



Science Subject Policy

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Marton Manor Primary School

Policy for Science

Vision

Here at Marton Manor, children are encouraged to become scientific enquirers. We want to foster their natural curiosity to help them gain a wider and deeper understanding of the world and beyond.

Intent

At Marton Manor Primary School, we all recognise the importance of science as a core curriculum subject that is crucial to our pupil's understanding of the world, next steps and future career aspirations. It is our intention to provide a high-quality science education that builds connected knowledge and key skills through concepts, deeper/blended learning and a hands-on, investigatory approach to teaching. We will work with our parents, community and wider external STEM providers/employers to enrich our learning and support high Science Capital with all our pupils irrespective of starting point, background, gender or race.

Implementation

Children have weekly lessons in Science throughout Key Stage 1 and 2. In Early years, science is taught through play; children are introduced to the world around them by having opportunities to explore and question. Additional opportunities are provided in Science, through Science days in school, utilising the school grounds and educational visits linked to the science curriculum, such as visits to The Life Centre.

Impact

Through the National Curriculum for Science, Marton Manor Primary School aims to ensure that all pupils:

- sequentially develop / recall connected scientific (substantive) knowledge, vocabulary and a conceptual understanding of science through a progressive use of science models across the science curriculum. They will be challenged to develop depth to their understanding through an appropriate, coherent and ambitious curriculum.
- develop an understanding of the nature and methods of science (disciplinary knowledge) through focussed / progressive Working Scientifically skills

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development (dual objectives) and the use of different types of Science Enquiry that help pupils to become increasingly independent and successful investigators.

- are equipped with the scientific knowledge required to understand the uses and implications of science, engage with current/future debates (Science Literacy) and develop high Science Capital.

To support a fully progressive curriculum, the foundations for learning science begin in Early Years Foundation Stage through planned substantive / disciplinary knowledge and key vocabulary development that dove-tails into National Curriculum expectations. Pupils are taught to use appropriate science equipment when investigating the world around them. This builds stronger foundations for success.

Teaching and learning style

We use a variety of teaching and learning styles in science lessons and children are encouraged to take ownership of their learning. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes, we do this through whole-class teaching, while at other times, we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. They use ICT in science lessons because it enhances their learning. They take part in observation and discussions, and engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in real scientific activities, e.g. investigating a local environmental problem, 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 (we do not expect all children to complete all tasks);
- providing resources of different and increasing complexity, matched to the ability of the child;

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- using classroom assistants to support the work of individual children or groups of children.

Science curriculum planning

Science is a core subject in the National Curriculum. The school uses the Trust curriculum document when planning. The national scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork, although we may at times choose a locality where the physical environment differs from that which predominates in our immediate surroundings.

We carry out our curriculum planning in science in year groups. The long-term plan maps the scientific topics studied in each term during the year. The science subject leader works this out in conjunction with teaching colleagues in each year group. In some cases, we combine the scientific study with work in other subject areas, especially at Key Stage 1; at other times, the children study science as a discrete subject.

Our more detailed plans, which we have based on the national scheme of work in science, give details of each unit of work for each term. The science subject leader keeps and reviews these plans. We aim to ensure complete coverage of the National Curriculum, without repeating topics but building on previous learning.

We have planned the topics in science so that they build on prior learning and assessment so that there is support, some re- visiting and extension of learning for each child, at each stage of attainment. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and we also build progression into the science scheme of work, so that the children are increasingly challenged as they move up through the school.

Implications for the whole school will be :

Programmes of study in Years 1-6 will be informed by the National Curriculum 2013 to ensure continuity and progression of skills. There is a broad and balanced curriculum map in place that ensure continuity and progression throughout the science curriculum.

Well-judged and effective teaching strategies successfully engage pupils – a hook, learning journey and high quality outcome will be in evidence in each unit of learning.

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Teachers will have well-developed subject knowledge with which to develop pupils' knowledge, skills and understanding in a structured way. They will use well-framed questions, knowledgeable answers and discussion to promote deep learning. They will ensure an appropriate ratio of exposition to learning- activity in their teaching

Where appropriate links will be made with other learning institutions and schools to share learning and good practice e.g. Trust wide work and STEM as well as Children Challenging Industry.

Work will be pitched at a level that is achievable if they work hard and try their very best. The pace and depth of learning must be maximised to provide differentiated challenge to learners of all abilities. The leader of Science will analyse pupil progress to ensure all groups are achieving well including those who are more able and talented.

Classroom and learning environments will be orderly with risk assessments in place through our subscription to CLEAPSS so that the atmosphere is purposeful and children can work safely.

The Foundation Stage

We teach Science in reception classes as an integral part of the topic work covered during the year. As the reception class is part of the Foundation Stage, we relate the scientific aspects of the children's work to the objectives set out in the Early Years Curriculum for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water, what plants need to grow and the variety of birds that visit our school garden.

The contribution of science to teaching in other curriculum areas

In working scientifically children conduct research contributing to progress in English by actively promoting the skills of reading, writing, speaking and listening. Some of the texts and vocabulary that the children study in literacy are of a scientific nature. The children develop oral skills and an understanding of fair testing in science lessons through discussions (e.g. of the environment) and through recounting their observations of working scientifically. They develop their writing skills through writing reports and projects and by recording information.

Personal, social and health education (PSHE) and citizenship

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

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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. They also learn about how to keep themselves healthy and how to adopt healthy eating habits.

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. Children also learn about the work of scientists including those who made significant discoveries that have changed our world.

Science, Technology (IT), Design and Technology (Engineering) and Maths

IT enhances the teaching of science in our school significantly, because there are some tasks for which IT is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impractical to do directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use IT 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. 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.

We explicitly show pupils the shared objectives and skills e.g. in reasoning, problem solving, communicating and drawing strong conclusions in all these areas.

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Science and inclusion

At our school, we teach science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and any child who may be learning English as an additional language, and we take all reasonable steps to achieve this. For further details, see individual whole-school policies: Special Educational Needs and Disability Discrimination.

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 standards. This ensures that our teaching is matched to the child's needs.

Intervention will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs. The IEP may include, as appropriate, specific targets relating to science.

We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom (a trip to a science museum, for example), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Assessment for learning

Teachers will assess children's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it to see if there is progress being made in scientific skills and knowledge by highlighting objectives, and uses this assessment to plan for future learning. There is also assessment of application and development of scientific enquiry. Verbal or written feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.

At the end of a unit of work, s/he makes a summary judgement about the work of each pupil in relation to the National Curriculum standards of attainment. This may be done through low stakes tests which help inform staff about the impact of their teaching and the children's retention of their learning. The teacher records the attainment. We use these assessments as the basis for assessing the progress of

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each child, and we pass this information on to the next teacher at the end of the year and key stage.

Teachers make an assessment of the children's work in science at the end of Key Stage 1. Children are assessed in science at the end of Key Stage 2. We report the results of these assessments to parents and carers, along with the teacher assessments which we make whilst observing children's work throughout the year. We use science programmes of study in Key Stage 2 to assess children's progress.

The science subject leader keeps samples of children's work in a portfolio, and uses these to demonstrate the expected standard of achievement in science for each age group in the school.

Resources

Science resources are used to support children's understanding of new concepts (scientific vocabulary, books, posters etc...) We have sufficient resources for all science teaching units in the school. We keep these in a central store, where there is a box of equipment for each unit of work. The library contains a good supply of science topic books and we can access computer software to support children's individual research. We also use related out-of-school and enrichment activities

Monitoring and review

The coordination and planning of the science curriculum are the responsibility of the subject leader, who also:

- supports colleagues in their teaching, by keeping informed about current developments in science and providing a strategic lead and direction for this subject;
- gives the head teacher an annual summary report in which s/he evaluates the strengths and weaknesses in science and indicates areas for further improvement;
- uses specially allocated management time to review evidence of planning and assessment, review the children's work, talk to pupils and observe science lessons across the school.

The quality of teaching and learning in science is monitored and evaluated by the Science subject leader as part of the school's agreed cycle of lesson observations.