

Our Lady of the Missions Primary School
Science Policy

Rationale:

“Science, technology and innovation are essential in increasing competitiveness and improving Scotland's economic performance in today's knowledge-based economy. They are key drivers of Scotland's future economic success and quality of life and an important part of developing robust, evidence based policy across all of the Government's responsibilities.

They are also fun, interesting and stimulating!”

Scottish Government, April 2011

“Science is an important part of our heritage and we use its applications every day in our lives at work, at leisure and in the home. Science and the application of science are central to our economic future and to our health and wellbeing as individuals and as society. Scotland has a long tradition of scientific discovery, of innovation in the application of scientific discovery, and of the application of science in the protection and enhancement of the natural and built environment.”

Curriculum for Excellence, Principles and Practice

“Through learning in the Sciences, children and young people develop their interest in, and understanding of, the living, material and physical world. They engage in a wide range of collaborative investigative tasks, which allows them to develop important skills to become creative, inventive and enterprising adults in a world where the skills and knowledge of the sciences are needed across all sectors of the economy.

Curriculum for Excellence, Principles and Practice

Aims:

At Our Lady of the Missions Primary School, Science has an important role to play in ensuring that our children become confident individuals, successful learners, responsible citizens and effective contributors. We aim for pupils to experience a range of different contexts for learning which draw on important aspects of everyday life and work.

Children and young people participating in the sciences at OLM Primary will:

- Develop a curiosity and understanding of their environment and their place in the living, material and physical world
- Demonstrate a secure knowledge and understanding of the big ideas and concepts of the sciences
- Develop skills for learning, life and work
- Develop skills of scientific inquiry and investigation using practical techniques
- Develop skills in the accurate use of scientific language, formulae and equations
- Apply safety measures and take necessary actions to control risk and hazards
- Recognise the impact the sciences make on their lives, the lives of others, the environment and on society
- Develop an understanding of the Earth's resources and the need for responsible use of them
- Express opinions and make decisions on social, moral, ethical, economic and environmental issues based upon sound understanding
- Develop as scientifically literate citizens with a life-long interest in the sciences
- Establish the foundation for more advanced learning and, for some, future careers in the sciences and the technologies

In OLM Primary, staff ensure all children are treated fairly, equally and with respect. We are a UNICEF Rights Respecting School and as such promote rights and responsibilities throughout the school community. It is school practice to ensure equality in terms of opportunity, social background, race gender, sexual orientation and disability. Religious beliefs of pupils and their families and also respected.

There are 916 pupils in the school. Of this 0.2% are recorded as disabled, 53.6% are male and 46.4% female, 13.5% are BME (black minority ethnic) and 14.5% have additional support needs. It is important that work is differentiated to allow the curriculum to be accessible by all members of the school community. Children when studying Science at OLM Primary should gain the necessary skills, knowledge and understanding afforded by Science to allow them to become effective citizens in any communities which they participate in. At OLM Primary we are cognisant of our Catholic faith and the religious beliefs of pupils and their families and will always consider them when planning programmes of study, particularly related to biodiversity and interdependence.

Learning and Teaching Approaches

To ensure that Science learning and teaching is effective at OLM Primary it is essential that our learning and teaching approaches cover experiences and outcomes clearly identified in the five organisers:

- Planet Earth
- Forces, Electricity and Waves
- Biological Systems
- Materials
- Topical science

Topical Science

Topical Science is an integral part of science education and children should contribute to discussions on current scientific news items to help develop their awareness of science and allow them to develop skills necessary for becoming an effective learner.

Approaches

Our approaches at OLM Primary must stimulate children's interest and motivation. Our programmes of study and methodology must be challenging, engaging and enjoyable. We will develop understanding and critical evaluation in Science at OLM Primary. There will be flexibility and choice for both teachers and pupils.

Science learning and teaching at OLM Primary School depends upon the skilful use of varied approaches, including:

- scientific investigations and the development of thinking skills
- active learning and planned, purposeful play
- the development of problem solving skills
- the use of relevant contexts, familiar to young people's experiences
- the appropriate and effective use of technology/real materials and living things
- building on the principles of Assessment is for Learning
- collaborative learning and independent thinking
- emphasis on children explaining their understanding of concepts, informed discussions and communication

Skills Development

Science at OLM Primary allows children to develop and practise a range of inquiry and investigative skills, scientific analytical thinking skills and develop attitudes and attributes of a scientifically literate citizen. Science at OLM Primary affords children the opportunity to develop skills for life and work, including literacy, numeracy and skills in ICT.

Inquiry and Investigative Skills at OLM Primary

Through experimenting, carrying out practical scientific investigations, carrying out research, problem solving and meeting challenges, children:

- ask questions or hypothesise
- plan and design procedures and experiments
- select appropriate samples, equipment and other resources
- carry out experiments
- use practical analytical techniques
- observe, collect, measure and record evidence, taking account of safety and controlling risk and hazards
- present, analyse and interpret data to draw conclusions
- review and evaluate results to identify limitations and improvements
- present and report findings

Science inquiry

The main approaches to Science inquiry are:

- observing and exploring – careful observations of how something behaves, looking for changes over time and exploring 'what happens if...' and 'how could I' questions.
- classifying – through identifying key characteristics
- fair testing – through identifying all possible variables and then changing only one while controlling all others
- finding an association – linking two variables to determine relationships
- researching using secondary resources

Scientific Analytical Thinking Skills

Children at OLM Primary develop a range of analytical thinking skills in order to make sense of scientific evidence and concepts. This involves them:

- being open to new ideas and linking and applying learning
- thinking creatively and critically
- developing skills of reasoning to provide explanations and evaluations supported by evidence of justifications
- making predictions, generalisations and deductions
- drawing conclusions based on reliable scientific evidence

Education Scotland Skills Framework

Education Scotland's Skills Framework offers advice and support in the STEM skills that should be covered when specific learning experiences and outcomes are being taught. Specific skills are aligned to Experiences and Outcomes to ensure a breadth of coverage across a level, depth of understanding and application through a variety of different contexts.

Planning

In Forward Planning there is a science curriculum map which suggests the Experiences and Outcomes to be taught at each stage. This ensures a breadth of coverage at each stage and depth and progression across levels as learners build on their prior knowledge.

Stimulating programmes of study meeting the principles of curriculum design – challenge and enjoyment, breadth, progression, depth, personalisation and choice, coherence and relevance - ensure Experiences and Outcomes are covered comprehensively. There are specific activities developed to stretch pupils at the top of levels and ensure that they are not constrained in their development of knowledge, understanding or skills.

Skills will be more complex as learners conceptual understanding develops within increasingly complex science contexts. Planners focus on how specific skills are developed through investigations, inquiries, problem solving activities or challenges.

At second level, for example, children develop a growing awareness of themselves and the world around them through observation, collecting specimens and carrying out experiments. They develop their ability to formulate questions or predictions based on observations or information that can be answered through experimentation, inquiry and research. As they answer these questions, they show an increasing awareness of the factors that could be changed and can plan a 'fair test' that involves keeping all the factors the same except one.

Assessment

OLM Primary is an AiFL school. The principles of Assessment is for Learning, in line with school policy and practice, should be followed.

Assessment of Science at OLM Primary is in line with advice given in national documents, including Building the Curriculum 5.

Pupils with Additional Support Needs (ASN)

Refer to OLM Primary School policy on Getting it right for every child.

Roles and Responsibilities

Management

The management team will manage the implementation of the school policy, with due regard to the Science curriculum, resources and staff development.

Science Champions

The Science Champions (there are 3 currently) have a responsibility to support teaching staff throughout the school to deliver exciting, engaging and relevant science. They will keep up to date with national, authority and cluster developments in science and disseminate any new knowledge, advice and resources to staff.

Teachers

Teachers will ensure that the policy is fully implemented and the Science curriculum is delivered with reference to the outlined learning and teaching approaches.

Parents/Carers

Parents/carers will be encouraged to and supported in playing an active role in their child's learning, thereby fostering the home/school partnership

Pupils

Pupils will work to the best of their abilities to develop knowledge, understanding, skills and informed attitudes in Science.

Resources

The Head Teacher will ensure that OLM Primary has up-to-date and appropriate resources to ensure effective learning and teaching. The Head Teacher will ensure that the organisation of resources is clearly understood by all staff, inventories are made and resources are easily accessible to all staff and pupils.

Glow

There is a comprehensive bank of resources on Glow to support teachers delivering high quality science. There is a guide to finding relevant resources which all teaching staff have access to.

Health and Safety

The maintenance of safe environment for learning will be catered for by following the guidance set out in risk assessments, school policies and standard circulars. Teachers should ensure that safe practice is adopted at all times.

Staff Development

All members of staff will have access to advice and entitlement to Continuing Professional Development (CPD) in Science.

Monitoring and Evaluating of Policy

This policy will be reviewed annually by the management team and any necessary amendments made.

The Evolution of Science at OLM Primary

Curriculum for Excellence programmes of study are in place and skills planners and a comprehensive curriculum map are in use throughout the school in line with the St Ninian's cluster. Programmes of study will be constantly evaluated and improved, there being a commitment to continual improvement of programmes of study.

Staff are currently working on a science glossary to help staff and pupils understand and use the vocabulary of science from Early through to Third level.

Staff at OLM Primary will continue to ensure that programmes of study reflect the ideals of CfE Science as stated in the principles and practice of Science document, including how experiences and outcomes are organised, learning and teaching of Science, assessment, progression and connections with other areas of the curriculum.

The teaching of Science affords many opportunities for children to experience relevant Literacy and Numeracy across learning experiences. There are natural opportunities and meaningful contexts for teaching Mathematics and Literacy and Language in Science programmes of study.

Rich Literacy and Numeracy experiences are part of day to day teaching of Science at OLM Primary and will continue to be developed. Cluster common language and methodology related to Literacy and Mathematics will be used. Meaningful links with Social Subjects, Expressive Arts, Health and Well Being and RERC, amongst other subjects will continue to be explored.

Programmes of study will continue to be audited to ensure that the principles of Curricular Design - Challenge and Enjoyment, Breadth, Progression, Depth, Personalisation and Choice, Coherence and Relevance - are an integral part of OLM Primary School's Science programmes of study.