Science at St. Michael's

The National Curriculum states that: 'A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics…Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena'. At St Michael's, we believe that the teaching of science should inspire and develop pupils' curiosity in the subject, whilst helping them to achieve to their full potential. To do this, they need to acquire the necessary scientific knowledge whilst being able to enjoy the experience of engaging and purposeful scientific enquiry in order to help them answer scientific questions about the world around them.

Curriculum Implementation

Science is an important National Curriculum subject and is taught weekly in each class across all key stages. Planning considers the school's emphasis on the development of pupils' skills of working scientifically, also linking with our school vision, 'Shine as lights in the world'. We encourage the development of an appreciation of, and engagement with, the awe and wonder of science, enabling them to flourish in this area. In most lessons, these skills are taught alongside knowledge and understanding through the key subject areas: Plants; Animals, including humans; Materials; Seasonal changes; Living things and their habitats; Rocks and soils; Light; Forces and magnets; States of matter; Sound; Electricity; Earth and space and Evolution and inheritance. Some topics are repeated across key stages with increasing levels of challenge.

The national curriculum for Science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them;
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

At St Michael's we use Developing Experts to aid in our teaching of science as it provides a bridge between the teaching of science and applying science to the real world. Developing Experts helps to spark enthusiasm and open the eyes of the children to the different opportunities available to them through science and exposes them to job opportunities linking to what they learn. The teaching of science at St Michael's focuses on enabling children, through first hand experiences, to think as scientists. All lessons have clear learning objectives that are shared and reviewed with the pupils. Activities are challenging, motivating and extend pupils' learning. Lessons make effective links with other curriculum areas, especially Maths, English, Computing, Design and Technology, History, Physical Education and Religious Education. At St Michael's, we have been able to provide exciting opportunities for pupils to experience 'science in the real world', through community links with parent scientists visiting the school to deliver 'science assemblies' and a variety of class workshops linking closely with class curriculum topics. We also participate in county-wide competitions, enabling children to put forward their work in science, whilst further

developing their skills and enthusiasm for the subject, as well as whole school competitions such as a Science in Nature photography competition. External providers have also been invited in to run exciting science workshops with individual year groups, across the whole school.

Through our holistic approach to the teaching of science at St Michael's, children are also able to develop in other valuable areas:

Thinking Skills:
The teaching of science provides numerous opportunities for the development of higher order thinking skills. Scientific enquiry demands a range of different types of thinking and processes that can be developed through thoughtful questioning.

Spiritual development:
Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world, and using 'Big Questions' related to topic areas. Topical scientific issues are also discussed as appropriate.

Personal, social and health education:
Health education is taught as part of the unit, 'Animals, including humans', across the key stages.

Through the teaching of Science, all children are encouraged to:

- be healthy - by learning about and looking after their body by eating healthily, good hygiene and through exercise;
- stay safe - by learning how to use equipment safely;
- enjoy and achieve - through participating in practical and exciting lessons;
- make a positive contribution - through lesson participation and working with others.

Science in EYFS

The 2020 document Development Matters identifies the prerequisite skills for Science within the National Curriculum.

Statements for EYFS Science are taken from three key areas of learning:

Area of learning	Science skills
Communication and Language	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.
Personal, Social and Emotional Development	• Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing

	- sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
Understanding the World	• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.

KS1

During years 1 and 2, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Working scientifically:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;
- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

Lower KS2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Working scientifically:

- asking relevant questions and using different types of scientific enquiries to answer them;
- setting up simple practical enquiries, comparative and fair tests;
- making systematic and careful observations and, where appropriate, taking accurate; measurements using standard units, using a range of equipment, including thermometers and data loggers;
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions;
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables;
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions;
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;
- identifying differences, similarities or changes related to simple scientific ideas and processes;
- using straightforward scientific evidence to answer questions or to support their findings.

Upper KS2

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Working scientifically:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary;

- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate;
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;
- using test results to make predictions to set up further comparative and fair tests;
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations;
- identifying scientific evidence that has been used to support or refute ideas or arguments.

Curriculum impact

Through our science curriculum at St Michael's, by the end of their primary school journey, our pupils are expected to have developed their understanding and enjoyment of scientific subject knowledge, skills and processes specified by the National Curriculum.

At St Michael's, a systematic approach to assessment is taken and tracked as a school to determine children's understanding and inform future planning. At the end of each unit taught, in each year group, teachers assess pupils understanding against specific national curriculum targets. Children are also encouraged to self-assess their understanding against learning objectives.

Collective work scrutiny, as well as staff and pupil voice, led by subject leaders, takes place where teachers can openly discuss work produced across the school, agreeing future whole school targets. Training is provided for staff as necessary. Pupils' progress in this subject is shared with parents on a termly basis, via school reports.