MARSHGATE
PRIMARY SCHOOL

Science Policy

Spring 2020

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At Marshgate, we encourage children to be inquisitive throughout their time at the school, empowering them for lifelong learning. The science curriculum fosters a healthy curiosity in children about our universe and the world around us. 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 'Working Scientifically' skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently. Children also learn to question and discuss science-based issues that may affect their own lives and the direction of society and the future world.

Aims / Ambition

Our aims in teaching science are that the children will:

- Enjoy science, study it with a sense of achievement and be taught so that they can reach their full potential.
- Achieve a high standard in science and gain a secure understanding of knowledge, skills and concepts.
- Develop investigative skills with confidence and understanding.
- Acquire a body of scientific knowledge and attitudes through investigation and research, which builds on and develops the sense of curiosity and a love of learning.
- Develop an understanding of respect and our responsibilities towards living and non – living things.
- Make good use of the school grounds and habitats and to foster links with the wider community and places of scientific interest.
- Look at science, its achievements and applications, and how it can change our lives.
- Have access to stimulating, appropriate, 'hands-on' science activities that include aspects of creativity, inquiry and collaboration.

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 learning and teaching of science involves the following:

- Science will be taught in planned and arranged blocks by the class teacher and will have a topic-based approach. This is a strategy to enable learners to develop a greater depth of knowledge.

- Through our planning, we ensure problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and are given opportunities to use their scientific and research skills to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to challenge learners and to test conceptual knowledge and skills. Children are regularly assessed to identify gaps in learning, so that these areas can be addressed.

- We build upon the knowledge and skills development of children's previous learning. As children's knowledge and understanding increases, we encourage children to become more proficient in predicting; selecting and using scientific

equipment; collating and interpreting results and in reasoning and concluding findings based on real evidence.

- 'Working Scientifically' skills are embedded into lessons to ensure scientific skills are being developed throughout the children's school career. New vocabulary and challenging concepts are embedded in planning and in lessons.

- Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops as much as possible.

- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the science curriculum further. These are purposeful and link with the knowledge and skills being taught in class.

- Whole-school events, such as Science Week or project days, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events involve families, parents and the wider community.

Learning and Teaching in Science

Scientific knowledge and conceptual understanding

The programmes of study as set out in the national curriculum for science describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop a 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 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. Children should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, scientific 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. Through use of the KWL strategy (what is already known (K), what would like to be known (W) and what has been learnt (L)), children are also able to suggest what they would like to learn at the start of each teaching sequence and this ensures that teachers are able to adapt the programme of study to ensure that this is informed by children's interests and to maximise their engagement with and motivation towards studying 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 various skills: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunities to seek answers to questions through collecting, analysing and presenting data.

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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 Marshgate, science lessons provide a variety of subject specific language to enable the development of children's ability to articulate scientific concepts clearly and precisely with the correct use of vocabulary. 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 address misconceptions.

Science Assessments

Science topics begin and end with KWL grids (see above for further explanation). Throughout all science lessons, assessment for learning strategies (AfL) are used to generate feedback which is then used to inform children of their next steps. Children are also involved in the process of self-improvement, recognising their achievements and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success. Formative assessments of children are recorded on Target Tracker half termly.

Children's work is compared with age appropriate exemplification and teachers moderate children's work to ensure consistency. A summary of each child's progress in Science is presented to parents at consultation evenings and all children receive an annual written report commenting on progress and achievement in science at the end of the academic year.

The Year 2 and Year 6 staff assess children's attainment and progress at the end of each key stage. This is based on assessment records and science work completed by the children.

In Early Years, children are assessed through the 'Understanding of the World' Early Learning Goal. Some aspects of 'Expressive Arts and Design' are also science based.

Planning and Resources

Science planning is completed weekly in year group teams. At Marshgate, we use a variety of schemes of work including TigTag Science, Switched on Science and ASE materials. We always ensure the key knowledge and skills of each science topic is covered. Teachers also have access to additional resources such as SNAP Science, LGFL and Primary Science Trust materials to further support Science planning. Science resources to aid and support the teaching of all units and topics taught, from EYFS to Y6 are kept in a central store, where they are easily accessible to all staff. EYFS have a range of resources kept in classes, for simple access for children during exploration activities. The library contains a good supply of science topic books to support children's individual research.

Cross Curricular Links

Science has strong links with other curriculum areas such as language through reading, mathematics through data handling and DT through application of scientific principles. There is also a strong link with the PSHE curriculum e.g. caring for the environment, sustainability and showing care for living things. Children are made aware of these links in lessons.

Foundation Stage (See Early Years Policy)

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.

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Equal Opportunities
At Marshgate we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

Inclusion (e.g. EAL/SEN/PPG/Provision for HA)
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 SEND children to complete their own projects, 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. 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.

Role of the Subject Leader
It is the responsibility of the subject leader to monitor the standards of children's work. 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, books, 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, liaising with other subject leaders from other schools and organising science events.

Parents (Including Homework)
Parental input is highly valued, and parents are invited and welcomed into school to share their own expertise in science with the children. Children may receive science homework based on their current topic.

Health and Safety
At Marshgate, all children are made aware of the importance of health and safety considerations when undertaking work in Science (please also see the Health and Safety Policy). The teaching staff ensure that children receive demonstrations of how to use any specialist equipment. All equipment is maintained in good condition and stored safely. Staff will always warn children of any foreseen dangers and take necessary precautions. At Marshgate we expect our pupils to learn to take responsibility for the safety of themselves and their peers.