Science Policy

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St. Michael's C.E. (VC) First School

Science Curriculum Intent

At St Michael's we aim to create curious learners who ask questions and experiment, developing scientists of the future in our ever changing world. Through our curriculum we aim to develop children's substantive knowledge and disciplinary skills of science. We want to inspire and ignite curiosity about processes and methods and how these help to shape the future encouraging our children the think and work like Scientists. Our approach to science gives opportunities for our children to learn things that they might not ordinarily encounter in daily life and is a source of cultural capital. Such as visits to museums, farms and zoos, observing animal lifecycles in class and making use of our outdoor environment and forest school sessions.

We intend to provide all children of all abilities with an inclusive, broad and balanced science curriculum that is adaptive where necessary.

Our Science curriculum, in line with the national curriculum, 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 lines of scientific enquiries that help them to answer 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 aim to achieve an exciting science curriculum by allowing the children to;

- Research scientists and explore the impact they have had on our world, both historically and recently.
- Be curious, think critically and ask questions to further their knowledge and understanding.
- To take part in practical activities and apply their scientific skills to this and use their new knowledge to predict, give reason and explain findings.
- Explore science across other subjects; such as maths when analysing, art and DT when creating.
- Engage in science with their family through our competitions and presentations as a school, encouraging a family connection and learning how our families are involved with science.

Science Curriculum Implementation:

From our Foundation Stage to Lower KS2 we use White Rose as science scheme of work to ensure there is consistency throughout the school and focus on the key vocabulary in each year group. Lessons are adaptive and ensure all children can access them.

In our Early Years Foundation Stage the teaching staff focus on aspects in Understanding the World and Expressive Arts and Design to build the children's knowledge, vocabulary and curiosity through extensive outdoor learning opportunities and weekly forest school sessions. These foundations ensure as the children progress through the years they take this enjoyment and inquisitive nature with them to learn new exciting skills.

Our Nursery and Reception children engage in weekly outdoor learning sessions exploring the world around them and developing core language linked to Understanding the World. Our Foundation children are encouraged to play, think critically and explore to develop skills. They will work towards being able to describe what they hear and see in our world,

recognise differences between environments, understand the effect of changing seasons as well as the importance of a healthy lifestyle and wellbeing, including the importance of tooth brushing and reduced screen time (EYFS ELG's).
In KS1 and Lower KS2 Science is taught weekly and is also interwoven in other lessons for cross curricular links to keep the magic of science alive. This allows our children to use newly learned vocabulary in all aspects of learning and make links with science and the wider world. Our school is fortunate to have extensive grounds to explore and use for science as well as curriculum rich resources.

The Science National Curriculum aims:

Key stage 1

Working scientifically

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

- 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 Key Stage 2

In preparation for Middle school where our Science has been carefully planned to ensure full coverage by the end of KS2, the children will;

- ask relevant questions and use different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- Make systematic and careful observations and, where appropriate, take accurate measurements using
standard units, using a range of equipment, including thermometers and data loggers
- Gather, record, classify and present data in a variety of ways to help in answering questions
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Report on findings from enquiries, including oral and written explanations, displays or presentations of
results and conclusions
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise
further questions
- Identify differences, similarities or changes related to simple scientific ideas and processes
- Use straightforward scientific evidence to answer questions or to support their findings.

White Rose science has been designed to cover all the requirements of the National Science curriculum in a way that is intended to develop pupils' understanding of the concepts, practices and perspectives that underpin each discipline of science. It also engages children in and how their work in science can impact the world and future.

Lines of Enquiry

Our science lessons provides many opportunities for our children to explore the 6 lines of enquiry and reflect on these in their lessons as well as making links to maths to embed skills cross curricular.

Pattern seeking
Group and classify
Observe over time
Using Secondary sources
Comparative work
Working scientifically

Skills are revisited and developed each year which enables the children to consolidate the skills they have learned and transfer these as the curriculum develops.

Alongside White Rose, our school is also part of the national science group **The Ogden Trust**. Being part of the stone hub ensures the science leader and subsequently staff are up to date with new science initiatives to bring into their lessons, providing continuous professional learning and collaboration with other schools. We are a multi school group who share ideas to ensure science is taught coherently but also focused on our children's interests and strengths. To enhance our science we hold regular science competitions through The Ogden Trust group which involves the children and their parents/grandparents also getting involved, building a family community. This is a great way to showcase our scientific minded children and encourage more children to engage in the subject, raising the profile of science for all.

Science Planning

Medium Term Plans – Teachers complete a medium term plan for each scientific area using the White Rose Scheme and ensure they attempt to also include research of scientists, sustainability and progression in knowledge. The teachers will assess children's prior knowledge in the first lesson of the topic and plan progressive lessons to ensure sticky knowledge is practiced and new knowledge is taught.

Short term planning – Lessons are planned from the white rose scheme alongside teacher knowledge of subjects if they have a different approach to teaching a lesson. Vicabulary is key and is included in each lesson which the children access and vocabulary will be displayed in lessons for children to read and write in their work. Each lesson also highlights common misconceptions which are looked at in planning prior to teaching to ensure teachers are knowledgeable of this and how to answer curious questions. Teachers will use the lines of enquiry types in their class lessons and use the vocabulary linked to this so the children know which they are performing. The children at St Michael's access hands on learning in lessons and trip experiences to enhance their learning.

A lesson at St Michael's

A typical lesson of science would include:

- **Sticky knowledge** – what do the children already know or remember from the previous lesson.
- **Shared learning objective** and **subject specific vocabulary,** written up to read and write where appropriate.

- **Disciplinary Knowledge** – The teachers will share the **enquiry types** with the class for the lesson and ensure the children understand the methods, processes and skills they will use to **'work scientifically'**.
- **Effective verbal feedback, mini plenaries and peer support –** to ensure children feel confident to be curious, develop new learning and showcase their work to others.
- **Scaffolded learning –** Lessons will progress over time and learning will use high quality resources and teacher knowledge.
- **Adaptive lessons –** To ensure all children can access the topics and lessons with a range of resources, support and approaches
- **Hands on learning –** A practical approach to teaching and learning with high quality resources and time for peer collaboration to support each other.
- **Reflection and Evaluation –** The children have time to reflect on their learning and deliver an evaluation of their learning in class to others. Developing success, confidence and improved learning.

WOW Weeks

We hold WOW weeks throughout the year in all subjects and Science is also included. British Science Week is our main WOW week where we hold a competition through the Ogden Trust linking science to home and including our families. We also have this week to focus on Science and create work in each class to share at the end of the week. We also have a science and DT competition for the whole school to engage in, linking science across the curriculum.

Curriculum Enrichment

Our children's scientific learning is enriched by the following;

- Extensive outdoor area to explore with grounds next to the canal, woodland area and pond area
- Forest school lessons with 2x Level 3 forest school lead on site to support daily
- Trips and residential visits (E.g Laches Wood, Zoo's, Farm visits)
- British Science Week competitions and learning
- Ogden Trust Science partnership and competitions
- STEM club
- Volunteers from the local community
- Local middle school children and staff visitors

Science Curriculum Impact:

Our children get excited when discussing science lessons and the enjoyment they have in them. The children are able to reflect on learning and its outcomes clearly and confidently, making links to the wider world where appropriate. The teaching staff see excited learners asking questions to enhance learning and act on this to meet the needs of their inquisitive

minds. We endeavour for our children to be confident and creative in their learning whilst understanding the importance of science.
Progress in Science is demonstrated through regularly reviewing and scrutinising children's work to ensure there is a clear progression of skills being taught. Science staff meetings are also held to ensure teaching staff are up to date with new information and support can be given to those who seek it. A map of skills is regularly updated when children's books are being reviewed to ensure each line of enquiry is met throughout the year. When moderating work, pupil voice is also taken into account and a sample of children from each class will be asked to discuss their science learning. From this we see the excitement and children reflecting positively on lessons they have witnessed and taken part in. This also gives the children a chance to showcase the new vocabulary and use it in the correct context.

Progress and Assessment

Progress in Science is demonstrated through regularly reviewing and scrutinising children's work to ensure there is a clear progression of skills being taught and termly pupil voice demonstrates the children's knowledge and enjoyment of science. When reflecting on the teaching and learning, the children at St Michael's begin as curious and explorative learners in the EYFS, in KS1 they begin to make predictions and experiment hands on followed by our lower KS2 children enhancing these skills and drawing upon secondary sources, providing explanations in their work and presenting work in a more organised format.
Science data is collected termly and reviewed by the teachers and subject leader per topic. We ensure topic aspects are covered and identify children who are developing, achieving and working at greater depth. This data is then monitored and reflected upon to influence the teaching in future topics and revisions needed.

The teachers will use a variety of assessment methods to make judgments on the children's learning such as verbal discussions, evidence of work, written explanations and observing the children during lessons. Assessment is integral to our curriculum and is an ongoing process. The formative assessment methods are part of very lesson and then teachers make summative assessment judgements termly to track progress which the science leader will reflect upon with each year group.

British Values

Our science curriculum provides and promotes British Values throughout its teaching by;

- Developing **Mutual Respect** during experiments and team work
- Developing **Mutual Respect** when learning about sustainability and how we can impact future generations and nature around us
- Fostering **Individual Liberty** through curiosity and investigation
- Through health and safety the children learn about **rules** and **laws**
- Learning **respect** of others when learning about scientists

Roles and Responsibilities

Role of the Headteacher

- Ensure policies are implemented correctly
- Ensure staff members are given appropriate CPD in science and regular updates for the science lead
- Report to Governors on this policy and the effectiveness of science within St Michael's

Role of the Subject Leader

- Support quality teaching, planning and assessment
- Planning and leading staff meetings
- To engage our family community in science and invite them in during British Science Week to showcase their skills and support learning with the children.
- Provide quality resources
- Keep up to date with new polices and structures through training and CPD
- Collect evidence of science work across all year groups and abilities
- To keep knowledge and skills up to date in line with changes in National and local policy
- Support other staff in school including ECT's

Class Teachers

- To follow and uphold this policy
- To follow and plan science lessons in line with the National Curriculum
- To ensure our pupils are taught effectively and make use of the lines of enquiry is their lessons
- To ensure any visitors into school, extra-curricular activities or trips are there to support and enhance our curriculum

SEND and inclusion

All of the children at St Michael's First school have the opportunity to take part in our science lessons. We take an adaptive approach to teaching and if required, different technology or resources may be used to ensure every child can access a lesson. We actively promote values of respect and equality at St Michael's and ensure all children regardless of their background and ability, can enjoy science and become curious scientists of the future.