



Science Policy

Believe, Achieve, Celebrate

Reviewed December 2023 - B Harvey

Our Intent

Our Science Vision at Thurnby Mead

Our children are growing up in a world that increasingly requires scientific literacy and critical thinking skills. Science is all around us, and at Thurnby Mead, our science curriculum aims to support and guide our children to make sense of the world around them.

We recognise the importance of science and strive to maintain a high profile for the subject within our school. Our desire is to empower and motivate children to develop a lifelong love of science, which is reflected in our curriculum and learning environments.

Our Science Principles

A good scientist observes, questions, hypothesises, experiments, records data, and then analyses that data. All children can be scientists by following their own natural curiosity, and at Thurnby Mead, our teachers help to build and reinforce these skills so that our children are able to thrive and achieve.

In Thurnby Mead, Science teaching and learning looks good when:

- It makes meaningful links between classroom learning and the real world, and is linked across the curriculum subjects
- It develops scientific literacy, oracy and critical thinking skills by enabling children to design and carry out their own investigations
- It encourages progress, and allows children to fulfil their potential regardless of their circumstances
- It nurtures curiosity, wonderment and a sense of excitement

For the above principles to be achieved, we will:

- Provide frequent, high-quality, hands-on experiences related to Science
- Provide teachers with opportunities to further develop their subject knowledge
- Provide opportunities for children to experiment and plan their own investigations, and give them the support they need to be able to develop scientific skills
- Provide frequent opportunities for children to share what they already know, ask their own questions and be curious about science

Our Implementation

Teaching and Learning

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes this is done through whole-class teaching, while at other times children take part in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions.

Our children have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They also use ICT in science lessons where appropriate to enhance their learning. They take part in role-play and discussions and they present reports to the rest of the class, school or parents/guardians. They engage in a wide variety of problem-solving activities.

Wherever possible, we involve the pupils in real scientific activities, for example, investigating a local environmental problem, meeting 'real-life' scientists, or carrying out a practical experiment and analysing the results.

We recognise that in all classes children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- Setting tasks which are open-ended and can have a variety of responses
- Setting tasks of increasing difficulty through the use of extension or greater depth thinking
- questions – linked to Blooms Taxonomy. (we do not expect all children to complete all tasks)
- 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
- By teaching children in mixed ability groups
- By making links across subjects

Science Curriculum Planning

Science is a core subject in the National Curriculum. The school uses Kapow Scheme as the basis of its planning and to aid monitoring and assess progression of children's science learning within each topic. All topics in our science planning build on prior learning.

Our curriculum aims to encourage critical thinking and empower pupils to question the hows and whys of the world around them.

Our scheme encourages:

- A strong focus on developing knowledge alongside scientific skills across Biology, Chemistry and Physics.
- Curiosity and excitement about familiar and unknown observations.
- Challenging misconceptions and demystifying truths.
- Continuous progression by building on practical and investigative skills across all units.
- Critical thinking, with the ability to ask perceptive questions and explain and analyse evidence.
- Development of scientific literacy using wide-ranging, specialist vocabulary.

Kapow Primary's Science scheme of work enables pupils to meet the end of key stage attainment targets in the national curriculum and the aims also align with those set out in the national curriculum.

Lessons are evaluated by class teachers and the Science Coordinator and this is used to inform future teaching and learning (this does not need to be in a written format).

Key Stage 1 and 2 plan for a minimum of 1 hour of science per week (or an equivalent number of hours in small blocks if necessary).

Cultural and Science Capital

Cultural and Science capital is the accumulation of knowledge, experiences, behaviours, and skills that a child can draw upon and which demonstrates their cultural awareness, knowledge and competence. It is one of the key ingredients a pupil will draw upon to be successful in society, their career and the world of work.

At Thurnby Mead, we aim to provide children with opportunities to experience 'real life' science through high quality teaching, well resourced lessons, hands-on experiments, school

trips, in-school workshops and the inclusion of learning about a diverse selection of scientists within our science topics. We provide opportunities in lessons for all children, regardless of possible barriers, to engage with science. This is seen with differentiation, hands-on experimentation, the encouragement of oracy, and critical thinking using Explorify. We also help children to identify and use transferrable science skills in other parts of the curriculum and the wider world, as well as aiming to inspire by introducing them to 'science-skilled' people and jobs within the wider world.

Cross-Curricular Links

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 that the children study in Literacy may be of a scientific nature. The children develop oral skills in science lessons through discussions (e.g. of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

Personal, social, health and citizenship education (PSHCE)

Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way in which people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping poor or homeless people. Science thus promotes the concept of positive citizenship.

Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, e.g. 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 in which 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.

ICT

ICT enhances the teaching of science in our school significantly, because there are some tasks for which ICT is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. The new 2014 scheme of work gives teachers and children the opportunity to work from an online platform, where animations, videos and real life images are provided. Data loggers may be used to assist in the collection of data and in producing tables and graphs. Children use ICT to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media.

Our Impact

Learning in Foundation Stage

At this phase children are:

- ❖ Developing the crucial knowledge, skills and understanding that help them make sense of the world
- ❖ Are involved in activities based on first-hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking and decision-making and discussion
- ❖ Experiencing a wide range of activities, indoors and outdoors, including adult-focused, child-initiated and independent play

- ❖ Stimulated, interested and curious
- ❖ Observed by adults and learning is recorded in a variety of ways

Learning in Key Stage 1 and 2

At this phase children are:

- ❖ Learning through a science process skill-based approach
- ❖ Undertaking practical enquiries
- ❖ Working collaboratively and independently
- ❖ Developing high quality, purposeful talk for science
- ❖ Beginning to Record findings in a variety of stimulating and purposeful ways
- ❖ Building upon prior science learning, both skill and knowledge based
- ❖ Beginning to think about the positive and negative effects of scientific and technological developments on the environment and in other contexts
- ❖ Evaluating their own science learning;
- ❖ Using ICT to support and extend their learning in science
- ❖ Beginning to make links across subjects
- ❖ Experiencing a variety of teaching styles and strategies that promote positive science learning
- ❖ Learning through science, to raise social and moral questions, to understand differences between people and to have respect for others including those with disabilities.

Inclusion

Our inclusive approach and differentiation allows all children to learn regardless of race, gender, faith, culture or disability. We select and use resources that positively reflect the diversity of our school and the world around us. Our planning, teaching and learning in science sets high expectations for all children and provides opportunities for all children to achieve including; boys and girls, children who are part of our DSP unit, children with SEN, children with disabilities, children from all social and cultural backgrounds, children from different ethnic groups including travellers, refugees, asylum seekers and those from diverse linguistic backgrounds.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

All of our teachers are aware that children bring to school different experiences, interests and strengths that will influence the way in which they learn science. It is emphasised that we are all equal within the classroom and that we should show respect and tolerance towards one another. Teachers will use a variety of teaching styles and strategies to meet the needs of all children in their science learning.

Assessment for Learning

Assessment for science is carried out in line with the school policy and are carried out using both summative and formative assessment procedures. Formative assessments are made through observations in lessons. Summative assessment takes place at the end of each unit of work, with assessments being inputted every term. Teachers use the PLAN matrices and Examples of Work document for each year group to support their formative and summative assessments, as well as being supported by Science Lead. Regular sharing of good practice and completed work also enables our teachers to have a deeper understanding of the progression of science skills.

Written or verbal feedback is given to the child in line with school marking policy, to help guide his/her progress.

Role of the Subject Leader & Monitoring

It is the responsibility of the subject leader, alongside the Senior Leadership Team, to monitor the standards of children's work across the school. Monitoring for science is carried out in line with the school's science SIP by the Science coordinator and supporting governor. Best practice for science is regularly identified and shared amongst practitioners.

The subject leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and direction for science in the school. The subject leader monitors the budget, resources,

science topics and indicates trips and workshops to support learning. The subject leader has specially-allocated time for fulfilling the task of reviewing samples of children's work, training and liaising with other subject leaders from other schools.

Resources

All resources are stored centrally in the resources room with resources organised in boxes. Staff are responsible for informing the Science coordinator, when extra resources are needed, when there are breakages and when consumables are running low. The Science Coordinator will update and replenish resources when needed.

Health and Safety

Health and safety is in line with the school's policy. Safe use of equipment is to be promoted at all times. A copy of 'Be Safe' (ASE) is available for teachers in the staff room/science coordinator's science file.