St Mary & St Margaret's Primary

Science Policy 

Updated November 2024

CRC Article 29 (goals of education)

Article 29 of the UNCRC says that a child or young person's education should help their mind, body and talents be the best they can. It should also build their respect for other people and the world around them.

Science at St Mary & St Margaret's

Science is a key subject at St Mary & St Margaret's. We believe that science stimulates and excites children's curiosity about phenomena and events in the world around them. It also satisfies their curiosity with knowledge. As science links direct practical experience with ideas, it can engage learners at many levels.

We believe that science will lead to a better understanding of ourselves and the world. It provides opportunities to appreciate scientific facts and concepts and to experience scientific discovery.

Science at our school is about developing children's ideas and ways of working that enable us to make sense of the world in which they live through investigation, as well as using and applying processing skills.

Aims

- To encourage children to ask and answer scientific questions;
- To provide opportunities for children to plan and carry out scientific investigations, with the correct use of equipment (including computers);
- To ensure that children understand about life processes;
- To know about materials, electricity, light, sound, and natural forces;
- To know about the nature of the solar system, including the earth;
- To know how to evaluate evidence, and to present conclusions both clearly and accurately.
- To increase the child's knowledge and understanding of the world.
- To develop attitudes of curiosity, originality, co-operation, perseverance, open-mindedness, self-criticism, responsibility and independence in thinking.
- To enable children to effectively and confidently communicate their scientific predictions and discoveries as they are given the opportunity to observe, describe, illustrate, hypothesise, evaluate and interpret, using appropriate scientific vocabulary.
- To develop children's understanding of the effects of their actions on the environment.

Teaching and Learning Style

At St Mary & St Margaret's 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, 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 role-play and discussions, and they present reports to the rest of the class. They 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);
- grouping children by ability in the room, 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.

Science Curriculum Planning

Science is a core subject in the National Curriculum. The school uses the national scheme of work for science as the basis of its curriculum 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 choose a locality where the physical environment differs from that which predominates in our immediate surroundings.

At St Mary & St Margaret's Key Stage One and Key Stage Two follow the *Engaging Science* curriculum which is based on the principles that:

-Science is best taught through practical sessions and investigation

-Pupils should be encouraged to think both scientifically and creatively

-Curiosity, wonder, humour and even disgust are emotions that build engagement in Science.

Teachers base their lessons around the *Engaging* Science scheme but also adapt it on our school planning format so it is suitable for our children and so we best meet the national curriculum. We plan the topics in science so that they build on prior learning through the units. 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.

Working Scientifically Skills and Approaches

Staff actively use 'Working Scientifically Skills' when planning all science lessons to ensure they are covered throughout each science unit that is taught in school. The skills will not be taught separately but through and clearly related to the teaching of substantive science content in our programme of study.

Working Scientifically Skills:
-Asking Questions
-Making Predictions
-Setting Up Tests
-Observing and Measuring
-Recording Data
-Interpreting and Communicating Results
-Interpreting and Communicating Data
-Evaluating

Pupils will also use 'Working Scientifically Approaches' actively in their lessons and these are visible on the wall in classrooms as six individual magnifying glasses for children to move around and bring to focus on their whiteboard in science lessons. It enables them to think about how they are going to approach science each lesson and to become familiar with the multiple ways they can

approach science.

Working Scientifically Approaches:

- Comparative/Fair Testing
- Research
- Observation Over Time
- Pattern Seeking
- Identifying, Grouping and Classifying
- Problem Solving

Implementation of Policy

At St Mary & St Margaret's our scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is an ignition to critical and creative thought. Through science, children understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. Children recognise the cultural significance of science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world. Science is not just a question of knowing facts and understanding concepts. It is also about encouraging children to behave scientifically (posing questions to be investigated, hypothesising, recording and analysing).

Teachers aim to present science in practical contexts which are relevant to the children's experiences. This will involve learning in class, group and individual situations. Some content is taught directly but enlivened through practical demonstrations. Small group activities follow on from class discussion and encourage collaboration. Where possible, children are encouraged to investigate their own questions, making decisions for themselves and maintaining a high level of motivation. Children communicate their findings in a variety of ways such as poetry, drama, written reports, short talks and demonstrations.

Teachers use ICT widely in science. Children are given the opportunity to practice science skills and enhance their presentation using software. We use ICT for enquiry work, including microscopes, with digital cameras, video capture of images and activities, and data logging.

Science is celebrated around the school through displays of work, materials and objects.

To deliver the National Curriculum, teachers promote a broad and balanced science education which enables progression and continuity between classes. We aim to teach science in ways that are imaginative, purposeful, well managed and enjoyable. Teachers will give clear and accurate explanations and offer skilful questioning, whilst making links between science and other subjects.

The practical nature of science is recognised and opportunities for learning through play and firsthand experience should be provided, especially in the early years. Science plays an important role in the development of investigative skills and draws upon strong mathematical links, for example measurement, pattern recognition, graphical skills and data handling. Curricula links to other areas, for example, language, are recognised and developed.

Early Years

At St Mary & St Margaret's we follow the EYFS Early Adopter framework (2020). Within this framework there are four guiding principles which shape our practice.
These are:

1. **Every child is a unique child**, who is constantly learning and can be resilient, capable, confident, and self-assured.
2. Children learn to be strong and independent through **positive relationships.**

3. Children learn and develop well in **enabling environments** with teaching and support from adults, who respond to their individual interests and needs and help them to build their learning over time. Children benefit from a strong partnership between practitioners and parents and/or carers.

Children **develop and learn at different rates**. The framework covers the education and care of all children in early years provision, including children with special educational needs and disabilities (SEND).

As part of our practice we:

- Provide a balanced curriculum, based on the EYFS, across the seven curriculum areas, using play as the vehicle for learning;
- Promote equality of opportunity and anti-discriminatory practice.
- We provide early intervention for those children who require additional support;
- Work in partnership with parents and carers;
- Plan challenging learning experiences, based on the individual child, informed by observation and assessment and by the children's own ideas and interests;
- Provide opportunities for children to engage in activities that are adult-initiated, child-initiated and adult supported;
- Provide a secure and safe learning environment indoors and outdoors.

Science is fully embedded in the EYFS Curriculum and children have daily opportunities to explore and engage in scientific activities to help them progress towards meeting the ELG (Early Learning Goal) linked to the Science Curriculum at the end of Reception:

-Understanding the World

- Talk about the lives of the people around them and their roles in society.
- Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class.

- Understand the past through settings, characters and events encountered in books read in class and storytelling.
- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.
- Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class.
- Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and (when appropriate) maps.
- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Key Stage One

At St Mary & St Margaret's children observe, explore and ask questions about living things, materials and physical phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are preparing for the future in a caring environment.

In Key Stage One children follow the *Engaging Science* curriculum which covers a range of topics ensures progression through the year groups. Children use reference materials including ICT to find out more about scientific ideas. They share ideas and communicate them using scientific language, drawings, charts and tables with the help of ICT where appropriate. Children further develop their understanding of the world around them which they have gained in the Early Years. Children are able to observe, explore and ask questions about living things, materials and physical phenomena.

Children begin to work collaboratively with others, enabling them to develop their scientific knowledge and understanding and to link scientific concepts. Children communicate ideas orally using taught scientific language and begin to develop written methods for communicating their ideas (to include drawings, diagrams, use of ICT, tables and charts).

Key Stage Two

At St Mary & St Margaret's children learn about a wider range of living things, materials and physical phenomena. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources including ICT in their work. They talk about their work and its significances, using a wide range of scientific language, conventional diagrams, charts, graphs and ICT to communicate their ideas.

Key Stage Two classes also follow the *Engaging Science* curriculum, ensuring all areas of the Programme of Study are covered across Years 3, 4, 5 and 6. Children learn, explore and ask questions about a wider range of living things, materials and physical phenomena. Children think about the impact of scientific developments and technologies on themselves and the world around them.

Children are encouraged to develop an independent approach to their science learning, through asking questions, suggesting improvements to their work and supporting each other towards achieving a heightened understanding of scientific concepts.
SC1 is promoted across KS2 with children being given the opportunity to plan, carry out and evaluate experiments. Children are encouraged to develop their own methods for presenting their ideas (to include drawings, diagrams, use of ICT, tables and charts).

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 English are 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 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 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.

Progression

As children move from Early Years to KS1 and up to KS2, science teaching, the clearly planned units and effective assessment should allow opportunities for them to progress:

- From using everyday language to increasingly precise use of technical, scientific vocabulary, notation and symbols.
- From personal scientific knowledge in a few areas to understanding in a wider range of areas and knowing how these link together.
- From describing events and phenomena to explaining events and phenomena.
- From explaining phenomena in terms of their own ideas, to explaining phenomena in terms of scientifically accepted ideas or models.
- From participating in adult lead practical, scientific investigations to developing and undertaking their own scientific investigations, independently.
- From unstructured exploration to more systematic investigation of a question or questions developed independently.
- From using simple drawings, diagrams and charts to represent and communicate scientific information, to using more conventional diagrams and graphs.

All staff have a Science Progression Document which shows them clearly how each topic builds on prior learning.

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 those 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; Disability Discrimination; Gifted and Talented Children; English as an Additional Language (EAL).

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. Intervention through School Action and School Action Plus 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.

Health and Safety

At St Mary & St Margaret's all children will be made explicitly aware of the relevance of health and safety issues when undertaking scientific work. This will be specifically highlighted when they are asked to undertake scientific investigations, with additional adults being used effectively to assist with the safe running of all science lessons.

Resources

At St Mary & St Margaret's 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. There is also a collection of science equipment which the children use to gather weather data. The library contains a good supply of science topic books and computer software to support children's individual research.

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. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable 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 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. They also use e-mail to communicate on their scientific findings with children in other schools and countries.

Monitoring

At St Mary & St Margaret's monitoring of the standards of children's' work and of the quality of teaching in science is the responsibility of the science coordinator to ensure continuity and progression throughout the school. The role of science coordinator also involves being informed about current developments in the subject and providing a strategic lead and direction for the subject in school. An annual summary of science is made in which strengths and weaknesses in the subject are evaluated, and an action plan to address any issues arising is formulated for the forthcoming year.

Equal Opportunities

At St Mary & St Margaret's we believe that every individual within the school has the opportunity to achieve their full potential and has the same chance and equal access to all areas of the curriculum.

In science this means that all children will have the opportunity:

- To develop the process of systematic enquiry.
- To relate their understanding of science to everyday life and in environmental contexts.
- To communicate using appropriate vocabulary and present scientific information in a number of ways.
- To explore aspects of health and safety when working with living things and materials.
- To carry out experimental and investigative science.
- To develop and apply their ICT capability in their study of science. Staff members to make every effort to use stimuli that reflect the cultural diversity of our school and to draw on children own experiences.

At St Mary & St Margaret's we aim to create a "rich scientific enquiring environment". Boys and girls achievement is planned for equally and bilingual

support is offered where possible for children to whom English is an additional language.

Assessment

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, and uses this assessment to plan for future learning. Written or verbal 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 levels of attainment. The teacher records the attainment grades in a mark book. We use these grades as the basis for assessing the progress of each child, and we pass this information on to the next teacher at the end of the year.

The Role of the Science Subject Leader

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 headteacher an annual summary report in which s/he evaluates the strengths and weaknesses in science and indicates areas for further improvement;
- uses specially allocated regular management time to review evidence of the children's work, and to observe science lessons across the school.

Any questions or concerns regarding this policy should be made to Emma Wallin.