



St. Peter's C.E. Primary School
Science Subject Policy

*The child grew and became strong in body, mind and spirit.
Luke 2:40*

Be Curious. Be Creative. Be Determined. Be St. Peter's.

Introduction

Science is a core subject within the National Curriculum 2014. This policy is a statement of the aims, principles and strategies for the teaching and learning of Science at St. Peter's C.E. Primary School.

It was developed through a process of consultation with the co-ordinator and staff and is reviewed on an annual basis.

It is the role of the Headteacher, The Head of Teaching and Learning, and the Science Co-ordinator to ensure that the policy is successfully implemented.

School vision and key principles

Science is both a body of knowledge that represents current understanding of natural systems and the process whereby that body of knowledge has been established and is being continually extended, refined, and revised. Both elements are essential: one cannot make progress in science without an understanding of both. (Duschl, Schweingruber and Shouse, 2007).

Our key principles for outstanding science teacher are:

- Knowledge is retained and able to be built upon in succeeding years and topics
- Children are given the opportunity to, and are able to, investigate their questions in different ways
- The children feel that their learning is relevant to their everyday lives
- The children know why they are learning what they are learning
- Everyone participates and plays a key role in learning and discovery

These principles have been developed into a shared vision for science learning:

At St. Peter's C.E. Primary School, we want our children to be curious, inquisitive, creative and determined. We want them to be curious enough to look at their own bodies and the world that surrounds them and begin to question, '*what, how and why?*', inquisitive enough to become habitual in asking searching questions that lead to a deeper understanding, creative enough to conceive methods and measures that will lead to answers, and determined enough to meet and overcome the many pitfalls and misconceptions they will face along the way- not as individuals, but as a strong team of resourceful and resilient scientists.

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Through effective science teaching, we will build up in our children a body of key foundational knowledge and concepts that will encourage them to recognise the power of rational explanation and develop in them a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes (DfE, 2013a).

Our aims echo those found in the National Curriculum Framework Document (DfE, 2013b). We aim to ensure that our children:

- 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 science enquiries that help them to answer scientific questions about the world around them,
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Statutory Requirements

Statutory requirements for the teaching and learning of Science are laid out in the National Curriculum in England Framework Document for Teaching, September 2013 and the Statutory Framework for the Early Years Foundation Stage, September 2013.

Equal Opportunities

The staff endeavour to provide children regardless of social circumstances, ability, gender, religion etc. with opportunities, which are involved in the teaching of science. Every effort is made to ensure that science activities and investigations are equally interesting for both boys and girls and that they are differentiated and written in such a way that all children are included.

Science curriculum planning

Teachers plan exciting and engaging lessons that focus on developing their children's scientific knowledge and their ability to 'work scientifically'. Science, in Key Stages 1 and 2, is taught as a discrete subject, but wherever possible, links are made with other classroom subjects. Coverage and progression is ensured by following the topics found on our school's curriculum map.

- Medium term planning is completed for each term and made available on the staff share server by the second week of each term.
- Key Stage 1 plan for 1 ½ hours of science per week (or an equivalent number of hours in blocks);
- Key Stage 2 plan for 2 hours of science per week (or an equivalent number of hours in blocks);
- Planning is in line with the school planning policy;
- We combine scientific study with work in other subject areas where possible. (Cross-curricular links.);
- ICT should be integrated into planning when possible including use of laptops, data loggers and database software etc.

- We have planned the topics in science so that they build on prior learning;
- We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and we also build progression into our lessons shown clearly through the assessment guidelines provided by the science coordinator, so that the children are challenged as they move up through the school.

Assessment

Children's work in Science is subject to ongoing assessment, linked to the topic being covered and the skills taught. At St. Peter's, we follow the TAPS pyramid model for assessment. Assessment is both formative and summative and draws on practical experience rather than formal testing. Before the end of each topic (usually 2/3 of the way through a topic), an 'assessment activity' is carried out. Each of these has a very specific focus and allows teachers to make a judgement of the ability of each child in a manageable and meaningful way. Evidence (taken from observations of children, oral discussions and questioning, observations and marking of written work, observations of any disposable practical work and any formal testing) is added to these judgements and fed into moderation and discussion sessions. High repetition, low stakes testing informs teachers throughout the unit, and a short knowledge retrieval assessment is delivered at the end of the unit. A collation of all the evidence collected is shared and considered in the context of wider learning and progression. All of this allows teachers to make an accurate a valid assessment of each child that can be reported on and passed to the next teacher as the children progress along their scientific journey.

- Monitoring is carried out in line with the school monitoring policy.
- Assessment is used to inform planning and set targets.
- Best practise for Science is identified and shared amongst practitioners.
- Samples of children's work will be collected.
- Progress is reported to parents orally at parent's evenings and on annual written reports.

Teaching and Learning

We use a variety of teaching and learning styles in Science lessons. Our principal aims are to develop children's knowledge, skills and understanding with Science, as well as fostering a love of the subject and the confidence needed to thrive in it. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data (including statistics, graphs, pictures and photographs) and use ICT whenever possible. They take part in role-play and discussions and present reports to the rest of the class, or wider school community. They engage in a wide variety of problem-solving activities and carry out practical experiments before analysing results.

We recognise that in all classes, children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- setting tasks which are open-ended and can have a variety of responses,

- setting tasks of increasing difficulty through the use of extension or higher order thinking questions (see Bloom Taxonomy, Bloom, 1956),
- using staff and resources effectively to support the work of groups or individuals so that all have the support/scaffolding required to achieve an objective,
- making links across different subjects.

EYFS

At this phase children are:

- Developing the crucial knowledge, skills and understanding that help them make sense of the world;
- Involved in activities based on first-hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking and decision-making and discussion;
- Experiencing a wide range of activities, indoors and outdoors, including adult-focused, child-initiated and independent play;
- Stimulated, interested and curious;
- Observed by adults and learning is recorded in a variety of ways.

There is an investigation area within continuous provision (that is changed at least once every half term) that will provide children with a balance of scientific opportunities and practical investigations for the children to access. Children's achievements are documented in their learning journeys regularly.

Key Stage 1 and 2

At this phase children are:

- Learning through a science process skill-based approach;
- Undertaking practical enquiries;
- Working collaboratively and independently;
- Developing high quality, purposeful talk for science;
- Recording findings in a variety of stimulating and purposeful ways;
- Building upon prior science learning, both skill and knowledge based;
- Beginning to think about the positive and negative effects of scientific and technological developments on the environment and in other contexts;
- Evaluating their own science learning;
- Using ICT to support and extend their learning in science;
- Making links across subjects;
- Experiencing a variety of teaching styles and strategies that promote positive science learning;
- Learning that science promotes the concept of positive citizenship;

It is our intention to ensure that every child develops Science capability through provision of the equivalent of 1 ½ hours per week for each child in Key Stage 1 and 2 hours per week in Key Stage 2.

Science and Christianity

At St. Peter's, we believe that the study of science and nature is the study of God's perfect creation. We believe that religion and science are not mutually exclusive and that while the Bible teaches us the *why* of God's plan, science teaches us the *how*. By combining these two elements we can come to know and understand God better. We take every opportunity to look at the awe and wonder of science through the lens of our Christian values. We discover God's love for his creation and consider how we can love it too, as his stewards on Earth, and we look at ways in which the world is no longer perfect and consider how we can improve it as best we can. Our children are given opportunities to reflect on our impact in the world and consider and form ethical and spiritual arguments for a range of different issues. We come to consider ourselves- unique and special individuals- as part of God's perfect creation and learn to love science and nature as well as ourselves and others around us.

Resources

- All resources are stored centrally in the Science cupboard next to the KS2 playground doors.
- Resources are organised in to clearly labelled boxes and stored by sections- biology, chemistry and physics.
- Consumable, generic or large resources are stored separately within the cupboard.
- Staff are responsible for informing the Science co-ordinator when extra resources are needed, when there are breakages and when consumables are running low.
- The Science co-ordinator will update and replenish resources when needed.

Health and safety

- The safe use of equipment is to be promoted at all times.
- Be Safe (ASE) is available for teachers on Staff Share and from the Science co-ordinator.
- Risk Assessments are created when using outdoor spaces and to cater for allergies and disabled children where appropriate.

Promoting Science

- School visits for science are organised where possible in line with the current unit of work, to enhance and extend learning.
- Local resources, such as scientists from industry are used to support units of work where possible.
- Each year the school participates in National Science week
- Science displays in classrooms and around the school will celebrate the children's work and evidence progression.

Local Environment

Staff use the local environment to support the teaching of science wherever possible. The school library; the school garden, field and pond area; local green spaces; the public library and other resources used, including the help from local high schools.

Recording and reporting

Teacher's mark and comment on children's work in line with the Marking Policy. Samples of children's work are retained by the school and used to support teacher judgements at the end of each topic taught to identify whether a child is reaching the expectations for their year group, emerging them or exceeding them. Parents are kept informed, in line with school policy, of their child's progress and achievements through formal and informal arrangements:

- Good news letters sent home with work,
- Informal visits,
- Certificates,
- Parents meetings / evenings,
- Mid-year written reports,
- Individual members of staff also use their own system of rewards.

The role of the subject leader

It is the role of the subject leader to:

- take the lead in policy development and the production of schemes of work designed to ensure progression and continuity in Science throughout the school,
- support colleagues in their development of detailed work plans and implementation of the scheme of work,
- monitor assessment and progression in Science,
- take responsibility for the purchase and organisation of central resources for Science,
- keep up-to-date with developments in Science education and disseminate relevant information to staff,
- produce a report to Governors at the end of each school year.

References

Richard A. Duschl, Heidi A. Schweingruber, and Andrew W. Shouse. (2007). *TAKING SCIENCE TO SCHOOL Learning and Teaching Science in Grades K-8*. Washington DC: The National Academies Press. Available from: <http://nap.edu/11625>

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