

St Bernadette's Catholic Primary School



Science Policy
2023 – 2024

Learn to Love: Love to Learn

Our Mission Statement

At St. Bernadette's Catholic School you will find us caring, hardworking and co-operative. We follow the ways of Jesus using our talents and gifts to make our school special. We show respect to all and welcome you.

Intent, Implementation and Impact

Intent

Science teaching at our school aims to give all children a strong understanding of the world around them, whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and of the uses and implications of science, today and for the future. We aim to make learning relevant to our children by making them aware of the importance and relevance of science in the real world, as well as exposing them to a diverse range of inspiration figures in the world of science. Our curriculum allows children to build upon their prior knowledge, and develop their vocabulary, embedding these into their long-term memory.

Implementation

- Delivered through a topic blocking approach to allow the pupils to immerse fully in the concepts for 8 – 10 lessons per unit.
- Children will use a range of appropriate, engaging resources to develop their knowledge and understanding of each topic and to develop their ability to work scientifically.
- Children are exposed to, and are strongly encouraged to use, scientific vocabulary specific to each topic in every lesson through discreet lessons and recap sessions.
- Children will be able to build upon prior knowledge and link ideas together, through flashback activities which take place at the start of each lesson.
- A diverse range of scientists are covered, with at least one scientist focused on per topic.
- The golden thread of 'Care of God's Creation' runs through each unit, ensuring children develop their environmental awareness and understanding of their role in protecting our planet.

Impact

- Our science curriculum is high quality, well thought out and is planned to demonstrate progression and cohesion.
- Children's work shows a range of topics and evidence of the curriculum coverage for all science topics.
- Children will understand the role that science plays in their lives.
- Pupil voice plays an active role in shaping and developing our science provision.
- Flashback activities are carried in every lesson to assess retention and address misconceptions and gaps in knowledge.

A DEFINITION OF THE NATURE OF SCIENCE

The school takes as its definition of Science the one given by the Birmingham Curriculum Statement:

"Science is a human endeavour, a continuous process by which individuals and groups develop an understanding of the physical and biological aspects of the world. Whilst studying Science there is a need to acknowledge its history and have a concern for its future. It is a way in which, reliable knowledge about the world is progressively established through the generations. It is a testing of ideas and themes. Faced with a new phenomenon, the scientist uses existing ideas, which may then be modified or rejected if they do not help to explain it".

CATHOLIC FAITH

Science in St Bernadette's is taught so that children are encouraged to respect other people, their views, and be tolerant of individual differences. Children are encouraged to have respect for life and work in a co-operative, peaceful and caring way thus reflecting the Catholic ethos of the school.

All of God's creation is sacred and reflects something of who God is. Caring for this earth is part of what it is to be a Christian. The Catholic Church has a long tradition of teaching about the God-centeredness of the earth, which clearly focuses on the responsibility all people have for caring for creation. The golden thread of 'Care of God's Creation' runs through each science unit which links to the CST principles of:

- The Common Good
- Stewardship

This ensures children develop their environmental awareness and understanding of their role in protecting our God given planet.

SCIENCE CURRICULUM

At St Bernadette's we have designed a bespoke curriculum based on the National Curriculum 2014, the Early Years Foundation Stage statutory framework and Development Matters. In the EYFS, our practitioners reflect on the different rates at which children are developing and adjust their practice appropriately, referring to the characteristics of Effective Teaching and Learning. In KS1 and KS2, planning has been devised by Science co-ordinators ensuring a consistent approach across the school. This ensures pupils across a year band and indeed across the school are given access to the same learning opportunities.

Whole School Overviews provide a clear picture of the topics covered within each year group across the school, along with opportunities for cross curricular links. Medium Term Planning has been designed using a consistent approach. Each planning grid displays; a prior learning overview,

National Curriculum statutory requirements, where the learning leads to, common misconceptions, scientists covered in the unit and National Curriculum notes and guidance along with key information needed for each lesson.

Working Scientifically is planned and embedded throughout the curriculum. Children are exposed to 5 types of enquiry including; Comparative/fair testing, Research, Observation over time, Pattern seeking and Identifying, grouping and classifying. Characters have been designed to represent each of the Working Scientifically skills and appear throughout lessons even when the focus is not directly linked to enquiry. This is to enable children to become more aware of the skills they are acquiring.

Whole school planning is monitored by science co-ordinators to ensure standards remain high, retention and the development of scientific vocabulary is evident and progression continues throughout the key stages.

ORGANISATION

In Key Stages 1 and 2 the Science curriculum plan is built upon a topic-based system within the three disciplines of Biology, Chemistry and Physics. It is composed of prescribed topics ranging from Year 1 to Year 6 and is a spiral scheme; one which allows for the re-visitation of the programmes of study at progressively more difficult levels. This avoids unnecessary repetition of programmes of study whilst still ensuring skills and relevant concepts are adequately practised and retained. We aim to achieve a progressive, balanced and broad curriculum in this way.

Our bespoke planning has been designed to build upon prior knowledge and encourage retention of key knowledge and skills. Each unit contains prior learning checks and focused flashbacks to help pupils to retain prior knowledge within a topic as well as make links between old and new content. Each lesson begins with three flashback activities including vocabulary, prior learning and scientist. The purpose of these are to;

- help transfer information into pupil's long-term memory
- act as a 'pre-teach' for key concepts and vocabulary
- address common misconceptions before they arise
- lead to greater understanding as we progress through a topic as effective links can be made

At St Bernadette's we believe that vocabulary plays a crucial role in leaning and understanding in Science and is at the forefront of our teaching. Each science lesson contains: a vocabulary flashback, dual coding of key words and partner talk opportunities. In addition, each unit begins with a discrete vocabulary lesson which pre-teaches new scientific words. Flashback activities throughout the topic continue to encourage pupils to retrieve and apply key vocabulary. A selection of the key unit vocabulary is displayed on notice boards in classrooms for pupils to refer to throughout the unit.

Each of our units have been designed with a key scientist link. The scientists have been reviewed to ensure the curriculum is more diverse and relevant to our pupils. Many units even contain a 'Just

Like Me' scientist allowing pupils to begin to see themselves as scientists and possibilities for different career options within the field of science today. When learning about scientists, pupils will focus on;

- the impact that the scientist had on the world
- whose ideas the scientist built upon
- the barriers that they faced and how they successfully over came these
- which of the 'Working Scientifically' skills these scientists utilised

The organisation of Science lessons facilitates the introduction of scientific experiences and concepts in a variety of teaching methods. It also allows all children to follow their designs, plans and questions through to a full and satisfactory conclusion; producing an ideal situation for self-development and application of skills. A set of characters has been created to represent each of the 'Working Scientifically' skills that the children will utilise within their investigations and enquiries. These characters are displayed in every classroom and appear in many science lessons even when the focus is not directly linked to enquiry.

The EYFS framework is structured very differently to the National Curriculum as it is organised across seven areas of learning rather than subject areas. The seven areas of learning develop prerequisite skills for science within the National Curriculum. The most relevant areas of learning are:

- Communication and Language
- Personal, Social and Emotional Development
- Understanding the World

We have identified opportunities within our EYFS topics to develop the prerequisite skills for science. Our Science co-ordinators, in consultation with our EYFS practitioners, have developed and overview to clearly show how our EYFS curriculum links to the National Curriculum. This ensures a there is a clear progression of skills and knowledge and staff know how learning in the EYFS links to the National Curriculum and how our KS1 and KS2 curriculum builds on the learning in the EYFS.

TEACHING METHODS:

- 1 Whole class
- 2 Class/individual investigations
- 3 Use of secondary sources
- 4 Circus of experiments
- 5 Small groups
- 6 Individual exploration
- 7 Trips to local sites e.g. Eco-Park, Farms and Zoos

ASSESSMENT PROCEDURES

Pupils will be assessed continually throughout the year and will undertake a summative assessment (pop quiz) at the end of each topic. Formative assessment will be carried out informally throughout the year. This will enable teachers to identify pupils' understanding of subjects and inform their immediate lesson planning and flashback activities.

Assessment will take various forms, including the following:

- Talking to pupils and asking questions
- Discussing pupils' work with them
- Marking work against learning objectives
- Observing practical tasks and activities
- Pupils' self-evaluation of their work
- End of topic summative assessments

Termly meetings should also take place between Science co-ordinators and Science Faculty Leader to look at children's progress. Staff track children's attainment throughout each topic using an Excel spreadsheet. At the end of the year three books from each class (AA, A and BA) are to be kept as a record of the children's work and progress.

Staff in EYFS make regular assessments of children's learning and use this information to ensure that future planning reflects identified needs. Assessment in the EYFS takes the form of both formal and informal observation, and this involves the teacher and other adults as appropriate. Some of these observations are recorded in children's Learning Journey. This information feeds into the formal reporting of attainment at the end of the Reception year. Within the final term of Reception, parents are provided with a written summary reporting their attainment against the Early Learning Goals. The teacher will determine whether the child is meeting the expected levels (expected) or not yet meeting the expected levels (emerging). Where a child has an outcome of 'emerging' for an ELG, the Reception teachers will pass on additional information to the year 1 teachers (barriers to learning and successful strategies), alongside EYFS profile judgements.

REPORTING TO PARENTS

At St Bernadette's we make use of Twitter to share the experiences of our pupils with parents. In Science, teachers are encouraged to share updates on units, learning and experiences on a regular basis. These can be found using #stbernsscience. This allows us to make links with scientists we have discussed, resources we have used, literature we have shared. It also provides our parents with the opportunity to see what their children has been learning to allow for continued learning or further discussions at home.

Science reports are given to parents annually, as part of the pupil's end of year reports.

RESOURCES

The school provides a variety of science resources; computer based learning resources, books, and scientific equipment. All of these are needed for the delivery of a successful science curriculum. All children and staff are encouraged to care for and respect this equipment.

Practical resources are organised into topic boxes and stored in specific places. Key Stage One have their six boxes in each of their corridors and Key Stage Two boxes are stored in a cupboard in the upper KS2 corridor. These are labelled and boxed into topic resources for each year for ease of access.

At St Bernadette's we believe that reading is a cornerstone of each and every curriculum area. As such, opportunities to share picture books as well as fiction and non-fiction texts have been planned into each unit. Each classroom has a range of books related to each science topic in order to extend pupils' learning outside of lesson time.

COMMUNITY LINKS

The Eco Park is a valuable and well used resource which is used on regular basis throughout the school. Visits are planned by Science coordinators, making links to the most relevant units taught throughout the year. Staff then work alongside teachers to make children's visits to the park relevant to work being covered in school and a valuable learning experience.

EQUAL OPPORTUNITIES

All science experiences are planned with the school commitment to equal opportunities in mind. Science is approached in such a way that equality is afforded to all regardless of gender, faith or ability. This is directly in line with St Bernadette's Equal Opportunity Policy.

All pupils will be given equal access to the entire science curriculum, including practical experiments. Where required, pupils with SEND will be provided with additional support in order to fully engage with the science curriculum. Where it is inappropriate for a pupil to participate in a specific lesson because of reasons related to any protected characteristics, the lesson will be adapted to meet the pupil's needs and alternative arrangements involving extra support will be provided where necessary. The school aims to provide more academically able pupils with the opportunity to extend their scientific thinking through extension activities such as problem solving, investigative work and scientific research. Teachers will ensure that they adapted the provision for children who have English as an Additional Language to ensure the Science Curriculum is inclusive for all children.

CROSS CURRICULAR LINKS

Science at St. Bernadette's links closely with other subjects particularly:

Mathematics	<ul style="list-style-type: none"> • Use of graphs, tables and charts • Use of sorting, classifying and grouping skills • Application of measures e.g. dates, times, temperatures • 3D shapes
Geography	<ul style="list-style-type: none"> • Caring for the environment/conservation • Environmental change, global warming, pollution • Seasonal changes • The Water Cycle
History	<ul style="list-style-type: none"> • Changes to the local area • Scientists/inventors and their impact on the world
R.E	<ul style="list-style-type: none"> • Family Life Education – meetings with Year 5 & Year 6 • Parents. Evolution and inheritance (Y6). • Care of God's Creation
P.E	<ul style="list-style-type: none"> • Health Days
English	<ul style="list-style-type: none"> • Writing instructions/ captions/ labels • Reading facts, related literature • Speaking and listening skills e.g. role play, freeze frames • Topic specific books (narrative and non-fiction) have been purchased for each
Reading	<ul style="list-style-type: none"> • Use of electronics/ materials/ woodwork • Applying design skills e.g. bug hotel
Music	<ul style="list-style-type: none"> • Learning songs
Art	<ul style="list-style-type: none"> • Observational drawings and sketching • Collages

HEALTH AND SAFETY

Staff will act in accordance with the school's Health and Safety Policy at all times and the *Be Safe* guide. A risk assessment will be carried out by teachers before any higher-risk science-related activities when this is deemed appropriate. All pupils will be shown how to correctly use equipment prior to use and will be monitored by staff whilst using equipment. Pupils will also be made aware of how they are expected to behave, ensuring that they show respect to other people and the environment, and the personal safety protocols and protective equipment needed when using equipment or carrying out tasks. At the beginning of any experiment, the science teacher will outline the purpose of the experiment to the class, and all hazards and safety precautions will be thoroughly outlined. Any experiments or activities not previously conducted by the teacher will be trialled prior to being undertaken with pupils. Accidents and near-misses will be reported following the school's reporting procedures.

This policy is to be reviewed annually in order to ensure all parts of it reflect an effective, relevant and efficient way of teaching Science.

Revised by Science Co-ordinators S Hussain and E Finnegan

Revised September 2023