

Science

Intent, implementation and impact

ABOUT US

At St Michael's CE Primary School, we seek to nurture the whole child and install a love of learning by inspiring young minds within a happy, caring community based on Christian values. We believe whole-heartedly that St Michael's is a place that nurtures everyone with the wisdom and resilience to face all that life brings. Each and every person has the opportunity to flourish and achieve their God-given potential in all areas of the curriculum.

Our rigorous, well-planned curriculum, combined with high quality teaching, ensures that children are supported to be well-rounded, curious, empathetic, self-aware young people, who have a genuine thirst for learning. This broad and balanced curriculum has been created thoughtfully to provide our children opportunities to gain essential knowledge, skills and understanding across all areas.

Based on five main tenets, our curriculum focuses on learning about our world from these perspectives:



Science Topic Coverage

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year R	Me, I, myself	Dinosaurs – Jurassic R	Stronger together	Fairy Tales	We are farmers	Planes, trains and automobiles
Year 1	Exploring everyday materials What are things made from?	Animals including humans – (Animals) Do living things change or stay the same?	Animals including humans – About me What are bodies and what can they do? Seasonal change How does the weather change depending on the season?	Plants What does a plant need for healthy growth? Uses of everyday materials Why might some materials be more suitable for a certain task?		
Year 2	Use of everyday materials How do we choose materials?	Animals including humans – diet and health How can living things stay healthy?	Animals including humans – growth How do animals change as they grow?	Living things and their habitats How are habitats around the world different?		
Year 3	Animals including humans (Year 3) How do living things work?	Animals including humans Year 4 What do our bodies do with the food we eat?	Rocks and fossils – Year 3 Are all rocks the same?	Plants What do plants need to survive?		
Year 4	Forces and magnets - Year 3 What can magnets do?	States of matter – Year 4 Is water always wet?	Light – Year 3 What is the dark?	Plants – Year 3 Do living things need different things to survive?		
Year 5	Forces – Year 5 How do things move?	Animals including humans – Year 6 What is blood?	Sound – Year 4 How does sound travel?	Plants – Year 3 Are our plants in danger?		
Year 6	Light – Year 6 How do we see?	Electricity – Year 6 Can we vary the effects of electricity?	Evolution and inheritance – Year 6 How do living things change over time and place?	Living things and their habitats – Year 4 Are living things in danger?		

Biology

Physics

Chemistry

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INTENT

At St Michael's CE Primary school, our children are scientists. Our intention is to give every child a broad and balanced Science curriculum, which enables them to confidently explore and discover what is around them, so that they have a deeper understanding of the world we live in. We as staff recognise the importance of Science in every aspect of daily life and want the children to see this too. We want our children to have a love and passion for Science, to have the confidence to ask questions, but most importantly, we want them to have no limits to what their ambitions are and grow up wanting to be astronauts, forensic scientists, toxicologists or microbiologists.

We strongly believe that high quality Science education and teaching offers the foundations needed to understand the world around us. Science is ever changing and is fundamental for a prosperous future. Because of this, we give the teaching and learning of Science the prominence it requires.

We achieve this by ensuring that students are exposed to quality first teaching. We aim to deliver lessons that allow children to remember and cherish these memories and embrace the scientific opportunities they are presented with on a daily basis. This involves planning lessons that are exciting, practical and encourage curiosity and questioning. At the heart of our progressive Science curriculum is scientific investigation. Wherever possible we intend to deliver lessons where children learn through varied investigations and experiences. These stimulating and challenging experiences will help every child flourish and extend their scientific knowledge and vocabulary, as well as promoting a thirst for learning. A key element to our teaching is the building of fundamental scientific knowledge and concepts that can be added to and developed each year to allow our children to advance their rational thinking skills in addition to developing a sense of curiosity and excitement about Science. We also provide the children the opportunities to explain what is occurring, predict how things will behave, as well as analyse the causes they observe or record. Children at St Michaels are constantly immersed in key scientific vocabulary, increasing student's knowledge and understanding of not only the specific area they are learning, but of the world they live in.

At St Michael's we have researched and identified a coherent, well-planned Science curriculum (Developing Experts) which has been carefully designed and based around the National Curriculum. It has been developed with the need of every child at the centre of what we do. We want our children to be equipped with not only the minimum statutory requirements of the Science National Curriculum but to prepare for the opportunities, responsibilities and experiences of later life.

IMPLEMENTATION

At St Michael's CE Primary School, Science topics are taught within each year group in accordance with the National Curriculum and the Developing Experts Scheme. Science is taught consistently in standalone lessons, once a week for up to 1 hour and 45 minutes but is taught in many different contexts throughout all areas of the curriculum. For example, through our whole class reading lessons.

In ensuring high standards and learning in Science, we implement a curriculum that is progressive throughout our school.

We implement this by doing the following:

- A clear and comprehensive scheme of work that shows progression across all key stages within the science of Science.
- Every year group will build upon the learning from prior year groups and link ideas together, therefore developing depth of understanding and progression of skills.
- Teachers promote enjoyment and foster interest of the scientific disciplines: Biology, Chemistry and Physics.
- Children explore question, predict, plan, carry out investigations and observation as well as conclude findings. Children present their findings and learning using science specific language, observations and diagrams.
- Children are supported to review the learning taking place in a variety of ways allowing opportunities to revisit learning from previous topics as well as previous lessons.

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- Children have access to knowledge organisers at the start of each topic, which details information, dates and vocabulary. This is used to support children with their acquisition of knowledge and are used as a reference document.
- Children have access to key language and meanings in order to understand and readily apply to their written, mathematical and verbal communication of their skills.
- Teachers adapt and extend the curriculum where necessary to match all pupils need.
- Children have access to scientific experts to see their learning in a real life context as well as learn about the possibilities for careers in Science.
- Effective CPD opportunities are available to staff to ensure high levels of confidence and knowledge are maintained.
- Teachers have access to good quality resources and planning from the Developing Experts Scheme and use these to deliver high quality teaching.
- Teachers/Teaching Assistants deployed around the classroom to support children where and when necessary.
- Assessment tasks provide at the beginning and end of units to measure progress and learning.
- Teachers use effective assessment for learning in each lessons to address misconceptions.
- Effective modelling by teachers ensures that children are able to achieve their learning intention, with misconceptions addressed within in.
- Through using a range of assessment tools, differentiation is facilitated by teachers to ensure that each pupil can access the Science curriculum.
- Cross-curricular links are planned for, with other subjects such as Maths, English and Computing.
- Skills of a scientist are embedded and woven through lessons to ensure these skills are being developed throughout the children's school career.
- Through enrichment days such as 'Science Week and after school clubs', we promote the profile of Science.
- Provide children with opportunities to experience Science during outdoor learning.
- Pupil voice is used to further develop the Science curriculum.

EYFS:

The Early Years Foundation Stage Curriculum supports children's understanding of Science through the planning and teaching of 'Understanding the world.' Children find out about objects, materials and living things using all of their senses looking at similarities, differences, patterns and change. Both the environment and skilled practitioners foster curiosity and encourage explorative play allowing the children to ask questions about why things happen and how things work. Our children are encouraged to use their natural environment around them to explore. Children enjoy spending time outside exploring and observing mini-beasts, habitats, changing seasons, plants and animals.

KS1:

In KS1, all work is evidenced in whole class Science floor books. The children then have access to these books and are provided with opportunities to look back and recap on prior learning. This can then be built upon in the following lessons. This way of recording also provides more time and opportunities for the children to participate in investigations and experiments; allowing them to have high quality, first-hand experiences.

KS2:

In KS2, all topics are delivered and recorded in workbooks that have been created and developed by the class teaching and using the Developing Experts scheme of learning. These booklets are created for every child and contain:

- Front covers
- Biology, Chemistry, Physics tick box
- Beginning and end Assessment opportunities
- Knowledge organisers
- Key Vocabulary
- Skills of a Scientist

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- Information on Scientists linked to the learning.
- Lessons in sequence
- Reading
- Mission Assignments (Tasks, activities, experiments and investigations)
- Photographs and pictures
- Diagrams
- End of unit knowledge checkers

By having all this learning collated in one booklet, we can show how every child has progressed from the beginning of the unit to the end. This also allows greater opportunities for the children to review and revisit their learning at any point during the topic.

At St Michael's we understand and appreciate that, all children are different and will learn differently. With this in mind, we ensure we provide suitable learning opportunities for all children to flourish and achieve.

SEND and Inclusion:

As in all areas of the curriculum, teachers will deliver 'quality-first' teaching and differentiate in varied ways to support children with barriers to learning. On an individual basis, teachers will consider any limitations that a child has in accessing the planned lesson and provide resources, word banks with visual cues, stem sentences, adapted tasks and adult support.

With more able and 'Greater depth' pupils, teachers use a range of open-ended questions to promote deeper thinking and promoting pupils to use prior learning for formulate ideas.

Assessment:

As a school, we believe that assessment for learning is a collaborative process and can create effective feedback for both the teacher and the child.

All KS2 booklets contain assessments at the beginning of the unit and end. The assessment in the beginning is in the form of a written answer to the unit question. At the end of the unit, they will have a second attempt at the written answer to the unit question from the beginning of the workbook and complete a test linked to the learning undertaken.

We believe it is vital that all pupils are given feedback on the work they have completed. Immediate feedback is the most valuable as it gives the opportunity to rectify and improve immediately. Teachers and support staff gives feedback in conjunction with the 'Feedback and marking policy'.

IMPACT

The successful approach to the teaching of Science at St Michael's will demonstrate a fun, engaging, high quality Science education, that provides children with the foundations for understanding the world that they can take with them throughout life.

The impact of this curriculum design will lead to outstanding progress over time, across key stages, relative to a child's individual starting point and their progression of skills. Children will therefore be expected to leave St Michael's as enthusiastic Science learners and understand that Science has changed our lives and that is it vital to the world's future prosperity. We want to empower our children so they understand they have the capability to change the world. We also aim to create a culture of high scientific aspirations, which will allow our children a platform to develop their scientific learning and careers.

Our aims are:

- Most children **will** achieve age related expectations in Science at the end of their cohort year.
- Children **will** retain knowledge that is pertinent to Science with a real life context.

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- Children **will** be able to question ideas and reflect on knowledge.
- Children **will** work collaboratively and practically to investigate and experiment.
- Children **will** be able to explain the process they have taken and be able to reason scientifically.