



Policy: SCIENCE POLICY

Introduction/Philosophy

Science “offers practical opportunities for careful observation, measurement, communication in a variety of forms, predictions from perceived patterns and regulations, appreciation of the relationship between cause and effect, and for the solving of problems in the everyday context”.

Science 5-16 'A Statement of Policy'

Science at St. John's Meads aims to provide the children with the opportunity to investigate Science through practical experiences and develop learning skills such as curiosity, predicting, testing and problem solving that can be used across the curriculum.

Why We Teach Science

Science makes an extremely valuable contribution to all aspects of life. Children are naturally fascinated by everything in the world around them, and Science makes a valuable contribution to their understanding. We must encourage their naturally inquisitive minds and offer them opportunities to stimulate their natural curiosity.

Aims Of Our Science Teaching

- Teach the children scientific skills and scientific knowledge.
- Develop pupils' ability to use scientific methods of investigation.
- Build on our children's natural curiosity.
- Develop an understanding of scientific ideas.
- Stimulate our children to investigate and question.
- Cultivate positive, personal qualities and attitudes - in particular,
- Develop a critical awareness of the role of Science in society.
- Encourage pupils to enjoy and be excited by Science and see Science as an interesting, exciting and stimulating way of learning.

Through our aims we intend to develop the following skills in Science:

Prediction
Hypothesising
Recording information and collecting data
Discussion – reporting to others
Raising questions
Observation
Comparing, sorting, classifying
Making a plan
Undertaking and explaining what we mean by a 'fair test'.
Estimating and measuring
Controlling and manipulating variables
Handling equipment
Interpreting information
Making conclusions

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Co-ordinator: Tim De Marco



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National Curriculum 2014

As of April 2016, we base our science teaching on a curriculum provided by 'Empiribox' (www.empiribox.org). They closely follow and meet all of the expectations on the National Curriculum over a four year rolling plan. Every two terms, children in each key stage will undertake the same science topics, based on areas 'Physics', 'Chemistry' and 'Biology', with different age-appropriate aspects covered in each of the four years. This means that through their journey at St John's Meads, the children will still meet the National Curriculum standards for Science, and even exceed them, preparing them extremely well for secondary school science study. Ofsted have approved this curriculum, and have frequently observed 'outstanding' lessons taught with this scheme.

Organisation

The Science Co-ordinator will ensure that all areas of the Curriculum are being covered through the topics. There should be two taught sessions per week; one focusing on practical elements in science and one in knowledge and understanding. The sessions will be a mix of teacher demonstration (of some 'larger' experiments), followed by detailed discussion, and of investigations for the children to complete. There will also be time for recording of data and investigations.

There should also be a variety of books available for the children to investigate and extend their knowledge of given Science topics. Children are encouraged to extend their work and interests outside school by bringing things in from home, performing set tasks, listening to outside speakers or having visitors in their classrooms to support current topic work. At least one of the half term home learning projects should be linked to a forthcoming Science topic each year.

Planning

Planning is based around skills within Science. Full planning is provided through a login on the Empiribox web site, as well as in printed form through folders provided for each topic. This planning is available for teachers to consult in detail, with specialist subject knowledge provided to allow informed discussion and deep learning. As teachers in each key stage are all teaching the same units at the same time, they can ask each other for help, offer advice from sessions they have already taught, and even team teach where support may be necessary. Most units have an introduction session, but following this, the teachers can teach sessions in any order they see as appropriate.

Continuity and Progression

The four-year plan provided by Empiribox is available to view on the web site and saved in the staff planning folder on the school system. An overview of the science covered is kept in every classroom. Teachers will discuss how they have differentiated their science lessons, for example a way of approaching a task for a low ability Year 5 child may be suitable for a high ability Year 3 child. Teachers will discuss outcomes and the co-ordinator will use planning monitoring, book scrutinies and pupil voice to ensure that there is sufficient progression throughout each Key Stage within the same topic. If necessary, the science co-ordinator will liaise with relevant class teachers to address any needs that arise.



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Teaching Methods

Science at St. John's Meads is taught through termly topics. This cross-curricular approach provides an interesting and relevant focus to our Science teaching. Science is taught to children in a variety of ways, creating a balance of approaches and methods, depending on the Science activity. It may be:

1. Individual/paired work
2. Small groups
3. Triad groups (mixed ability threes – one lower, middle and higher ability).
4. Large groups (half class)
5. Whole class
6. Mixed classes (e.g. Year 3 and 4 or Year 5 and 6).

At all stages the Science lessons involve the use of a variety of practical equipment, provided by Empiribox in sufficient quantities for individuals and pairs to all be able to participate in high-quality science experiments. The emphasis is always on first-hand experience. Scientific discoveries are initially child-oriented with results and conclusions drawn up by the children and teachers. Children are encouraged to 'do' and 'have a go' at Key Stage 1 and Key Stage 2. As the children progress through the school they are encouraged to record their work in detail. It is expected that by the end of Key Stage 2 a precise and formal method of recording is achieved by most of the children. In each topic, the Empiribox curriculum focuses on a different skill, for example, 'planning' or 'predicting'.

Information and Communication Technology

ICT will be used in various ways to support teaching and learning. ICT will involve computers, laptops, tablets and other audio-visual aids. The interactive whiteboard (IWB) is a useful tool for delivering a range of teaching aids and can be used to support activities and enhance the learning of scientific concepts are detailed in science planning.

All resources, power points and video clips needed are provided in the teacher area of www.empiribox.org In addition, teachers may use some of the freely available resources on the internet which allow for effective teaching of Science, including virtual experiments, interactive games and multimedia clips to enhance their lessons. Three iPads and a class trolley of Nexus tablets are available if teachers find suitable apps to support science learning.

Equal Opportunities and Differentiation

Children of all abilities, gender and background can benefit from the study of Science. The teaching system within our school (see Teaching and Learning Policy) allows for variation of ability between children within the existing Science Curriculum. The Science taught at St. John's Meads is interesting and exciting, and we aim to create an environment that offers everyone the same opportunities, as well as offering support of extension to those pupils who need it.



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Resources

Science resources are kept in the central Resources Room. They are clearly boxed, labelled and organised. The majority of equipment is delivered termly by Empiribox through a courier service. This saves a lot of time and money in the long run, and allows children access to the highest quality resources, normally only used in secondary school science. The Science coordinator is responsible for ensuring all relevant resources are checked, audited and available. In case of missing or damaged items, or a low run of stock of consumable items, the coordinator can contact Empiribox who will send replacements within 24-48 hours. Teachers need to look well in advance of their topic to check they have resources they need and inform the Science Coordinator of any needs they may have. It is important that the children have access to, and are aware of, the resources available to them. This encourages scientific observation by individual children. In case of chemicals and other potentially harmful items, these are locked away from the access of children until needed and supervised by teachers.

Safety In Science Activities

We accept a responsibility to plan safe activities for Science. Teachers and support staff are aware of the Primary Curriculum Risk Assessments which are reviewed and revised by the Health and Safety Coordinator or the school. Before every topic, staff receive a day's training in all lessons, experiments and activities, being made aware of every potential risk and how to minimise it. The Empiribox risk assessment is signed by all staff as evidence of this each term. Teachers will ensure a high standard of behaviour in sessions, and ensure children are aware of all potential risks in each activity as appropriate.

Assessment and Record Keeping

Teachers record assessment data via Excel spreadsheets linked to the Empiribox curriculum, adapted for their class. They record assessment notes and quotes from individual children during sessions on assessment sheets and onto excel trackers. Children complete appropriate pre-assessment and post-assessment tasks before and after each unit, as well as self-assessing before and after each session, recorded in their books.

On Science Days, which happen three times a year, (Terms 2, 4 and 6), teachers will make detailed assessment of children's abilities in a specific assessment focus. APP sheets for each individual child are stored in each class teacher's assessment file and are updated after each Science day. Each teacher highlights the APP sheet in their class colour, to build a picture of individual progression as each child moves through the school. After each Science day, Intervention sheets are updated for each class to identify children performing well, making good progress, and also those who require further support or who may be making insufficient progress. On our annual school report, parents are given an outline of their child's achievements, but Science levels are not shared.

On each Science Day, teachers will assess AF4 – Using investigative approaches. Alongside this, in Term 2, we assess AF5 – Working critically with evidence. In Term 4, we assess AF1 – Thinking scientifically and in Term 6, we assess AF2 – Understanding the applications and implications of Science. AF3 – Communicating and collaborating in Science should be assessed on each Science day and through every topic as well.

Role of the Headteacher and the Science Co-ordinator

The Headteacher and the Science Co-ordinator will liaise between the Key Stage 1 and Key Stage 2 departments at St. John's Meads, as well as with their secondary feeder schools. The Science Co-ordinator will try to support colleagues who are planning Science activities, as well as being available when needed to implement those activities. The Science Co-ordinator will attend relevant

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Science Courses and network meetings with other colleagues, and report back to staff. They will look to develop moderation and collaborative teaching opportunities with other local schools using the Empiribox scheme. The Headteacher has a vital role in encouraging colleagues to teach effective Science and ensuring that the National Curriculum for Science is being delivered to the children at St. John's Meads Church of England Primary School.