Kington Primary School

Science Policy

Our School Vision

Developing caring, confident and creative children who achieve excellence.

Approved by:	Governors and Staff	**Date:**	June 2022
Last reviewed on:	January 2024		
Next review due by:	January 2025		

The Importance of Science

Our Science Intent:

Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying processing skills. We want to provide our children with rich learning experiences that aim to:

- Prepare our children for life in an increasingly scientific and technological world today and in the future.
- Help our children acquire a growing understanding of the nature, processes and methods of scientific ideas.
- Help develop and extend our children's scientific concept of their world.
- Build on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and developing the skills of investigation – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Develop the use of scientific language, recording and techniques.
- Develop the use of computing in investigating and recording.
- Make links between science and other subjects.
- Provide all children with a broad and balanced science curriculum.

The National Curriculum for science aims to ensure that all pupils:

- have high-quality science education that provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics.
- are taught essential aspects of the knowledge, methods, processes and uses of science.
- are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.
- are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Outcomes

In science education at Kington Primary School we aim to:

- 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.

Implementation of the Science Curriculum

We carry out curriculum planning in science in three phases (long-term, medium-term and short-term). Our science curriculum is delivered using the new Early Years framework (Understanding of the world element) and the 2014 National Curriculum Programmes of Study for Science as a tool to ensure appropriate pace, progression and coverage of the subject. This coverage is reviewed continually by class teachers and planning is adjusted accordingly to ensure appropriate coverage of all science strands.

Foundation Stage

Early Years uses the non-statutory Development Matters guidance to plan. This provides children with the skills to begin to understand the world and guides the children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

Key Stage 1 and 2

The Programmes of Study for Science are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014)

Key Stage 1

The principal focus of science teaching in Key Stage 1 is to ensure that pupils:

- experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.
- are encouraged to be curious and ask questions about what they notice.
- 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, and finding things out using secondary sources of information.
- begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.
- learn about science through the use of first-hand practical experience and some appropriate secondary sources, such as books, photographs and videos.
- are taught ‘Working scientifically’ through clearly related science content in the programme of study
- read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

By the end of Year 2, most pupils should meet the expected standard.

Working at the expected standard

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- ask their own questions about what they notice
- use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions:
  - observing changes over time
  - noticing patterns
  - grouping and classifying things
  - carrying out simple comparative tests
  - finding things out using secondary sources of information
- communicate their ideas, what they do and what they find out in a variety of ways.

Science content

The pupil can:

- name and locate parts of the human body, including those related to the senses [year 1], and describe the importance of exercise, a balanced diet and hygiene for humans [year 2]
- describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults [year 2]
- describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants [year 2]
- identify whether things are alive, dead or have never lived [year 2]
- describe and compare the observable features of animals from a range of groups [year 1]
- group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships [year 2]
- describe seasonal changes [year 1]
- name different plants and animals and describe how they are suited to different habitats [year 2]
- distinguish objects from materials, describe their properties, identify and group everyday materials [year 1] and compare their suitability for different uses [year 2].

Key Stage 2

The principal focus of science teaching in Key Stage 2 is to ensure that pupils:

- broaden their scientific view of the world around them, 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.
- should 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 and finding things out using secondary sources of information.
- should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- **'Work scientifically'**. Scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.
- read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

By the end of Year 6, most pupils should meet the expected standard in science.

Working at the expected standard

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
- ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)
- use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate
- record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways
- raise further questions that could be investigated, based on their data and observations.

Science content

The pupil can:

- name and describe the functions of the main parts of the digestive [year 4], musculoskeletal [year 3] and circulatory systems [year 6]; and describe and compare different reproductive processes and life cycles in animals [year 5]
- describe the effects of diet, exercise, drugs and lifestyle on how the body functions [year 6]
- name, locate and describe the functions of the main parts of plants, including those involved in reproduction [year 5] and transporting water and nutrients [year 3]

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- use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods [year 6]
- construct and interpret food chains [year 4]
- describe the requirements of plants for life and growth [year 3]; and explain how environmental changes may have an impact on living things [year 4]
- use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved [year 6]; and describe how fossils are formed [year 3] and provide evidence for evolution [year 6]
- group and identify materials [year 5], including rocks [year 3], in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties [year 5]
- describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle [year 4]
- identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components [year 5]
- identify, with reasons, whether changes in materials are reversible or not [year 5]
- use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects [year 6], and the formation [year 3], shape [year 6] and size of shadows [year 3]
- use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard [year 4]
- describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source [year 4]
- describe the effects of simple forces that involve contact (air and water resistance, friction) [year 5], that act at a distance (magnetic forces, including those between like and unlike magnetic poles) [year 3], and gravity [year 5]
- identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force [year 5]
- use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams [year 6]
- describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night [year 5].

Cross curricular

Throughout the whole curriculum, opportunities to extend and promote Science should be sought.

Mathematics

This is the subject, which most obviously links with Science. Science offers opportunities for practical application of many mathematical skills from basic computation to the drawing and interpretation of graphs, tables and pie-charts. Through working on investigations children learn to estimate, predict, accurately observe and record events. Science also provides opportunities for practical measurement and comparisons of: time, weight, length, capacity, area, volume and the weather.

English

The whole range of English skills can be developed through Science in a variety of ways:

- Speaking and Listening – Science lends itself to class and group discussions, debate, verbal descriptions and the reporting back of findings from investigations. Scientific vocabulary is developed, broadening children's language.
- Reading – Children must read the instructions from sheets or work-cards in order to carry them out. Research from written sources or ICT based sources is also a key skill. Linking the class reading book to a Science topic is also possible
- Writing - Science can provide many opportunities for the development of non-fiction writing, reporting, recording, instructing and describing. It can also provide an exciting source for creative writing and poetry.

Computing

Staff and children use ICT 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. Children may use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

Geography and History

In examining how scientific ideas affect the world we live in, links with geographical and historical aspects of our environment are inevitable. These links tend to be more obvious in the natural Science context; however, study of the environment also lends itself to work in forces and structures, the nature of materials, energy transfer and other aspects of physical Science.

Personal, Social and Health Education (PSHE) and Citizenship

Science makes a significant contribution to the teaching of PSHE. Firstly, the subject matter, primarily ourselves and growth enhances children's awareness of how bodies change and how to maintain our bodies in a fit and healthy state. Matters of citizenship and social welfare are raised when children study recycling and how environments are changed for better or worse. Opportunities to take part in debate and discussions are also available.

Spiritual, moral and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Science also raises many moral and social questions, e.g. pollution. Children are given 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 children about the reasons why people are different, by developing the children's knowledge and understanding of physical

P.E.

Through PE, children can investigate the impact of physical exercise on the body, specifically the circulatory system and how to maintain a healthy lifestyle.

Teaching and Learning

Science is taught as discrete units and lessons. Where possible, Science is linked to class topics. Due to one form year groups in our school, Science units are taught on a yearly rolling programme. This ensures progression between year groups and guarantees topics are covered. The curriculum is delivered by class teachers. Planning is based upon the new National Curriculum (2014). Programmes of Study inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and develop weekly plans which give details of learning objectives and where appropriate, differentiated activities. We use 'Kent Scheme of Work 'as a starting point for our planning. The PLAN matrices https://www.ase.org.uk/resources/plan-matrices can also be used to support planning in depth coverage of each objective, identifying key vocabulary for each topic and suggestions for further learning applications suitable for discovery learning.

Health and Safety:

Where appropriate, reminders are given to children about potential hazards and care of the equipment they are using. Staff plan for H&S in each lesson, following risk assessments that are kept centrally.

Inclusion and Equal Opportunities

All children are provided with equal access to the Science curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background. All children will have their specific needs met through in a variety of ways. We aim to remove barriers to learning through adaptive teaching. Teachers refer to 'Quality First Teaching' document.

Resources

Science curriculum folder in 'Common Staff' holds many resources to help teachers with planning and assessment.

Resources are stored centrally in two cupboards in the studio.

Assessment

Children in the Foundation Stage are assessed in accordance with the EYFS curriculum.

Assessment for learning is continuous throughout the planning, teaching and learning cycle.

A variety of assessment methods are used, these include:

- Observing children at work (individually, in pairs, in a group and in classes)
- Questioning, talking and listening to children
- Monitoring of pupils' work through book looks
- Children's work is continually monitored and tracked.

At the end of a unit of work teachers may use 'Primary Stem' assessments if they wish. These can be found in the Common staff - Science - Assessment.
In addition to this, the following link, https://www.ase.org.uk/plan, can be used to support teacher assessment of pupils' learning with exemplifications of every topic in each year group. Teachers can use this to support moderation. KS2 SATs data is reported to parents and the Local Authority.

Marking and presentation

Teachers are expected to adhere to the schools marking policy when marking books and presentation policy when guiding children as to how to present their work.

Impact - Monitoring and Evaluating the Science Curriculum

The subject coordinator, alongside the senior management team, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

Review

The science policy will be reflected in our practice. The policy will be reviewed annually.