



## **St. Bernadette's Catholic Primary Voluntary Academy**

### **Science Policy**

**March 2023**

#### **1. Overview**

In accordance with the academy's philosophy, we seek to inspire all our pupils and stimulate their curiosity about phenomena and events in the world around them. At St. Bernadette's Academy we believe that for young children, Science is an introduction to the world of living things, materials and phenomena. It is a largely practical subject which develops a spirit of enquiring by encouraging curiosity and reason. Scientists have revealed vast amounts of knowledge about our world by using the skills of observation, prediction, investigation and interpretation. Each child needs to enjoy the experiences associated with Science by increasing and developing their knowledge and by starting to use the skills associated with scientific methods of investigation. Working with others, learning how to persevere and learning how to ask questions are attitudes that encourage work to be carried out in a scientific way.

#### **2. Main Educational Aims and Intent**

We strive to make our curriculum relevant, engaging and unique for our pupils. Our role is to equip our pupils with the scientific knowledge, skills and understanding they need to understand the uses and implications of Science in our world today and in the future. We encourage them to think about the effects their actions may have on the environment and encourage them to question and debate scientific issues that may affect their own lives in the future.

The curriculum has been designed so that there is a progression of knowledge, skills and understanding across the different areas of learning. When working scientifically, the National Curriculum programmes of study have been arranged so that there is a progressive development of skills across each year group. Through a teach, practice, repeat type-approach, and the fact that these skills are incorporated into every topic, pupils are able to develop a greater depth of understanding and embed the skills they have developed in different contexts.

Topics have been chosen that we know are relevant, engaging and will meet the needs of our pupils. These topics have then been worked on in Key Stage and Year group teams to ensure continuity and progression of subjects, and how subjects link together to create purposeful learning journeys for our pupils. These are carefully put together and set out in coverage plans at the start of each topic. A key question acts as a hook and a way into new learning and topic webs act as a summary of key learning within topics. We are also focused on preparing our pupils for the future and so within each topic, it is our aim to develop an understanding of what Science really is, and the careers associated with it.

Our aims:

- To fulfil the requirements of the National Curriculum for Science.
- To provide a Science curriculum which is broad, balanced and relevant for our pupils.
- To ensure the progressive development of scientific concepts, knowledge, skills and attitudes through carefully constructed plans and sequences of work.
- To enable children to develop their knowledge and understanding of the world they live in, through investigation of that world.
- To develop children's natural curiosity about themselves and their world and use this to foster positive attitudes to scientific learning.
- To provide first hand experiences which help children to understand themselves and the world they live in.
- To provide opportunities for the child to acquire, practise and develop scientific skills and strategies through a carefully structured activity-based programme centred on investigations.
- To build upon the experiences children bring to Science and develop them in a wide range of contexts.
- To enable children to work scientifically in a range of appropriate contexts using a wide variety of materials and equipment.
- To provide flexible ways of working including class, group and individual.
- To provide opportunities for children and staff to share and develop ideas and respect each other's' views.
- To encourage children to work in an increasingly independent way and develop their own research skills.

### **3. Approaches to Teaching**

#### **Curriculum Organisation**

##### **Early Years**

There are seven Areas of Learning and Development that shape the Early Years Framework. All Areas of Learning and Development are important and inter-connected.

The Prime Areas:

- Communication and Language
- Physical Development
- Personal, Social and Emotional Development

The Prime Areas are particularly crucial for igniting children's curiosity and enthusiasm for learning, for building their capacity to learn, helping children to form relationships and thrive.

The Specific Areas:

- Literacy
- Mathematics
- Understanding the World
- Expressive Arts and Design

The Specific Areas enable the Prime Areas to be strengthened and applied.

Each Area of Learning and Development is implemented through planned, purposeful play and through a mix of adult-led and child-initiated activities. Play is essential for children's development, building their confidence as they learn to explore, to think about problems, and relate to others. Children learn by leading their own play, and by taking part in play which is guided by adults. Continuous and Enhanced Provision is carefully planned to enable all Areas of Learning to be developed.

Links can be made between Learning and Development Areas and Subjects outlined in The National Curriculum. Planning and teaching may look different to the way these subjects are taught in Key Stage 1 and 2 however it is within the Early Years Framework that the roots of each subject are embedded.

Learning and Development Area links with Science:

- Physical Development: Health and Self Care
- Understanding the World: The World

The children are able to access Provision Areas throughout the Early Years Unit, both indoors and outdoors, which support development in these areas.

- Indoors: Discovery Area, Small World Area, Role Play Area, Water Area, Snack Area
- Outdoors: Vegetable Garden, Water Area, Digging Pit

## **Key Stage One and Two**

We fully endorse the statements in the National Curriculum 2014 and it is our intent to provide a high-quality education in Science, providing the foundation for understanding the world through the disciplines of Biology, Chemistry and Physics. We acknowledge that Science has changed the world in which we live in many ways and that it is essential for technological developments in the future. The National Curriculum statements set out the statutory requirements for scientific knowledge and conceptual understanding, the nature, processes and methods of science.

## **Scientific Knowledge and Understanding**

The programmes of study clearly describe a sequence of knowledge and key concepts. There is a Programme of Study for each year group which sets out the statutory requirements and this provides the basis for planning our own schemes of work. While it is important that pupils make progress, we also recognise that each key block of knowledge is to be secure before progressing onto the next stage. This is key to avoiding misconceptions and any superficial understanding.

## **Scientific Enquiry**

Science is not just a question of knowing facts and understanding concepts. It is also about encouraging children to behave scientifically. In the National Curriculum, there is a section called 'Working scientifically' and we recognise the importance of the development of these skills throughout the academy. It is described separately in the Programmes of Study, but must always be taught through and clearly related to the teaching of Science content in the Programme of Study, covering aspects of Biology, Chemistry and Physics. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. At St. Bernadette's we ensure this includes: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils seek answers to questions through collecting, analysing and presenting data.

## **Organisation of Teaching and Learning**

Science is taught through cross-curricular topics which have been designed to meet the unique needs and interests of the children in our academy. Topics are planned on a two year cycle to ensure complete coverage of the Programmes of Study for Key Stage 1, lower Key Stage 2 and upper Key Stage 2. Detailed progression and coverage documents in Science have been created in order to ensure that all elements of Science are taught in a clear and developmental manner. This progression is closely followed during the planning process of all topics.

After a review of our new curriculum, it was decided that Science should be taught weekly as opposed to in blocks at different points of the year. This has allowed more time to the teaching of Science in Key Stage One and Two, ensuring that Scientific concepts can be broken down and given the time needed to be taught thoroughly. It has also enabled pupils to build on learning throughout topics and not have long periods of time where Science is not being taught.

We aim to present science in practical contexts which are relevant to the children's experiences. This will involve learning in class, group and individual situations. Some content is taught directly, but enlivened through practical demonstrations. Small group activities follow on from class discussion and encourage collaboration. Where possible, children are encouraged to investigate their own questions, making decisions for themselves and maintain a high level of motivation.

We teach the elements of a scientific investigation throughout all of our work in Science, but we ensure that at least 3 full investigations are carried out each year. These form part of a topic but may also be part of a Science week. As an academy, we have created and agreed to follow an investigation planning document and a set structure to our investigations. This ensures the development of skills, understanding and use of technical vocabulary as pupils move up through the academy, and ensures continuity.

## **Environment**

The pupils' environment is vital to inspire and engage pupils and for the successful acquisition of Science knowledge, skills and understanding. The Science topic board has a prominent position in the corridor and displays current information, any scientific focused work across the academy and may also celebrate pupils' work.

Within classrooms, Scientific vocabulary appropriate for that age-group is clearly displayed, along with any additional vocabulary or information appropriate for that particular topic. Work is celebrated and displayed on topic boards and washing lines.

## **Planning**

- Planning is based on the National Curriculum statutory requirements and follows the academy Coverage and Progression documents for Science. This documentation is presented on the academy website, along with topic webs which outline the key teaching in each topic.
- Coverage plans for each topic provide a detailed sequence of Science teaching and how it fits with other subjects being taught. This also enables cross-curricular work to take place and is recognised as an important aspect of teaching and learning. ICT and interactive resources are also used where they will enhance learning. These coverage and progression documents are displayed in the pupils' books at the start of each topic.
- Short term planning for Science is undertaken by all class teachers, using the agreed academy format. Essential elements for all short term planning are: objective, activity, adaptive teaching and assessment, incorporating the success criteria or learning outcomes.
- Success criteria are specific. Teachers assess against the objectives. Marking is carried out in accordance with our academy marking policy and is linked to the success criteria. Marking identifies ways forward and when appropriate, sets further questions to challenge and move the learning forward further.

## **Inclusion**

We recognise the entitlement of all pupils to a broad and balanced curriculum. All Science planning and teaching takes adaptive teaching in to account, to ensure appropriate pupil access to learning and maximise progress. Pupils are taught in their classes and within these, pupils are grouped in

ways most beneficial to their immediate learning needs. Grouping is fluid and changes with the needs of the child.

In ensuring that all pupils have access to their full entitlement to Science, pupils with SEND are included in all aspects of the Science lesson through adapted work and when appropriate, extra adult support. The class teacher's role is crucial in the provision of high quality teaching and learning in Science and lessons are personalised. Lessons in Science take into account the particular requirements for children on the SEND register, as outlined in their running records or EHCPs and in accordance with the academy SEND Policy document.

For children who have English as an additional language, we seek support and help from the relevant outside agencies, if necessary. In class, individual programmes are tailored to the child's needs.

Those entitled to Pupil Premium funding are fully supported in Science, as and when appropriate and required. They are monitored and tracked in order to ensure they make sustained progress in Science.

More able pupils in Science are also identified as part of our formative and summative assessment procedures. Pupils are challenged within Science lessons through a framework of high quality first teaching. Staff are beginning to make use of the NACE frameworks for the more able. In addition, we focus on developing their learning behaviours, including, greater reflection, problem solving and enquiry, making connections, higher order thinking skills and independent learning.

The Equal Opportunities Policy document should be consulted to ensure balanced and fair access to the Science curriculum for all groups.

## **Resources**

- The academy recognises that the most valuable classroom resource is the class teacher.
- The work of other adults, including TAs who work in a range of support programmes should be carefully planned by the teacher, in consultation with those adults.
- Science resources are kept in a locked cupboard in the hall. The key for the cupboard is held by the Science Leader.
- The Science Leader carries out an audit of resources and arranges the purchase of any new resources needed each year.

## **Training (CPD)**

All staff are encouraged to take full advantage of Science training opportunities, to develop their confidence and update their expertise, through academy, local or national training events. A recent staff Science questionnaire has enabled the subject leader to prioritise areas for future training and this will be developed going forward, especially for new staff.

## **Health and Safety**

The health and safety of our pupils is at the forefront when planning and delivering lessons. Staff are familiar with safety procedures, including the academy's First Aid and emergency procedures. When working with equipment and materials in Science pupils are taught:

- About hazards, risks and risk control
- To recognise hazards, assess consequent risks and take steps to control the risks to themselves and others
- To use information to assess the immediate and cumulative risks

- To manage their environment to ensure the health and safety of themselves and others
- To explain the steps they take to control risk.

#### **4. Roles and Responsibilities**

The Science Leader's role will include the following responsibilities:

- To ensure that the Science policy reflects the requirements of the National Curriculum and the needs of the ethos of the academy, and that this document updated at least every two years;
- To provide leadership and guidance in the area of Science, and to support staff as required;
- To promote Science as a subject, to ensure that it has a prominent place within the academy, through academy displays, the arrangement of special weeks or events, making links with careers associated with the subject and arranging visits and visitors to the academy;
- To be actively involved in whole-school curriculum design, in co-operation with other subject leaders, in order to maintain a relevant, broad, balanced and adaptive curriculum which is suitable for the pupils in our academy;
- To monitor, review and evaluate all planning stages for Science, from the Long Term Plan to weekly plans, ensuring that there is complete coverage of the National Curriculum for Science and that is taught in a progressive manner;
- To monitor and evaluate teaching and learning against the requirements of the National Curriculum for Science through observations, learning walks and scrutiny of work;
- To oversee summative school assessments in Science, in accordance with Assessment Policy guidelines, and to be actively involved in data analysis and any target setting for Science;
- To lead staff meetings and training sessions on issues related to the implementation of the Science curriculum throughout the academy and new developments as they arise, ensuring that staff training needs are met;
- To attend relevant training to update knowledge, and to disseminate advice and current information in the subject to staff;
- To liaise with other schools, colleges and other outside agencies, when appropriate;
- To undertake an audit and action plan on an annual basis;
- To maintain, evaluate and assess the resource base for Science teaching;
- To promote parental and governor interest in Science and listen to and take on board pupil voice;
- To carry out and meet the expectations of a Subject Leader Review when Science is the focus subject.

The class teacher's role is crucial in the provision of high quality teaching and learning in Science. The academy supports all teachers, so that they:

- Take account of the age, gender, ethnicity and capability of their pupils.
- Show secure subject knowledge.
- Plan effectively, setting clear objectives which pupils understand.
- Challenge and inspire pupils, having high expectations of them.
- Use a variety of methods which enable all pupils to learn effectively.
- Manage pupils well and insist on high standards of behaviour.
- Use time, support staff, other adults and resources, including ICT, effectively.
- Assess pupils' work thoroughly and use assessments to help and encourage pupils to make progress.

## **5. Assessment and Reporting**

### **Assessment**

Formative and Summative assessment are vital parts of the teaching and learning process and we use a variety of methods to assess Science.

Assessment for Learning (AFL) happens all of the time in the classroom. Teachers refer to the learning objectives and success criteria throughout each lesson. Science is assessed through verbal responses, observations, photographic evidence, practical work and through pupils' written responses. Assessments against the learning objectives are made and entered in to our electronic assessment system, according to the level of pupil understanding.

Formative assessment is built into short term planning. Its use is ongoing, to feed back to pupils, plan future lessons and inform our summative assessment. Besides teacher evaluations of individual lessons, pupils are also involved in the self-evaluation process. At the end of each lesson, pupils make judgements on their understanding against the success criteria. This takes place in different ways, depending on the age of the pupils. Pupils also become involved in peer evaluation where they review and discuss each others' work. This involvement helps them to set their own targets for the future.

At the end of a topic, teachers make final judgements on how well pupils have understood a particular aspect of Science. This may include the use of the Headstart end of topic tests. At the end of each term, teachers make a summative assessment based on their knowledge of their pupils and the formative assessments recorded in our electronic assessment system. Teachers and academy leaders are then able to monitor the progress of cohorts, classes, vulnerable groups and also on an individual basis.

### **Reporting**

Parents are informed of their child's progress and attainment in Science twice yearly at Parents Evenings and at the end of each year in a formal written report.

Reporting to parents of attainment and progress in Science is in accordance with Government Legislation and the academy's Assessment, Recording and Reporting policy.

## **6. Parental Involvement**

Parents are welcomed when volunteering to help in class, or for trips and special events. They are encouraged to support and show interest in any homework or holiday projects that the children are asked to complete.

## **7. Monitoring and Evaluation**

- Monitoring and evaluation of Science in terms of planning, teaching and learning and assessment outcomes will be undertaken by the Science Leader and the Senior Leadership Team during Appraisal and work scrutiny.
- The subject leader identifies key priorities and produces a yearly action plan which feeds into the curriculum/teaching and learning areas of the Academy Development Plan. Governors are kept updated and informed of key priorities.

## **Supporting documents**

The following school policy documents should be consulted to support the Science Policy:

Assessment, Recording and Reporting Policy

Marking Policy

SEND Policy

Equal Opportunities Policy

Safeguarding Policy

Continuing Professional Development Policy

## **Policy Review**

The Science Policy should be reviewed and updated every two years, during the half-term when Science is the focus subject in the Subject Leader Review Cycle.