



PALMERS CROSS
Primary School

Palmers Cross Primary School

Science Policy

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| Approved by: | Mr D Nicholls |
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Science Policy September 2021

This policy should read in conjunction with the Statutory Science National Curriculum Document (2013).

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. At Palmers Cross Primary School, we are aware of the lifelong value of science for our pupils: it gives them a chance to learn about the world around them, and to find out how and why things happen. We believe that science is not all about what we know, but how we know it. Through working scientifically our pupils are taught not only the facts of science, but also the use of scientific skills that will enable them to develop into independent young scientists.

Aims

Palmers Cross Primary School offers a high-quality science education that supports the aims of Early Years Statutory Framework, Development Matters, and the National Curriculum 'to ensure 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 knowledge required to understand the uses and implications of science, today and for the future.'* (National Curriculum, 2013)

Intent

Our science curriculum is designed with the intent that each child at Palmers Cross Primary School will become competent scientists who are inquisitive about the world around them. We intend to provide children with first hand scientific investigative experiences which inspires children's curiosity. Progression within our science curriculum ensures that children can make links to prior learning, develop deeper knowledge of key skills and master their learning through stimulating and challenging experiences. Our curriculum intends for children to have a positive science experience and to develop as life-long learners who will have an active role in science.

Working and thinking scientifically

Working scientifically specifies the understanding of the nature, processes and methods of science teaching. It should not be taught as a separate strand but must always be taught through and clearly related to substantive science content.

Implementation - Achieving our Aims Progressively

Foundation Stage

Within the EYFS, Science is taught as an integral part of the topic work covered during the year. In Nursery and Reception, we relate the scientific aspects of the children's work to the areas of learning set out in the Statutory Framework. Our curriculum is planned around the Development Matters, with our objectives stemming from the Understanding the World area of learning. At the end of Reception, children will then be assessed against the 17 Early Learning Goals (ELGs), with the main scientific focus stemming from The World. Our principle focus of early science teaching is to encourage pupils to have a natural curiosity of the world around them. Almost all teaching is carried out through first-hand experiences using simple scientific language. Pupils are provided with rich learning opportunities both in and outside of the classroom that offers the children the opportunity to explore, use their senses and be physically active and exuberant. During Child-Initiated learning, observations of the children take place so that additional focused resources and support can be provided to enrich their scientific learning. To ensure that we meet the individual needs of all of our children we make regular observations of the children's interactions, interests, skills, and development of concepts. Incorporating observations on how our children learn through the characteristics of effective learning.

KS1

In key stage one the principal focus of science teaching is to enable pupils to experience and observe phenomena, looking more closely at the world around them. Pupils are encouraged to be curious and ask questions about what they notice. They are 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.

The majority of science teaching is through the use of first-hand practical and outdoor experiences, using secondary sources only when appropriate. Simple scientific language is encouraged at all times to communicate what has discovered and children should communicate their ideas in a variety of ways.

Lower KS2

As our pupils move in to key stage two, the principal focus of science teaching is to enable them to broaden their scientific view of the world around them. Pupils 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 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, carrying out simple comparative and fair tests, and finding things out using secondary sources of information. Simple conclusions are made by pupils and the use of some scientific language to talk about and, later, to write about what they have found out is encouraged at all times.

Upper KS2

The principal focus of science teaching in upper KS2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. Pupils do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. They will encounter ideas that are more abstract and begin to recognise how these ideas help them to understand and predict how the world operates. Pupils will also begin to recognise that scientific ideas change and develop over time. They will select for themselves 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. They will 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. The use of scientific language, that is pronounced and spelled correctly, will be encouraged at all times.

Teaching and Learning

Learning happens when:

- Children can discover for themselves through trial and error.
- Children use scientific vocabulary.
- Teachers are confident about what they are teaching.
- Children talk, ask questions, share ideas, explain.
- Children are inspired to do and know more, transfer knowledge.
- Children work in groups.
- Children work practically.
- Children are engaged, excited, involved.
- Children record their learning in a variety of ways using their own words.

Science Coverage

Within EYFS, Science is taught as part of themed topic lessons each week. From Year1 onwards science is taught for a minimum of two hours each week, as a standalone subject.

Palmers Cross uses the National Curriculum's Programme of Study for Science as the basis of its curriculum planning. This ensures pupils receive the complete coverage of statutory requirements for primary science education, and that the education delivered is done so progressively through the phases. By the end of each phase, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Planning

The planning of science within EYFS is completed so through weekly topic planning. It is the class teacher's responsibility to write these plans and discuss them with the subject leader or member of the Senior Management Team when necessary. The planning within this phase will be in line with the school's Early Years Foundation Stage policy, Statutory Framework and Development Matters.

From Year 1 onwards science planning consists of two aspects: a whole school long-term overview and individual year group medium-term planning.

The whole school long-term plan maps the scientific areas of learning studied in each term. The science subject leader plans this out in conjunction with teaching colleagues in each year group. Although science is taught as a standalone subject, where possible we link scientific study with work in other subject areas including English, Maths and Topic.

Detailed medium-term planning is available for each area of learning. Planning specifies introductory activities, learning objectives, main teaching, activities, vocabulary and differentiation for each for each lesson taught within the area of learning. The science subject leader keeps and reviews these plans.

Science units are planned so that they build on prior learning. We ensure that we build progression into the science programme of study, so that pupils are increasingly challenged as they move up through the school.

Floor Books

Floor books are used within Science learning as a way of developing, recording and assessing children's understanding of scientific concepts and practical science skills that are not the main focus of the science lesson. Floor books will include photographs, children's comments, drawings, table or graphs and annotated diagrams.

Organisation

Science lessons at Palmers Cross are delivered to meet the learning styles of our pupils ensuring auditory, visual and kinaesthetic approaches. We do this by providing enriching and engaging opportunities for pupils to learn through a variety of activities such as role-play, computing, observing, testing and discussions.

We recognise that in all classes pupils have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all pupils 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 (we do not expect all pupils to complete all tasks);
- grouping pupils by ability in the room, and setting different tasks for each ability group;
- providing resources of different complexity, matched to the ability of the child;
- using classroom assistants to support the work of individual pupils or groups of pupils

Recording

In the Nursery, observations linked to scientific study are made and recorded within individual pupils' learning journeys using Evidence Me. Within Reception, additional evidence is recorded by pupils, as well as photographic evidence within the pupils' topic books.

Pupils in Year 1 onwards will have a science book to record their work. In this book will be evidence of the specific learning objectives, as detailed in the medium term plan, for each unit.

Marking and feedback

All marking and feedback is in line with the school's marking and feedback policy.

Assessment

Assessment of Science is in line with the school's assessment policy. Children are assessed at the end of each term based on working scientifically age related expectations. Additionally children are assessed based on their knowledge of each topic taught. The topic assessment will be used to inform future planning and ensure that learning is progressive.

The contribution of science to teaching in other curriculum areas

English

Science contributes significantly to the teaching of English by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that pupils study in English are of a scientific nature. The pupils develop oral skills in science lessons through discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing and recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. The pupils use weights and measures and learn to use and apply number. Through working on investigations, they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

Computing

Pupils use computing in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the Internet. Pupils use computing to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

The Wider Curriculum

Science makes a significant contribution to the teaching of the wider curriculum within primary education. Science teaching offers pupils many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, pupils develop a sense of awe and wonder regarding the nature of our world. Science gives pupils the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches pupils about the reasons why people are different and, by developing the pupils' knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Equality

Palmers Cross is committed to equality of opportunity. All pupils will be provided with a progressive, stimulating science curriculum irrespective of gender, ethnicity, social-economic background or special educational needs as in line with the school's equal opportunities policy.

SEN

At our school, we teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching, we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. . Assessment against the EYFS ARE's, Early Learning Goals and the National Curriculum allow us to consider each child's attainment and progress against expected levels within Nursery and Reception.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching matches the child needs of the child.

We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, a trip to a science museum, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Environment

Within EYFS, each setting has an investigation area to allow children to explore scientific provision and a Topic display which shares the children's current unit of work.

From Year 1 onwards, each classroom should have a science display linked to the children's current unit of work. The display should support the children's learning and may include key scientific vocabulary, questions, mind-maps or concept cartoons sharing the children's thoughts and ideas or examples of their science work.

Resources

An extensive range of equipment and resources are stored in the science resource room. These are sorted into units to enable staff to access resources easily. Science reference books can be found in the science resource room and class libraries. It is primarily the responsibility of the subject leader to ensure resources are stocked and maintained. All staff are responsible for the day-to-day safe storage and maintenance of resources.

Health and Safety

This section should read in line with the Department For Education's (DFE) Health and Safety: advice on legal duties and powers for local authorities, school leaders, school staff and governing bodies, February 2014.

The Leadership team take the responsibility for ensuring staff have the necessary health and safety training to minimise risks within everyday lessons.

For school staff "*common sense should be used in assessing and managing the risks of any activity.*" (DFE, p.4, 2014) It is therefore the responsibility of the class teacher to ensure

- they work in line with the school's current Health and Safety Policy
- they indicate any possible health and safety risks on their lesson plans
- they inform pupils/staff of any hazards or safety issues related to their science lesson and advise them how to minimise any risks
- they implement behaviour management strategies in line with the school's current behaviour policy to help minimise any risks to health and safety

Assessment

In science, activities and tasks are carried out prior to, during and after teaching a unit in a variety of ways to inform planning or how far ideas have progressed after a period of teaching.

Formative assessment is continually on going in the form of marking pupils work and making notes on weekly planning in order to inform planning for the next lesson. These assessments are linked to the key learning objectives for the lesson.

At the end of each term, Nursery and Reception pupils are assessed to be beginning, developing or secure for their age bands, 0-2 years, 2-3 years, 3-4 years and 4-5 years. Pupils in KS1 and KS2 are assessed using ARE.

The assessment of science will be reviewed throughout the year of 2016 – 2017 to ensure it caters effectively for the new curriculum.

Monitoring

It is the responsibility of the science subject leader and Leadership Team to monitor the standards of pupil's work and the quality of teaching in science. The science subject leader is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school. The science subject leader has specially allocated time for fulfilling the vital task of reviewing samples of pupil's work and visiting classes to observe teaching in the subject.

Impact

Our science curriculum will ensure children leave our school as life-long learners who are resilient, self-motivated and independent learners. Children will make outstanding progress across all key stages as a result of carefully planned lessons that build on prior learning and embed key skills.

Review

This policy will be reviewed annually or earlier if necessary.