Bishopton Primary School

Science

Policy

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Science is a systematic investigation of the physical, chemical and biological aspects of the world which relies on first hand experiences and on other sources of information. The scientific process and pupils' problem-solving activities will be used to deepen their understanding of the concepts involved. The main aspects of science to be studied will be determined by the programmes of study of the National Curriculum 2014.

Through science, pupils at Bishopton will continue to deepen their respect, care and appreciation for the natural world and all its phenomena.

Aims

We live in an increasingly scientific and technological age where children need to acquire the knowledge, skills and understanding to prepare them for life in the 21st century. Through the framework of the National Curriculum 2014, where science is a core subject, we aim to:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics, thus forming and developing substantive knowledge in science.
- 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, thus forming and developing disciplinary knowledge.
- Are equipped with the scientific skills required to understand the uses and implications of science, today and for the future.
- Stimulate children's interest and enjoyment in science.
- Build on children's enthusiasm, inquisitiveness and natural sense of wonder about the world.
- Encourage children to raise questions and learn how to investigate and explore these using both first-hand experience and secondary sources.
- Build an appreciation of science's contribution to all aspects of everyday life.
- Allow children to identify and find out about key scientific figures.
- Use a planned range of investigations and practical activities to give pupils a greater understanding of their concepts and knowledge of science.
- Provide pupils with opportunities for 'child-led' learning: developing their own ideas and investigations.
- Develop pupils' use of computing and maths skills through their science studies.
- Encourage children to treat the living and non-living environment with respect and sensitivity.
- Help children recognise and assess risks and hazards to themselves and to others when working with living things and materials
- Introduce pupils to the language and vocabulary of science and encourage them to use it through talk and writing.
- Extend the learning environment for our pupils via our environmental areas, the locality as well as educational visits.
- Promote a 'healthy lifestyle' in our pupils.
- Relate science work to the real world and everyday examples will be used where possible.

The teaching of science should help develop the key scientific skills of:

- Hypothesising and predicting
- Planning and carrying out investigations, including fair tests (UKS2 will identify variables)

- Using equipment correctly
- Careful observation
- Making accurate and appropriate measurements
- Presenting results
- Interpreting data using graphs and charts
- Evaluating results and drawing conclusions
- Identifying need for or possible further investigations

Implementation:

Throughout the programmes of study, the children will obtain and develop the key knowledge that has been identified within each unit of each year group, as well as the application of scientific skills, through a range of theoretical and practical lessons. We ensure that the Working Scientifically skills are built-on and developed as they progress through the school, so that they can apply their knowledge of science when using equipment, conducting experiments and explaining concepts confidently. We encourage children to ask and answer questions that draw upon their higher order thinking skills. Bishopton aims to prepare children for life in an increasingly scientific and technological world.

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science includes the following:

- Sequential learning: we build upon the learning and skill development of the previous years.
- Science is taught consistently, once a week for up to two hours.
- Planning is progressive and ambitious and allows children to learn essential aspects; we seek to build on what the children already know about a subject.
- 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.
- Teachers use precise questioning in class to test conceptual knowledge and skills.
- Working Scientifically skills are embedded into lessons to ensure these skills are being taught and developed throughout the children's school career.
- New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Where possible, science is planned to link with class topics, however when this is not possible, some units are taught discretely to ensure complete curriculum coverage. We make links between science and other subjects explicit.
- Children with SEND are included in whole class sessions and the activities and support given will scaffold their learning.
- Regular events, such as Science Week and project days, provide pupils with broader provision and the acquisition and application of knowledge and skills.
- Assessment for learning forms and important part of each lesson and sequence of learning and is used to inform next steps as well as identify misconceptions to address.

The implementation of our science curriculum is monitored through discussions with staff, pupil interviews / conversations, assessment data, planning and book trawls. We monitor regularly to identify those children with gaps in learning, so that all children can make progress.

Time Allocation

- Key Stage 1 aim to spend 1-1½ hours on science each week

- Key Stage 2 aim to spend 1½-2 hours on science each week

Planning

Long term Planning

Year groups are following the framework set out in the 2014 National Curriculum. This ensures a breadth and balance of content across both Key Stage 1 and Key Stage 2. Where possible, learning is cross-curricular to enable children to make connections between subjects and transfer key knowledge and skills to deepen understanding.

Medium term Planning

To ensure a balanced curriculum, science is broken down into manageable units which generally last half a term. These units may be moved during the year. Teachers use a combination of Cornerstones, including Love to Investigate, Explorify, New Prospectus Curriculum and PlanBee when planning. Planning includes practical activities where possible. Staff have access to a range of pre-planned practical activities organised by unit and year group in the shared area.

Short term planning

Individual lessons are planned for with objectives and activities on short term weekly planning sheet.

Classroom organisation/ Management

The majority of science lessons take place within the classroom. However, we are keen to use all opportunities to use the school grounds for appropriate science activities. Practical tasks can also take place in the KS1 shared area, library, hall or outside on the playground and school field. Lessons may also take place in the Forest School if it is available. If possible, the local area will be used to enhance pupils' experiences of science.

Expectations in science

Here are some useful hints for carrying out science:

1. Put a clear date and title on your work.
2. Underline headings with a ruler.
3. Draw your diagrams with a pencil.
4. Clearly label diagrams and pictures.
5. Work safely and sensibly.
6. Make sure you always produce your best work.
7. Steps for scientific enquiry need to be in order.

Impact:

Our curriculum is designed so that children are taught a variety of activities throughout their key stage(s) and there is a progression journey through all of these.

Children will:

- Develop their substantive knowledge of scientific concepts; deepening this each year through revisiting units.
- Develop a wide variety of disciplinary skills.
- Experience a wide variety of types of scientific enquiry.

- Develop a rich vocabulary which will enable them to articulate their understanding of taught concepts.
- Form a growth mindset approach to science and be able to ask questions to develop their scientific skills and understanding.
- Have high levels of pride in the quality and presentations of the work in science.

Assessment and recording

Throughout each unit of work, teachers monitor pupil's progress in scientific knowledge, understanding and skills through:

- Observation and discussion with class and individuals during lessons
- Asking probing questions
- Encouraging children to explain using the appropriate scientific vocabulary
- Marking written work
- Giving an opportunity for children to evaluate their own progress and how they can improve

Currently, learning objectives are identified in each unit of work, which provide opportunities for teacher assessment against each objective. Misconceptions can then be identified and addressed before ending the unit. In the summer term, children complete an 'end of year' test to assess their retention of knowledge of the science covered that year.

The progress of children in science is reported to parents/ guardians in the annual report.

Teaching and learning Styles

A variety of teaching styles are used to teach science. The main focus is to provide practical and investigative activities that enable children to develop their knowledge, understanding and skills through first-hand experiences. Also, many opportunities to apply their knowledge to new situations.

This involves:

- Whole class teaching
- Use of videos and modelling by teacher to demonstrate phenomena
- Enquiry based research activity
- Discussion between pupils and teacher
- Opportunity to use a variety of data such as statistics, graphs, pictures and photographs
- Use of ICT to enhance learning
- Drama and role play
- Presenting reports to the rest of the class
- A wide range of problem-solving activities
- Carrying out practical experiments and analysing the results

Because children have widely different scientific abilities, we ensure that we provide suitable learning opportunities for all children by:

- Setting common task which are open ended and can have a variety of responses
- Setting tasks of increasing difficulty (we do not expect all children to complete all tasks)
- Grouping children in ability groups and setting different tasks

- Grouping children in mixed ability groups so they share ideas and support each other
- Providing resources of different complexity, matched to the ability of the child
- Using TA's to support or extend the work of individual children or groups of children
- Encouraging children to plan their own investigations and enquiries

Early Years Foundation Stage

Science is taught through Understanding of the World. Science is developed by building upon the children's natural curiosity and fascination for their environment and the world around them. Children are encouraged to use all their senses to investigate, explore and make predictions.

Teaching Science to children with special educational needs

The school strives to enable all pupils to reach their potential. Science forms part of the school curriculum policy to provide a broad and balanced education for all children. Science activities are carefully chosen to match the needs of children with learning difficulties. Our work in science considers the targets set in the children's Individual Education Plan.

Equal Opportunities

All children have equal access to the science curriculum and its associated practical activities. The SLT, Class Teachers and TAs at Bishopton Primary School are responsible for ensuring that all children, irrespective of gender, learning ability, physical disability, ethnicity and social circumstances, have access to the whole curriculum and make the greatest possible progress. Where appropriate, work will be adapted to meet pupils' needs and, if appropriate, extra support given.

We believe science is critical area for promoting equal opportunities and counteracting stereotypes in science. In Science we provide opportunities to draw on different interests and experience of pupils to raise awareness and value cultural and ethnic diversity.

Health and Safety

Science in our school is safe. However, when children are engaged in a variety of practical activities, including open ended investigations, there is always a possibility that something could go wrong, and we need to be vigilant. A risk assessment will be made, as part of the planning process, before any potentially dangerous scientific activity is undertaken. Children will be taught to use scientific equipment safely when using it during practical activities. They will be informed of any risks or hazards but will also be encouraged to assess and identify risks for themselves. Class Teachers and Teaching Assistants will check equipment regularly and report any damage, taking defective equipment out of action. No electrical equipment should be brought in, unless it is safe and appropriate for use by children of a primary age. All mains electrical equipment is subject to a regular safety check in accordance with the LA health and Safety policy.

Resources

The science resources are kept in the storage room next to the library in clearly labelled boxes. Teachers are responsible for returning any equipment and resources used as soon as possible after lessons to the appropriate box or drawer, so that it can be used by others. Any broken or missing equipment should be reported to the science leader, who will keep a log of resources

that need to be re-ordered. The science leader is then responsible for ordering new equipment and resources to be used. All teachers should inform the science leader of any equipment or resources that may be needed for the upcoming term in advance, so that budget can be spent accordingly.

Monitoring and review – the role of the science coordinator

The science teaching and learning is subject to continual review, evaluation and monitoring.

The science coordinator is responsible for this and will:

- Monitor the standards of the children's work and the quality of teaching.
- Analyse data to consider trends or issue.
- Be responsible for the support of colleagues in the teaching of science
- Provide a strategic lead and direction for the subject, which indicates areas for further improvement.
- Be responsible for the science input to the school development plan.
- Keep informed about current developments in the subject.
- Attend regular meetings with other schools in the Stratford Science Cluster for CPD and to share good practice.
- Seek CPD for self and teachers when appropriate.

Evidence of monitoring can be found in science co-ordinator's file.

Primary Science Quality Mark (PSQM)

Bishopton received the PSQM in 2023, celebrating the achievements of the science across the school. The profile of science has been raised significantly, and pupils' stereotypes of scientists have been resolved. Furthermore, a thorough monitoring cycle has been established and there has been an increase in practical science across the school. As a result, pupil voice highlighted that pupils are significantly more excited about science lessons and enthusiastic to learn.