Hill Farm

Science Policy

Local Level Policy

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Headteacher	
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Science at Hill Farm Primary School

Introduction

Science is everywhere! The fundamental ability to understand the world around us is the foundations for developing the scientists of the future. At Hill Farm, we understand that our pupils are growing up in a scientifically advanced world and it is vital that we nurture their natural curiosity and encourage them to become problem solvers. By teaching them essential aspects of the knowledge, methods and processes, our pupils will be able to discover why science is vital to our ever-changing world and how they can be a part of this.

The school's aims are to:

- Provide a broad, challenging and enquiry-based curriculum for pupils, meeting the requirements of the national curriculum programmes of study for science;
- Teach investigative science where pupils can explore, ask questions, learn and discover a deeper understanding of the world in which we live;
- Apply skills and knowledge to real-life contexts and understand the implications of science;
- Prioritise essential experiences and opportunities for pupils to open their eyes to the possibilities the subject brings;
- Develop staff's subject knowledge through regular training to ensure deliver of an engaging curriculum and provide opportunities for cross-curricular opportunities.

The National Curriculum aims in science are to ensure that all pupils:

- 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 science enquiries that help them to answer scientific questions about the world around them;
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Objectives

Key Stage 1

By the end of Key Stage 1, pupils will be taught about the world around them: pupils are taught to experience and observe natural phenomena by looking closely at nature. They will be encouraged to ask questions, observe changes over time, notice patterns, group and classify things and carry out comparative tests. Key vocabulary will be introduced and pupils will be encouraged to use this language by describing what they have found out. The key topics taught in this phase include;

- **Plants** – identifying, naming and describing their structure, moving onto how seeds and bulbs grow;

- **Animals including humans** – identifying, naming and describing fish, amphibians, birds, mammals and reptiles, classifying them into carnivores, herbivores and omnivores. When focusing on mammals, pupils will identify, name and draw basic parts of the human body including those associated with the senses. They will recognise that animals produce offspring that grow and will identify the basic needs of those animals. In year 2, pupils will focus on humans, their need for exercise, food and hygiene;

- **Everyday materials** – identifying, naming and describing everyday materials, being able to compare and group them. Pupils will move onto identifying their suitability and everyday use and whether solid shapes can be manipulated;

- **Seasonal changes** – observing changes throughout the seasons, including the weather and length of day light

- **Living things and their habitats** – comparing differences between things that are living and dead. Pupils will identify the suitability of animals` habitats and the basic needs they provide. Pupils will learn to name different plants and animals in their habitats and identify how they obtain food, creating basic food chains

Lower Key Stage 2

Across years 3 and 4, pupils will be taught to broaden their scientific view of the world around them: they are taught to explore, talk, test and develop ideas about everyday phenomena and the relationships between living things and familiar environments, functions, relationships and interactions. They will be encouraged to ask their own questions about what they observe and make their own decisions about which types of scientific enquiry are the most appropriate, including changes over time, noticing patterns, grouping and classifying, and comparative and fair tests. They will be taught to draw conclusions using some scientific language to talk and write about what they have discovered, supporting these conclusions with recorded findings using drawings, diagrams, keys, bar charts and tables. The key topics taught in this phase include;

- **Plants** – identifying and describing the functions of different parts of flowering plants, including pollination, seed formation and seed dispersal. Exploring the requirements of plants for life and growth. Pupils will also investigate water transportation in plants;

  Animals including humans – identify that nutrition is from what we eat and the right amounts that are needed. In year 4, pupils will describe the simple functions of the human digestive system, the different types of human teeth and their functions and construct and interpret food chains, identifying producers, predators and prey;

- **Rocks** - compare and group together different kinds of rocks, describe how fossils are formed and recognise that soils are made from rocks and organic matter

- **Light** – identifying light and dark, understanding reflection, to protect our eyes from sun light and how light produces shadows;

- **Forces and magnets** – comparing different surfaces, forces that need contact and magnetic forces;

- **Living things and their habitats** – pupils will group living things using classification keys, identify and name a variety of living things in the local and wider environment and consider environmental changes and their dangers

- **States of matter** – In year 4, pupils will compare and group materials together, observe changes in state and link evaporation and condensation to the water cycle

- **Sound** – In year 4, pupils identify how sounds are made, recognise how vibrations travel and find patterns in pitch and volume.

- **Electricity** – In year 4, pupils identify common electrical appliances, construct a simple circuit naming its basic parts and recognise common conductors and insulators.

Upper Key Stage 2

By the end of Year 6, pupils will be taught to develop a deeper understanding of a wide range of scientific ideas. Pupil are encouraged to explore, talk about their ideas, ask their own questions about scientific phenomena and analyse functions, relationships and interactions more systematically. At upper key stage 2, pupils will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They are encouraged to follow their own line of enquiry, selecting the most appropriate ways to answer science questions including observing changes over different periods of time, noticing patterns, grouping and classifying things and carrying out comparative and fair tests. Pupils should independently take measurements using scientific equipment and record findings, increasing complexity of scientific diagrams to include labels, classification keys, tables, scatter graphs, bar and line graphs. Pupils should draw conclusions based on their data and observations, including explanations of causal relationships and reporting on the degree of trust in their results. Finally, they should support or refute their findings with scientific evidence, ideas or arguments. The key topics taught in this phase include;

- **Living things and their habitats** – describing differences in the life cycles of a mammal, an amphibian, an insect and a bird as well as describing the process of reproduction in some of these animals. Pupils will move onto describing classification into broad groups based on observation characteristics;

- **Animals, including humans** – describing human changes as we develop into old age. In year 6, pupils will identify, name and describe the main parts of the human circulatory systems, recognise the impact of diet, exercise, drugs and lifestyle of body functions and describe how nutrients and water are transported within animals;

  Properties and changes of materials – comparing and grouping materials based on their properties (including hardness, solubility, transparency, conductivity and response to magnets). Knowing which materials dissolve and how to recover a substance, using the key vocabulary of reversible and irreversible changes. Separating mixtures through filtering, sieving and evaporating. Giving reasons for uses of everyday materials;

- **Earth and Space** – In year 5, pupils will describe the movement of the earth, and other planets, relative to the sun. Describe the movement of the moon and explain how Earth's rotation signifies day and night;

- **Forces** – describing and explaining the forces of gravity, air resistance, water resistance and friction. Recognising that smaller forces such as levers, pulley and gears have a greater effect;

- **Evolution and inheritance** – In year 6, pupils will recognise that living things have changed over time, that animals produce offspring that vary and how plants and animals are adapted to suit their changing environments;

- **Light** – recognising that light travels in straight lines and that objects are seen because they reflect light into our eyes. Pupils will use this information to explain why shadows have the same shape as the object that casts them;

- **Electricity** – recognise the effects of an increase in voltage in a circuit and use recognised symbols when representing circuits in diagrams.

Planning and Evaluation

The science objectives, where suitable, are integrated within our bespoke topic based curriculum to ensure cross-curricular learning. Long-term planning is completed by the subject leader to ensure accurate coverage of key objectives and is regularly reviewed and updated in response from staff and pupil feedback. Using the unit objectives, the medium-term planning is completed by classroom teachers who plan a sequence of lessons, pitched appropriately for their year group. This is regularly quality assured by the subject leader.

Assessment

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in each unit of work. To ensure this, pupils` understanding is checked effectively both in and after lessons. Teacher's use observation, questioning and discussion to support formative assessment during the teaching of each objective. Feedback to address misconceptions or challenge learning further is provided to the pupils and they have time to reflect and respond to this. Summative assessment of pupil progress and attainment is used to support teacher's judgements and this is reported to parents/carers orally as well as in a written report. These judgements are validated by continuous moderation.