

Panshanger Primary School Science Policy

Intent

Why do we teach this? Why do we teach it in the way that we do?

Through our work in science we aim to teach an understanding of natural phenomena and to help children to develop an awareness of the world around them. We want to stimulate their curiosity in finding out why things happen in the way they do. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying working scientific skills. At Panshanger we want to prepare children for life in an increasingly scientific and technological world and to foster concern about, and active care for, our environment.

Aims (based on the National Curriculum 2014):

- 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.

Objectives:

The aims will be achieved by enabling children to:

- develop and extend their knowledge and understanding of scientific concepts;
- ask and answer scientific questions;
- plan and carry out scientific investigations using equipment, including computers, correctly;
- know and understand the life processes of living things;
- know and understand the physical processes of materials, electricity, light, sound and natural forces;
- know about the nature of the solar system, including the earth;
- evaluate evidence and present their conclusions clearly and accurately;

Implementation

What do we teach? What does it look like?

Planning:

The school uses the National Curriculum 2014 for science as the basis of its curriculum planning. Long-term plans are based on the Herts for Learning structure and map the scientific topics studied in each year group during each key stage. Medium-term plans give details of each unit of work, building on prior learning and ensuring continuity and progression. These are then adapted to suit the learning needs of the class being taught, showing the learning objective, key questions and activities for the week's lessons. Activities are designed to encourage the development of scientific enquiry as well as to impart knowledge and skills.

Scientific enquiry includes:

- asking questions
- planning,
- hypothesising,
- collecting evidence through observations and measurements,
- organising and presenting evidence,
- evaluating findings and drawing conclusions.

Science is taught as a discrete subject although at times scientific study is combined with work in other subject areas. The science subject leader regularly monitors and reviews plans to ensure breadth, balance, continuity and progression through each stage.

Teaching and learning style:

At Panshanger School a variety of teaching and learning styles are used in science lessons in order to develop children's knowledge, skills, and understanding. This may be done through whole-class teaching, group work or enquiry-based research activities. The children are involved in a wide variety of problem-solving activities and are encouraged to ask, as well as answer, scientific questions and are given the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. ICT is used in science lessons where it enhances learning. 'Real' scientific activities are planned where possible, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results, which are presented in a variety of ways. Emphasis is placed on providing practical activities to provide real experiences for the children within science lessons and giving the children opportunities to design their own investigations. Wherever possible children are encouraged to use and apply their learning in other areas of the curriculum.

Resources:

The school is well resourced to enable children to study all science teaching units. Resources are kept in a central store, where there is a box of equipment for each topic or area of work. There is a dedicated working scientifically cupboard containing general resources required for carrying out investigations. The library contains a good supply of science topic books and all classes have access to the Internet to support children's individual research. The use of Smart boards in each classroom allows children access to a wide variety of interactive and online resources to enhance learning. The school also has interactive data loggers and microscopes, which can be linked to computers and the Smart board.

Health and Safety

All children will be taught to use equipment for practical work safely and in accordance with health and safety requirements, taking into account the age and ability of the children. All adults working with pupils in science will be made aware of the health and safety implications, will have access to any guidelines used by the school, and will be aware of the school's First Aid policy. Risk assessments are written for specific activities such as pond dipping.

Foundation Stage:

Science learning is covered under the 'understanding of the world, physical development and communication and language' areas of learning identified in Development Matters, which underpin curriculum planning for children aged three to five. It is also covered through the characteristics of effective learning which develop the skills needed for scientific enquiry. Planned activities offer children opportunities to investigate and explore scientific concepts through play, such as experimenting to see which objects float and sink when placed in water. Children are encouraged to ask questions and talk about what they have found out. Some activities will be child chosen, and some directed by the teacher, but clear learning objectives are set out for all activities and records are kept to track children's choices and ensure a balance of activities.

Science

Three and Four-Year-Olds	Communication and Language	<ul style="list-style-type: none"> Understand ‘why’ questions, like: “Why do you think the caterpillar got so fat?”
	Personal, Social and Emotional Development	<ul style="list-style-type: none"> Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	<ul style="list-style-type: none"> Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Begin to make sense of their own life-story and family’s history. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.
Reception	Communication and Language	<ul style="list-style-type: none"> Learn new vocabulary. Ask questions to find out more and to check what has been said to them. Articulate their ideas and thoughts in well-formed sentences. Describe events in some detail. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Use new vocabulary in different contexts.
	Personal, Social and Emotional Development	<ul style="list-style-type: none"> Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> - regular physical activity - healthy eating - toothbrushing - sensible amounts of ‘screen time’ - having a good sleep routine - being a safe pedestrian
	Understanding the World	<ul style="list-style-type: none"> Explore the natural world around them. Describe what they see, hear and feel while they are outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them.

ELG	Communication and Language	Listening, Attention and Understanding	<ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	<ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Cross-curricular links:

Learning in Science supports and is supported by learning in other subjects. Speaking and listening forms a key part of learning in science as children develop their scientific vocabulary and use questioning and discussion to develop understanding of scientific concepts. Books are often used to engage children in new topics and introduce concepts in both KS1 and KS2. Opportunities to present learning take different forms and the children write stories, poems, information leaflets, posters, monologues and comic strips among others. Computing skills are used to present learning and as a tool for research. We also use some technological tools such as data loggers and digital cameras. Mathematical skill go hand in hand with learning in science as practical work often requires taking measurements, drawing tables and graphs and recording and analysing data. Science investigations give children opportunities to secure their knowledge of units of measurement and using measuring equipment including rulers, stopwatches, scales, thermometers and data loggers.

Reading:

The teaching of reading is supported in Science through the use of high quality texts. Books and extracts are used in lessons and reading based tasks develop the skills of retrieval and understanding vocabulary. Key scientific vocabulary is introduced in every lesson and its correct use is modelled by all teaching staff. Science based texts are also used in guided reading sessions, as class readers or whole class texts in English lessons. The study of non-fiction texts types is often linked to learning in science.

Social, Moral, Spiritual and Cultural:

Science is about looking for meaning and purpose in natural and physical phenomena. Children develop their sense of wonder about what is special about life and an awareness of the scale of living things from the small micro-organism to the largest creature. Children develop their curiosity about the living world, the vastness of space and the interdependence of all living things and materials of the Earth. Children develop open-mindedness as they consider the opinions of others and how scientific developments may give rise to moral dilemmas.

Collaboration and teamwork is an important part of our practical work. Children need to take responsibility for their own and other people's safety. In lessons children build on their understanding of the effect science has on the quality of our lives and consider the benefits of scientific developments and the social responsibility involved.

Children learn about scientific discoveries by a wide range of men and women in many different cultures. There are opportunities to consider the environmental issues that are central to science.

SEND

As an inclusive school, we try to remove barriers to learning so that all children can achieve and make progress. When progress falls significantly outside the expected range (above and below the age related expectations), a child may have special educational needs. When assessing this, a range of factors is considered including classroom organisation, teaching materials, teaching style and differentiation, so that additional or different action can be taken to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs.

Science is taught to all children whatever their ability. Science forms part of the school's curriculum policy to provide a broad and balanced education to all children. We provide learning opportunities matched to the specific needs of children and we take into account the targets set for individual children in their individual needs e.g. Learning Plans and information from outside agencies.

Teachers take account of the three principles of inclusion that are set out in the National Curriculum:

- Setting suitable learning challenges.
- Responding to the diverse learning needs of pupils.
- Overcoming potential barriers to learning and assessment for individuals and groups of pupils.

There are children of differing ability in all classes. Suitable learning opportunities are planned for all children by matching the challenge of the task to the ability of the child. This is achieved through a range of strategies including:

- setting common tasks that are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty where not all children complete all tasks;
- grouping children by ability and setting different tasks for each group;
- providing a range of challenges with different resources;
- using additional adults to support the work of individual children or small groups.

Equal Opportunities/ Inclusion

It is the responsibility of all teachers to ensure that children irrespective of ability, race, gender, age, faith, sexual orientation, and disability are given full access to the history curriculum and make the greatest possible progress in accordance with recent legislation. Please refer to the schools Equal Opportunities Policy.

Impact

Assessment and Recording:

In Science we assess children's knowledge and understanding within a topic and their working scientifically skills. The children's work is assessed by making informal judgements during lessons and through marking against the learning objective which will be shared and discussed at the outset of a lesson. Success criteria displayed in each lesson also help pupils to achieve by focusing on the specific expectations for that task. Children are involved in assessment for their abilities and achievements in the short term through self/peer marking and discussion of their work using these success criteria. At the end of a unit of work, summary judgements are made about the work of each pupil and these are used to inform the annual reports. The information is also passed on to the next teacher at the end of the year. At the end of Key Stage 1 and Key Stage 2, children's work in science is formally assessed by the teacher using the teacher assessment framework.

Monitoring and review:

The science subject leader, together with the Headteacher, monitors the standards of children'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 reviewing samples of children's work and visiting classes to observe teaching in the subject.