

GRINDON INFANT SCHOOL



SCIENCE POLICY

Science Policy 2024

Intention

The 2014 national curriculum 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this.

We believe a high-quality science education provides foundations for understanding the world. Science has changed our lives and is vital to the world's future prosperity. Through building 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 key knowledge and concepts can be used to explain what is occurring, predict how things will behave, and analyse causes. This understanding should be consolidated through their appreciation of applications of science in society and the economy. In teaching science, we are developing in our children:

- a positive attitude towards science and an awareness of its fascination.
- an understanding of science through a process of enquiry and investigation;
- confidence and competence in scientific knowledge, concepts and skills.
- an ability to reason, predict, think logically and to work systematically and accurately.
- an ability to communicate scientifically.
- the initiative to work both independently and in co-operation with others.
- the ability and understanding to use and apply science across the curriculum and real life.

At Grindon Infants our aim is to enthuse, develop and challenge pupils through an engaging and progressively structured science curriculum and teaching approaches.

Implementation

The National Curriculum for Science is used as a framework for science content, skills and pupil expectations at our school. To support our key principles, we will deliver this curriculum through:

- A skills-focussed approach to teaching that ensures an appropriate and flexible challenge within the classroom. This approach is called 'dual objective'. The Science National Curriculum states that "*Working and thinking scientifically ... must always be taught through the substantive science content*". This is supported by the explicit use of dual objective planning.
- Five key science skills that support knowledge / conceptual development and Working Scientifically to match pupil performance to national Key Stage expectations (see Science Planning and Assessment File for details).

Science at Grindon Infants is a core curriculum subject. In KS1 teachers will follow the Topic Grids to support their planning and teaching and will deliver science x1 session per week as a minimum expectation. In EYFS science is an integral part of the topic work covered during the year, relating the geographical aspects of the pupil's work to the objectives set out in the Early Learning Goals. To support a fully progressive curriculum, the foundations for learning science begin in Early Years Foundation Stage through planned substantive / disciplinary knowledge and key vocabulary development that dove-tails into National Curriculum expectations. Science makes a significant contribution to the ELG objectives of developing a pupil's knowledge and understanding of the world. Pupils are taught to use appropriate science equipment when investigating the world around them. This builds stronger foundations for success as pupils move into year 1.

Evidence of this learning is made in their learning journals. Further EYFS information can be found on the EYFS policy.

Year group expectations (see Science Assessment Boards) are set against appropriate challenge for each individual year group and are matched to ensure progression and build on prior knowledge to embed the pupils' knowledge and understanding, in order to support retaining information into their long-term memory. This challenge will be reviewed regularly and adjusted, to ensure appropriate progress. Specific Key Stage expectations are given in the Science Planning and Assessment File.

Attainment Targets

By the end of each key stage, pupils are expected to know, apply, and understand the matters, skills and processes specified in the relevant programme of study.

Grindon Infant Science Curriculum Overview

		Explaining Science	Classification	Designing Experiments	Data, Tables & Graphs	Making Conclusions	Particle Model	Force Arrow Model	Energy Transfer Model	Big Picture Model
Key Stage 1	1	Seasonal Changes <ul style="list-style-type: none"> Observe & describe changes across the four seasons. Observe, describe, measure & record weather across the four seasons. Observe the sun moving across the sky. Describe changes in day-length across the seasons (see Light & Shadows). 	Plants <ul style="list-style-type: none"> Identify & describe the basic structure of flowering plants. Identify, name & observe a variety of common plants (garden/wild/veg plants, trees) growing in their habitat. Identify deciduous & evergreen trees. 	Everyday Materials <ul style="list-style-type: none"> Describe the materials that a range of objects are made from. Describe simple physical properties of a variety of everyday materials. Compare & group a variety of everyday materials using their physical properties. 	Pushes & Pulls <ul style="list-style-type: none"> Recognise & name a push and a pull force in action. Know that a force is needed to move an object. Explore & investigate that a bigger force is needed to move an object further. A bigger force is needed to move a heavier object. Force can be bigger / smaller & moves an object in a direction. 	Animals Including Humans <ul style="list-style-type: none"> Identify, name, describe features of and compare common vertebrates. Identify & name common carnivores, herbivores & omnivores. Identify, name, draw & label basic human body part. Know the five senses and link these to human body parts. 	Light & Shadows <ul style="list-style-type: none"> Identify a range of light sources (natural & man-made). Observe & describe light coming from a light source. Observe & describe brightness close to and further away from a light source. Observe how materials behave with light. Describe how a shadow forms. Know how to stay safe in the bright sunlight and in the dark. 			
	2	Living Things & Habitats <ul style="list-style-type: none"> Know the differences between things that are living, dead and those that have never been alive. Describe how habitats give a place for animals and plants to live, grow and feed. Living things are suited to their habitat (microhabitat). Identify & name animals & plants. Describe food chains. Identify and name sources of food. 	Animals Including Humans <ul style="list-style-type: none"> Animals (including humans) have offspring which grow into adults. Compare to other animal life cycles. Animals need water, food and air (oxygen) to survive. It is important to exercise, eat the right amounts of different types of food and to keep ourselves clean (hygiene). 	Uses of Everyday Materials <ul style="list-style-type: none"> Can describe the properties of a range of everyday materials. The uses (application) of a variety of everyday materials. There are three states of matter. Know the properties of solids, liquids, and gases. The shape of solid objects can be changed by squashing, bending, twisting and stretching. 	Building Circuits <ul style="list-style-type: none"> Know appliances that need electricity (power/energy source) to work (mains, battery, rechargeable, etc). Can name (with their symbol) and use components correctly/safely in simple circuit. Can build simple closed series circuits from instructions. Can identify dangers & know how to use electricity safely in the home/classroom. 	Plants <ul style="list-style-type: none"> Know and describe the stages as seeds (& bulbs) grow into mature plants (life cycle of a flowering plant). Know that plants need water, light and a suitable temperature to grow and stay healthy. 				

The curriculum will:

- Build **depth** through recalled, connected substantive knowledge, explicit vocabulary expectations, a conceptual understanding of science (through a progressive use of science models) and a hands-on, investigatory approach to teaching. Activity will be varied, targeted to build conceptual knowledge/Working Scientifically skills, support connection and with a gradual release of responsibility (GRR) to the pupils.
- Be appropriately **challenged** through a sequential, coherent and ambitious curriculum, dual objective teaching (ensures clear focus, pitch and differentiation by expectation), effective questioning & activity (higher order), formative assessment approach and addressing misconceptions quickly. Independent thinking and investigation will be scaffolded and encouraged with a growth mindset.
- Build **connected** substantive knowledge through ensuring secure prior knowledge, conceptual understanding to link knowledge across the curriculum, blended learning across topics/wider curriculum and scientific theory development using key scientists within the learning. Factual knowledge is grounded into conceptual knowledge that then expands into connected knowledge.
- Build key **disciplinary knowledge & skills** through focussed/progressive Working Scientifically skill development (by dual objectives) through a range of Enquiry Types that help pupils to become increasingly independent and successful investigators. Explicit year group specific Working Scientifically Skills are mapped across the curriculum to ensure coverage, sequencing and the tracking (assessment) of progress.

- Support **next steps** through high attainment (tracked), conceptual component knowledge and Working Scientifically Skills to support KS2 readiness.

Science Across the Curriculum

Science contributes significantly to the teaching of English by actively promoting the skills of reading, writing, speaking and listening. Some of the texts studied in English (Reading) are of a scientific nature. Pupil's comprehension skills are developed, and they learn to distinguish fact from opinion. They develop oral skills through discussions and through recounting their observations of practical work. They develop writing skills through report writing and recording information in different formats. They extend their vocabulary, learning the meaning of, and correctly using, new scientific vocabulary.

Mathematics

- Pupils perform measurements; they learn to use and apply number, estimate and make predictions, apply data-handling techniques and use different ways of presenting results graphically.

Design and Technology

- Knowledge gained from science lessons is applied practically in Design and Technology, for example when pupils in Year 1 use their knowledge of materials when studying structures and building bridges, in Year 2 pupils use their knowledge of different food types when designing and making a healthy snack.

Computing

- Software is used to support the pupils' constructing graphs and viewing different concepts. Pupils learn how to find, select and analyse information on the internet.

Personal, social, health and economics education (PSHE) and citizenship

- Science makes a significant contribution to the teaching of PSHE and citizenship. For example, pupils can apply what they have learnt about healthy lifestyles when considering their own health and wellbeing.
- They learn to care for their world, for example through recycling,

Spiritual, Moral, Social and Cultural Development

- Science teaching offers pupils many opportunities to examine some of the fundamental questions in life, for example the evolution of living things.
- 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 and Inclusion

At our school we teach science to all pupils, whatever their ability or additional needs. Science forms part of the school curriculum to provide a broad and balanced education to all children. Through our science teaching we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take reasonable steps to achieve this. For more information see SEND and Equal Opportunity policies. We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the school, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils. See also the Educational Visits policy.

Assessment

We use assessment to inform and develop our teaching.

Topics commonly begin with an assessment of what children already know, and what they want to learn. Teachers assess pupil's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it, using a Science Assessment Board which provides criteria matched to year group expectation. Teachers then use this assessment to plan for future learning. Written and/or verbal feedback is given to the child to help guide his/her progress. Pupils are encouraged to reflect on their own, and others' work, and to make suggestions about how they can improve or develop, in ways appropriate for their age. See also the Marking policy.

At the end of a unit of work, the teacher makes a summary judgement about the work of each pupil, in relation to age-related expectations using the yearly updated Standardisation Files.

Teacher assessment data is inputted termly into our school assessment system.

Pupils' progress will be reported to parents through parent consultations and end of year reports.

Teachers make the statutory assessment of each pupil's attainment in science at the end of Key Stage 1. This assessment is reported to parents.

Developments in Science and Raising the Profile

At Grindon Infants we believe in high quality teaching and learning and to ensure we stay abreast of new developments in the curriculum; teaching styles; funding; and assessment strategies we:

- Work with local STEM groups and training facilities.
- Provide opportunities for pupils to attend science visits.
- Provide opportunities for science visitors to attend school.
- Create awe and wonder through a Science Club and Science Weeks.

Health and Safety

Activities are planned regarding our Health and Safety policy. Risk assessments are carried out as appropriate.

When working with tools, equipment and materials in practical activities and in different environments, pupils should be taught:

- about hazards, risks and risk control
- to recognise hazards, assess consequent risks and take steps to control risks to themselves and others
- to use information to assess the immediate and cumulative risks
- to manage their environment to ensure the health and safety of themselves and others
- to explain the steps they take to control risks.

Class Teachers, Teaching Assistants and the Subject Leader will check equipment regularly and report any damage, taking defective equipment out of action.

Role of Subject Leader

It is the responsibility of the subject leader:

- To monitor the standards of children's work and the quality of teaching in science.
- To be responsible for supporting colleagues in their teaching,
- For bringing information about current developments in the subject and attending Network Meetings
- For providing a strategic lead and direction for science in school.
- To complete an annual evaluation for science and set science priorities.

Impact

Due to pupils acquiring the appropriate age-related knowledge linked to the science curriculum and skills which equip them to progress from their starting points and within their everyday lives, results in pupils at Grindon Infants enjoying science, being motivated learners with sound scientific understanding.



Science Policy

Author's Name	Grindon Infant School
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SIGNATURES:

Head Teacher	
Chair of Governors	