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Feniton Church of England Primary School **Science Policy**

‘Believing and Achieving together to be THE BEST WE CAN BE’

This policy has been developed with and will be implemented in accordance with the HEART Christian values of our school.

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1. PURPOSE

There are four main purposes to this policy:

- To establish an entitlement for all pupils.
- To establish expectations for teachers of this subject.
- To promote continuity and coherence across the school.
- To state the school's approaches to this subject in order to promote public, and particularly parents' and carers', understanding of the curriculum.

2. INTENT

Science teaching at Feniton C of E Primary School aims to give all pupils a strong understanding of the world around them, whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and an understanding of the uses and implications of science today and for the future. Our high-quality science education provides foundations for understanding the world. Science has changed our lives and is vital to the world's future prosperity. Through building key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They are encouraged to understand how key knowledge and concepts can be used to explain what is occurring, predict how things will behave, and analyse causes. This understanding is consolidated through their appreciation of applications of science in society and the economy. Scientific enquiry skills are embedded in each topic that the pupils study and these topics are revisited and developed throughout their time at school. Topics, such as Plants, are taught in Key Stage One and studied again in further detail throughout Key Stage Two. This allows pupils to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding the knowledge into their long-term memory. All pupils are encouraged to develop and use a range of skills including observations, and planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific questions. Specialist vocabulary for topics is taught and broadened, and effective questioning to communicate ideas is encouraged. Concepts taught are reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.

In teaching science, we are developing in our children:

- a positive attitude towards science and an awareness of its fascination.
- an understanding of science through a process of enquiry and investigation.
- confidence and competence in scientific knowledge, concepts, and skills.
- an ability to reason, predict, think logically and to work systematically and accurately.
- an ability to communicate scientifically.
- the initiative to work both independently and in co-operation with others.
- the ability to use and apply science across the curriculum and real life.

3. AIMS

We aim for our pupils to be able to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics.
- develop an 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.
- equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

4. STATUTORY REQUIREMENTS

Statutory requirements for the teaching and learning of science are laid out in the National Curriculum. The programmes of study for science are set out year-by-year for Key Stages 1 and 2. We are however, only required to teach the relevant programme of study by the end of the Key Stage. Within each Key Stage, we have the flexibility to introduce content earlier or later than set out in the programme of study and may introduce key stage content during an earlier key stage if appropriate. Teachers will base their planning on the programmes of study for their relevant year groups.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. Pupils will develop their use of ICT (video, digital camera, data logger) to record their work and to store results for future retrieval throughout their science studies and be given opportunities to obtain information using the internet.

The nature, processes, and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1

The focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas 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. They 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. Most of the learning about science should be done using first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – Years 3 and 4

The focus of science teaching in Lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing, and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships, and interactions. They should 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, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge.

Upper Key Stage 2 – Years 5-6

The 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. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships, and interactions more systematically.

At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should 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 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. Pupils should read, spell, and pronounce scientific vocabulary correctly.

5. IMPLEMENTATION

Teachers create a positive attitude to science within their classrooms and reinforce an expectation that all pupils can achieve high standards.

Science is taught in topic blocks, planned, and arranged by the class teacher. Through our planning, we involve problem solving opportunities that allow pupils to investigate for themselves. Pupils are encouraged to ask their own questions and given opportunities to use their scientific research skills to discover the answers.

Planning involves teachers creating engaging lessons and often involves high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those with gaps in learning, so that all pupils are achieving scientific topics throughout the school and build upon the learning and skill development of the previous years. As the pupil's knowledge and understanding increases and they become more proficient in selecting and using scientific equipment, and collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on evidence.

Scientific enquiry skills are embedded into lessons to ensure these skills are being developed throughout the pupils' schooling and new vocabulary and challenging concepts are introduced through direct teaching. This is developed across the years, in-keeping with the topics. Teachers demonstrate how to use scientific equipment, and various scientific enquiry skills in order to embed scientific understanding. We find opportunities to develop pupils' understanding of their surroundings by accessing outdoor learning and workshops with experts.

Pupils are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class. Regular events, such as Science Week, and project days, such as Earth Day, allow all pupils to access extra-curricular topics, broadening their science knowledge, and complimenting and enhancing skills learnt in the core curriculum.

6. MEDIUM TERM PLANNING

All lessons should have a key question which is shared with the pupils. A variety of strategies, including questioning, discussion, concept mapping and marking, is used to assess progress made within a lesson and/or sequence of lessons. The information is used to identify what has been learned and what needs to be taught next. Teachers annotate their plans as evidence of this assessment. Activities should be challenging, motivating, and designed to extend pupils' learning. They should inspire the pupils to investigate and to help them generate their own questions such as "Why...?", "How...?" and "What happens if...?" Pupils should have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and decide on the best form of communicating their findings.

Scientific enquiry should be explicit in medium term planning. All types of scientific enquiry should be covered each year in line with the National Curriculum science programmes of study.

The teaching of literacy, numeracy and ICT is promoted in science as part of the school's drive to raise standards in literacy and numeracy.

7. INCLUSION AND EQUAL OPPORTUNITIES

Pupils are generally grouped in mixed ability and gender groups for all activities, though occasionally they may be taught in ability groups. The pupils may work individually, in pairs, as part of a small group and as a whole class.

Support staff will be directed by the teacher about the individual(s) or group they are working with and the support they should be giving. All pupils, including those with special educational needs, undertake the full range of activities. Medium term planning shows how activities have been adapted or extended for the needs of all pupils and, where appropriate, how they relate to IEPs.

8. THE LEARNING ENVIRONMENT

Classrooms should have displays of current science with the relevant scientific vocabulary clearly visible.

9. SAFE PRACTICE

The school recognises that programmes of study require that children should be taught about how to identify and reduce risks in the way that they work, and a balance must be achieved between independent learning and the necessary supervision to ensure safety. School staff ensure that they are familiar with all risks which might arise from the tools, equipment, materials and processes they plan for children to use. Teachers must also consider the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. The LEA has adopted the ASE book 'Be Safe' as its model risk assessment and therefore this should be consulted when necessary. If an activity is not covered by 'Be Safe' then we will contact CLEAPSS (School Science Service Helpline) for further advice.

10. CROSS-CURRICULAR SKILLS AND LINKS

Science permeates every aspect of our lives, and we relate it to all areas of the curriculum. We also ensure that pupils realise the positive contribution of both men and women to science and the contribution from those of other cultures. We not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce.

11. EXTENSION OR EXTRA-CURRICULAR OPPORTUNITIES

Medium-term planning should identify visits to places of scientific interest and visitors to the school in order to support learning. When possible, other opportunities are provided to promote interest in science, for example Science Club, Science Challenge, and whole school participation in National Science Week.

12. ASSESSMENT

This is achieved through

- questioning and/or discussion with pupils.
- observation of pupils.
- marking work (in line with School Assessment Policy).
- formative assessment at the beginning and/or throughout a unit of work.
- summative assessment at the end of a unit of work.

Teachers analyse pupils' progress at the end of each school year to complete an annual report to parents.

13. IMPACT

Pupils enjoy and are enthusiastic about science in our school. There is a clear progression of teaching and expectation in our school. Pupils' work shows evidence of the curriculum coverage for all science topics. Pupils are becoming increasingly independent in science, selecting their own tools and materials, completing child lead investigations, and choosing their own strategies for recording. Teachers give feedback, often with 'next step' questions to encourage further learning. Standards in science are high and issues are addressed effectively in school. This is through internal and external moderation of teacher's assessment judgements. Pupil voice is used to further develop the science curriculum. Questioning of pupils' views and attitudes to science is used to improve planning to increase enjoyment of science and to motivate learners. Our Senior Management Team (SMT) and governors are kept up to date with developments in the way science is run in our school with subject reports, action plans and review meetings.

14. MONITORING AND EVALUATION

All teachers are responsible for monitoring standards but the subject leader, under the direction of the Head of School, takes the lead in this.

The Subject Leader will review Science teaching and learning through monitoring activities planned across the year. In summary these are:

- lesson observations.
- scrutiny of pupils' work.
- scrutiny of medium-term planning.
- monitoring ongoing displays.

In addition, the subject leader will prepare a short summary for the governing body once per year which will include analysis of annual teacher assessments.

The subject leader provides summary feedback to teachers, on the results of all formal and informal monitoring procedures about standards across the school as part of the school's subject monitoring programme. This identifies staff development

needs and, where appropriate, these are built into the school's staff development programme. An annual report is drawn up for the end of the summer term so that the governing body can determine the priorities for improvement. Any member of staff attending training is expected to share the useful points with the rest of the staff by presentation and/or documentation at staff meetings. The subject leader attends Exeter Consortium and Teaching School Alliance Science conferences and Local Learning Community Science subject leader meetings. The subject leader is responsible for maintaining the science section of the staff library, using the budget allocation for purchase of relevant and up-to-date information.

15. REVIEW

This policy will be reviewed bi-annually in line with the school's policy review programme.