



EDWARD THE ELDER
Primary School

Edward the Elder Primary School Science Policy

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Science Policy **September 2023**

This policy should read in conjunction with the Statutory Science National Curriculum Document (2013).

Science is central to the world in which we live in. At Edward the Elder Primary School we are aware of the lifelong value and understanding that science can have on our pupils. It gives them a chance to learn about the world around them and to find out how and why things happen. We believe that science is not all about what we know, but how we know it. Through working scientifically our pupils are taught not only the facts of science, but also the use of scientific skills that will enable them to develop into independent young scientists.

Aims

Edward the Elder Primary School offers a high-quality science education that supports the aims of the Early Years Foundation Stage, Development Matters and the National curriculum 'to ensure 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.'* (National Curriculum, 2015)

Our Science Principles

At Edward the Elder, we believe there are a number of principles we should be implementing throughout our teaching of Science to ensure teaching and learning is fun and effective. These principles focus on 4 key areas: attitude to learning, learning style, key skills and progress and achievement.

Attitude to learning

- Inspired
- Engaged
- Excited
- Fun
- Awe and wonder
- Enthusiasm

Learning style

- Exploration
- Experiment
- Practical
- Child-led
- Talk

Key skills

- Asking questions
- Language
- Communication
- Co-operation
- Relates to real life

Progress and achievement

- New knowledge
- Develop understanding
- Build on knowledge

Intent

Our science curriculum is designed with the intent that all children will become a competent scientist who are inquisitive about the world around them. We intend to provide children with first-hand scientific investigative experiences which inspires children's curiosity and builds their science capital. Our thematic lessons will provide children with numerous opportunities to take their learning across year groups by preteaching and revisiting skills and knowledge. This progression within our science curriculum ensures that children can make links to prior learning, develop deeper knowledge of key skills, and master their learning with repetition through stimulating and challenging experiences.

Working and thinking scientifically

Working scientifically specifies the understanding of the nature, processes and methods of science teaching. It should not be taught as a separate strand but must always be taught through and clearly related to substantive science content.

Achieving our Aims Progressively

The Curious Scientist

Within the foundation stage science is taught as an integral part of the topic work covered during the year. In Nursery and Reception, we relate the scientific aspects of the children's work to the areas of learning set out in the Statutory Framework. Our curriculum is planned around the Development Matters, with our objectives stemming from the Understanding the World area of learning. At the end of Reception, children will then be assessed against the 17 Early Learning Goals (ELGs), with the main scientific focus stemming from The World. Our principle focus of early science teaching is to encourage pupils to have a natural curiosity of the world around them. Almost all teaching is carried out through first-hand experiences using simple scientific language. Pupils are provided with rich learning opportunities both in and outside of the classroom that offers the children the opportunity to explore, use their senses and be physically active and exuberant. During Child Initiated learning, observations of the children take place so that additional focused resources and support can be provided to enrich their scientific learning. To ensure that we meet the individual needs of all of our children we make regular observations of the children's interactions, interests, skills, and development of concepts.

The Budding Scientist

In key stage one our principal focus of science teaching is to enable pupils to experience and observe phenomena, looking more closely at the world around them. Pupils are encouraged to be curious and ask questions about what they notice. They are helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, solving problems and finding things out using secondary sources of information.

The majority of science teaching is carried out through the use of first-hand practical experiences, and through outdoor experiences using secondary sources only when appropriate. Simple scientific language is encouraged at all times to communicate what they have found out in a variety of ways.

The Blossoming Scientist

As our pupils move in to key stage two our principal focus of science teaching is to enable pupils to broaden their scientific view of the world around them. Pupils do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They are encouraged to ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns,

grouping and classifying things, carrying out simple comparative and fair tests, problem solving and finding things out using secondary sources of information. Simple conclusions are made by pupils and the use of some scientific language to talk about and, later, to write about what they have found out is encouraged at all times.

The Growing scientist

It is once our pupils reach upper key stage two that our principal focus of science teaching deepens to enable pupils to develop a deeper understanding of a wide range of scientific ideas. Pupils do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage two, they will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Pupils will also begin to recognise that scientific ideas change and develop over time. They will select for themselves the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, problem solving and finding things out using a wide range of secondary sources of information. They will draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. The use of scientific language, that is pronounced and spelled correctly, will be encouraged at all times.

Learning and Teaching

Science Coverage

In the Foundation Stage, science is taught as a part of themed topic lessons each week. From Year 1 onwards science is taught for a minimum of two hours each week, as a standalone subject and where it is appropriate linked to the thematic curriculum.

Edward the Elder Primary School uses the National Curriculum's Programme of Study for Science as the basis of its curriculum planning. This ensures pupils receive the complete coverage of statutory requirements for primary science education, and that the education delivered is done so progressively through the phases. By the end of each phase, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Science will also be linked to our thematic teaching through the Dimensions curriculum. This will include chances to pre-teach and re-teach key concepts (please refer to Dimensions and Science document)

Planning

The planning of science in the foundation stage is done so through weekly topic planning. It is the class teacher's responsibility to write these plans and discuss them with the subject leader or member of the Senior Management Team when necessary. The planning within this phase will be in line with the school's Early Years Foundation Stage policy and the Statutory Early Years Foundation Stage, the Early Years Foundation Stage Profile and Development Matters.

From Year 1 onwards we carry out our curriculum planning in science in 3 phases (long-term plans, unit coverage and short-term planning).

The long-term plan maps the scientific topics studied in each term during the phase. The science subject leader works this out in conjunction with teaching colleagues in each year group. Although science is taught as a standalone subject, where possible we link scientific study with work in other subject areas.

Our unit coverage give details of each unit of work for each term and is linked to the coverage given by the National curriculum. Staff are able to assess children against these at the end of a unit. Science units are planned so that they build on prior learning. We ensure that we build progression into the science programme of study, so that pupils are increasingly challenged as they move up through the school.

It is the responsibility of the class teacher to create effective SMARTs with all key learning (short-term plans). These SMARTs are to include the Science Principle, Enquiry type, STEM career, specific learning objectives, learning activities and expected outcomes of each lesson. The class teacher uploads these SMARTs to the SharePoint each week and will discuss, on an informal basis, with the subject leader or member of Senior Management Team when necessary.

Floor Books

Floor books are used within Science learning as a way of developing, recording and assessing children's understanding of scientific concepts and practical science skills that are not the main focus of the science lesson. Floor books will include date, learning objective, photographs, children's comments, drawings, table or graphs and annotated diagrams.

Organisation

Science lessons at Edward the Elder Primary School are delivered to meet the learning styles of our pupils ensuring auditory, visual and kinaesthetic approaches. We do this by providing enriching and engaging opportunities for pupils to learn through a variety of activities such as role-play, computing, observing, testing and discussions.

We recognise that in all classes pupils have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all pupils by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- setting tasks which are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty (we do not expect all pupils to complete all tasks);

- grouping pupils by ability in the room, and setting different tasks for each ability group;
- providing resources of different complexity, matched to the ability of the child;
- using classroom assistants to support the work of individual pupils or groups of pupils

Throughout all lessons, staff will ensure there is a working scientific focus and these skills will be embedded and developed across the 3 phases of school.

Recording

In the Foundation Stage, observations linked to scientific study are made and recorded within the individual pupils' learning journeys using EvidenceMe software. Additional evidence may be recorded by pupils, or in photographic form in the pupils' topic books.

Pupils in Year 1 onwards will have a science book to record the working scientific skill they are focussing on within the lesson. In this book there will be evidence of the specific knowledge taught, as detailed in the medium term plan, for each unit. Evidence of children's group learning will be evidenced in floor books. These books will contain photographic evidence of learning, comments and questions made by the children and group tasks completed.

Marking and feedback

Individual science books will show marking and feedback in line with the school's marking and feedback policy. Floor books will not be marked but will be monitored by teachers to identify areas for development.

The contribution of science to teaching in other curriculum areas

English

Science contributes significantly to the teaching of English at Edward the Elder Primary School by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the pupils study in English are of a scientific nature. The pupils develop oral skills in science lessons through discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. The pupils use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

Computing

Pupils use computing in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the Internet. Pupils use computing to record, present and interpret data and to review, modify and evaluate their work

and improve its presentation. Children are also encouraged, particularly within KS2, to use data loggers in order to secure accurate readings when collecting results.

The Wider Curriculum

Science makes a significant contribution to the teaching of the wider curriculum within primary education. Science teaching offers pupils many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, pupils develop a sense of awe and wonder regarding the nature of our world. Science gives pupils the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches pupils about the reasons why people are different and, by developing the pupils' knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Equality

Edward the Elder Primary School is committed to equality of opportunity. All pupils will be provided with a progressive, stimulating science curriculum irrespective of gender, ethnicity, social-economic background or special educational needs as in line with the school's equal opportunities policy.

SEN

At our school we teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs.

We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, a trip to a science museum, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Gifted & Talented

In science, staff will develop differentiated weekly plans to ensure pupils who are identified as gifted in science and achieving exceptionally high levels of achievement are catered for. For these pupils, accelerated learning experiences are provided, whether through working scientifically skills from the next school phase or year group being accessed by the pupils through

investigative work, or enrichment activities being planned for giving these pupils open ended investigations to complete that link to the science programmes of studies being covered.

Environment

A science display linked to the children's current unit of work should also be displayed in each of these classrooms. The display should support the children's learning and may include key scientific vocabulary, questions, mind-maps/concept cartoons sharing the children's thoughts and ideas or examples of their science work. Each classroom will also display a copy of the scientific enquiry cycle and the Science principles.

A school science display will also be displayed showing evidence of science learning across the school and identify links to 'real life'.

Resources

A growing range of equipment is developing at Edward the Elder Primary School and is stored in the SPR. Science reference books can be found in the library. It is primarily the responsibility of the subject leader to ensure resources are stocked and maintained. All staff are responsible for the day-to-day safe storage and maintenance of resources.

Health and Safety

This section should read in line with the Departments For Education's (DFE) Health and Safety: advice on legal duties and powers for local authorities, school leaders, school staff and governing bodies, February 2014.

The senior management team take the responsibility in ensuring staff have the necessary health and safety training to minimise risks within everyday lessons.

For school staff "*common sense should be used in assessing and managing the risks of any activity.*" (DFE, p.4, 2014) It is therefore the responsibility of the class teacher to ensure

- they work in line with the school's current Health and Safety Policy
- they indicate any possible health and safety risks on their lesson plans
- they inform pupils/staff of any hazards or safety issues related to their science lesson and advise them how to minimise any risks
- they implement behaviour management strategies in line with the school's current behaviour policy to help minimise any risks to health and safety

Assessment

In science, activities and tasks are carried out prior to, during and after teaching a unit in a variety of ways to inform planning or how far ideas have progressed after a period of teaching.

Formative assessment is continually on going in the form of marking pupils work and making notes in order to inform planning for the next lesson. These assessments are linked to the key learning objectives for the lesson.

Knowledge overviews are completed for each unit to identify those children who are developing, secure or exceeding in that knowledge and why. Targeted ARE's are completed, at least, termly to identify attainment of working scientifically skills.

At the end of each science unit pupils are assessed to be emerging, developing or secure for their age band.

Monitoring

It is the responsibility of the science subject leader and Senior Management Team to monitor the standards of pupil'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 fulfilling the vital task of reviewing samples of pupil's work and visiting classes to observe teaching in the subject.

Review

This policy will be reviewed annually or earlier if necessary.