



Subject Story: Science



- I know about the world around me
- I can test my hypothesis fairly
- I understand how to work scientifically

Intent – What are we trying to achieve?

At St Michael, we believe our Science curriculum should provide the foundations for pupils to explore and understand God's world so that they are naturally curious and are able to make scientific enquiries. Our curriculum will help our pupils understand their responsibility for protecting our precious planet and having a positive impact on it as they grow older. We want our children to see the relevance of science in our daily lives and the impact it can have on our future lives in areas such as technology engineering and maths. We want our pupils to be excited and curious about Science so that they can make a positive difference to their local and global community both now and in the future, as reflected in our recent achievement when we gained our PSQM Gilt Award. Our aim is for children to develop an understanding of the world they live in to appreciate scientists, discoveries and breakthroughs of the past.

We follow the national curriculum programmes of study for Science, which is broken down into specific content for each group so that pupils learn about:

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| • Animals including humans | • Light |
| • Plant | • Forces |
| • Materials | • States of matter |
| • Seasons | • Sound |
| • Living things and their habitats | • Electricity |
| • Rocks | • Evolution |
| • Earth and space | |

Throughout each stage of learning a theme of Working Scientifically is encouraged and supported. The curriculum approach to Science is an explorative one. Children are given opportunities to gain new, subject-based knowledge and use that knowledge to participate in child-led, scientific investigations. Strong links between the three core subjects (English, Mathematics and Science) and the STEM subjects (Science, Design & Technology, Computing and Mathematics) should be evidenced in children's workbooks and application of the agreed 'Working Scientifically' skills should be evidenced in the class Big Book.

Implementation – How is the curriculum being delivered?

At Saint Michael's, we believe Science is effectively taught when:

- Pupils build up a body of key foundational knowledge and concepts and are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.
- Lessons are child-led: Every child can ask their own scientific questions and investigate them in a practical way. Sometimes learning should be independent, sometimes it should be collaborative. Pupils should be able to make choices in the way investigations are carried out and explain their reasoning.
- Pupils have logical yet practical opportunities: Every child is engaged and able to access relevant and high-quality practical activities. They are taught to investigate a logical way to gain a deeper understanding.



- Pupils see themselves as Scientists inside and out: Every child can explore and question every part of the science curriculum allowing them to gain a better understanding of the world around them. Children's curiosity is nurtured with outdoor learning as a way of experiencing real, living science.
- Pupils can Speak Scientifically: Every child is able to use precise scientific vocabulary in the correct context. They naturally use these words whilst working scientifically.
- Pupils Record and Reflect: Every child is given time to reflect on their learning and reach conclusions. They understand that experimentation and fair testing in Science is the key to becoming an excellent scientist. Children know that making a mistake in Science can sometimes be the best way of developing scientific knowledge. Children can record their learning in a variety of different ways.
- And most importantly... every child loves Science!

Our pupils will also be given opportunities to be taught Science both discretely and in other curriculum subjects e.g. Topic, English, Maths, RE, Guided Reading etc. They will have opportunities to use a variety of resources in a dedicated learning space (The Lab), which will encourage pupils to learn through practical Science following their own lines of scientific enquiry whenever possible. Our outdoor environment will also be used to inspire their work. We have chosen a group of pupils, the 'Mini-Einsteins', to support teachers in preparing for lessons in The Lab. These pupils also act as ambassadors for Science. Teachers will create a Planning Overview for each Science topic tailored for their pupils and differentiated appropriately so that all pupils are challenged to meet or exceed age-related expectations. Pupils will be given feedback for each piece of work so that they can make rapid and sustained progress over their school life.

Impact – What difference is the curriculum making?

Our PSQM Award was given in September 2018 in recognition of the quality of the teaching and learning of Science at St. Michael's; we gained an accreditation in September 2023 for the PSQM Gilt Award to acknowledge the excellent Science provision offered to our pupils.

Pupil attainment in Science is consistently above national averages.

Our Science curriculum is ensuring that our pupils have an accurate and precise grasp of scientific concepts and can express them using the correct scientific vocabulary. It will inspire our pupils to pursue further scientific education and careers in STEM industries.

Our Science curriculum allows our pupils to pursue their curiosities about our world and grow to love the subject. Science will promote the pupil's spiritual, moral, social and cultural development by discussing the scientific reasoning behind natural phenomena and how this can link to cultural, moral, social and spiritual beliefs both historically and in modern-day. The subject also relates classroom learning to real-life experiences, known as 'Science Capital', which allows children to make connections between Biology, Chemistry, Physics and Working Scientifically skills and every part of their daily lives. Science will help pupils understand and appreciate the world we live in and all of the life that inhabits our world.

Science will promote British Values by exploring the importance of tolerating others' beliefs through experimenting in groups and learning about historical scientific figures who may have had different beliefs to the children. Practical lessons, where group work is involved, will also promote mutual respect – encouraging children to share tasks fairly and listen to others' ideas with scientific interest. Our Science curriculum will ensure children develop their understanding of how science and scientific discovery can both reflect and shape our history, and contribute to the culture, creativity and wealth of our nation.

Science will help pupils develop a Growth Mindset by child-led investigations and experiments. Children will be encouraged to believe that, in Science, some of the best discoveries can stem from investigations which have not followed a predetermined plan or structure. Children are continuously encouraged to learn from unexpected results and ideas. Science will show pupils that enquiry and mistakes can lead to new discoveries. It will help them see that existing theories can be challenged and knowledge can evolve.



If you visited a Science lesson at St Michael's you would see:

- Enthusiasm and passion about Science
- All lessons should feel like a journey of discovery – both in Working Scientifically lessons and knowledge lessons.
- Children consolidating their learning and building their knowledge over time
- Fun, explorative learning
- Children learning that experiments go wrong but that we can learn from these by adopting a growth mindset
- Challenge for all pupils
- Use of scientific resources to aid scientific discovery

Pupil Voice

Year 1 – I love doing experiments and I think Science is important because we learn about the weather and how animals live.

Year 3 – I really enjoy learning about Science because it gives us lots of knowledge about the real world. I especially enjoyed learning about flowering plants, we were able to do lots of practical investigations!

Year 5 – I enjoy the experiment in Science because it helps us to learn in a more practical way. I recently enjoyed the coke and Mentos experiment! Science is important because it helps us have a better understanding of the world.

Our Diverse Curriculum

As a school, we are passionate that our children receive a broad, balanced, inclusive and diverse curriculum. Within this subject, we will ensure:

- That the children have the opportunity to learn about a variety of Scientists from different cultures and eras.
- That children are aware of both female and male role models in Science and the contributions they have made.

Our Ambitious Curriculum

Our curriculum is designed to give all our children the knowledge and cultural capital they need to succeed in life.

Pupils with Special Needs: In Science, children are supported to achieve through carefully chosen, differentiated tasks that may be adapted to meet their individual needs. Adult support is available in lessons, which designed to include children with special needs so that they can achieve alongside their peers. Pre-teaching of vocabulary and concepts are also made available to ensure each child is able to access the learning.

Other strategies to support pupils access the curriculum include:

- Key vocabulary on slides, learning journeys and shared with pupils at the start of every lesson.
- Pictures and resources included to support their understanding of key vocabulary
- Pre-teaching of vocabulary
- Independence is supported
- Talk for learning and teacher modelling
- Link understanding science to real-world contexts
- Use pre-topic assessment to check the pupils' baseline before building on key knowledge
- A range of visual aids, such as videos, concept cartoons and animations, to support learning of new concepts
- A variety of means used to record their work eg. Recording on Learnpads, use of scribes, photographs of learning

Working scientifically

- Differentiated learning and templates to support this
- Mixed ability pairs/triads/groups
- Stem sentences
- Easily accessible scientific equipment for use and child-led exploration at playtimes



Disadvantaged Pupils: All children at St Michael's have access to the excellent resources and facilities we provide such as The Lab, science equipment and a spacious outdoor environment. They all benefit from excellent teaching and learning. All educational visits and workshops at school are fully funded for disadvantaged pupils so every child has access to the same high-quality learning experiences.

More Able Pupils: We identify pupils that show exceptional attributes in our curriculum. In Science, we select more able pupils to join the mini-Einsteins, where these pupils have opportunities to be challenged further in lessons, take a more lead role in assisting the teacher and their peers. Mini-Einsteins also have been able to further develop their scientific skills by attending a science club where they have worked towards a crest award and are invited to additional enrichment activities such as Q&As with scientists.

An example of progression in our curriculum

Animals including Humans						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding the World:/The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.	identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; identify and name a variety of common animals that are carnivores, herbivores and omnivores; describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	notice that animals, including humans, have offspring which grow into adults; find out about and describe the basic needs of animals, including humans, for survival (water, food and air); describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat; identify that humans and some other animals have skeletons and muscles for support, protection and movement.	describe the simple functions of the basic parts of the digestive system in humans; identify the different types of teeth in humans and their simple functions; construct and interpret a variety of food chains, identifying producers, predators and prey.	describe the changes as humans develop to old age.	identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function; describe the ways in which nutrients and water are transported within animals, including humans.

Outstanding Examples of Learning:



In EYFS, the children were fascinated by the recent weather. They explored and investigated which conditions would keep the ice frozen and which would melt the ice.



In Year 6, the children have been working on classifying bones when dissecting owl pellets, in order to explore the diet and habitat of owls in the local area. They also explored the parts and function of the circulatory system by dissecting pig hearts and identifying each part within.

