



# Science Policy

St Joseph's is a **happy**, welcoming **community**, enriched by our **diversity**, where we strive to be **better than our best**.

A place where we **love** one another, love **learning**, love **Jesus** and **love life**.

Date of Policy	Autumn Term 2023
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## Overview:

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This document is a statement of the aims, principles and strategies for the teaching and learning of Science at St Joseph's Catholic Primary School. Through adherence to this policy, St Joseph's will not only ensure statutory compliance with the national curriculum, but also that all pupils have a solid grounding in science and a positive attitude towards scientific knowledge and experimental processes.

## Intent:

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Our children gain knowledge in science formed through interesting and exciting experiences that enhance awareness of their own abilities and strengths as a learner. They use their prior knowledge and apply taught skills to solve problems and develop the sophistication of science.

Our children see learning in science as an ongoing process not a one-off event, making links with how their learning fits with the world around them, including careers.

Our children will meet the National Curriculum expectations in science, taught by highly qualified staff who support children to develop mastery of concepts and inspire enthusiasm and interest in the subject. This supports St Joseph's belief that **'Every child has the right to an education' (Article 28)**

Our children will have opportunities to experience learning beyond the classroom. This is because at St Joseph's we believe that **'Every child has the right to an education which develops their personality, respect for other's rights and the environment' (Article 29)**. This will allow them to enrich their knowledge by visiting science museums and education laboratories and exploring the natural world all around them.

## Implementation:

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The key threshold concepts across the Science curriculum are taught sequentially over time to develop scientific knowledge and skills from EYFS to Y6 and beyond. The curriculum is built around a process of interweaving topics, self-testing, and re-testing to aid the development of long-term memory and mastery of both skills and knowledge required. Children are taught with reference to the 3 scientific disciplines of Biology, Chemistry and Physics:

**Biology:** Children learn that animals, humans and plants are made up of complex interacting systems to function. They recognise that organisms require a supply of energy to carry out basic functions of life and growth.

**Chemistry:** Children learn that the Earth is a complex of interacting rock, water, air and life. They explore that particle theory of matter is the

abstract idea that helps us develop an understanding of why materials behave as they do.

**Physics:** Children learn that energy is a powerful and unifying abstract idea which is difficult to define. Forces change the state of rest or motion of the body.

## Impact:

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Clear outcomes focus and guide Science development plans and drive improvement. Our children demonstrate outstanding progress that reveals a clear learning journey. Children talk enthusiastically about their learning in science. Our children are inspired to follow a pathway towards further study in science and aspire to a scientific career.

## Purpose of Study:

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A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry, and physics. Through teaching science children are given opportunities to develop their knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences. Children will acquire a curious and questioning mind, develop skills of observation and investigation, and collect, retrieve, present and communicate their findings to others in a variety of ways. Science has changed our lives and is vital to the world's future prosperity.

### 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.

These aims and purposes are taught through:

# Knowledge and Understanding:

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Children should:

- Be curious about things they observe, experience, and explore the world about them with all of their senses.
- Use this experience to develop their understanding of key scientific ideas and make links between different phenomena and experiences.
- Begin to think about models to represent things they cannot directly experience.
- Try to make sense of phenomena, seeking explanations and thinking critically about claims and ideas.

# Processes and Skills:

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Children should:

- Acquire and refine the practical skills needed to investigate questions safely.
- Develop skills of predicting, asking questions, making inferences, concluding, and evaluating based on evidence and understanding and use these skills in investigative work.
- Use practical mathematical skills in real contexts.
- Learn why numerical and mathematical skills are useful and helpful to understanding.

# Language and Communication:

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Children should:

- Think creatively about science and enjoy trying to make sense of phenomena.
- Develop language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds.
- Use scientific and mathematical language including technical vocabulary and conventions and draw diagrams and charts to communicate scientific ideas.

- Read non-fiction and extract information from sources such as reference books and the Internet.

## Values and Attitudes:

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Children should:

- Work with others, listening to their ideas and treating these with respect.
- Develop respect for evidence and evaluate critically ideas, which may not fit evidence available.
- Develop a respect for the environment and living things and for their own health and safety.

## Science and the National Curriculum Key Stage 1:

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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:

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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 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:

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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 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. Pupils should read, spell and pronounce scientific vocabulary correctly.

## Organisation and Planning:

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### EYFS

Science in EYFS is covered in the ‘Understanding the World - the natural world- area of the EYFS Curriculum. It is introduced indirectly through activities that encourage our children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

Science in the Early Years also helps children with skills in other areas of learning, such as physical development and expressive arts and design through hands on investigation and observational drawings of the world around them. During the first year at school in reception, our children will explore animals, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. They will also learn to use their senses, exploring the world around them to develop an understanding of



the world. They will make lots of observations of animals and plants and explain why some things occur and talk about changes they see.

A fundamental part of Understanding of the world is the children's ability to communicate effectively as scientists in order to make sense of the things they see. At St Joseph's Catholic Primary School, we believe this key skill is essential to allow our children to progress as young scientists and focussing on the effective use of vocabulary when discussing aspects of the world around them.

### **Key Stage 1 and Key Stage 2**

At St Joseph's Catholic Primary School each year group covers National Curriculum objectives specific to their classes during their science teaching. Science is taught as a discrete lesson and as part of cross-curricular themes when appropriate. Science has links with other areas of the curriculum including geography, English, maths, art and design technology.

Teachers in Key Stage 1 and 2 use the National Curriculum guidelines to inform medium term planning. Teachers also use a wide range of resources, including the school environment to enhance and enrich the children's learning. Children work at their own level of understanding in science. We aim to ensure that children are given the opportunity to achieve through their experience of science tasks and activities, and always provide the opportunity for our children to work towards higher level tasks.

## **Assessment:**

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Assessment in science is based upon scientific knowledge and understanding. In reception we assess children's knowledge and understanding according to the Early Learning Goals. In KS1 and KS2 we assess children's prior knowledge at the start of each topic, and throughout children are assessed against prior knowledge through the use of knowledge clocks and at the end of each science topic, children carry out a short quiz to assess their conceptual knowledge.

All staff strive to ensure that our children reach their full potential in science and enjoy their experiences. Children with Special Educational Needs will be monitored by our SEND Co-ordinator ensuring that these children follow the National Curriculum Programmes of Study through work schemes that promote the child's development and self-esteem.

Multi-Cultural links will be developed wherever possible in the teaching of this National Curriculum subject. We endeavour to include aspects of science within our themed weeks in school so that our children begin to realise the global importance of science.

Assessment should:

- Be formative and summative.
- Be used to inform the teacher for future planning.
- Promote continuity and progression.
- Form the basis for reporting to parents.
- Be based on observation, participation, and written outcomes.

## Recording:

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Children's recording will take many forms according to the nature of the activity:

- Verbal
- Pictorial
- Diagrammatic
- Graphical
- Written
- Symbolic
- I.C.T.
- Photographic

## Classroom Organisation:

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Children will be grouped as appropriate for the task to encourage flexibility:

- Ability groups
- Mixed ability groups
- Mixed ability partners
- Ability partners
- Individuals
- Whole class groups

## Resources:

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Central resources in science are the responsibility of the Science Co-ordinator who has a budget available. Science equipment is audited annually. Consumables are replaced and discussions with staff determine if there are any other pieces of equipment required to enhance the teaching and learning of science. Children are encouraged to value and take care of all equipment. Central resources houses a range of resource books. Books which are pertinent to a particular year group can be found in relevant classrooms.

## The Role of the Science Co-Ordinator:

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The Science co-ordinator is to:

- Take lead in policy development and support with Schemes of Work.
- Support colleagues in their development of work plans, and implementation of the Scheme of Work.
- Monitor the resources in science and advise the Head Teacher of any action needed.
- Take responsibility for the purchase and organisation of central resources for science.
- Keep up to date with developments in science education and disseminate information to colleagues as appropriate.
- Monitor the teaching and learning of science throughout the school.

## Differentiation and Additional Educational Needs:

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The study of science will be planned to give pupils a suitable range of differentiated activities appropriate to their age and abilities. Tasks will be set which challenge all pupils, including the more able. For pupils with SEND the task will be adjusted, or pupils may be given extra support. The grouping of pupils for practical activities will take account of their

strengths and weaknesses and ensure that all take an active part in the task and gain in confidence.

## Equal Opportunities:

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All children are entitled to access to the science curriculum in line with the school's policy for equal opportunities. Children who show a particular ability and flair for science, who work more quickly through the levels of the National Curriculum are extended through the use of more challenging problems and investigations. All children have equal access to the Science Curriculum, its teaching and learning, throughout any one year. This is being monitored by analysing pupil performance throughout the school to ensure that there is no disparity between groups.

## Health and Safety:

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Pupils will be taught to use scientific equipment safely when using it during practical activities. Class Teachers, and the Science Co-ordinator will check equipment regularly and report any damage, taking defective equipment out of action. A simple risk assessment will be carried out for all practical activities. The Headteacher will review the risk assessments annually.

### **Policy Review**

This policy will be reviewed annually or as necessary in view of government or LA initiatives, analysis of assessments or curriculum development.