

# St Patrick's Catholic Primary School



## Science Policy

### Rationale

*At St Patrick's Catholic Primary School we believe that science stimulates and excites children's 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.*

*At St Patrick's we believe that science will lead to a better understanding of ourselves and the world. It provides opportunities to appreciate scientific facts and concepts and to experience scientific discovery.*

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

### Aims of our Science Curriculum

- *Engage children as learners at many levels through linking ideas with practical experience;*
- *Help children to learn to question and discuss scientific issues that may affect their own lives;*
- *Help children develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought;*
- *Show children how major scientific ideas contribute to technological change and how these impacts on improving the quality of our everyday lives;*
- *Help children recognise the cultural significance of science and trace its development*
- *To increase the child's knowledge and understanding of the world.*
- *To develop attitudes of curiosity, originality, co-operation, perseverance, open mindedness, self-criticism, responsibility and independence in thinking.*
- *To enable children to effectively and confidently communicate their scientific predictions and discoveries as they are given the opportunity to observe, describe, illustrate, hypothesise, evaluate and interpret, using appropriate scientific vocabulary.*
- *To develop children's understanding of the effects of their actions on the environment.*

### Implementation of Policy

Science pedagogy is based on the development of these key scientific concepts:

- **Conceptual understanding**

- **Processes**
- **Skills of enquiry**
- **Scientific attitudes**

At St Patrick's scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is an ignition to critical and creative thought. Through science, children understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. Children recognise the cultural significance of science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

**At St Patrick's good science lessons should:**

- ✓ *Give opportunities for speaking and listening.*
- ✓ *Have questions of different levels and styles with opportunities for children to confer and discuss their ideas.*
- ✓ *Have interesting and varied activities.*
- ✓ *Have opportunities for assessment for learning such as self marking to evaluate own understanding.*
- ✓ *Allow for discussion of misconceptions.*

Science is not just a question of knowing facts and understanding concepts. It is also about encouraging children to behave scientifically (posing questions to be investigated, hypothesising, recording and analysing).

At St Patrick's teachers 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 maintaining a high level of motivation. Children communicate their findings in a variety of ways such as written reports, short talks and demonstrations.

At St Patrick's we use ICT in science. We use ICT for enquiry work, with digital cameras, video capture of images and activities, and data logging.

Science is celebrated around the school through displays of work, materials and objects. We use cross-curricula links to science with, for example, design and technology, art and music.

Staff aim to promote a broad and balanced science education which enables progression and continuity between classes. We aim to teach science in ways that are imaginative, purposeful, well managed and enjoyable. Teachers will give clear and accurate explanations and offer skilful questioning, whilst making links between science and other subjects.

The practical nature of science is also recognised and opportunities for learning through play and firsthand experience should be provided, especially in the early years. Science plays an important role in the development of investigative skills and draws upon strong mathematical links, for example measurement, pattern recognition, graphical skills and data handling.

## Early Years Foundation Stage

Children in EYFS will be introduced to science through the Early Years Foundation Stage (EYFS) Curriculum Guidance. The Early Learning Goals (ELGs) for 'Understanding of the World' forms the foundation for later work in science, design and technology, history, geography and ICT.

Wherever possible the children are provided with activities based on firsthand experience that encourage **exploration, observation, problem solving, prediction, critical thinking, decision making and discussion**. We provide an environment with a range of indoor and outdoor experiences that stimulate their interest and curiosity.

## KS1

As children progress through the Keystages, they continue to 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**.

The KS1 curriculum follows the National Curriculum, ensuring all areas of the Programme of Study are covered across both Years 1 and 2.

## KS2

At St Patrick's children 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 including ICT in their work. They talk about their work and its significances, using a wide range of scientific language, conventional diagrams, charts, graphs to communicate their ideas.

At KS2 the curriculum follows the National Curriculum, ensuring all areas of the Programme of Study are covered across Years 3, 4, 5 and 6. Children learn, explore and ask questions about a wider range of living things, materials and physical phenomena. Children think about the impact of scientific developments and technologies on themselves and the world around them.

Children are encouraged to develop an independent approach to their science learning, through asking questions, suggesting improvements to their work and supporting each other towards achieving a heightened understanding of scientific concepts.

Sc1 is promoted across KS2 with children being given the opportunity to plan, carry out and evaluate experiments. Children are encouraged to develop their own methods for presenting their ideas (to include drawings, diagrams, use of ICT, tables and charts.)

In both Keystages at St Patricks' staff follow the PLAN Assessment resources- these include knowledge matrices, working scientifically matrices and examples of children's work.

## Progression

At St Patrick's as children move from Early Years to KS1 and up to KS2, science teaching and effective assessment should allow opportunities for them to progress in a range of ways.

We ensure progression in the following key concepts:

- Conceptual understanding
  - Processes
  - Skills of enquiry
  - Scientific attitudes
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- *From using everyday language to increasingly precise use of technical, scientific vocabulary, notation and symbols;*
  - *From personal scientific knowledge in a few areas to understanding in a wider range of areas and knowing how these links together;*
  - *From describing events and phenomena to explaining events and phenomena;*
  - *From explaining phenomena in terms of their own ideas, to explaining phenomena in terms of scientifically accepted ideas or models;*
  - *From participating in adult lead practical, scientific investigations to developing and undertaking their own scientific investigations, independently;*
  - *From unstructured exploration to more systematic investigation of a question or questions developed independently;*
  - *From using simple drawings, diagrams and charts to represent and communicate scientific information, to using more conventional diagrams and graphs.*

## Health and Safety

At St Patrick's all children will be made explicitly aware of the relevance of health and safety issues when undertaking scientific work. This will be specifically highlighted when they are asked to undertake scientific investigations, with additional adults being used effectively to assist with the safe running of all science lessons.

## ICT

At St Patrick's children will be given opportunities to apply and develop their ICT capability throughout their science lessons, through the use of science/ICT software, allowing them to utilise equipment such as Data Loggers and Interactive Microscopes, and the Internet.

## Monitoring

At St Patrick's monitoring of the standards of children's' work and of the quality of teaching in science is the responsibility of the science coordinator to ensure continuity and progression throughout the school. The role of science coordinator also involves being informed about current developments in the subject, and providing

a strategic lead and direction for the subject in school. An annual summary of science is made in which strengths and weaknesses in the subject are evaluated, and an action plan to address any issues arising is formulated for the forthcoming year.

## **Equal Opportunities**

At St Patrick's we believe that every individual within the school has the opportunity to achieve their full potential has the same chance and equal access to all areas of the curriculum.

In science this means that all children will have the opportunity;

- *To develop the process of systematic enquiry*
- *To relate their understanding of science to everyday life and in environmental contexts*
- *To communicate using appropriate vocabulary and present scientific information in a number of ways*
- *To explore aspects of health and safety when working with living things and materials*
- *To carry out experimental and investigate science*
- *Staff members make every effort to use stimuli that reflect the cultural diversity of our school and to draw on children's own experiences.*

## **Assessment**

When children have engaged in sufficient activities to be secure in the required knowledge, it is time to reflect on their learning. The PLAN examples of work show the learning of one child that is secure that can be used as a benchmark against which to assess children's work

To assess the working scientifically skills of children, teachers observe their execution of skills that have been previously modelled and take note of those children who are not secure in using them.

If children are still not secure in the knowledge and skills, further opportunities should be provided, later in the year, for them to revisit them.

Using the website 'Explorify' throughout the year to re-visit topics, a whole school Science Day, displays around school and end of term quizzes will hopefully embed the learning.

At St Patrick's a range of assessment techniques will be used depending on the nature of the lesson, knowledge acquired, or the process skills used. They may be assessed through close teacher observation or discussion and sometimes small tests or problem-solving tasks may be set.

## **The Role of the Science Subject Leader**

At St Patrick's the Science subject leader will:

- *Ensure the development of a progressive curriculum map, monitor its implementation and impact.*
- *Promote the integration of Science within appropriate teaching and learning activities;*

- *Manage the provision and deployment of resources and give guidance on classroom organisation support;*
- *inspire colleagues to deliver high quality teaching and learning opportunities;*
- *lead INSET within the school, and investigate suitable courses elsewhere;*
- *Analyse data to identify strengths and weaknesses in outcomes; planning for improvement accordingly.*
- *write, monitor and evaluate an action plan for Science for the School Improvement Plan*
- *Lead the evaluation and review of the school's Science policy.*
- *Bid for and manage the budget for this curriculum area;*
- *Monitor and review the science provision within the school*

### **Disability Equality Impact Assessment**

This policy has been written with reference to and in consideration of the school's Disability Equality Scheme. Assessment will include consideration of issues identified by the involvement of disabled children, staff and parents and any information the school holds on disabled children, staff and parents.

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