

# Sacred Heart Catholic Primary School



# Science Policy

2017-18

**PROUD** of our children: **PROUD** of our school: **PROUD** of our faith

<b>Date Policy agreed</b>	June 2017
<b>Governors Committee Responsible</b>	Teaching, Learning and Curriculum
<b>Governor Lead</b>	
<b>Status and Review Cycle</b>	<b>Annual</b>
<b>Next review date</b>	June 2019
<b>Headteacher signature</b>	
<b>Chair of Governors signature</b>	

## Document Purpose:

The purpose of this document is to outline the teaching, organisation and management of the science taught and learnt at Sacred Heart Catholic Primary School. The policy has been drawn up as a result of staff discussion and has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all teaching and support staff.

## Mission Statement:

Our Mission Statement set out what our school stands for; beliefs, ethos, values and purpose.

At Sacred Heart we are:

**PROUD** of our children; **PROUD** of our school; **PROUD** of our faith.

We aim:

***To live as a Christian family inspired by the values of Jesus.***

***To celebrate and develop every child's full potential through a rich and enjoyable learning environment.***

***To promote and encourage an effective partnership between home, school, parish and community.***

The staff of Sacred Heart Catholic Primary School will work to give each child the tools necessary for them to make **progress**, show **resilience**, approach subjects with an **open heart**, celebrate **uniqueness** (irrespective of ability) and provide opportunities to **demonstrate their faith**. From this each child will have a strong sense of self-worth and self-esteem. We are **PROUD** that all teaching and learning is underpinned by the school mission statement.

This science policy sets out how we achieve our Mission Statement and School Aims

## Rationale:

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. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live, through investigation, as well as using and applying process skills.

## **The Aims of Science**

We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

- Prepare our children for life in an increasingly scientific and technological world.
- Foster concern about, and actively care for, our environment.
- Help develop and extend our children's scientific concept of their world.
- Develop our pupils understanding of the international and collaborative nature of science.
- 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 scientific enquiries that help our children answer scientific questions about the world around them.
- Equip children with the scientific knowledge required to understand the uses and implications of science, today and for the future.

## **Spoken language**

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.

## **Attitudes**

- Encourage the development of positive attitudes to science.
- Build on our children's natural curiosity and help them to develop a scientific approach to problems.
- Encourage open-mindedness, self-assessment, perseverance and responsibility.
- Build our children's self-confidence to enable them to work independently.
- Develop our children's social skills to work collaboratively with others.
- Provide our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

## **Skills**

- Give our children an understanding of scientific processes.
- Help our children to acquire practical scientific skills.
- Develop the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Develop the use of scientific language, recording and techniques.
- Develop the use of ICT in investigating and recording.
- Enable our children to become effective communicators of scientific ideas, facts and data.

## Provision:

We recognise that there are a variety of ways in which teaching may be effective and that each has its value. A good balance of methods includes:

- \* Direct teaching
- \* Teacher demonstration
- \* Discussion
- \* Research
- \* Clearly focused exploration
- \* Individual and group work
- \* First-hand experience of teacher led and child initiated investigation

It has been agreed that all pupils should be involved in at least one investigative activity each half term and that an ever-increasing level of independence should be the aim of our work in our teaching of science. The application and development of mathematical and linguistic skills will inevitably be involved in the teaching and learning process. Since all children have an equal entitlement to the whole curriculum, differentiation will allow access to science at a level appropriate to all pupils' needs including those with Special Educational Needs and for the high attaining pupils. Guidance regarding class room management and the setting of tasks etc. is given in other school documentation

## Organisation of Teaching and Learning:

### Early years

In Early Years Science is taught as an integral part of the topic work covered during the year. They relate the scientific aspects of the children's work to the objectives set out in the Early Outcomes and Development Matters documents, which underpin the curriculum planning for children from birth to five. Science makes a significant contribution to the development of each child's understanding of the world. Children's own ideas and interests are an essential part of the planning and teaching and teachers encourage children to develop their own scientific thinking by developing their own experiments and guide them to find the answers to their own questions and enquiries.

### **Early Years children should be able to: -**

- Know about similarities and differences in relation to places, objects, materials & living things.
- Talk about the features of their own immediate environment and how environments might vary from one another.
- Make observations of animals & plants & explain why some things occur, and talk about changes.
- Ask questions to gain information about the world around them.

## **Key Stage One**

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

## **Working scientifically**

'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. At the end of Key Stage 1 most pupils will be able to:

- ask simple questions and recognise that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classify
- use their observations and ideas to suggest answers to questions

### **At the end of Key Stage 1 pupils will have learned about:**

#### **Biology**

- Plants
- Animals, including humans
- Living things and their habitats

#### **Chemistry**

- Everyday materials
- The uses of everyday materials

#### **Physics**

- Seasonal changes

## **Lower Key Stage 2**

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

### **Working scientifically**

'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. At the end of Lower Key Stage 2 most pupils will be able to:

- ask relevant questions and use different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate
- measurements using standard units, use a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings

### **At the end of Lower Key Stage 2 pupils will have learned about:**

#### **Biology**

- Plants
- Animals, including humans
- Living things and their habitats

#### **Chemistry**

- Rocks
- States of matter

#### **Physics**

- Electricity
- Forces and magnets
- Sound
- Light

## **Upper Key Stage 2**

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

## **Working scientifically**

'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. At the end of Upper Key Stage 2 most pupils will be able to:

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

## **At the end of Upper Key Stage 2 pupils will have learned about:**

### **Biology**

- Animals, including humans
- Living things and their habitats
- Evolution and Inheritance

### **Chemistry**

- Properties and changes of materials

### **Physics**

- Electricity
- Forces
- Earth and Space
- Light

## Planning:

The teachers who deliver the Science curriculum within their age range are responsible for planning a broad, balanced Science curriculum in line with the requirements of the New National Curriculum 2014. Teachers have access to the Learning Challenge Curriculum Science units, which are in line with the New Curriculum. They also have an overview of end of year expectations, which will ensure good coverage of each programme of study and cater for progression within each area. Scientific Knowledge, Conceptual understanding and Scientific Enquiry are incorporated within each topic. Science will be taught to the whole class with opportunities to carry out investigative work in small groups. The online resource 'Tig Tag World' is available to all teachers and contains high-quality videos, lesson ideas and images.

## Assessment and Record Keeping:

Assessment is regarded as an integral part of teaching and learning and is a continuous process. At Sacred Heart Catholic Primary, we are continually assessing our pupils and recording their progress, allowing us to match the correct level of work to the needs of the pupils and to identify children who are in need of additional / targeted support. Assessment is carried out on three levels:

Short-term assessments are an informal part of every lesson. Questioning throughout all parts of the lesson informs the teacher about the level and depth of understanding of each pupil.

## Marking and Feedback

Work is marked during (over the shoulder) and after each lesson. Marking informs part of the on-going teacher assessment. When a child has exceeded teacher expectations or misunderstood an aspect of learning, a challenge or re-direction will be set, which will focus on deepening the child's understanding or correcting misconceptions.

Work is marked in accordance with the colour-coding marking policy. Verbal feedback about learning is particularly important and has greatest impact on pupil learning.

See Marking and Feedback Policy for more details.

## Cross-curricular Links:

Science is taught mainly as a separate subject but every effort is made to link it with other areas of the curriculum. Opportunities will be sought to draw scientific experiences out of a wide range of activities. This will allow children to begin to discuss and question scientific ideas in real contexts and to apply their English and Mathematical skills within a scientific context.

## **Computing:**

Computing is used in various ways to support teaching and motivate children's learning. Many sources of IT are used including; various science based software programmes, Smart Board resources and opportunities for scientific research.

More able pupils will be taught with their own class and stretched through work and more in-depth questioning which enriches their learning. When working with the whole class, teachers will direct higher order questions to the more able. Next steps when marking are also used to further scientific understanding.

## **Special Educational Needs and Disabilities:**

Teachers will aim to include all pupils fully in their science lessons. Teachers will differentiate learning tasks and activities to meet the needs of pupils and deploy additional resources e.g. Teaching Assistants to support such pupils where appropriate.

More able pupils will be taught with their own class and stretched through work and more in-depth questioning which enriches their learning. When working with the whole class, teachers will direct higher order questions to the more able. Next steps when marking are also used to further scientific understanding.

## **Reporting to Parents:**

During the year there are three parent consultation evenings that allow the teacher and parents to discuss a child's progress and attainment. All parents receive an annual written report on which there is a summary of their child's efforts and progress in science over the year.

At the end of Reception, Key Stage 1 and Key Stage 2 each pupil's attainment is included as part of their annual written report.

## **Parental Involvement:**

At Sacred Heart Catholic Primary School, we encourage parents to be involved by:

- Inviting them into school twice yearly to discuss the progress of their child.
- Inviting parents into school in the summer term to discuss the yearly report.

## **Equal Opportunities:**

We endeavour to maintain an awareness of, and to provide equal opportunities for all our pupils in science. We aim to take into account cultural background, gender and SEN, both in our teaching attitudes and in the published materials we use with our pupils.

## **TRAINING AND DEVELOPMENT:**

The subject leader should:

- Audit staff skills and confidence in the teaching of science on a regular basis.
- Arrange training for individuals as required.
- Attend courses and support and train staff as far as possible.

Advice, regarding all aspects of science, can be sought from the subject leader and any requirements for training can be discussed and planned for.

## **MONITORING AND EVALUATION:**

The Science Subject Leader, together with the Leadership Team, is responsible for monitoring and evaluating Science in line with the whole school policy. The Science policy is reviewed every two years (or as needed) and updated as necessary.