related roles
- Talking about science in everyday life