

St. John Bosco RC Primary School



Science Policy

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INTRODUCTION

At St. John Bosco RC Primary School we believe that 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, methods, 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.

We believe that good science teaching and learning happens when:

- Children can discover for themselves through trial and error.
- Children use scientific vocabulary.
- Teachers are confident about what they are teaching.
- Children talk, ask questions, share ideas, explain.
- Children are inspired to do and know more, transfer knowledge.
- Children work in groups.
- Children work practically.
- Children are engaged, excited, involved.
- Children record their learning in a variety of ways using their own words.

1. CURRICULUM AIMS

The 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 knowledge required to understand the uses and implications of science, today and for the future.

2. CURRICULUM PLANNING

The programmes of study for science are set out year-by-year for key stages 1 and 2 in the National Curriculum. Class teachers are responsible for ensuring that all of the relevant statutory content is covered within the school year. The National Curriculum gives a full breakdown of the statutory content to be taught within each unit. Non-statutory guidance is also provided which staff members are encouraged to use. Specific skills and knowledge developed through Science are mapped out in the National Curriculum. Our school uses the National Curriculum as a basis for its curriculum planning in Science. We carry out the planning in three phases: Long Term, Medium Term and Short Term. Science should be taught discretely in most cases but teachers are encouraged to make links to Creative Curriculum planning wherever possible.

Long Term Plans:

Long term plans map out the areas of Science covered in each term during the Key Stage.

Medium Term Plans:

Medium term plans provide a mapping overview of:

- The details of each unit of work for each term to ensure clear progression and an appropriate balance and coverage of work across each term.
- Key skill development to ensure children progress at a level according to their ability. They identify learning objectives and outcomes for each topic.
- Opportunities to 'work scientifically' are also identified.
- As a starting point teachers consider the statutory key learning content and the non-statutory guidance within the National Curriculum for Science.

Short Term/Weekly Plans:

Short term/weekly plans are completed by staff for each lesson. These include:

- The specific learning objective and detail of how the lessons are to be taught.
- Success criteria which are shared with the children to ensure that they understand their next steps in learning.
- Activities to engage the children and to lead their development through active participation.

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3. FOUNDATION STAGE

We teach the children in Foundation Stage to 'Understand the World' around them as an integral part of the themed units of work covered during the year. Science comes under the Understanding the World section of the early Years Outcomes. Understanding the World makes a significant contribution to the Early Years Outcomes objectives by developing a child's sense of the world, forming the foundation for later learning.

4. WORKING SCIENTIFICALLY WITHIN THE CURRICULUM

Class teachers must ensure that there are frequent opportunities for pupils to 'work scientifically' within the curriculum. 'Working scientifically' specifies the understanding of the nature, processes and methods of science. Pupils are required to work scientifically within all areas of the science curriculum.

The following skills are statutory:

Years 1 and 2

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: -

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

Years 3 and 4

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straight forward scientific evidence to answer questions or to support their findings.

Years 5 and 6

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments.

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5. TEACHING STYLE

Science teaching should include visual, auditory and kinaesthetic elements to ensure access for children with different learning styles. All lessons have clear learning objectives, to be shared and reviewed with the pupils. Lessons will make effective links with other curriculum areas and subjects, especially English, Mathematics and Computing. 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. 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. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. Teachers should plan to allow for a wide range of scientific enquiry, including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. 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. Teachers should plan opportunities for outdoor learning wherever possible with each year group embarking on an external educational visit once per year which is Science based.

6. CONTRIBUTION OF SCIENCE TO OTHER CURRICULUM AREAS

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in the English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping the poor or homeless. Science thus promotes the concept of positive citizenship.

Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet, and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Science and ICT

Information and communication technology enhances the teaching of science in our school significantly, because there are some tasks for which ICT is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model the Scientific concepts, and to allow children to investigate processes, which it would be impracticable to do so directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use ICT to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media. They also use e-mail to communicate on their scientific findings with children in other schools and countries.

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7. INCLUSION

The Governors and staff of St. John Bosco RC Primary School are committed to providing an inclusive range of high quality learning opportunities for all of our children. We will ensure that everyone has an equal opportunity to access the full range of provision available in Science and will actively seek to remove the barriers to learning and participation. The teaching and learning, achievements, attitudes and well being of every child are important. We follow the necessary regulations set out in the SEND Code of Practice (2014) to ensure that we take the experiences and needs of all our children into account when planning for learning.

8. TEACHING SCIENCE TO CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

At our school we teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through science teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs through differentiated activities. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs. Intervention is provided, as set out in the renewed SEN code of Practice (2014), through quality first teaching and where a child is in receipt of a statement of Special Educational Needs or Education Health Care (EHC) plan a specific education plan will be in place linked to specific targets. The targets may include, as appropriate, specific targets relating to Knowledge and Understanding of the world. We enable pupils to have access to the full range of activities involved in learning Science skills. Where children are to participate in activities outside the classroom, for example, an educational visit, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

9. ASSESSMENT AND RECORDING

Formative assessment involves spending time before and during each unit or theme time eliciting children's knowledge and understanding – Mind Mapping, discussions etc. We follow the principles of Assessment for Learning in all of our Knowledge and understanding. This involves identifying a child's progress in each area of learning, determining what each child has learned and identifying the next steps in his/her learning, linked to the learning intention and success criteria for the session. Effective tools used by our teaching staff include:

- Sharing explicit learning intentions and success criteria
- Quality questioning
- Self assessment and peer assessment against learning intentions and success criteria
- Observing children carrying out practical tasks
- Quality marking to identify areas where the success criteria has been met and areas that need to be improved

Summative assessment involves spending time at the end of each unit or at the end of year assessing children's skills and understanding. The Early Year Outcomes provide a baseline assessment level in each area of learning. This can be used to produce end of year targets throughout KS1 and KS2. Class teachers will use their professional judgement to determine whether each child is working at, above or below the expected level using the key skills document termly and levels are inputted into the school's tracking system.

The Science subject leader keeps samples of children's work in a portfolio. These demonstrate what the expected level of achievement is in science for each age group in the school.

10. SAFETY

Teachers must plan safe activities for science and complete a risk assessment if necessary. Teachers and teaching assistants need to be aware of health and safety procedures when using equipment/food in science lessons. Pupils must be aware of the need for personal safety and the safety of others during science lessons.

Guidance considered include:

- 'Be Safe' COSHH publication
- CLEAPSS 'Model Health and Safety Policy in Schools'.

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11. RESOURCES

There are sufficient resources for all Science teaching units in the school. This allows resources to be matched to any developments in the curriculum through the teaching of key skills. The library also contains a good supply of topic books and software to support children's individual research.

10 MONITORING & REVIEW

The coordination and planning of the Science curriculum and the monitoring of the quality of teaching and learning through observations is the responsibility of the Senior Leadership Team and Subject Leader. The work of the Subject Leader also involves supporting colleagues in their planning and teaching, being informed about current developments in Science and providing a strategic lead and direction for this subject in the school.

Signed: _____

Designation: _____

Date: _____

Review Date: _____