



# Science Policy 2022-2023





#### What is science?

Science is a particular way of understanding the physical world, which requires precise approaches and ways of thinking.

#### The purpose of science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. 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. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.(National Curriculum 2014)

#### Coverage of science

Through the teaching of science, children will develop an understanding of the world through the specific disciplines of biology, chemistry and physics. They will become familiar with, and use technical vocabulary accurately and precisely, building up an extended specialist vocabulary. Children will be encouraged to work scientifically within each aspect of science, as opportunities will be embedded within the content being taught. This will give the children the opportunity to answer relevant scientific questions; make observations over time; seek and identify patterns; classify and group living and non-living things and carry out comparative and fair testing. Children will also be given the opportunity to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

#### Aims

The national curriculum (2014) 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.

At Bankfields Primary School, we aim to:

Produce children who are independent investigators, by providing a balanced and varied programme of scientific skills, knowledge and understanding and attitudes;
Stimulate and excite pupil's curiosity about changes and events in the world and

satisfy this curiosity with knowledge;

• Engage pupils as learners at many levels through linking ideas with practical first hand experiences;

• Help pupils to learn to question and discuss scientific issues that may affect their own lives;

• Help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using criteria and creative thought;

• Show pupils how major scientific ideas contribute to technological changes and how this impacts on improving the quality of our everyday lives;

• Help pupils recognise the cultural significances of science and trace its development, including the scientists who played such a key role in each area of science;

• Teach science through a variety of individual, group and whole class teaching, providing equal opportunities for all children.

# Science Intent

At Bankfields Primary school, we aim to promote a child-led curriculum so that children can investigate for themselves, be creative and foster a love of learning in Science. All children are encouraged to be independent learners and understand that in Science we need to be resilient to find proven conclusions. This may be done through carrying out investigations, experimenting with a broad range of equipment and working collaboratively on group tasks. We aim for children to understand that the world we live in is built with Science at its core. Children are given the opportunity to broaden their scientific vocabulary with the use of the science dictionary. We inspire children to set themselves high aspirations from communication with the wider community including STEM ambassadors and a range of visitors within the local area. Our children ask questions and are curious about the world through having an understanding of how significant scientists have had an impact on the world today. Science shows children how they can have an impact on improving our quality of life. By the end of their primary journey, we want our children to be excited and engaged with Science and move onto secondary school with a vision of how they can help to improve our world.

#### **Curriculum Provision**

In the Early Years Foundation Stage science activities are available daily with additional experiences provided through topic focus. Observation of children's interests and activities informs planning and provision for this area of learning. Science is a core subject of the National Curriculum and pupils undertake science activities every week at both KS1 and KS2. Science objectives are covered through half termly topics within each class and the science subject leader monitors the completion of objectives and ensures continuity and coverage when variations in mixed aged classes occur.

# **Teaching and Learning**

Early Years and Foundation Stage

Science is included in one of the six areas of learning known as Understanding the World. Scientific learning occurs through:

\*access to a range of developmentally appropriate practical activities based on first hand exploratory experiences. For example, a nature walk, magnifiers to explore natural objects, manipulating wet/dry sand etc.

\* enthusiastic and meaningful interaction with adults, who provide opportunities to develop communication skills, use correct scientific language and carefully framed open-ended questioning techniques to develop thinking skills.

\* exploration of both indoor and outdoor environments linking all areas of learning \* recognition and extension of their existing knowledge and understanding gained from their home setting.

# Key Stage 1

At KS1 pupils observe, explore and ask questions about plants, living things and their habitats, animals including humans, seasons and materials. They begin to work together to gather and record evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are fair. They use reference materials to find out about more scientific ideas. They share ideas and communicate them using scientific language, drawings, charts and tables with the help of ICT if it is appropriate.

# Key Stage 2

At KS2 pupils learn about a wider range of plants, animals including humans, evaluation and inheritance, materials and physical phenomena. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others and can suggest improvements and use findings to raise further questions. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs, classification keys and ICT to communicate their ideas.

# Planning

Planning takes into account that the school places a high emphasis on the development of pupil's knowledge and skills when working scientifically. In the majority of lessons the practical scientific methods, processes and skills are taught alongside the knowledge and understanding of the statutory requirements, ensuring that there is equivalent emphasis of the skills, knowledge and understanding.

#### **Teaching and Learning**

For KS1 and 2 overall learning objectives are recorded in teachers planning each week. All lessons have clear learning objectives which are shared and reviewed with 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 are child led, challenging, motivating and extend pupil's learning. Lessons make effective links with other curriculum areas, especially Literacy, Numeracy and ICT. We use ICT widely in science. Children are given the opportunity to practise science skills and enhance their learning using carefully chosen software such as Purple Mash, Espresso and Science clips and videos and recourses such as data loggers and microscopes. Activities inspire the pupils to experiment and investigate the world around them and to participate in a range of activities. These include: asking questions, locating sources of information, observation, selecting appropriate equipment and using it safely, discussion, planning investigative work, raising ideas and predicting, testing, collecting evidence, measuring and checking results, making comparisons and communicating results and findings.

# Cross Curricular Links

Literacy: in particular at KS1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. At KS2, the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they find out. In science, they should be applying their literacy skills at levels similar to those which they are using in their English work. Numeracy: At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their numeracy skills similar to those which they are using in their maths work. Maths vocabulary will be promoted within the science curriculum. ICT: At both key stages pupils ICT skills are used to locate and research information (Internet, Espresso, access to iPads); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in the use of calculators, digital cameras and recording using the ipads and green screen as well as the computer.

History: At both key stages, the pupils are expected to learn about the scientists that have had an impact on science throughout history, showing how attitudes to scientific phenomenon have changed how we view the world and recognising the implications they have on the future.

# Training

All staff, including managerial and student teachers, receive support from the subject leader or technicians. At Bankfields Primary, the Science subject leader will assess and address staff training needs as part of the annual development plan process or in response to individual needs and requests throughout the year. Individual teachers should attempt to continually develop their own skills and knowledge, identify their own needs and notify the coordinator.

#### Assessment and Monitoring

Teachers regularly assess capability through observations and looking at completed work. Teachers assess mostly at the end of each unit of work. Judgments are formed through assessing the children's work in Science by making informal judgements as we observe the children during lessons. Use of independent child-led tasks, provide opportunities for pupils to demonstrate capability in relation to the term's work. These are often evidenced in the class teachers' floor books or within the children's curriculum books.

Throughout the academic year, class teachers can use the supporting documentation to establish whether a child has achieved the curriculum intent.

The subject leader is responsible for monitoring the standard of the children's work and the quality of teaching in line with requirements from subject leader meetings, work analysis and lesson observations. The 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. It is the responsibility of the subject leader to monitor the progress of Science across the school with reference to specific action points outlined in the Science action plan.

#### Inclusion/ SEND/ G&T

Planning at all levels ensures that account is taken of race, gender and special educational needs, as well as catering for the range of ability within the class. The pupils work individually, in pairs, as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work. All pupils, including those with special educational needs undertake the full range of activities and identified children are supported within the group. Children that are gifted and talented are identified and highlighted on the G&T register and are given extension work to challenge their thinking and understanding even further.

#### Safeguarding and Health and Safety

Safe practice must be promoted at all times. Teachers must take into account any health and safety and child protection issues, particular attention must be given avoiding the use of anything which aggravates individual pupil allergies. Risk assessments are carried out to ensure safety issues have been identified and that specific attention is made when activities are unusual and beyond the scope of normal practice.

#### Support staff

Educational support staff work as directed by the teacher. They are able to refer to a planning sheet for the particular group with whom they are working, seek additional resources and adapt planning as directed by the class teacher. Guidance regarding

question types and related vocabulary to be used with children are highlighted on differentiated planning sheets.

# Parental and Community Involvement

# Parents and Governors

Parents are kept informed of activities and children's progress in science through:

- Newsletters
- Family learning days
- Parent consultation evenings and drop in sessions
- • End of year reports.

Governors are kept informed of activities and developments in science through:

- Curriculum learning walks
- • Meeting with the science coordinator.

#### **Promoting Science**

**Science weeks** - Each year the school holds an interactive Science Week. This offers the opportunity to engage all children in cross curricular approaches to science based activities. Outside agencies and organisations provide links to the greater community and offer a wider experience for children to engage in fun and interesting science themes.

**Science clubs** - children throughout the school have access to a science club throughout the school year. Each club is level appropriate and focuses on fun, practical experiments that can be completed using everyday resources and equipment.

**Family Learning Days** - children and their parents have the opportunity to work alongside each other to complete an activity with a science focus and objective.