



SCIENCE POLICY

**January 2016
(Review January 2019)**

This policy document is underpinned by the Mission Statement for Our lady and St Philip Neri School, which permeates and is central to all aspects of school life.

Introduction

Physicians take an oath that commits them to 'first do no harm'. The best science teachers, set out to 'first develop and maintain curiosity' in their pupils. Without curiosity and wonder children lose their natural inclination to observe the world, ask questions of it and investigate to find answers. Like this, primary science should be child-led and enquiry based and be saturated with curiosity and wonder for both teachers and pupils.

National Curriculum Purpose of study

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. Above all science should be interesting and fun in all lessons, not just Science Week.

Aims and Objectives

- To provide children with opportunities to learn about science through questioning, enquiry and investigation in order to make progress and attain knowledge and understanding of this core subject.
- To give children an environment which is safe and secure and which provides encouragement of curiosity for the development of all aspects of scientific learning.
- To ensure that there is equality of access and opportunity for all children to develop their investigative and enquiry skills.
- To seek to ensure that all children achieve their full potential in all aspects of Primary Science by the time they move from Primary to Secondary Education.

Teaching and Learning

The school believes that its teachers must work together to plan, deliver and moderate the teaching of Science in order to ensure that expectations are high and that children are able to achieve the best of their ability. Teaching will follow the new Primary Curriculum Programmes of Study (and the school's Science Schemes of Work). The main vehicle for curriculum delivery will be the explicit teaching of Science for at least one and a half hours a week in KS1 and two hours a week in KS2. Children will be taught in mixed ability groups across phase groups with appropriate challenge and support given to individuals.

Lessons will have three types of learning goals: **knowledge, skills and understanding**. Knowledge is about facts. The easiest way to find out whether children have learned these facts is through regular self, peer and teacher assessment, whether written or oral. Dialogue and discussion should be at the heart of science learning. Teachers need to ensure that discussion and debate are a central theme in science lessons so that pupils share and debate science knowledge. Skills are practical and experiential. They are not right or wrong; they are developmental so that children build their scientific skills over time. Scientific skills should be developmental so that children build their scientific skills over time. Scientific skills should be developed in the pursuit of 'finding out' so that children learn to apply their skills in order to investigate science questions. Science skills and knowledge are not taught separately, but science skills are used in order to acquire knowledge. Through the different types of investigation children should find answers to their science questions. It is important that children begin to understand the five different types of investigation and which types of question each type will answer.

Types of investigation children should develop:

Examples of investigation questions:

Identifying and Classifying.

- What do different animals eat?
- All the food in the shop has been muddled up - how can we sort it?
- What type of shoes do most children have?
- How can we sort the clothes in the play corner?
- Are all the wheelie toys the same?

Observation over time:

- What happens to a seed when it grows?
- What happens to bread if its left out for a long time
- What happens to the ice cube in your hand?
- What happens to the sun over the course of a day?

Pattern Seeking:

- Do birds feed at different times of the day?
- Which flowers do mini-beasts prefer?
- Do all oranges have the same number of seeds?
- Do we all have the same size feet?
- How many turns does it take to make the clockwork car go 1 metre & 2 metres?

Fair testing:

- What happens to a seed when it grows?
- What happens to bread if it's left out for a long time?
- What happens to the ice cube in your hands?
- What happens to the sun over the course of a day?

Research:

- How does a dentist help us look after our teeth?
- What's the most common mini-beast in the UK?
- How are candles made?
- How is plastic made?

Teaching Science

The best way to do this is to provide an interesting stimulus at the start of a topic, allow the children to develop their curiosity in the subject. Then the children should have the opportunity to say what they know, what they want to find out, and later also a chance to say what they learnt at the end of the topic. Teachers then use the children's knowledge and questions to adapt the science planning. Importantly teachers use the children's questions as the basis for investigations, teachers adding in their own questions to ensure coverage of the different types of investigations and the national curriculum knowledge areas. This ensures science is largely child-led yet covers curriculum requirements. It is not acceptable to simply take science plans and teach because this is then not using the children's prior knowledge and creates repetition that is boring for children or misses gaps in learning that need covering.

The general teaching sequence for science can be summarised as follows:

- Explore!
- Pose questions(s) - I wonder if/why/how/when/what
- Decide on the type of enquiry needed
- Gather evidence
- Understand evidence
- Suggest answers
- Report findings

Planning and Lesson Content

Good lessons need to be planned for. We use a variety of planning resources including TIGTAG and Hamilton. All classes should be using Concept Cartoons to encourage discussion. There is no specified planning format for science; however, the following should be included and evident on class planning where possible/appropriate:

For individual tasks/ lessons:

- Shared learning intentions - both skills and knowledge
- An agreed success criteria for the lesson or specific activities (this might be determined with the children during the lesson, but should be thought about before)
- Differentiation - ensuring the different science learning needs are met through activities and adult support
- Key questions to cause thinking and assess knowledge
- Methods of recording the children's learning

- Use of adults during the lesson
- Resources
- Vocabulary

For medium term unit plans (science topic overview):

- A stimulus or Big Question - get them thinking, create an enquiry (concept cartoons/event)
- Assessment at the start of topics
- Opportunities to investigate actively rather than through work sheets or excessive written tasks
- Opportunities to develop the five types of investigations over the topic
- Opportunities for assessment (individual, peer, teacher) through use of the success criteria and science assessment

The Science Subject Leader is available to support teachers with planning. All classrooms should have a space for science vocabulary and on-going class enquiries to be shown. This can be part of inside or outside display.

Inclusion

The pupils work individually, in pairs, or as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work, with discussion and debate being a central theme in science lessons. Children with literacy difficulties should not have this as a barrier to science learning. All children should be stretched and challenged through the depth of investigation; some children will need more support than others. Differentiation should be considered as “...*the planned and spontaneous intervention or withdrawal of a teacher’s actions throughout the lesson...*” Like this, teachers need to plan for needs of their children, but also act according to their needs within the lesson and be ready to go ‘off plan’ when necessary. This should also include the actions of support staff in the class. It should be remembered that while children might need support at times, there are also times when teaching staff need to stand back and allow for discovery, intervening with questions to scaffold and support learning where necessary. Children learn more by finding out in science than by being told.

Resources

Science resources are centrally stored in the science cupboard in the Key Stage 2 corridor. Equipment should be stored in labelled trays in large open cupboard units. The overall responsibility for maintaining this area is that of the Subject Leader. However, the whole staff are responsible for ensuring equipment is returned neatly, and cleaned, to the correct unit and that broken or used up equipment is reported to the Science Subject Leader so that, repairs, replacements or new orders can be made. Equipment must be taken from and returned to the science cupboard by staff only and not children. When finished with equipment must be returned and not stored in classrooms indefinitely. Teachers need to check with the subject leader before ordering science resources.

N.B. Under NO circumstances are children allowed access to the science resource area alone.

Health and Safety

Science is taught in line with our general school Health and Safety Policy which all staff should be up to date with. Science in our school is very safe. However, when children are engaged in a variety of practical activities, including open-ended investigations, vigilance is needed. Individual teachers will need to undertake their own specific risk assessment. All science activities should be consistent with the 'Be Safe! Some aspects of safety in Science and Technology for key stages one and two' (ASE 2001). The governing bodies code of practice for Health and Safety in Primary Science is encompassed in the booklet 'Be Safe!'. Copies of this booklet are kept in school. All staff are expected to follow its guidance. The LEA maintains a subscription to CLEAPSS school Science service (Brunel University, Uxbridge) This organisation produces a termly newsletter, Primary Science and Technology and a wide range of guides about primary science, especially resources. They also provide a helpline number: 01895 814372 which teachers can use for health and safety advice and other issues concerning science. It is the class teacher's responsibility to ensure science activities are safe. Using the above advice it is up to the individual teacher to do their own risk assessment.

Use of ICT

The use of ICT will be built into the delivery of the Science programme wherever possible. In particular, the TIGTAG scheme and activities for virtual science which can be taught/demonstrated through use of the Interactive Whiteboard (IWB). Data and graphing programmes should be utilised by children when reporting findings.

Equal Opportunities/Race Equality

We are committed to an environment that promotes equal opportunities for all children, regardless of their race/colour/gender and religion and any work undertaken reflects this commitment. Please also see the school's Race Equality and Equal Opportunities policy.

Marking/Assessment

Marking will be carried out regularly and in accordance with the school's marking policy. Children should be assessed using both formative and summative assessments. Teachers are provided with ongoing skills and knowledge spreadsheets in order to keep a check on the provision and progress of children in their class. As a core subject, teachers are expected to track children's progress and be informed about which children are 'working towards', working at' or 'exceeding' age related expectations.

Monitoring and Review

Monitoring of subjects is undertaken on a yearly basis according to the School's Development Plan (SDP). Please refer to the current SDP for the current cycle. We are aware of the need to regularly review our policies to take account of the new initiatives, changes in curriculum or developments in technology. We will review our policy during the Spring Term 2017.

Role of Governors/Parents

Our governors determine, support and monitor and review the school's policies. We believe that parents have a fundamental role to play in helping their children learn and progress within our school. We are committed to ensuring that parents are informed about topics we cover, when homework is set and how to help their child.

Signed (Headteacher)

Signed(Chair of Governors)