

St. Joseph and St. Bede RC Primary School



Science Policy

S. Prince

January 2016

St Joseph and St Bede R.C Primary School

Science Policy

Mission Statement

Our school is a welcoming, Catholic community, with Christ at the centre.

Through worship, we come together to listen and speak to God, to spread the Gospel message and to move forward in faith together.

As *“Guardians of life and creation”*; we work together with respect, understanding, honesty and joy, to develop love, tolerance and justice for all.

We strive for greatness in our learning, we develop our unique talents and each day we take pride in all our efforts and achievements.

Rational

Science is about developing an understanding and making sense of our environment, primarily through first-hand experience, exploration, interaction with scientific phenomena and developing scientific language. It is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us. 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.

Policy Aims

- To develop attitudes of curiosity, originality, co-operation, perseverance, open mindedness, self-criticism, responsibility and independence in thinking;
- To 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;
- To develop pupils’ understanding of the effects of their actions on the environment;
- To stimulate and excite pupils' curiosity about changes and events in the world;
- To satisfy this curiosity with knowledge;
- To engage pupils as learners at many levels through linking ideas with practical experience;
- To help pupils to learn to question and discuss scientific issues that may affect their own lives;
- To help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought;
- To ensure pupils can work individually and cooperatively, listening to, and valuing, the opinions of others;
- To develop pupils who can observe, question, hypothesise, plan, measure, construct a fair test, communicate and draw conclusions;

- To ensure are able to relate science to everyday life and appreciate its contribution both in the present, and historically, to our society and other cultures;
- To appreciate the nature of science and the importance of collecting evidence.

Objectives

- To develop the child's ability to observe and find patterns in observation, raise questions, experiment and investigate reason systematically and logically, solve problems and communicate;
- To develop manipulative skills using appropriate equipment;
- To complement other areas of the curriculum;
- To ensure that pupils know how to access relevant scientific information;
- To develop the ability to work in a variety of ways including, working together in groups, independently, in partners and as a whole class;
- To follow the programme of study 'Switched on Science' in KS1 and KS2 and Development Matters and the Early Learning Goals for the Foundation Stage, in order to develop scientific skills, knowledge and understanding.
- To provide a scientifically stimulating environment.

Children's Experiences

The school will provide these scientific experiences through:

- The Foundation Stage curriculum and the Early Learning Goal – understanding the world;
- At KS1 and KS2: Switched on Science
- Making science an integral part of the school experience.
- Using and applying science in practical, real-life and problem-solving situations using the appropriate scientific language.
- Opportunities to work scientifically to develop breadth and mastery of the curriculum.
- Visiting specialists from outside organisations to provide enrichment activities.

Strategy for implementation

'Switched on Science' programme of study is used throughout Key Stage One and Two. Development Matters and the EYFS profile are followed in Foundation Stage. 'Switched on Science' concept is built around the principles of getting children to work scientifically through hands on experiments. It follows the programmes of study for each year very carefully and provides the right balance between working scientifically and learning scientific facts..

Planning takes into account that the school places a high emphasis on the development of pupils' skills of working scientifically. In the substantial majority of lessons the skills for

scientific enquiry are taught alongside the knowledge and understanding. Planning is uploaded weekly onto the school Dropbox account.

The Curriculum

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies their curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Working scientifically is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of science and trace its world-wide development. Mastery learning is a scientific approach in which learning is broken down into discrete units and presented in a logical order. Pupils are required to demonstrate mastery learning from each unit before being moved onto the next unit. All pupils should achieve this level of mastery, some may take longer than others, but all will get there in the end. Children working above age related expectation will not be pushed into learning more scientific knowledge, but will be given the opportunity to develop breadth and deep learning, both with knowledge and working scientifically.

Foundation Stage

Pupils use early learning goals to help them find out about the world around them. They use first hand experiences to help them make sense of scientific ideas. Science makes a significant contribution to the objective in the ELGs of developing a child's Understanding of the World through People and Communities, The World and Technology.

People and Communities -

They know about similarities and differences between themselves and others, and among families, communities and traditions.

The World -

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Technology -

Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

At Key Stage 1

At Key Stage 1 pupils observe, explore and ask questions about living things, materials and physical phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are fair. They use reference materials to find out more about scientific ideas.

Year One Science Overview

| Key Features | | | | |
|---------------------|--|---|--|--|
| | Plants | Animals (inc humans) | Light and Dark | Materials |
| Year 1 | Identification and labelling; including trees Structure of plants including roots, stem, flower | Identification and labelling a variety of common birds and animals Know carnivores and herbivores How animals are suited to their environment Name parts of the human body | Sources of light including the sun Features of day and night including temperature Electricity as a source of light Shadows | Use of different everyday materials Classifying and grouping Changing materials by bending etc |

Year 2 Science Overview

| Key Features | | | | | |
|---------------------|---|---|--|--|--|
| | Plants | All living things and their habitats | Animals (inc Humans) | Materials | Sound |
| Year 2 | Living things and non-living things What plants need to grow Growing from seeds and bulbs | Habitats Early food chains | Exercise and healthy eating What animals and humans need to survive Animals have offspring which grow to be adults | Use of different everyday materials Classifying and grouping Changing materials by bending etc | Sources of light Louder and softer sounds |

At Key Stage 2

At Key Stage 2 pupils learn about a wider range of living things, materials and physical phenomena. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of

scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and ICT to communicate their ideas.

Year 3 Science Overview

| Key Features | | | | | |
|---------------------|--|---|--|--|---|
| | Animals | Plants | Light | Forces and Magnets | Rocks |
| Year 3 | Nutrition linked to what we eat Skeletons and muscles | Function of different parts of the plant What different plants need to flourish Journey of the food in a plant Life cycle of a plant | Sources including the sun and electricity Shadows Reflection Vocab e.g. translucent | How magnets attract some materials Floating and sinking | How rocks are formed Different kinds of rocks Fossils |

Year 4 Science Overview

| Key Features | | | | | |
|---------------------|-------------------------------|---|--|-------------------------------|---|
| | Animals inc Humans | All living things | States of Matter | Electricity | Sound |
| Year 4 | Digestive system Teeth | Identify and name a variety of living things in their local and wider environment Recognise that environments can change and can pose danger | Solids, liquids and gases Heating and cooling Evaporation and condensation | Alternative sources of energy | Sources Vibration Loud and faint Pitch Volume |

Year 5 Science Overview

| Key Features | | | | | |
|---------------------|---------------------------|---------------------------|--|-----------------------------------|---------------|
| | All living things | Animals inc humans | Properties and changes of materials | Earth, Space and Magnetism | Forces |
| | Life cycles of plants and | Changes as humans | Dissolving | Earth relative to | Gravity |

| | | | | | |
|---------------|--|-------------------------------|-------------------------------------|--|--------------------------------------|
| Year 5 | animals | develop from birth to old age | Evaporating | the sun | Air resistance |
| | Birth, growth, development, and reproduction | | Filtering | Moon relative to the earth | Water resistance |
| | | | Reversible and irreversible changes | Relationship between sun, earth and moon | Friction |
| | | | | Earths rotation | Gears, pulleys, leavers, and springs |
| | | | | Day and night | |

Year 6 Science Overview

| Key Features | | | | | |
|---------------------|---|---|---|-------------------|--------------------------|
| | All living things | Animals inc humans | Evolution and Inheritance | Light | Electricity |
| Year 6 | Classification of living things | Circulatory system | Fossils tell us about the past | How light travels | Electrical circuits |
| | Vertebrates and invertebrates | Heart, blood and vessels | Off spring | The eye | Designing traffic lights |
| | Classifying reptiles, amphibians, insects etc | Diet, exercise and drugs | Changes to the human skeleton over time | Shadows | |
| | | Transport of nutrients through the body | Darwin | | |

Equal Opportunities

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

- We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.
- Our expectations do not limit pupil achievement and assessment does not involve cultural, social, and linguistic or gender bias.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.
- We value science as a vehicle for the development of language skills, and we encourage our children to talk constructively about their science experiences.
- We exploit science's special contribution to children's developing creativity; we develop

this by asking and encouraging challenging questions and encouraging original thinking.

- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We recognise that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.
- 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.

Assessment

We use assessment to inform and develop our teaching.

- Topics commonly begin with an assessment of what children already know.
- Children are involved in the process of self-improvement, recognising their achievements and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success.
- 'Floor Books' are used as a way of recording evidence and experiments across a topic.
- Assessment is continually under review to ensure that accurate information is obtained regarding achievement. Assessment is updated into Target Tracker (KS 1 and 2) and Orbit (EYFS.)
- Assessment is both formative and summative and may rely on questioning and observation throughout the topic, evidence may not always be in a written format.
- At the end of KS1 and KS2 assessment judgements may draw on the previous judgements that have been made earlier regarding the science content that has been taught before the final year of the key stage.

Health and Safety

The children's safety is paramount and therefore all risks during lessons are assessed and demonstration lessons may be appropriate for some lessons where particular risk is involved, rather than practical hands-on experience. In some instances, this will involve the completion of a written risk assessment, prior to teaching, for approval by the Head teacher. The Be Safe document will be referred to whenever necessary.

Management (Monitoring)

The science subject leader monitor progress through the school by; reviewing teacher assessments; observing lessons; completing learning walks; monitoring planning and through scrutiny of work.

Children who are not succeeding, and children who demonstrate high ability in science, are identified and supported or challenged accordingly.

Reports to parents are made verbally in the autumn and spring terms, and a written report is given in the summer term.

Teaching & Learning Strategies

All lessons have clear learning objectives which are shared and reviewed with the pupils throughout the lessons. A variety of strategies, including questioning, discussion, concept mapping, disproving theories and marking, are used to assess progress. The information is used to identify what is taught next. Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?" Activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings. Lessons make effective links with other curriculum areas and subjects, especially literacy, numeracy and computing. Pupils have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

Assessment

Teachers' assessment takes place throughout and at the end of each unit of work, noting any attainment and progress which is significantly lower or higher than expected. Teachers analyse pupils' progress in the units of work they have completed at the end of each school year to complete the annual report to parents. This report takes the form of a summary of the teachers' observations and continued assessment of the pupils at work thus giving parents a view of what their children know, understand and can do. Assessment information is uploaded into Target Tracker (KS1 and 2) and Orbit (EYFS.)

Safe Practice

Safe practice must be promoted at all times. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety issues have been identified in medium-term planning and risk assessments must be completed in weekly planning, when activities are identified that are unusual and beyond the scope of normal safety practice. The Be Safe document is referred to when necessary.

S. Prince

January 2016