HAYDOCK ENGLISH MARTYRS' CATHOLIC PRIMARY SCHOOL

'Lighting the flame for life-long learning'

SCIENCE POLICY

Science in English Martyrs develops the children's knowledge, skills and understanding. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. We aim to provide challenging work to achieve success and allow pupils to progress as learners. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level. A 'hands on' approach to Science is encouraged, so that pupils can test their hypotheses and come to reasonable conclusions following investigations. Scientific principles, devised by pupils, are displayed in class and in books. These principles underpin the teaching of science in our school. Science is displayed in all classes, and each class has developed a scientific 'investigation station' which further encourages pupils to become independent learners in science.

Intent

- To ask and answer scientific questions.
- To plan and carry out scientific investigations, using equipment, including computers correctly.
- To know and understand the life processes of living things.
- To know about seasonal changes.
- To know and understand about materials and their properties.
- To know and understand the physical processes, electricity, light, sound and natural forces.
- To know about the nature of the solar system, including the earth.
- To know about evolution and inheritance.
- To learn to use a variety of approaches to answer relevant scientific questions.
- To become familiar with, and use, technical terminology, and build up scientific vocabulary.
- To evaluate evidence and present their conclusions clearly and accurately.
- To encourage children to work with others in a range of group situations.
- To increase children's ability to use what they have learnt to improve their questioning.
- Develop a responsible attitude towards safety and safe practice and enable pupils to make informed decisions with regard to use of equipment.

Implementation:

Teaching & Learning

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop the children's knowledge, skills and understanding and we do this through a mixture

of whole-class teaching and individual/group activities. Other times, we engage the children in an enquiry-based research activity. The science principles, devised by pupils, underpin science teaching. Working scientifically is embedded within the teaching of all science topics.

Children's questions are at the heart of working scientifically and we encourage the children to ask, as well as answer, scientific questions.

Children use ICT in science lessons where it enhances their learning. They engage in a wide variety of problem solving activities. Where appropriate, children engage in purposeful outdoor learning to enhance science lessons. Ongoing aspects of learning, such as changes over time, are planned for. Wherever possible, we involve the pupils in 'real' scientific activities. We encourage the children to evaluate their own work as well as the work of others. Within lessons, we give the children the opportunity to use a wide range of resources.

We recognise that there are children of widely different scientific abilities in all classes, we ensure that we provide suitable learning opportunities for children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies:

- Setting common tasks that are open ended and can have a variety of responses
- Setting tasks of increasing difficulty, where not all children complete all tasks
- Grouping children by ability and setting different tasks for each ability group
- Providing resources of different complexity, matched to the ability of the child
- Using classroom assistants to support the work of individual children or groups of children.

Curriculum Planning

Science is a core subject in the National Curriculum. We base our teaching on the National Curriculum Programmes of Study and this is particularly helpful with ensuring that there is continuity and progression.

The National Curriculum document for Science sets out a clear, full and statutory requirement for all children. It determines the content of what will be taught, and sets attainment targets for learning. The programmes of study set out what should be taught at Key Stage 1 and 2 and The Foundation Stage programmes of study for Understanding of the World are set out in the EYFS.

The curriculum planning in science is carried out in three phases (long term, medium term and short term). The long term plan is based over a two year cycle and maps out the scientific topics studied each term during the key stage. The science coordinator works out this in conjunction with teaching colleagues in each year group. In some cases, we combine the scientific study with work in other subject areas, especially Key Stage 1; at other times the children study science as a discrete subject.

Our medium term plans, which we have adopted from the national scheme, give details of each unit of work for each term. As we have some mixed age classes, we do our medium term planning on a two-year rotation cycle. In this way, we ensure complete coverage of the National Curriculum without repeating topics. These plans define what we teach and ensure an appropriate balance and distribution of work across each term. The coordinator keeps and reviews these plans.

Class teachers plan for science using the school science plan. These plans list the specific learning objectives of each lesson. The class teacher keeps these plans, and the coordinator discusses them on an informal basis.

We plan the science topics so that they build upon prior learning of the children. While there are opportunities for children of all abilities to develop their skills, knowledge and understanding in each unit, there is planned progression built into the scheme of work, so that the children are increasingly challenged as they move up through the school.

Expectations

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 from the National Curriculum.

Cross Curriculum Links / Contribution of subject to other curriculum areas

English – Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts the children study are of a scientific nature. The children develop oral skills in science lessons through discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Maths – Science contributes to the teaching of mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Through work on investigation, they learn to estimate and predict. They develop the key skills of accurate observations and recording events. They frequently collect data and record this on tables, charts and graphs.

Computing – Children use ICT to record, present and interpret data when appropriate, and to review, modify and evaluate their work and improve its presentation.

Personal, Social and Health Education (PSHE) and Citizenship – Science makes a significant contribution to the teaching of personal, social and health education and citizenship. This is mainly in two areas. Firstly, the subject lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material

and how environments are changed for the better or worse. Secondly, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. It also introduces them to the need for exercise and healthy eating and how to make informed choices about these.

Spiritual, Moral, Social & Cultural Development

The teaching of science offers opportunities to examine some of the fundamental questions of life, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Foundation Stage

Science is taught in the Nursery and Reception classes as an integral part of their topic work covered during the year. The EYFS strand 'Understanding the World' leads directly to scientific elements of the curriculum and leads to more formalised Science learning in KS1 and then KS2.

Science makes a significant contribution to the ELGS of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and sinks when placed in water. We encourage the children to develop confidence and control of the way they handle tools and equipment. We give all children the opportunity to undertake activities that offer appropriate challenge, using a wide range of resources to support specific skills.

Equal Opportunities/ Inclusion

We aim to give every pupil the opportunity to experience success and achieve as high a standard as possible. In order to do this we:

- Teach the knowledge, skills and understanding in ways that suit pupils' abilities and challenge them.
- Are flexible in choosing lesson content from a suitable level and Key Stage.
- Set high expectations and provide opportunities for all pupils to achieve, including boys, girls, pupils with Additional Needs/Disabilities, more able pupils and pupils from all social, cultural and linguistic backgrounds.
- Set appropriate and challenging targets for all children, including targets set for children with Additional Needs in their I.E.P's.

- Use a range of organisational approaches, such as grouping or individual work, to ensure learning needs are properly addressed.
- Plan work that builds on interests and experiences of pupils and allows a variety of interpretations and outcomes.
- Use materials that are free from discrimination or stereotyping.

Health & Safety (when applicable e.g. science, DT, PE)

The general teaching requirement for health and safety applies in this subject. We encourage the children to consider their own safety and that of others at all times. Pupils will be taught to use scientific equipment safely when using it during practical activities. Teaching staff will check equipment regularly and report any damage, taking defective equipment out of action. A simple risk assessment will be carried out for all practical activities any perceived hazards will be reported to the Head who will determine the appropriateness of said activity.

Assessment & Recording

Teachers assess children's work in science by making assessments as they observe them working during lessons. Formative assessment strategies are on-going throughout lessons across a unit of work and across a term/ year. Teachers record the progress that children make by assessing the children's work against the key learning for their lessons. At regular intervals following retrieval opportunities, (to allow us to ensure learning has moved from short to long term memory) teachers will note any pupils who are not able to remember key learning and identify how they may be able to ensure that support can be put in place to ensure that they can continue to develop and make progress as they move on to learning within future topic. At the end of the academic year, they are able to use their professional knowledge and assessment information to indicate whether children are working towards, working at or working above age related expectations.

The science subject leader keeps evidence of planning, videos and photographs of children's achievements in a portfolio.

The subject leader uses 'Tell Me Time' to evaluate the quality of science education provided. This is a strategy adapted from Alex Bedford's 'Pupil Book Study' research work. This involves speaking with the children at regular intervals discussing learning.

Resources

There are a wide range of resources to support the teaching of science across the school. We keep these in a central store located in the main school building, although EYFS has their

own additional resources. We have science-based books in the library and make use of the Local Authority's Loan service to supplement these.