St Peter's Church of England (VC) Primary School and Pre-school

March 2024

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1. Curriculum statement

At St Peter's we aspire to encourage pupils to explore and learn about the world around them, progressively building on key scientific knowledge, vocabulary and skills learnt in line with the National Curriculum. We want all children to see Science as exciting, fun, thought-provoking and challenging. Our goal is for all children to be fascinated by how biological, chemical and physical processes work and question how everything functions, so they can continue their learning journey throughout secondary school and in their future lives.

Intent

The 2014 national curriculum for science aims to ensure that all pupils:

● 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 skills required to understand the uses and implications of science, today and for the future. It is therefore important for lessons to have a skills-based focus, and scientific knowledge can be taught through a variety of methods.

At St Peter's, we encourage children to enjoy science and be inquisitive throughout their time at the school. We teach a topic-based curriculum so we aim to make meaningful connections between the different subject areas. There are occasions, however, where it is necessary to teach parts of the Science curriculum separately due to the topic not linking so easily with planned topics. This ensures links wherever possible and the continual full coverage of the science curriculum.

We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes towards this exciting subject. We then aim for the children to use this knowledge to express their understanding from each unit and across each year group to be able to apply their scientific skills. We ensure that the 'Working Scientifically' skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions (this includes EYFS being curious about their surroundings).

Implementation

At St Peter's we want science to be regarded as an important subject. We encourage teachers to create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Where possible science displays should be up linked the subject being taught at the time.

Our whole school approach to the teaching and learning of science involves the following aims:

- Preparing our children for life in an increasingly scientific and technological world.
- Teaching children from a young age to actively care about the environment (living and non-living).
- Teaching science in a global and historical context, including important contributions of significant scientists from a range of countries and cultures.
- Helping our children to acquire a growing understanding of scientific facts and methods.
- Helping to develop and extend our children's scientific concept of the world they live in.
- To encourage children to ask their own questions and be given opportunities later in a topic to discover the answers for themselves.

At St Peter's we also want to implement positive attitudes towards science:

- By building on the children's natural curiosity and developing a scientific approach to problems.
- Encourage open-mindedness, ability to predict, collect results in a meaningful way, self-assessment, perseverance and responsibility.
- Development to children's social and team working skills so they can work together successfully and collaboratively.
- Develop children's self-confidence to enable them to work independently.
- To provide children with an enjoyable experience of science so that they will develop a deep and lasting interest which may lead to further scientific study.

Finally, we want the children to develop a key set of skills to use now and in future learning:

- To teach children the key facts linked to each topic so they can develop an understanding of scientific processes.
- To help children to acquire practical scientific skills in selecting and safely using scientific equipment.
- To develop the skills of investigation: predicting, hypothesising, developing working methods, observing, measuring, collating and interpreting results, explaining and evaluating results and making conclusions bases on findings.

Impact

The successful approach at St Peter's results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the living and non-living world. Forest school ensures EYFS children experience frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, trips and interactions with experts or resources, children access additional scientific learning opportunities to enrich their curriculum learning.

Year 5/6 children learn the possibilities for careers in science, as a result of our community links and connection with national agencies and volunteers coming and discussing their jobs with children. Our children also gain exposure to a range of different scientists from various backgrounds (often carried out in Science Week).

2. Teaching and learning

Due to the nature of our school being a mixed year group set up we teach on a two-yearly cycle (Cycle A and Cycle B). This ensures all children cover all the curriculum topics needed while at primary school.

At St Peter's Explorify has been embedded into the teaching of Science. This fantastic tool allows teachers to use it to start lessons with a thought-provoking 'Odd One Out' activity, 'Zoom in, zoom out' object, 'What is going on?' question or interesting video on the subject to establish an interest in the topic being taught. Explorify is also used in separate 15-20 minute sessions to recap past facts or link up with separate areas being taught. Classes have a poster in their classroom to add stickers to for every 3 activities completed.

Science capital is important to the breadth of knowledge of all children and the more we can provide at school the better, so this is actively encouraged at St Peter's.

Before a topic of science commences pre-assessment of the children's knowledge is carried out to establish what the children know and also what they would be interested to learn. In KS2 KWL grids are often used and these can be returned to at the end of the topic to add all the important information children have learnt. In KS1 pre-assessment is more through questions and talking but written evidence will also be produced.

2.1: EYFS

The Foundation Stage deliver their Science content through the 'Understanding of the World' strand of the EYFS curriculum. Children are guided to make sense of their physical worlds and their community through opportunities to explore and find out about places, people, technology and the environment. A lot of the science teaching is carried out in Forest School which we believe gives the children a really hands on experience of the natural world. Children are assessed largely by observations linked to the strands of the

EYFS curriculum but the framework for further learning is being laid by teaching children to start using the skills below.

Working Scientifically:

- I have my own ideas.
- I question why things happen.
- I can talk about what I find e.g. plants, animals, materials.
- I can use my senses and look at things closely.
- I can draw simple pictures of people and places.
- I test my ideas.
- I can notice similarities and differences.

2.2: KS1

The principal focus of science teaching in key stage 1 is to embed a love of science, exploring new ideas and learning about the world around them. We aim to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world they live in. At St Peter's we encourage pupils to be curious and ask questions about what they are learning. Children's understanding of scientific ideas is developed by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.

Introduction of key scientific vocabulary is important in Year 1 and 2 where children should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. We aim to develop science learning through the use of first-hand practical experiences, but appropriate secondary sources, such as books, photographs and videos will also be used. Children need to learn key facts and skills to enable them to build on this in later years. The skills we teach linked to 'Working scientifically' are listed below. We aim for pupils to read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Working Scientifically:

- I use simple scientific language.
- I can ask simple questions.
- I can perform simple tests with help from my teacher.
- I can compare things and sort them into different groups.
- I can observe carefully.
- I can talk about what I have found.
- I can collect and record simple data.

2.3: KS2

Lower key stage 2:

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. We do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments. Pupils are encouraged to ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things. Pupils will carry out simple comparative and fair tests as well as finding things out using secondary sources of information. We encourage children to draw simple conclusions and use some scientific language in their work.

Below is a list of the keys aims linked to 'Working scientifically' we teach pupils as part of our topics taught. Where ever possible we aim to integrate a practical approach to learning once the key facts and skills of a topic have been taught. We aim for pupils to read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Working scientifically:

- I can use relevant scientific language.
- I can ask questions and make predictions.
- I can set up my own tests and ideas.
- I can use a range of equipment to measure accurately.
- I can make observations linked to my investigation.
- I can gather, record, classify and present data/results in a range of ways.
- I can talk about my finding using some scientific language.
- I can make simple conclusions about my finding and link them back to my predictions.

Upper key stage 2:

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. At St Peter's we encourage pupils to do this through exploring and talking about their ideas; asking their own questions about scientific phenomena and analysing functions, relationships and interactions more systematically.

In upper key stage 2, pupils should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. We teach pupils to select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding

things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Below is a list of the key aims linked to 'Working and thinking scientifically' taught alongside the factual skills. By Year 5 and 6 we expect the majority of pupils to be able to read, spell and pronounce scientific vocabulary correctly and use them accurately in their work.

Working scientifically:

- I can use relevant scientific language and illustrate diagrams successfully.
- I can ask questions specific to my topic area.
- I can plan different types of scientific enquires to answer different questions.
- I can make well informed predictions using key knowledge.
- I can set up fair tests and understand what a fair test is.
- I can decide what observations and results to take during an investigation.
- I can use a range of scientific equipment to measure accurately and understand the units used.
- I decide how to record my results using a table, graph, classification key, diagram or explanations.
- I can make more in depth conclusions about what happened in my investigation and why it happened. I can also explain if my prediction was correct or not.

3. Assessment

At St Peter's we understand the importance of assessing our children's understanding of science. In year 1-6 we expect children to receive effective feedback of weekly science work carried out in their books. Teacher assessment, both orally and through written feedback is in line with the keys learning objectives set out by the primary science curriculum. Lessons have a lesson objective linked to the key topic area they are learning so pupils understand what they are learning each lesson. Teachers provide feedback to pupils (verbal or written) which clearly identifies how they might need to improve.

EYFS teachers assess science against the 'Development Matters' statements in the 'Understanding of the world' area of the Early Years Curriculum. The statements go from birth through to the Early Learning Goals at the end of Reception.

For formative assessment teachers use effective Assessment for Learning (AfL) strategies which are used to inform their planning and teaching. The teachers are also aware of the Primary Science Assessment (PLAN) assessment methods and have access to numerous examples on the whole school vle system they can use to help them assess children.

At St Peter's KS2 teachers assess science on a termly basis against the statements for the band in which the children are working. The Working Scientifically strand is assessed using observations of more child centric investigations. In KS1, children are assessed more informally through observations and questioning, but short quizzes will be used.

Explorify can be used to gain individual responses linked to key topics in all classes and this can form part of the overall picture of pupil understanding.

4. Monitoring

The Science co-ordinator monitors planning by each year group by looking at planning on the central One Drive on a half termly basis. Book scrutiny is carried out regularly and examples of excellent work photographed, and feedback is given to teachers. At St Peter's we are also very interested in pupil perception of science, so pupil voice questionnaires are carried out, as well as more informal chats to pupils in class settings and Science club.

5. Health and safety

Teachers must plan safe activities for science and complete a risk assessment if necessary. Teachers and teaching assistants need to be aware of health and safety procedures when using equipment/food in science lessons. Pupils must be aware of the need for personal safety and the safety of others during science lessons. Staff follow the guidelines set out in the Association for Science Education booklet 'Be Safe' and can ask the science lead if unsure.

6. Organisation and Resources

Science resources are stored in two large cupboards located next to each set of stairs leading up to the hall. Resources are boxed by subject, and are labelled and numbered and colour coded for the appropriate cupboard. Each cupboard door has an alphabetical list of equipment, cross-referenced with the box number. There is also a list of equipment listed by box. The subject leader must be informed of any changes regarding science resources i.e. missing or broken resources and/or when new or replacement resources are required.

We have purchased the Chris Quigley Education 'Greater Depth in Science' document and it is my future hope to use it to develop a greater depth and mastery approach to science. Questions can be put to all children to assess understanding following a topic and also used for G & T pupils to assess deeper understanding of them. This folder is kept in the Science leads classroom and can be borrowed on request.

All teachers are signed up to Explorify and are expected to use this resource to aid teaching of topics and class discussion at other times where appropriate. Monitoring of use of this resource is regularly made and posters to assess class engagement should be displayed in all classrooms.

We now have a set of resources for all year groups linked to the Playground Science scheme. This was relaunched in in 2022 and classrooms have bags in their classrooms that

can be used at lunchtimes. Science club members will sometimes play them with KS1 children.

7. Inclusion (SEN, PPG, EAL, Provision for high attainers)

At St. Peter's, teachers ensure that they adopt an inclusive approach to their science planning and teaching; ensuring that pupils of all abilities and backgrounds have an equal opportunity to make good progress and enjoy science. A range of experiences children would not usually get the opportunity to experience are aimed to be facilitated e.g. planetarium visits, borrowing scheme of meteorites and rocks from space.

Science displays are encouraged in all classrooms to aid children's understanding and these can contain key vocabulary to help EAL or SEN children. A Seesaw account has been set up by the Science lead to photograph class displays so a record can be kept.

It is important when teachers are planning independent tasks, that the higher attaining pupils have extension work to complete or are able to focus more deeply on what they are learning. The Greater Depth in Science document by Chris Quigley can be used for this later in topic teaching. G & T children are also given the opportunity to take part in specific science courses outside school to broaden knowledge and understanding.

8. Role of the Science leader

At St Peter's it is the responsibility of the subject leader to maintain the importance of Science in the school curriculum as a core subject. They monitor the teachers plans, standards of children's work and are responsible for supporting colleagues in their teaching. Making sure the school is resourced well is also paramount and ordering new or replacement equipment is key to sustaining pupil learning.

They must be informed about current developments in the subject and provide a strategic lead and direction for science in the school. Accessing CDP and attending science conferences is also encouraged at our school. Gaining special opportunities in science is also important at our school to again enable the children to take part in opportunities they might not get elsewhere.

The science leader is co-leader of the PLN Science Network which meet termly with a group of Science co-ordinators from around Essex to provide training, support and reflections of leading science. Their role also provides training for teachers at staff meetings, organising special events such as Science week and getting involved in national schemes such as judging the Royal Society Book of the Year Award. They also run a popular weekly Science club for KS2.

Date of Policy: March 2024

Policy review date: October 2024