Buntingsdale Primary School and Nursery
Science Policy

Rights of the child…
Article 1: Everyone under the age of 18 has all the right in the convention
Article 24: You have the right to the best health care possible, safe water to drink, nutritious food, a clean and safe environment, and information to help you stay well.
Article 28: A good quality education. Should be encouraged to go to school to the highest level they can.
Article 29: Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights as well as their parents, their own culture and other culture and the environment.

Intent

National Curriculum states, "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 children should be taught essential aspects of the knowledge, methods, processes and uses of science."

The national curriculum for science aims to ensure that all children:

- 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 Buntingsdale Primary, we want our children to be confident and curious children who apply their skills in a scientific way, using lines of enquiry across the curriculum and in later life. They should be able to ask and answer challenging question and successfully carry out investigations using correct techniques, accurately record their findings using

appropriate scientific language and analyse their results. We will ensure science lessons are purposeful, accurate and imaginative. We will endeavour to ensure children have sufficient scientific knowledge to understand both the uses and implications of science, today and in the future. This will also give children an appreciation of the changing nature of scientific knowledge. We plan to use the outdoors whenever possible within science teaching because of the huge benefits to pupils and the science learning. The Association for Science Education (ASE) describe outdoor learning as

> "[learning] takes place beyond the four walls of the traditional classroom environment. This could be within school grounds, local green or urban environments or further afield. The important point … is that the learning is taking place in the **outdoors**."

Implementation

Our learning is sequenced into coherent and cumulative lessons that build and connect on previous content. Specific skills are discreetly taught and practised so that they become transferrable. Appropriately sequenced units activate prior learning, build on skills and deepen knowledge and understanding.

Our children begin their science experience in Early Years Foundation Stage, with informal investigation within the classroom and outside. Teachers facilitate children's curiosity with open ended questions and clearly thought out learning experiences which are both child led and adult led.

In Key Stage 1 and 2, Science will be taught in planned and arranged topic blocks by the class teacher, these are, where appropriate linked to the Year group's overall Topic theme

Existing knowledge is checked at the beginning of each topic to identify misconceptions. In KS2 children use Knowledge organisers to aid pre-learning and become familiar with the Key Vocabulary and concepts which will be taught. This also ensures that teaching is informed by the children's starting points and that it takes account of pupil voice.

At the beginning of each lesson, teachers plan opportunities for pupils to recall prior learning. This enables pupils to consolidate their previous learning, while also preparing them for future learning, in line with the sequence of lessons. This is particularly important for our EAL and SEND children, who may need more opportunities to retain and embed scientific vocabulary and concepts.

Working Scientifically skills are embedded into lessons to ensure that skills are systematically 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 in order to embed and develop scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning

Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum and develop children's Science capital.

Regular events, such as Science Week to provide broader provision and help develop the children's Science Capital. These events often involve families and the wider community.

At the end of each topic, key knowledge is reviewed by the children and rigorously checked by the teacher and consolidated as necessary.

Impact

In ensuring high standards of teaching and learning in science, we implement a curriculum that is progressive throughout the whole school. This ensures children not only acquire the appropriate age-related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.
- A richer vocabulary which will enable children to articulate their understanding of taught concepts.
- Skills to be able to work collaboratively
- High aspirations, which will see them through to further study, work and a successful adult life

Legal framework

This policy has due regard to statutory legislation and guidance including, but not limited to, the following:

- DfE (2013) 'Science programmes of study: key stages 1 and 2'
- DfE (2021) 'Statutory framework for the early years foundation stage'
- The Control of Substances Hazardous to Health Regulations (COSHH) 2002
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013

Roles and responsibilities

The subject leader is responsible for:

- Preparing policy documents, curriculum plans and schemes of work for the subject.
- Reviewing changes to the national curriculum and advising on their implementation.
- Monitoring the learning and teaching of science, providing support for staff where necessary.
- Encouraging staff to provide effective learning opportunities for children.
- Helping to develop colleagues' expertise in the subject.
- Organising the deployment of resources and carrying out an annual audit of all science resources.
- Liaising with teachers across all phases.
- Communicating developments in the subject to all teaching staff.
- Leading staff meetings and providing staff members with the appropriate training.
- Organising, providing and monitoring CPD opportunities in the subject.
- Ensuring common standards are met for recording and assessment.
- Advising on the contribution of science to other curriculum areas, including cross-curricular and extra-curricular activities.
- Collating assessment data and setting new priorities for development of science in subsequent years.

The classroom teacher is responsible for:

- Acting in accordance with Buntingsdale's Primary School Science Policy, ensuring that lessons are taught in line with the school's Health and Safety Policy at all times.
- Liaising with the science coordinator about key topics, resources and supporting individual children.
- Ensuring that all of the relevant statutory content is covered within the school year.

- Monitoring the progress of children in their class and reporting this on an annual basis.
- Reporting any concerns regarding the teaching of the subject to the subject leader or a member of the senior leadership team (SLT).
- Undertaking any training that is necessary in order to effectively teach the subject.

The national curriculum

The national curriculum is followed and provides a full breakdown of the statutory content to be taught within each unit.

During reception class, in accordance with the 'Statutory framework for the early years foundation stage', focus will be put on the seven areas of learning, with the scientific aspect of children' work relating to the objectives set out within the framework.

During years 1 and 2, children will be taught to:

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.

During years 3 and 4, children will be taught to:

- Ask relevant questions and use different types of scientific enquiries to answer these questions, setting up simple practical enquiries, comparative and fair tests.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.
- Gather, record, present and classify data in a variety of ways to help answer questions.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

- Identify differences, similarities or changes related to simple scientific ideas and processes.
- Use straightforward scientific evidence to answer questions or to support their findings.

During years 5 and 6, children will be taught to:

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of the results and the degree of trust in them. This should be in oral and written forms such as displays and other presentations.
- Identify scientific evidence that has been used to support or refute ideas/arguments.

<u>Cross-curricular links</u>

Wherever possible, the science curriculum will provide opportunities to establish links with other curriculum areas.

English

- Children are encouraged to use their speaking and listening skills to describe what is happening.
- Children' writing skills are developed through recording their planning, what they observe and what they found out.
- Science based texts are sometimes used in English lessons and in guided reading sessions.

Maths

- Science will involve a degree of numeracy at all levels.
- Children use their knowledge and understanding of measurement and data handling.

- Where appropriate, children record their findings using charts, tables and graphs.

Computing

- Children will use ICT skills to locate and research information.
- ICT will be used to record findings, using text, data and tables.
- Children are encouraged to use calculators and other electronical devices, gaining confidence throughout their school experience.

PSHE

- Health education is taught as part of the science unit about ourselves, which covers:
  - Health and growing
  - Teeth and eating
  - Moving and growing
  - Keeping healthy
  - Life cycles

History

- Scientific discoveries and the contribution of individuals to science will be studied.

Religious Education

- Children' development will be focussed on the vastness of science and the natural world, encouraging a sense of awe.
- Children are encouraged to think about the effect of scientific discoveries on the modern world.

Character Education (CoJo)

- Children's development of core character behaviour traits will support the learning of science
- Missions will develop problem solving and teamwork
- Some topics within the character curriculum topics will be science based

Outdoor Learning

- To make first hand observations of living things or phenomena that cannot be brought into the classroom
- To observer how the natural world changes throughout the year

- To contextualise learning by observing and interacting with living things where they naturally occur

Teaching and learning

Children will be taught to describe associated processes and key characteristics in common language, as well as understand and use technical terminology and specialist vocabulary.

Lessons will allow for a wide range of scientific enquiry, including the following:

- Questioning, predicting and interpreting
- Pattern seeking
- Practical experiences
- Collaborative work
- Carrying out investigations
- Carrying out time-controlled observations
- Classifying and grouping
- Undertaking comparative and fair testing
- Researching using secondary sources

Opportunities for outdoor learning will be provided wherever possible.

Planning

All relevant staff members are briefed on the school's planning procedures as part of staff training.

Throughout Buntingsdale, science is taught as a discrete lesson and as part of cross-curricular themes when appropriate.

Teachers will use the key learning content in the DfE's 'Science programmes of study: key stages 1 and 2' and the national curriculum as a starting point for their planning.

Lesson plans will demonstrate the balance of visual, auditory and kinaesthetic elements used in teaching, ensuring that all children with different learning styles can access the learning experience.

Long-term planning will be used to outline the units to be taught within each year group

Medium-term planning will be used to outline the vocabulary and skills that will be taught in each unit of work, as well as highlighting the opportunities for assessment. Medium-term plans will identify learning objectives (including prior learning), misconceptions, main learning activities and differentiation.

Assessment and reporting

Children will be assessed and their progression recorded in line with the school's Assessment Policy. Children will be assessed continuously throughout the year, as well as undertaking a summative assessment at the end of each key stage
Throughout the year, teachers will plan on-going creative assessment opportunities in order to gauge whether children have achieved the key learning objectives. Assessment in science is based upon scientific knowledge and understanding, rather than achievement in English or maths.
Assessment will be undertaken in various forms, including the following:

- Talking to children and asking questions
- Discussing children' work with them
- Marking work against the learning objective
- Specific assignments for individual children
- Observing practical tasks and activities
- Children' self-evaluation of their work
- Classroom tests and formal exams

Formative assessment, which is carried out informally throughout the year, enables teachers to identify children' understanding of subjects and informs their immediate lesson planning.

In terms of summative assessments, the results of end of year assessments will be passed to relevant members of staff, such as the pupil's future teacher.

Parents will be provided with a written report about their child's progress during the summer term every year. These will include information on the pupil's attitude towards science, progress in understanding scientific methods, ability to investigate, and the knowledge levels they have achieved.

Children with special educational needs and disabilities (SEND) will be monitored by the special educational needs coordinator.

Parents (Including Home learning)

Parental input is highly valued and parents are regularly invited and welcomed into school to share their own expertise with the children. There is an annual family challenge event

that engages many families in scientific activity. Children may receive science home learning based on their current topic.

Equipment and resources

Science resources for each unit are stored in the main corridor. With electricity stored in the Dt cupboard

The subject leader is responsible for ensuring that all resources and equipment are sufficiently maintained.

Equipment will be checked prior to each use and any damages or defects must be reported to the subject leader immediately.

The subject leader is responsible for maintaining an inventory of resources.

Staff members must inform the subject leader of any changes regarding science resources, such as broken items or when new resources are required.

Any equipment or resources which are a cause of concern will be removed from the cupboard immediately.

The subject leader will carry out an annual audit of the science resources, reordering any consumables when necessary.

Class teachers can discuss the need for new resources with the subject leader.

The subject leader is responsible for negotiating requests from staff members and ensuring resources are bought within the amount allocated in the annual budget.

Health and safety

All staff will act in accordance with the school's Health and Safety Policy at all times.
Accidents and near-misses will be reported following the procedure outlined in the school's Accident Reporting Procedure Policy.
A risk assessment will be carried out by teachers before conducting an experiment or undertaking practical activities.
All children will be shown how to correctly use equipment and will be monitored by staff members whilst using equipment.
All children will be made aware of how they are expected to behave, ensuring that they show respect to other people and the environment.
Children are made aware of the personal safety protocols and equipment needed when using different equipment or carrying out different tasks.

Staff members will be made aware of the COSHH and RIDDOR regulations as part of their induction training and will act in accordance with these whilst undertaking activities.

Any 'new' experiments or activities which a teacher has not used in the classroom before will be trialled prior to being performed with children.

At the beginning of any experiment, the teacher will outline the purpose of the experiment to the class, and all hazards and safety precautions will be thoroughly outlined.

Equal opportunities

All children will have equal access to the entire science curriculum, including practical experiments.

Gender, learning ability, physical ability, ethnicity, linguistic ability and/or cultural circumstances will not impede children from accessing all science lessons.

Where it is inappropriate for a pupil to participate in a lesson because of reasons related to any of the factors outlined above, the lessons will be adapted to meet the pupil's needs and alternative arrangements involving extra support will be provided where necessary.

All efforts will be made to ensure that cultural and gender differences will be positively reflected in all lessons and teaching materials used.

Monitoring and review

This policy will be reviewed on an annual basis by the subject leader, in collaboration with the headteacher. The subject leader will monitor teaching and learning in science at name of school, ensuring that the content of the national curriculum is covered. Any changes made to this policy will be communicated to all teaching staff.