

Pray, Learn, Achieve and Celebrate Together



Science Policy

“For in him all things were created: things in heaven and on earth, visible and invisible, whether thrones or powers, or rulers or authorities; all things have been created through him and for him”

Colossians 1:16

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Science Policy

Mission Statement

Pray, Learn, Achieve and Celebrate Together

St Gabriel's Catholic Primary School is a nurturing and inclusive community, united through the love of Jesus and inspired by Christian values to share the Good News.

A new commandment I give unto you: that you love one another as I have loved you." John 13:34

Our Mission will be fulfilled through the line in our school prayer: *"Treat others as you would like to be treated yourself,"* and the promotion of Our Core Values:

- Respect: *We respect others and their property.*
- Love: *We are kind, caring and helpful; we think about others and do not hurt other people's feelings.*
- Forgiveness: *We ask for forgiveness when we have done something wrong and we do not hold grudges.*
- Honesty: *We are honest and never hide the truth.*
- Courage: *We show courage when things are difficult and keep on trying.*
- Effort: *We work hard and do not waste time.*
- Responsibility: *We take responsibility for our own actions.*

Aims

Our Mission Statement will help us to achieve in Science through:

Learn Together

- *To provide an excellent broad and balanced, creative curriculum which is challenging and differentiated for all.*
- *To create a safe, stimulating and nurturing environment for learning.*

Achieve Together

- *To ensure all children achieve their full potential.*
- *To nurture the Spiritual, Moral, Social, Cultural and Academic achievements which prepare the pupils for life in modern Britain.*

Celebrate Together

- *To value the unique talents and gifts of all our pupils.*
- *To work in partnership with our parents, parish and wider community to celebrate our achievements.*

Curriculum Intent

At St Gabriel's, we encourage children to be inquisitive throughout their time at the school, and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living.

We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes.

Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each phase/Key Stage. The key knowledge is informed by the National Curriculum and builds towards identified phase 'end points' in accordance with National Curriculum expectations.

Key skills are mapped for each phase/Key Stage and are progressive throughout the school. These too ensure systematic progression to identified skills end points which are in accordance with the Working Scientifically skills expectations of the National Curriculum.

The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. Children are encouraged to ask questions and be curious about their surroundings and a love of science is nurtured through a whole school ethos and a varied science curriculum

St Gabriel's science curriculum is planned so that:

- Children develop a love of science and are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future
- Children are taught essential aspects of knowledge, processes and uses of science
- Children are able to recognise the power of rational explanation
- Children understand how science can be used to explain what is occurring, predict how things will behave and analyse cause and effect

And above all:

- Children develop a **sense of excitement and curiosity about natural phenomena**
- Children are taught how to raise questions, problem solve and answer questions
- Children work with independence
- Children are taught to communicate effectively
- Children are taught how to be a **'scientist'**

Scientific Understanding

A high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes.

Curriculum Aims

Our Science Policy follows The National Curriculum 2014 for Science Guidelines and 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 specific questions about the world around them;
- are able to recognise the power of rational explanation;
- develop an understanding of how science can be used to explain what is occurring, predict how things will behave and analyse cause and effect
- are equipped with the **scientific knowledge** required to understand the **uses and implications** of science, today and for the future
- develop a **sense of excitement and curiosity about natural phenomena**

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. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

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 also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

Essential Knowledge

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.

Schools are not required by law to teach the example content in [square brackets] or the content indicated as being ‘non-statutory

The national curriculum for science reflects the importance of spoken language in pupils’ development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Key Skills

‘Working scientifically’ specifies the understanding of the nature, processes and methods of Science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how ‘working scientifically’ might be embedded within the content of biology, chemistry and physics, focusing 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 should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

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.

Curriculum Progression

EYFS

The Foundation Stage deliver science content through the ‘Understanding of the World’ strand of the EYFS curriculum. This involves guiding the children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

Key Stage 1 – Years 1 and 2

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.

They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

‘Working scientifically’ is described separately in the programme of study, but must **always** be taught through, and clearly related to, the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1

Lower Key Stage 2 – Years 3 and 4

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and later, to write about what they have found out.

‘Working scientifically’ is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Upper Key Stage 2 – Years 5 and 6

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on

their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Inclusion

At St Gabriel’s we aim to meet the needs of all of our children by adaptation in our planning and by providing a variety of approaches and tasks appropriate to ability levels. This involves planning for our SEND children to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take part in scientific learning, practical activities and investigations in order to achieve the goals that they have been set.

Some children will require closer adult supervision and more adult support to allow them to progress, whilst more able children will be extended through adapted activities.

By offering enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities, by deepening and widening their understanding.

Teacher’s planning will ensure that a range of strategies are used which include and motivate all learners, ensuring optimum progress is made throughout each part of the lesson.

Breadth of Learning

St Gabriel’s follow the units of work as set out in the national curriculum, enhancing the programmes of study with ideas and activities from ‘PlanBee’, ‘Hamilton Trust’ and ‘Twinkl’, in order to deliver engaging, sequential science sessions, along with ‘Inspiring Science’ and ‘ASE’ to support scientific enquiry. ‘Progression Maps’ have been developed that detail the specific knowledge, scientific enquiry skills and vocabulary to be taught throughout the Primary Science Phase. ‘Knowledge Organisers’ for each year group, provide clear expectations for each unit of work which assist both the teacher in planning the unit, but also provide children and parents/carers with key vocabulary to be learnt, along with examples and diagrams of key learning.

Cross Curricular Studies

Children will have opportunities to develop their scientific skills through a range of subjects including, numeracy, literacy, computing and topic lessons.

Particularly in computing, this will enhance the development of enquiry skills through the use of data handling techniques, in the collection, recording, analysis and presentation of data and information.

Children will have the opportunity to use data loggers, laptops and i-pads to develop their scientific skills in a cross curricular manner.

Assessment and Recording of Progress

Assessment for learning is continuous throughout the planning, teaching and learning cycle.

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

Formative assessment is used to guide the progress of each child in each area of the science curriculum, determining what each child has learnt and what the next stage of their learning is. An overall teacher assessment judgement is made at the end of the unit indicating whether the children are working towards, working at, or working within the greater depth bracket of the expected standard for that particular age phase.

Bespoke assessments compiled by the Science lead are completed at the end of each unit of work, that measure the core learning. These assessments support staff to make teacher judgements and inform future planning.

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 and provide an appropriate level of challenge for our children.

Staff Roles and Responsibilities

Teachers Role

Teacher will:

- Plan and deliver the requirements of the EYFS, KS1 and KS2 programmes of study to the best of their ability
- Set high expectations for all their pupils, including pupils with special educational needs and/or disabilities (SEND), pupils from various social, cultural and linguistic backgrounds, and academically, more able pupils
- Encourage pupils to apply their knowledge, skills and understanding of science across the curriculum
- Maintain up-to-date records of formative and summative assessments of all children
- Tailor lesson delivery according to pupils' respective abilities

Subject Leader's Role

Subject leaders will:

- Co-ordinate and plan the science curriculum
- Support colleagues in their teaching
- Writes an annual summary report, in which they indicate the strengths and weaknesses in science and indicates areas for further improvement – individual, key stage or whole school training
- Use specially allocated management time to review evidence of children's work and observe science lessons across the school

The quality of teaching and learning is monitored and evaluated by the head teacher as part of the schools agreed cycle of lesson observations

SLT Role

Senior leaders will:

- Provide management time to observe lessons, scrutinise planning, books and 'talk' to children
- Monitor assessment data
- Monitor pupil voice
- Support science co-ordinator with planning scrutiny
- Support science co-ordinator with lesson observation and feedback

Governors Role

Governors will:

- Take an interest in Science across the school
- Ensures science remains high on the school's agenda
- Attends in-school training where possible
- Meets with science lead
- Be involved in the school's attempts to inform and involve parents in their child's learning

Monitoring and Evaluation

It is the role of the subject leader to monitor the standards of the children's work. The subject leader is also responsible for supporting colleagues in their teaching, resourcing science topics, attending LLG science meetings and disseminating information, knowledge and ideas.

The subject leader follows the School Self Evaluation for Subject Leaders' guidelines and is achieved through:

- discussions with children
- shared planning
- monitoring of planning
- monitoring and evaluation of children's books
- lesson observations
- observing displays / working walls

Marking

The marking of Science is in line with the whole school marking policy.