Pheasey Park Farm Primary School and Early Years Centre
Policy for Science

Mission Statement

We have the motto "Believe and Achieve" to remind everyone in the school community, pupils, parents, staff and governors that we should always have high expectations of ourselves and each other. If we believe we can do it, then we can do it.

Aims

At Pheasey Park Farm Primary School everyone aims to work together to strive for excellence in learning and behaviour. Every child has the right to achieve their potential in a positive, orderly and stimulating environment. We aim to bring learning alive and encourage confident learners who enjoy thinking, active enquiry and participation.

We aim to value children as individuals and support them to achieve success. The curriculum is responsive to changes in society and in education and promotes responsibility to prepare children to become responsible citizens. The school aims to provide the essential building blocks for future learning as well as fostering at each stage vital social, emotional, intellectual and spiritual developments.

The 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 knowledge required to understand the **uses and implications** of science, today and for the future.

Curriculum Intent

At Pheasey Park Farm, we recognise the importance of science in every aspect of daily life. We aim to develop our children's natural curiosity, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence. Children will study a varied curriculum which is carefully planned to build on knowledge year by year and covers the three scientific disciplines of Biology, Chemistry and Physics. It is important to us that our children learn about the scientific knowledge, methods, processes and uses so that they can develop an understanding of the world we live in, today and for the future. When designing our science curriculum, we carefully embedded the Curriculum Drivers to help our children succeed at Pheasey and beyond.

Our Curriculum Drivers are:
Possibilities – for pupils to be aware of all opportunities available to them and have high aspirations for their future.
Resilience – for pupils to have the courage to bounce back from any setbacks or challenges and maintain a positive outlook on life
Diversity – for pupils to appreciate and understand that everyone is unique and to recognise and celebrate our individual differences

Within science, children are regularly introduced to key scientists as well as a range of occupations. When Working Scientifically, children are encouraged to be resilient and reflect on how they can improve their investigations next time.

Implementation
Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils can achieve high standards in science. Our whole school approach to the teaching and learning of science involves the following.

- Science is taught as a discrete subject each week. However, in some topics, there will be further opportunities in cross-curricular lessons which build on skills as children progress through the school. This strategy enables the achievement of a greater depth of knowledge and regular consolidation. This approach directly coincides with Ofsted's inspection framework which states: *"People learn new knowledge when new concepts are connected in their minds with what they have already learned. It is more appropriate, therefore, to understand the way knowledge is stored as a complex, interconnected web or 'schema'. Every time a pupil encounters a word they have previously learned, but applied in a new context, it adds to the complexity of their understanding of that concept. In other words, they develop a deeper understanding of that concept and enhance their capacity to use that concept in their own thinking".*
- Prior knowledge is assessed at the start of each topic and any gaps in understanding are planned for. Common misconceptions are planned for and challenged. Teachers are supported to do this through the common misconceptions document and the progression of knowledge and skills document.
- Through planning, teachers include problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, involving 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 children with gaps in learning, so that all pupils keep up.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting and using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
- Children 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 or theme days, provide pupils with broader provision and the acquisition and application of knowledge and skills.
- Children present and record their work in a variety of ways allowing for more time within the science lesson. When Working Scientifically, children can present their work through photographs, videos, recordings and post-it notes to work collaboratively and spend more time completing the science. This allows all learners to succeed, including those with Special Educational Needs, as all children's learning styles are catered for.

Impact

The approach at Pheasey Park Farm Primary School results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and firsthand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, trips and interactions with experts, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science, because of our famous people prompts in assemblies. From this exposure to a range of different scientists from various backgrounds, all children feel they are scientists and capable of achieving. Children at Pheasey Park Farm Primary School enjoy science and this results in motivated learners with sound scientific understanding.

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.

Early Years Foundation Stage

At Pheasey Park Farm Primary School, science in EYFS is taught in the new Early Years Foundation Stage as a specific area of learning called Understanding of the World. This area of study involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

Key Stages 1 and 2

At Pheasey Park Farm, the principal 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.

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. 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 comparative and 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.

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. 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 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.

Organisation and Planning

At Pheasey Park Farm primary school, our curriculum planning is in three phases, (long term, medium term and short term). Our long-term planning maps the science concepts studied in each term, during each key stage. The subject leader devises this plan in conjunction with teaching colleges in each year group. We use the National Curriculum which is delivered through Curriculum Maestro as the basis for our medium-term plans. This gives details of each unit of work for each term. The subject leader reviews these plans, ensuring that

children have complete coverage of the Nation Curriculum. Each class teacher creates a short-term plan for each lesson and each wrapper lists specific learning objectives and activities for each lesson. We plan the topics in science so that they build on prior learning. Children of all abilities have the opportunity to develop their skills and knowledge in each unit and, through planned progression built into the unit of work, we offer them an increasing challenge as they move up the school.

Teaching and Learning

Teaching and Learning in science at Pheasey Park Farm, aims to ensure that:-

- All lessons have clear learning objectives which are shared and reviewed with the pupils effectively.
- A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next.
- Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why…?", "How…?" and "What happens if…?".
- Activities develop the skills of enquiry, making predictions, setting up a variety of tests, observing and measuring, recording data, interpreting and communicating results and evaluating their enquiry. Within this, they will need to select appropriate equipment and use it safely.
- Lessons make effective links with other curriculum areas.
- Activities are challenging, motivating and extend all pupils' learning.
- Pupils have frequent opportunities to take part in a range of enquiry types which include observation over time, identifying and classifying, pattern seeking, research and comparative and fair testing.
- Ed Tech is used to support teaching and learning in science.
- Science lessons are connected to the real world, to show children how their learning applies to everyday life. This links to our Curriculum Driver Possibilities.

Assessment

Assessment is an integral part of teaching and learning and based upon teachers' judgements of pupil attainment and progress. Teachers will assess children's work by making informal judgements during lessons, as well as using assessment grids which assess against Age Related Expectations and the National Curriculum objectives.

On completion of a piece of work, the teacher assesses the work and uses this information to plan future learning. Written or verbal feedback is given to the child to help guide his or her progress, as well as incorporating success criteria into the lesson to assist pupils with understanding how to be successful within a particular session. Pupils are also encouraged to make judgements about how they can improve their own work, using success criteria where appropriate. Assessment activities should be matched to the pupils' ability, providing appropriate scaffolds or challenge.

Special Educational Needs

At Pheasey Park Farm Primary school, all children are encouraged and supported to develop their full potential in science. Some children may require extra support in the classroom and opportunities for consolidation and reinforcement. Activities are scaffolded to meet the needs of all pupils and all learning styles are catered for. Each science lesson is vocabulary-rich and there are frequent opportunities to consolidate the key vocabulary to support understanding. Teachers are supported in catering for special educational needs through our 'Science Subject Adjustments' document which provides links, suggestions and resources for areas of Science.

Academically More able

At Pheasey Park Farm Primary School, we challenge academically more able children, they will be given open-ended questions and tasks and be encouraged to follow line of thought independently. Deeper understanding problems are given in every lesson and children are encouraged to reason why misconceptions are not correct. Each year group identifies any child that has achieved beyond the expected level for an area of Science so that when the child joins the next year group, their new teachers are aware.

Cross-Curricular Links

Science is a subject that touches on many other areas taught in Pheasey Park Farm Primary School, including English, Mathematics as well as the foundation subjects.

These cross curricular links are important because …

- They help the curriculum to become a 'whole learning experience' with continuity rather than a series of separated lessons on different subjects.
- They can improve teaching by getting both teachers and pupils to work together for common goals.
- They add fun and novelty to lessons, encouraging wider thinking, participation and enthusiasm.
- They promote subjects with 'reality', setting topics into a relevant context for pupils and remove the isolated learning so often associated with single subject teaching.
- It gives opportunities to practise and apply skills using technology in order to locate and present information efficiently and appropriately.

Roles and Responsibilities

At Pheasey Park Farm Primary School, there is a named co-ordinator responsible for co-ordinating the teaching of science throughout the school.
Their role is to:

- Provide support, advice and resources to members of staff.
- Monitoring the teaching of science and outcomes for all children, revising policies and supporting staff with planning of science where necessary.
- Monitor the teaching of science across the school highlighting the continuity and progression of the areas taught across the school.
- Attend relevant training and support staff through relevant INSET sessions.
- Monitor the use and needs of resources throughout the school.

Inclusion

Effective inclusion involves teaching a lively, interesting, relevant, stimulating science curriculum that:

- Builds on and is enriched by the differing experiences pupils bring to science.
- Meets all pupils' learning needs; including boys and girls, pupils with SEN, pupils with disabilities, Pupil Premium children, higher attainers including academically more able children, pupils from all social and cultural backgrounds, children who are in care and those subject to safeguarding, pupils from different ethnic groups and those from diverse linguistic backgrounds.

To overcome any potential barriers to learning in science some pupils may require;

- Support to access texts (immersive reader).
- Help to communicate their ideas, other than writing (photographs, QR codes, recording, pupil voice).
- A non-visual way of accessing sources of information (visual and catering for learning styles).

Health and Safety

Safe practice as indicated in The Association of Science Education publication, "Be Safe!" must be promoted at all times. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety issues have been identified in medium-term planning and risk assessments must be completed in weekly planning, when activities are identified that are unusual and beyond the scope of normal safety practice. Teachers actively encourage children to think "pro-actively" about behaving in a safe way at all times.

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

Monitoring and Review

All teaching staff are involved in the planning and teaching of science. Monitoring will be carried out by the Head Teacher, Senior Leadership Team and the Subject Leader in the following ways:

- Informal discussion with staff and pupils.
- Staff voice.
- Pupil voice.
- Collection/monitoring science planning.

- Monitoring of work through book trawls.
- Classroom observations.
- Science moderation across and within year groups.
- Analysis of assessment.

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