



St Gabriel's Catholic Primary School

Science Policy
September 2024

Mission Statement

‘Nurturing Hearts and Minds’

God’s love is at the heart of all that we do at St Gabriel’s Catholic Primary School.

Hearts and Minds are nurtured in a stimulating and safe environment. We believe that every child is unique and we nurture each child through a creative and rounded curriculum to reach their full potential. Talents are celebrated and differences are respected within a strong, supportive Catholic community.

At St Gabriel’s, children learn to love, respect and care for each other and God’s entire world. Our school is a place where children are filled with a love of life and learning.

As a school, we are aware of our duties under the Equality Act 2010, and we take account of pupils’ race, religion and culture, and of pupils with SEN, a disability and the circumstances of other vulnerable pupils. We aim for this policy to work for the majority of pupils, however on occasion, we understand that adaptations may need to be made depending on circumstance.

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I. Our Rationale for Teaching Science

Science is a body of knowledge built up through the experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children’s ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. Science is also a collaborative activity where ideas and suggestions are shared and investigated together. Through practical activities and teamwork, children experience and learn how to work together have mutual respect for one another and value social cohesion. We

believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

2. Aims

Our aims in teaching science include:

- Preparing our children for life in an increasingly scientific and technological world.
- Fostering concern about, and active care for, our environment.
- Helping our children acquire a growing understanding of scientific ideas.
- Building on pupils' curiosity and sense of awe of the natural world
- Helping develop and extend our children's scientific concept of their world.
- Developing pupil's enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life.
- Introducing pupils to the language and vocabulary of science.
- Developing our children's understanding of the international and collaborative nature of science.

Attitudes:

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work cooperatively with others.
- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills and their ability to make accurate and appropriate measurements.
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Developing the use of ICT in investigating and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.
- Using a planned range of investigations and practical activities to give pupils a greater understanding of the concepts and knowledge of science.

The intent behind our school's Science curriculum

The 2014 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 skills** required to understand the **uses and implications** of science, today and for the future. We understand that it is important for lessons to have a skill-based focus, and that the knowledge can be taught through this.

At St Gabriel's, we ensure that from the very start of school all children gain a diverse range of scientific knowledge and skills rooted in quality first hand on experiences. We follow the national curriculum, in addition to identifying further opportunities to link our science learning through our rich class topics and links made with quality texts. Our science investigations focus on the 5 main types of scientific enquiry: pattern seeking, observations over time; identifying, classifying and grouping; comparative and fair testing, and research using secondary sources. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at St Gabriel's so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts. Whilst doing this our children use scientific vocabulary throughout both key stages to explain their learning. Throughout their time at St Gabriel's, each child's knowledge and skills progressively builds and consolidates their prior learning.

Finally, we are passionate about supporting our communities in growing and developing the next generation of scientists. We ensure all children have access to a breadth of rich experiences which spark curiosity and wonder, develop scientific knowledge and inspire positive attitudes towards careers in STEM.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following:

- Teach science for 2 hours per week (years 1-6) following a school wide progression document which sets out all aspects of the national curriculum.
- Through our planning, we involve problem solving opportunities that allow children to apply their knowledge, and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Practical work has a clear purpose, forms part of a wider teaching sequence and only takes place when pupils have enough prior knowledge to learn from the activity. The scientific enquiry of the focus of each lesson is clearly identified during the lesson and in pupil's books.

- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts when possible.
- Each topic is launched with a big question. The big question is answered at the beginning and end of the topic to show a progression of scientific understanding.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- Regular events, such as Science Week provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

Impact

Our Science Curriculum is high quality, progressive and provides additional opportunities for the gaining of scientific knowledge and skills. At St Gabriel's we provide a fun, engaging, high quality science education, that provides children with the foundations and knowledge for understanding the world. Throughout teaching, teachers are able to assess pupil outcomes and development of key knowledge and skills against the objectives. These outcomes are monitored and tracked, with planning and learning evaluated and adapted. A cycle of monitoring takes place by Subject Leaders and Senior Leaders. This includes book scrutinies, learning walks and pupil consultations.

In addition, we are able measure the impact of our curriculum through the following methods:

- At the start of a topic, children are given the opportunity to ask questions they are interested in finding out answers to throughout the unit.
- Ongoing teacher assessment throughout a unit to assess pupil's progress against the learning objectives for that unit.
- TAPS assessments are used to assess pupil's working scientifically skills.
- Ongoing assessment of pupil's working scientifically skills is combined with the end of unit assessment to provide teachers with the necessary information to evaluate pupils' progress.

Children at St Gabriel's overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

3. Teaching and Learning

Science is good when;

- We apply our 'working scientifically skills' to solve problems, explore, observe and investigate.
- We ask questions and work together to discover the answers
- Science has a wow factor and promotes a sense of awe and wonder
- Our learning is enhanced by outdoor learning, specialist visitors and we have access to quality resources
- We are involved in creating and carrying out investigations and can share and explain our ideas and conclusions

- Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.
- Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think.
- Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge
- Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. The key knowledge for each topic and across each year group is mapped across the school and checked at the end of each science topic.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.
- Teachers find opportunities to develop children's understanding by accessing outdoor learning.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Pupil's starting points are identified at the beginning of each science unit and the children are able to convey what they know already. At the end of the unit, pupil's knowledge is checked in line with the key learning objectives of the unit. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

Each science unit is identified as biology, chemistry and biology. It also has a scientist attached to it, one of which will be studied in depth once a term. An age appropriate book will also be linked to each science unit and in some instances will form a cross curricular overlap with other subjects.

Across each year group the individual scientific enquiry types and working scientifically skills will be taught, teachers ensuring that each of these are covered throughout the year. This will be monitored and evidenced in teacher planning and through book trawls.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying,

classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given the opportunity to seek answers to questions through collecting, analysing and presenting data.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At St Gabriel's science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probing and remedying their misconceptions.

4. Assessment

Children's progress is continually monitored throughout their time at St Gabriel's Primary School and is used to inform future teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge.

Pupils receive effective feedback through teacher assessment, both orally and through written feedback in line with the learning objective for the lesson/unit. Pupils are guided towards achievement of the main objective through the use of process based 'success criteria', provided by and explained by the teacher in each lesson. Assessment for learning is continuous throughout the planning, teaching and learning cycle.

However, children are more formally assessed at the end of a topic in KS1 and KS2 using a variety of methods:

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children
- Considering work/materials / investigations produced by children together with discussion about this with them.
- Using knowledge based teacher assessments
- WS assessments (TAPS) to confirm teacher judgement.

The programme of study is responsive to the children's starting points in Key Stage 2 by using the Explore, Engage and Extend resources from the PSTT, as well as their specific interests. It also ensures a focus on the key identified knowledge of each topic, which is mapped within and across year groups to ensure progression. At the end of each blocked science unit, this key knowledge is checked. Outcomes of work are also evidence of its acquisition.

In EYFS, we assess the children's Understanding of the World according to the Development Matters statements.

5. Adaptive teaching and Inclusion

Science is taught as a class based subject and is organised according to the needs of the pupils. The class teacher will decide on the level of adaption and the groupings needed within their class to aid the pupil's learning and the objectives being taught. We believe that every pupil is entitled to the full range of activities and that these are relevant to all pupils irrespective to their gender, age, ethnic background or disability. To allow for adaptive teaching, we plan to cater for different ages and abilities, including those with specific learning difficulties or who are more able through providing a variety of support and challenge. Good adaptive teaching provides challenging activities for all pupils.

6. Health and Safety

In their planning of activities, teachers will anticipate likely safety issues. They will also explain the reasons for safety measures and discuss any implications with the children. Pupils should always be encouraged to consider safety for themselves, others, the environment and the resources they use, when undertaking scientific activities.

7. Roles and responsibilities

7.1 The governing board

The governing board will approve the Science policy, and hold the headteacher to account for its implementation.

7.2 The headteacher

The headteacher is responsible for ensuring that Science is taught consistently across the school.

7.3 Staff

The Science Lead is Mrs R Schauer who will ensure through regular monitoring that staff:

- Deliver Science in a fun and engaging way to encourage the wonder and awe of children of the scientific world around them
- Model positive attitudes to Science learning
- Monitor the progress of the children they are teaching
- Respond to the needs of individual pupils

7.4 Pupils

Pupils are expected to engage fully in Science and, when discussing issues related to Science, treat others with respect and sensitivity.

8. Continuing Professional Development

The professional development needs of all staff in relation to the teaching and learning in Science will be regularly assessed and monitored and relevant training and support provided when required. The subject leader for Science will regularly model and disseminate best practice, working closely with the SLT and named governor.

Signed:

Mr. E. Byrne
Headteacher

Mr. G. Silverlock
Chairman of Governors

Mrs. R. Schauer
Year 5 Teacher and Science Lead

Date: September 2024

Review Date: