

Science Curriculum

Our science curriculum is built upon our 4 core values of faith, pride, challenge and success. Science is an essential skill, which is vital to the world's future and prosperity. Through Science lessons in Biology, Chemistry and Physics, we will provide the foundation for children's understanding of the world. All children are taught essential aspects of science: knowledge, procedures and purpose.

INTENT		IMPLEMENTATION		IMPACT	
Alignment to National Curriculum	In line with the National Curriculum, we ensure that our children: 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. Our curriculum is underpinned by the 'big ideas' of science.	Pedagogical Approaches	The pedagogical approaches to the teaching of science are closely aligned to the approaches and principles of teaching in other subject areas, with the key elements being: <ul style="list-style-type: none"> • Deliberate and intentional retrieval of previous knowledge to build on previous learning • Regular checkpoints and formative assessments to tailor lessons to the needs of pupils • Positive relationships that create the conditions conducive to effective learning • High levels of subject knowledge • Making reference to the curriculum values when teaching; this supports pupils to contribute and engage in lessons and be part of a class community striving to unlock each member's potential. 	Approach to Assessment	We understand that learning happens over time rather than in a single lesson. As a result of our carefully designed and planned curriculum, pupils develop detailed knowledge and skills across the curriculum and, as a result, achieve well. Assessment is done formatively during lessons, and at the end of each lesson teachers will assess the children's current level of skills. Degree of mastery of these skills will be made note of and used to inform teacher judgment on a termly basis. Task design is intentionally open in order for children to demonstrate their level of depth. Impact can be measured by teachers through the use of recall strategies such as those suggested by Tom Sherrington in his book Rosenshine's Principles in Action.
End Points	Working scientifically is represented as procedural knowledge. children revisit and deepen their knowledge and understanding in each year group as they progress through school. Substantive knowledge represents the science content that is taught in each year group – the content we want the children to know and remember. This builds through their Science learning journey at St. Mary's towards clear endpoints at the end of KS2.	Teachers' Expert Knowledge	Teachers are given regular opportunities to access CPD. The subject leader provides regular updates to staff. The culture of the school promotes openness and honesty in relation to proactively seeking support; this may be reflected in PDM content, and discussions between colleagues.	Performance Data	There is no published data for science at primary school. The school tracks foundation subjects broadly to ensure that pupils are working within the curriculum expectations for their year group. This is reported to parents within the end of year report.
Sequencing	The National Curriculum for science follows the Bruner model of a spiral curriculum and so has been carefully sequenced to provide progression through the domains of biology, chemistry and physics. The Big Ideas are introduced, revisited and referenced in different year groups as the children move through school to enable them to make connections with prior learning, and to help them understand how their current learning relates to a specific scientific discipline. Our curriculum ensures that we are not merely covering content and filling children with knowledge, but developing key skills, crucial knowledge and understanding.	Promoting Discussion and Understanding	We use the spiral nature of the science curriculum to ensure children have the skills needed to achieve as they progress through school. In all lessons, discussion is integral in order to deepen thinking and promote understanding. Pupils are given regular opportunities to explore and discuss questions at an age-appropriate level. Teachers use their strong knowledge of the progression in the curriculum in order to ask questions which lead children to develop the skills we intend to promote.	Pupils' Work	Children's work will be used as a way of securing and showing learning and not simply a record of activities done in class. Children should be able to refer back through their work, to support themselves with new learning and retrieve key elements of previous learning. Evidence will be recorded in a variety of forms. A discussion of previous learning will form the beginning of each lesson. The pupils record their learning within their science books. EYFS record evidence using 'Evidence Me.' There is an expectation that the learning in science is evidenced in books at an age-appropriate level.

Alignment with EYFS	Understanding the world involves guiding children to make sense of their physical world. In developing the children's understanding of the world, we build upon their personal experiences which increases their knowledge and sense of the world around them. These personal experiences and the opportunities provided in provision foster their understanding of our ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Understanding of the world with a focus on the natural world is part of our core provision all year round. Children are given opportunities and experiences to enable them to meet the expected level of development. A key aim of our St Mary's EYFS curriculum in relation to understanding the world is to be able to care for living things.	Knowing More and Remembering More	Knowledge organisers are used as a way of identifying key vocabulary (tier 2 and 3) and sharing the crucial knowledge and key concepts of each topic. These are regularly referred to and added to in order to activate prior knowledge and as a scaffold for learning. Children are encouraged to reflect on previous learning and use that to explain their current understanding. Teaching actively promotes recall and retrieval strategies to commit knowledge to long term memory and this is part of a wider suite of metacognition tools and strategies used in all lessons.	Talking to Pupils	The subject leader will dedicate time regularly to the scrutiny of books, discussion with teachers, enhancing subject knowledge, and discussion with pupils. Pupils will have the opportunity to talk about their work, their enjoyment and understanding of the lessons, and how much of their crucial knowledge they can recall. Their responses will be used to inform an evaluation of the quality of teaching and learning.
Addressing Social Disadvantage	We recognise that children come to our school with wide differing amounts of science capital (knowledge, experiences, skills and attitudes). Subject specific vocabulary is used in all lessons, with explicit teaching of tier 2 and 3 vocabulary (Alex Quigley, 2018). With the right support, we expect that all children will be able to master the science curriculum. We help to build children with science capital through scientific experiences, fieldtrips and opportunities to work with experts in the scientific field. This will help to close the gap between less advantaged and more advantaged pupils. Our curriculum is ambitious and gives our pupils the experiences, knowledge and cultural capital they need to succeed in life including future learning and employment.	Teacher Assessment	Well planned pre-learning tasks help to bring out what learners already know and what misconceptions they may have. We take account of the outcomes from pre-learning tasks to plan. Teachers assess formatively in each lesson. Children will have opportunities to evaluate and recognise their own success and teachers will carry out formative assessment for learning through the use of checkpoints. Task design allows children to demonstrate their progress. Teachers endeavour to carry out live feedback in line with research about which forms of marking and feedback have most impact. We keep track of children's progress against the skills progression, having three data points, one at the end of each school term.		
Local Context	We use our school and local environment; which includes woodlands, field, grassland and a reservoir to support our learning and scientific fieldwork when appropriate across the key stages. We recognise that science occurs in all aspects of the world around us and through using these resources in our science teaching, we are building up the children's science capital. To meet the need of our children to experience diversity, we ensure that the science curriculum references great scientists from a range of ethnic and social backgrounds, cultures and gender. Reference and links are made to our values and mission statement.	Adaptations for SEND	The science curriculum aims to be ambitious and inspiring for all students with SEND, emphasising the need to adapt the delivery of scientific knowledge, concepts, and language to ensure accessibility for everyone. This includes pre-teaching, using print resources, and knowledge organisers to introduce new vocabulary and concepts, along with providing additional opportunities for discussion and collaborative work. The collaboration between teachers and special educational needs staff ensures that each student's unique needs are addressed while still offering a meaningful educational experience.		

My domains of knowledge

- States of matter - Chemistry
- Materials (properties and changes) - Chemistry
- Living things and their environment – Biology
- Reproduction, inheritance and evolution - Biology
- Earth and space - Physics
- Energy – Physics
- Forces – Physics
- Scientific skills