Policy 2020
Hampreston First School

Vision

Our vision for science is to ignite curiosity in all our children so that they ask questions about the universe we live in. We aim to give children a science curriculum which gives them the confidence, skills and opportunities to explore and discover the world around them, find answers to their questions, and gain a deeper understanding of the world we live in. This will involve exciting, practical hands-on experiences that fuel explorations and investigations.

Why We Believe Science is Important

Children live in an age of ever advancing, rapidly changing science, design and technology. This area of learning is fundamental to exploring, understanding and influencing the natural and made environment in which we live. It offers a wealth of experiences and ideas that encourage children's natural curiosity and creativity, inspiring awe and wonder. Science supports the development of technology and advances in technology lead to new scientific discoveries, shaping how we live safe and healthy lives in our rapidly changing society. Science helps children to find new ways of looking at the world and to engage with changing explanations about how the world works. They learn to value ideas and to see talking, thinking and imagining as essential elements in developing understanding of new processes. Children tackle problems, forming questions, generating and testing ideas and deciding how to seek solutions. They gather and make sense of evidence, test out hypotheses and evaluate processes and outcomes. They learn the possibilities of science, which we hope will inspire them to become the scientists, engineers and innovators of the future that we so desperately need to tackle our global and local environmental problems and to tackle world poverty.

Characteristics of Scientists

At Hampreston First School we aim to develop scientists who:

- Are curious about our world and ask questions to find out why and how things happen.
- Are excited to investigate, find answers and share their increasing scientific knowledge.
- Make connections between their knowledge and understanding of the world.
- Make careful observations and measurements, using these to spot similarities and patterns.
- Are systematic and logical in their practical work.
- Explain confidently to others their ideas and what they have found out.

Subject Statement

Intent

The 2014 national curriculum for science aims 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 skills required to understand the uses and implications of science, today and for the future.

We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this. At Hampreston, we encourage children to be inquisitive throughout their time with us and beyond. The

science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the skills to work scientifically are built-on and developed throughout children's time at our school. This ensures 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.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- Science will be taught in planned topic blocks by the class teacher, and cross curricular links will be made where possible. This is a strategy to enable the achievement of a greater depth of knowledge.
- Through our planning, children are encouraged to be curious and ask their own questions. They are given opportunities to use their scientific skills and research to discover the answers for themselves. Teachers plan engaging lessons, often involving high-quality practical and digital resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Skills needed to work scientifically are embedded into lessons to ensure these skills are being developed throughout the children's school career. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use scientific equipment, and the various skills required for working scientifically, in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning in the grounds where possible.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Children's starting points are identified at the beginning of each science topic and the children are able to convey and often record what they know already. At the end of the block, children's knowledge is checked in line with the key knowledge identified prior to the teaching block. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. Children are often asked what they would like to find out about, to maximise their engagement with and motivation to study science.

The nature, processes and methods of science

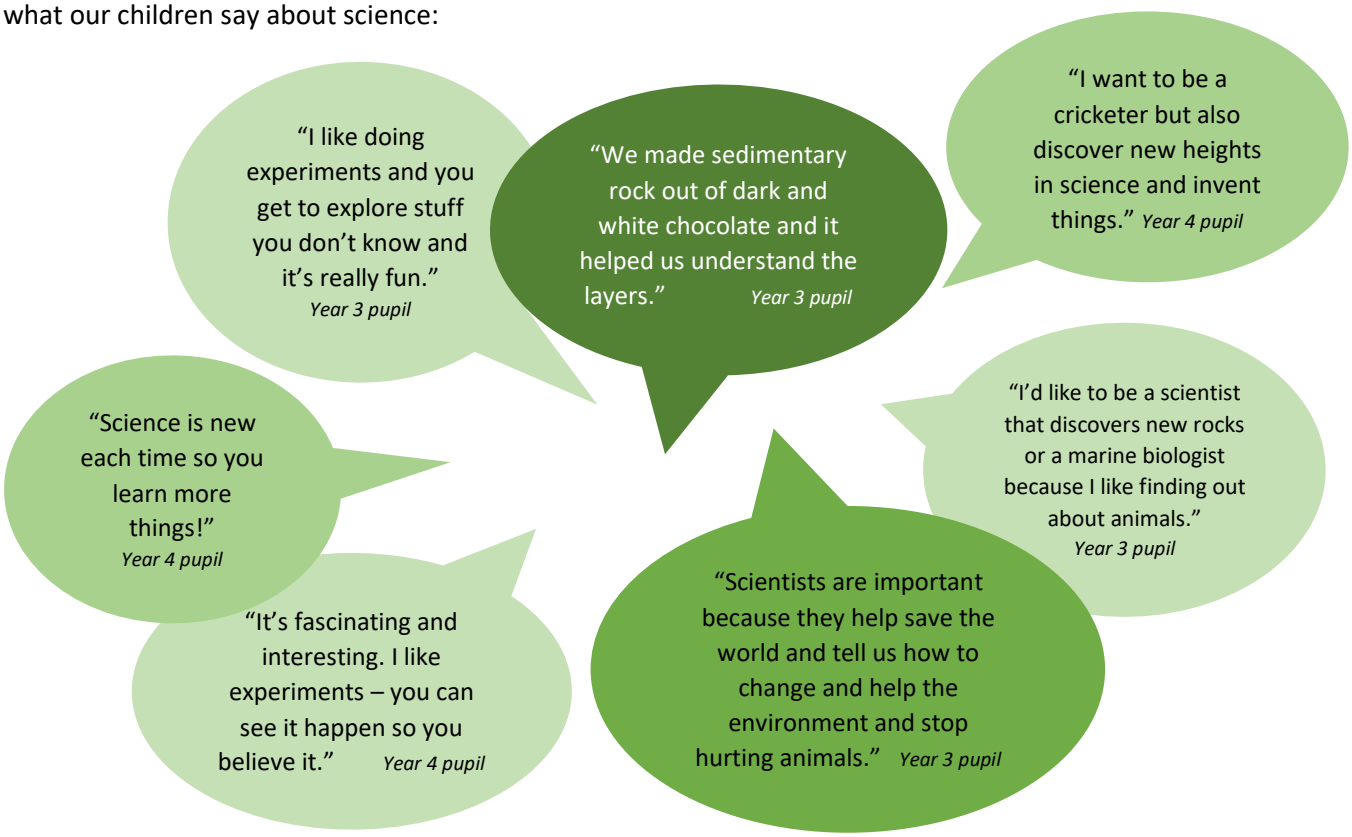
'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At Hampreston, science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Impact

The successful approach at Hampreston results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Children at Hampreston really enjoy science and this results in motivated learners with sound scientific understanding. This is what our children say about science:



Children's progress is continually monitored throughout their time at Hampreston First School and is used to inform future teaching and learning. The knowledge for each science unit is assessed at the end of the topic and skills to work scientifically are assessed throughout the year to build up a picture of understanding which informs the final judgement of whether a child is working at the expected level. This information is tracked across the school. The subject leader monitors assessment data and also quality of lessons and work in books.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge. Assessment is a continuous process which relies considerably on the professional expertise and judgement of the class teacher. Assessment is an integral part of learning and teaching and helps us measure the attainment and progress of all children in our school. Assessment should be considered at the planning stage in order to ensure that learning is matched to all children's needs. It is part of a continuous cycle. Formative assessment provides information for the teacher to plan the next steps in children's learning (close up or day to day). Summative assessment provides a snap-shot in time of a child's achievement and to sum up attainment over time. Assessment for learning is continuous throughout the planning, teaching and learning cycle.

Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the learning objective or success criteria. Children will be aware of these objectives in lessons and they can be used to identify areas of difficulty by children and teachers when reviewing and assessing work.

The Foundation Stage deliver science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. In EYFS, we assess the children's Understanding of the World according to the Development Matters statements and some aspects of Expressive Arts Design are also science based.

At Hampreston, we know science is good when:

- We see children apply their skills for working scientifically, to solve problems, explore, observe and investigate.
- Children ask questions and work together to discover the answers
- Science has a wow factor and promotes a sense of awe and wonder
- Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think.
- Children show enjoyment and record their findings in a variety of ways.

Science Curriculum Overview

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Personal Hygiene	Changes in the Seasons	Raft building materials	Hatching chicks Fossils & dinosaurs	Plants / Growing	
Year 1	Human Body: *(parts, eye & hair colour, senses)* Changing Seasons *(leaves, day length, temperature)*	Animal Classification: *kingdoms, bodies and animal diets*	Properties of Materials Changing Seasons *(growth, Spring)*	Properties of Materials	Plants Changing Seasons *(flowers, day length, heat)*	Weather
Year 2	Uses of Everyday Materials	Uses of Everyday Materials	Living Things and Their Habitats: *Arctic/ Garden birds*	Plants	Animals, including humans: *basic requirements exercising, nutrition, growth*	Living Things and Their Habitats: *minibeasts esp. aquatic*
Year 3	Rocks & Fossils	Animals, including humans: *Nutrition / food chains and webs*	Animals, including humans: *Skeleton and muscles*	Forces & Magnets	Plants	Light
Year 4		Animals, including humans: *Teeth and Digestion*	Electricity	Living Things and Their Habitats and protecting the environment, the impact of change	States of Matter	Sound

Promoting British Values Through Science

We endeavour to promote the British Values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs through our science curriculum. Please see our British Values policy for further information. Through our science lessons we promote individual liberty through encouraging children to make their own choices and mutual respect in listening to other people's ideas.

Spiritual, Moral, Social and Cultural Aspects

Science provides opportunities to promote spiritual development through sensing the world they live in, reflecting on their part in it and asking questions. Moral development is promoted through drawing conclusions using observation

and evidence rather than preconceptions. To ensure social development, children learn to respect the opinions of others and work together in groups. Cultural development is promoted through helping children's recognise how human discoveries and ideas have affected the way people think, feel, create and behave and live. Beliefs, spiritual awareness, high standards of personal behaviour including a positive caring attitude towards other people, an understanding of their social and cultural traditions and an appreciation of the diversity and richness of other cultures are all critical skills and dispositions that we nurture, encourage and develop through National Curriculum areas and the wider curriculum.

Inclusion & Equal Opportunities

In school we aim to meet the needs of all our children by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for children with Special Education Needs (SEN) or Disabilities to complete their own projects, sometimes with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will be extended through differentiated activities. Children with EAL will need support with language but should be able to access science lessons with appropriate resources and support. By being given enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities. Teachers ensure that a range of teaching and learning strategies are used which include and motivate all learners, ensuring that optimum progress is made throughout each part of the lesson. We are proud that the vast majority of our pupils with SEN achieve age related expectations in science. At Hampreston First School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture, religion or class.

Date of policy review: