



Science Policy

July 2020

Great Bardfield Primary School

Rationale for teaching science

At Great Bardfield Primary we believe that Science should encourage children to be inquisitive throughout their time at the school and beyond with an understanding of the uses and implications of Science, today and for the future. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. Topics are revisited and developed throughout their time at school. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory.

Attitudes

- Encouraging the development of positive attitudes to science.
- Promoting a desire to embrace challenging activities, including opportunities to undertake high-quality research across a range of Science topics.
- Developing a sense of curiosity about the world in which we live and an understanding of the important contributions of influential scientists that have impacted the way we view the world.
- Building on our children's natural curiosity and developing a scientific approach to questions they ask or problems they have to solve.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work cooperatively with others.
- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Children gain scientific understanding from the moment they begin to interact with the world. In the early developmental stages of movement, hearing, seeing and playing, children begin to establish rules about how things within the environment react and behave. From this they develop their judgements about safety and risk, about their ability to explore, create, invent and enjoy. They discover and employ their senses of hearing, seeing, touching, smelling and tasting.

Scientific learning in the Primary School extends and enhances this natural curiosity by providing pupils with the opportunity to apply and further develop the skills that they have already mastered. When pupils learn science they

obtain a set of skills and a body of knowledge that will be required for the essential routines of life, work and pleasure as well as for creativity in the future.

Skills:

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills through regular practical activities.
- Encouraging them to develop their questioning skills
- Allowing them to determine what they want to investigate and what equipment to use
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, and giving them a range of recording techniques and methods to match their ability
- Developing the use of COMPUTING in investigating and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.
- Encourage them to become independent learners able to reflect on, and assess their own work

Curriculum and coverage

To develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics.

To develop understanding of the **nature, processes and methods of science** through different types of science enquiries which help them to answer scientific questions about the world around them.

That children are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

We treat Science as a core subject and base our coverage of the subject on the statutory parts of National Curriculum (2014). The curriculum is arranged into: Working Scientifically; Biology; Chemistry; Physics. The curriculum is arranged into Foundation Stage, Key Stage 1 (years 1&2) and Lower KS2 (years 3&4) and Upper KS2 (years 5&6) on a 2 year rolling programme.

Children in the Foundation Stage are taught the science elements through the Early Years Curriculum: Knowledge and Understanding of the World. Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum Science and Science in the Foundation Stage. Science teaching in the school is about excellence and enjoyment. We adapt and extend the curriculum to match the unique circumstances of our school and in particular a thematic approach.

The school follows a spiral curriculum which develops children's knowledge and enquiry skill in Science. This ensures progression between year groups and guarantees topics are revisited. The National Curriculum is adapted and modified to utilise the many opportunities we have in our local environment. Generally, one unit will be taught in each half term. Some units may have been moved between years, or amalgamated, where appropriate.

There is a rolling programme of study in Key Stage One and Two to ensure children cover the objectives for each key stage irrespective of which mixed year group class they are in. Because of mixed-age classes in the school, some units may be taught out of their year group. Some units may be taught in collaboration with outside agencies, including neighbouring secondary schools.

Our Teaching Aims

- To encourage pupils to have a sense of wonder, fascination and curiosity about their world so as to develop a thirst for learning.
- To promote and develop the pupil's thinking skills, applying their scientific learning in a variety of contexts across the curriculum.
- To include content, which is logical, relevant, broad and balanced in terms of the areas of subject content we have selected which reflect the guidance of and in line with National Curriculum.
- To provide sequences of lessons to ensure that pupils can build on previous knowledge and understanding as they tackle more complex and demanding enquiries as they progress through the school.
- To give opportunities, wherever possible, for the pupils to learn through investigation.
- To encourage pupils to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their own scientific based questions.
- To include various Scientific areas which allows pupils opportunities to build on previous knowledge and understanding as they tackle more complex and demanding scientific enquiries;
- To teach specialist vocabulary for topics and to encourage effective questioning to communicate pupils' ideas. Concepts taught should be 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.

- To ensure that every pupil receives equal opportunity to develop their scientific skills, understanding and knowledge (See Appendix- National Curriculum Programmes of Study), alongside the acquisition of other basic skills throughout their Primary education.
- To enable pupils to think, reflect, debate, discuss and evaluate the scientific discoveries by formulating and refining questions and lines of enquiry.
- To ensure that pupils have the opportunity to effectively and confidently communicate their scientific predictions and discoveries as they are given opportunity to observe, describe, illustrate, hypothesise and interpret, using appropriate scientific vocabulary.
- To build upon the provision for Science established in the Early Years Foundation Stage and in particular address the knowledge and skills expectations of the Understanding the World Early Learning Goal.
- To ensure Science is inclusive in terms of delivering the same curriculum to all our pupils irrespective of specific learning needs or disabilities and adapting where necessary through, for example, in class support, providing different learning environments, alternative learning activities and assessment outcomes.
- For children to use their prior knowledge as well as the knowledge of where and how to find relevant scientific information, through effective use of secondary sources. These may include: information books, virtual learning platforms, the internet, newspaper and magazine articles as well as asking questions or through group discussions.
- Pupils will begin to develop a spiritual, moral and social understanding about the effects of theirs and others actions on their environment.

Assessment and Monitoring

We use assessment to inform and develop our teaching.

- Topics commonly begin with an assessment of what children already know to inform planning.
- We use assessment for learning (AfL). Children are involved in the process of self improvement, recognising their achievements and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success.

Teachers in KS2 use questions in books to assess understanding. The children are given opportunities to respond to the marking

- We mark units of work positively, making it clear verbally, or on paper, where the work is good, and how it could be further improved. Children's work is compared with model answers to determine the step being worked at. Once a term, we moderate work together to ensure that our assessment is consistent. Assessment records are reviewed annually.
- We have a tracking system to follow and accelerate children's progress (Target Tracker). This is updated at the end of the school year when units from all attainment targets have been taught. The school science coordinator monitors progress through the school by sampling children's work at regular intervals. Children who are not succeeding, and children who demonstrate high ability in science, are identified and supported.
- A continuous assessment of children's work is carried out, much of which is during practical sessions.
- The Y2 staff assess children's level of attainment at the end of the KS1 programme of study. This teacher assessment is based on assessment records and work samples.
- In the Foundation Stage 80% of assessment takes place during child initiated activities, the other 20% during adult led opportunities
- Reports to parents are made at Parents Evenings, and written twice per year, describing each child's attitude to science, his/her progress in scientific enquiry and understanding of the content of science programme
- Teaching and learning are monitored annually through observations and scrutiny of planning and samples of work.

Health and Safety

Whilst Primary Science does not require pupils to handle dangerous chemicals, some lessons will involve investigations and demonstrations, which could be potentially hazardous if mishandled.

- Teachers will always warn pupils of any foreseen dangers and ensure that where possible they take necessary precautions.
- The CLEAPPS folder will be kept in the staffroom to ensure staff are up to date with contemporary safety advice.
- We expect all of our pupils to learn to take responsibility for the safety of themselves and their classmates.
- Class teachers will use their professional judgement as to the suitability of such investigations for their class, bearing in mind age and maturity.

- Investigations will always be supervised by the class teacher and, where necessary, an LSA or other adults.
- In the unfortunate case of an accident, first aid will be administered and recorded by a trained member of staff.

Equal Opportunities

Science is taught within the guidelines of the school's equal-opportunities policy.

- We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.
- Our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.
- We value science as a vehicle for the development of language skills, and we encourage our children to talk constructively about their science experiences. In our teaching, science is closely linked with literacy and mathematics.
- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We recognise that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.
- We exploit science's special contribution to children's developing creativity; we develop this by asking and encouraging challenging questions and encouraging original thinking.

Resources

The Science subject leader will be responsible for the ordering of new and replacement equipment. These are stored in clearly labelled boxes in the science area; (between Staff room and Green classrooms).

The school possess a wide range of resources to support all areas of the Science Curriculum across KS1 and 2 including:

- QCA Assessment toolkits for KS1 and KS2
- Books to support knowledge and understanding
- Concept cartoons – To promote discussion and thinking about scientific concepts.