Science Policy

Costock CE Primary School

Where every child is a star!

'As God's children, we shine like Stars' Philippians 2 v.15

Our Promise

Every day at Costock Church School we are experiencing and learning;

Service to God, each other and ourselves, Truth, Agape and Respect

As we leave each day we take these Christian Values with us

Approved by:	SLT	**Date:**	Autumn 2023
Last reviewed on:	Autumn Term 2023		
Next review due by:	Autumn Term 2026		

Contents

1. Purpose of the policy

This policy reflects the aims and values of Costock C of E Primary School. It ensures all stakeholders, including staff, governors, parents and pupils, are working towards the same goals.

The purpose of this policy is to:

- Set out a framework for all teaching and non-teaching staff, giving guidance on planning, teaching and assessment
- Demonstrate adherence to the National Curriculum objectives and guidelines (if appropriate)
- Provide clear information to parents and carers about what their children will be taught
- Allow the governing board to monitor the curriculum
- Provide Ofsted inspectors with evidence of curriculum planning and implementation

2. Construction of Curriculum (Intent)

"*Science has changed our lives and is vital to the world's future prosperity*"

National Curriculum 2013

At Costock C of E Primary School, we recognise the importance of Science in every aspect of daily life. As one of the core subjects taught in Primary Schools, we give the teaching and learning of Science the prominence it requires.

It is our intent to give all children a strong understanding of the world around them whilst equipping them with the skills and knowledge to help them think scientifically and be Scientists. We encourage children to be inquisitive and strive to foster a healthy curiosity about our universe, promoting respect for both the living and non-living.

At Costock C of E Primary School, in conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children 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;
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- be exposed to a number of scientists and their research and be able to appreciate advances that have been made in science throughout history.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- be scientifically literate and have a strong understanding of scientific vocabulary in the curriculum.
- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

We endeavour to ensure that the Science curriculum we provide will distil a lifelong love for the subject within our pupils and give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experience.

3. Aims and outcomes

By the time pupils leave the school, they should:

- 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

4. Teaching and learning

Science is taught in mixed aged classes by class teachers. The teaching of Science is supported by the Kapow Primary scheme of works. Lesson plans are based around the subject's long-term plan and resources available, with objectives adapted to suit the stage of development for the pupils in each class. The teaching of Science might involve:

- 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

The class teacher, in collaboration with the subject leader, will ensure that the needs of all pupils are met by:

- Setting tasks which can have a variety of responses.

- Providing resources of differing complexity, according to the ability of the pupils.
- Setting tasks of varying difficulty, depending on the ability group.
- Utilising teaching assistants to ensure that pupils are effectively supported.

Focus is put on the development of a deep structural knowledge and the ability to make connections, with the aim of ensuring that what is learnt is sustained over time. Key Skills, knowledge and questions have been identified for each year group.

5. Curriculum overview

Here at Costock C of E Primary School, pupils will follow a Science curriculum that gradually develops learning, the outcome being the acquisition of knowledge and skills that enable each pupil to

5.1 Early Years Foundation Stage (EYFS)

All pupils in the EYFS are taught science as an integral part of the topic work covered during the academic year.

All science objectives within the EYFS are underpinned by the objectives of the early learning goals (ELGs).

The science curriculum in the EYFS is delivered with particular reference to the Area of Learning –

Understanding the World and the ELG - The Natural World, which enables children to:

- Explore the natural world around them, making observations and drawing pictures of animals and plants.

- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

5.2 Key Stage (KS) 1

The national curriculum will be followed for all science teaching.

During Years 1 and 2, pupils will be taught to:

Working scientifically

- 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.

- Gather and record data to help in answering questions.

Year 1 pupils will also be taught to:

Plants

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

- Identify and describe the basic structure of a variety of common flowering plants, including trees.

Animals, including humans

- Identify and name a variety of common animals, including fish, amphibians, reptiles, birds and mammals.

- Identify and name a variety of common animals that are carnivores, herbivores and omnivores.

- Describe and compare the structure of a variety of common animals, i.e. fish, amphibians, reptiles, birds and mammals, including pets.

- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Everyday materials

- Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.

- Describe the simple physical properties of a variety of everyday materials.

- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Seasonal changes

- Observe changes across the four seasons.

- Observe and describe weather associated with the seasons and how day length varies.

Year 2 pupils will also be taught to:

Living things and their habitats

- Explore and compare the differences between things that are living, dead, and things that have never been alive.

- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

- Identify and name a variety of plants and animals in their habitats, including microhabitats.

- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Plants

- Observe and describe how seeds and bulbs grow into mature plants.

- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Animals, including humans

- Notice that animals, including humans, have offspring which grow into adults.

- Find out about and describe the basic needs of animals, including humans, for survival, i.e. water, food and air.

- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Uses of everyday materials

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses.

- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

5.3 Key Stage (KS) 2

During Years 3 and 4, pupils will be taught to:

Working scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.

- Set 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, classify and present 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.

Plants

- Identify and describe the functions of different parts of flowering plants, i.e. roots, stem or trunk, leaves, and flowers.

- Explore the requirements of plants for life and growth, i.e. air, light, water, nutrients from soil, and room to grow, and how requirements vary from plant to plant.

- Investigate the way in which water is transported within plants.

- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Living things and their habitats

- Recognise that living things can be grouped in a variety of ways.

- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

- Recognise that environments can change and that this can sometimes pose dangers to living things.

Animals, including humans

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.

- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

- Describe the simple functions of the basic parts of the digestive system in humans.

- Identify the different types of teeth in humans and their simple functions.

- Construct and interpret a variety of food chains, identifying producers, predators and prey.

Rocks

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.

- Recognise that soils are made from rocks and organic matter.

States of matter

- Compare and group materials together, according to whether they are solids, liquids or gases.

- Observe that some materials change state when they are heated or cooled, and

measure or research the temperature at which this happens in degrees Celsius (°C).

- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Sound

- Identify how sounds are made, associating some of them with something vibrating.

- Recognise that vibrations from sounds travel through a medium to the ear.

- Find patterns between the pitch of a sound and features of the object that produced it.

- Find patterns between the volume of a sound and the strength of the vibrations that produced it.

- Recognise that sounds get fainter as the distance from the sound source increases.

Light

- Recognise that they need light in order to see things and that dark is the absence of light.

- Notice that light is reflected from surfaces.

- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.

- Recognise that shadows are formed when the light from a light source is blocked by an opaque object.

- Find patterns in the way that the size of shadows change.

Forces and magnets

- Compare how things move on different surfaces.

- Notice that some forces need contact between two objects, but magnetic forces can act at a distance.

- Observe how magnets attract or repel each other and attract some materials and not others.

- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.

- Describe magnets as having two poles.

- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Electricity

- Identify common appliances that run on electricity.

- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

- Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery.

- Recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit.

- Recognise some common conductors and insulators, and associate metals with being good conductors.

During Years 5 and 6, pupils will be taught to:

Working scientifically

- 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, in oral and written forms such as displays and other presentations.

- Identify scientific evidence that has been used to support or refute ideas or arguments.

Living things and their habitats

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

- Describe the life process of reproduction in some plants and animals.

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.

- Give reasons for classifying plants and animals based on specific characteristics.

Animals, including humans

- Describe the changes as humans develop to old age.

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

- Describe the ways in which nutrients and water are transported within animals, including humans.

Evolution and inheritance

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Properties and changes of materials

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.

- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.

- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

- Demonstrate that dissolving, mixing and changes of state are reversible changes.

- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Earth and space

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

- Describe the movement of the Moon relative to the Earth.

- Describe the Sun, Earth and Moon as approximately spherical bodies.

- Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky.

Forces

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

- Identify the effects of air resistance, water resistance and friction that act between moving surfaces.

- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Light

- Recognise that light appears to travel in straight lines.

- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.

- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.

- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Electricity

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, and the on or off position of switches.

- Use recognised symbols when representing a simple circuit in a diagram.

5.4 Programmes of study

Costock CofE Primary School Science Rolling Curriculum Long Term Overview						
Cycle A						
Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Twinkle	Human body, teeth	Seasons- Autumn/Winter	Seasons- Winter/Spring	Plants and growing	Minibeasts	Seasons- Summer and keeping healthy in the sun
Class 1	Forces and Spaces - Seasonal Changes (Yr 1)	Materials - Everyday Materials (Yr 1)	Materials - Uses of Everyday Materials (Yr 2)	Plants - Introduction to plants (Yr 1)	Plants - Plant growth (Yr 2)	Making Connections
Class 2	Animals - Movement and Nutrition (Yr3)	Animals - Digestion and food (Yr 4)	Energy - Light and Shadow (Yr 3)	Energy - Electricity and circuits (Yr 4)	Plants - Plant and Reproduction (Yr 3)	Making Connections
Class 3	Living things – Life Cycles and reproduction (Yr 5)	Living things – Classifying big and small (Yr 6)	Living things – Evolution (Yr 6)	Forces + Space – Earth and Space (Yr 5)	Forces + Space – Imbalanced Forces (Yr 5)	Making connections
Cycle B						
Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Twinkle						

Class 1	Forces and Spaces Seasonal Changes (Yr 1)	Living things - Habitats (Yr 2)	Living things - Microhabitats (Yr 2)	Animals - Sensitive bodies (Yr 1)	Animals - Comparing animals (Yr 1)	Animals - Life Cycles and Health (Yr 2) Making Connections
Class 2	Energy - Sound and Vibrations (Yr 4)	Forces and Space - Forces and Magnets (Yr 3)	Materials - Rocks and Soil (Yr 3)	Materials - States of Matter (Yr 4)	Living Things - Classification and changing habitats (Yr 4)	Making Connections
Class 3	Materials – Mixtures and Separation (Yr 5)	Materials – Properties and changes (Yr 5)	Energy – Light and reflection (Yr 6)	Energy – Circuits, batteries and switches (Yr 6)	Animals – Human timeline (Yr 5)	Animals – Circulation and Exercise (Yr 6) Making Connections

6. Cross-curricular links and SMSC

Wherever possible, the science curriculum will provide opportunities to establish links with other curriculum areas. Opportunities will be identified by the subject leaders and by teams of teachers.

English

- Pupils' writing skills are developed through recording their planning, what they observe and what they found out.

- Pupils' speaking skills are developed through their explanations of what they have observed.

Mathematics

- Pupils use their knowledge and understanding of data handling, including through recording their findings on charts, tables and graphs.

- Pupils use their knowledge of measurement to use a range of equipment, such as thermometers and stopwatches, within investigations

PSHE

- Health education is taught as part of the science units about humans, including information about healthy lifestyles, growth, age, and reproduction.

SMSC

- Science supports spiritual development by providing many opportunities for children to think and spend time reflecting on the amazing wonders which occur in our natural world.

- Science supports moral development by showing children that different opinions need to be respected and valued. There are many moral and ethical issues that we cover in science including discussions about environmental and human issues.
- Science supports social development by exposing children to the power of collaborative working in the science community which has led to some amazing and life changing breakthroughs in medicine. When undertaking experiments and research children work collaboratively.
- Science supports cultural development by looking at how scientists from a range of cultures have had a significant impact globally. It also helps children to understand how important science is to the economy and culture of the UK.

7. Assessment and recording

7.1 Assessment

Costock C of E Primary uses assessment to enable staff to understand what pupils have learnt before, what they need to learn now and what they will learn next.

Pupils will be assessed and their progression recorded in line with the school's Primary Assessment Policy. Assessment in science will be based upon scientific knowledge and understanding as well as working scientifically. Pupils will be assessed continually throughout the year.

Formative assessment will be carried out informally throughout the lessons. This will enable teachers to identify pupils' understanding of subjects and inform their immediate lesson planning.

Assessment will take various forms, including the following:

- Talking to pupils and asking questions

- Discussing pupils' work with them

- Marking work against learning objectives

- Specific assignments for individual pupils

- Observing practical tasks and activities

- Pupils' self-evaluation of their work

Summative assessment is completed termly, based on the scientific skills that the medium-term plan requires as a key focus.

At the end of each school year, pupils will be assessed within 1 of the following bands:

- Pre-Key Stage (PKS)
- Working Towards the curriculum (WT)
- Working at Expected (EXP)
- Working at Greater depth (GDS)

The progress and development of pupils within the EYFS is assessed against the early learning goals outlined in the 'Statutory framework for the early years foundation stage'.

Parents will be provided with a written report about their child's progress during the Summer term every year. Reports will include information on the pupil's attitude towards science and the knowledge levels they have achieved. Verbal reports will be provided at parent-teacher meetings during the Autumn and Spring terms.

The progress of pupils with SEND will be monitored by the SENDCO.

Marking
Children receive regular feedback and marking follows the school's marking policy.

7.2 Recording

In Science, pupils will record their learning in the following ways:

- Science books
- Reception-Individual Learning Journey
- Video

This may take the form of photographs, pictures, notes or written work, and may be worksheet-based or fully independent.

8. Resources

8.1 Textbooks and other equipment

Science resources for each unit are stored in the science cupboard in the hallway between Class 2 and Twinkle. The science lead is responsible for ensuring that all resources and equipment are sufficiently maintained, and for maintaining an inventory of resources. The science lead will carry out an annual audit of the science resources, reordering any consumables when necessary. Any equipment or resources which are a cause of concern will be removed from the science cupboard immediately. Equipment will be checked by the relevant teacher prior to each use and any damages or defects will be reported to the science lead immediately. Staff will also inform the science lead of any changes regarding science resources, such as when supplies of resources have been used.

8.2 External speakers, local museums, trips

Opportunities for outdoor learning will be provided where possible. Each class will have the opportunity to undertake science-based external educational visits where appropriate. Throughout their time at school, all children will have the opportunity to take part in Gardening club where they will have the opportunity to plant, grow and eat a variety of plants.

9.1 Headteacher

The headteacher at our school will:

- The overall implementation of this policy.
- Ensuring the school's science curriculum is implemented consistently.
- Ensuring appropriate resources are allocated to the science curriculum.
- Ensuring all pupils are appropriately supported.
- Appointing a member of staff to lead on the school's approach to teaching science.

9.2 Subject Leader

The subject leaders at our school will:

- Preparing policy documents, curriculum plans and schemes of work for science.
- Reviewing changes to the national curriculum and advising on their implementation.
- Monitoring the learning and teaching of science, providing support for staff where necessary.
- Organising the deployment of resources and carrying out an annual audit of all science resources.
- Leading staff meetings and providing relevant staff with the appropriate training.
- Advising on the contribution of science to other curriculum areas

9.3 Governor

The link governor responsible for Science at our school will:

- Monitor the impact of the subject across the school and on pupils
- Monitor teacher workload and professional development
- Ensure subject action plans are suitable
- Monitor the quality of resources

- Keep track of pupil and parent engagement with the subject
- Keep up to date with the curriculum (what's taught, why it's taught, and how it's taught)

9.4 Classroom teacher

- Acting in accordance with this policy.

- Ensuring that lessons are taught in line with the school's Health and Safety Policy at all times.
- Liaising with the science lead about key topics, resources and support for individual pupils if required.
- Ensuring that all relevant statutory content is covered within the school year.
- Monitoring the progress of pupils in their class and reporting this on an annual basis.
- Reporting any concerns regarding the teaching of the subject to the science lead or a member of the SLT.
- Undertaking any training that is necessary to teach the subject effectively. 9.5 Parents

9.5 Parents

The parent community at our school will:

- Make sure their children are prepared for learning
- Monitor the completion of home learning tasks

10. Inclusion

Teachers set high expectations for all pupils in Science. They will use appropriate assessment to set ambitious targets and plan challenging work for all groups, including:

- More able pupils
- Pupils with low prior attainment
- Pupils from disadvantaged backgrounds
- Pupils with special educational needs (SEN)
- Pupils with English as an additional language (EAL)

Teachers will plan lessons so pupils with SEN and/or disabilities can study Science, wherever possible, and ensure that there are no barriers to every pupil achieving.

Teachers will also take account of the needs of pupils whose first language is not English. Lessons will be planned so that teaching opportunities help pupils to develop their English, and to support pupils to take part in Science.

Further information can be found in our statement of equality information and objectives, and in our SEN policy and information report.

11. Links to other policies

This subject policy links to the following policies and procedures:

- Curriculum policy

- Assessment policy
- Marking and Feedback policy
- SEND policy

12. Monitoring and review

This policy will be reviewed by SLT every 3 years or sooner if required.