Science Policy

For I know the plans I have for you, plans to prosper you and not to harm you, plans to give you hope and a future.
Jeremiah 29:11

Date of policy/review	Author	Approved by	Signature	Date for review
Sept 2023	J Dawes	Mrs Bottell	See Paper Copy	Dec 2025

Mission Statement of Nutgrove Methodist Primary School

Nutgrove Methodist Primary School strives to provide a caring environment in which every individual can achieve his or her full potential, without limits.

This is encompassed by our Bible verse For I know the plans I have for you," declares the Lord, "plans to prosper you and not to harm you, plans to give you hope and a future. Jeremiah 29:11.

To achieve this, we wish to create a happy, secure and purposeful culture throughout the school, which is conducive to learning and high standards, and is based on our Christian values, love, hope and respect.

Our school's motto and vision is 'My Best, Always, Everywhere' which is interwoven within our curriculum intent and design.

Safeguarding Statement

At Nutgrove Methodist Primary School we recognise our moral and statutory responsibility to safeguard and promote the welfare of all children.

We work to provide a safe and welcoming environment where children are respected and valued. We are alert to the signs of abuse and neglect and follow our procedures to ensure that children receive effective support, protection and justice.

The procedures contained in the Child Protection and Safeguarding Policy apply to all staff, volunteers and governors.

Introduction

At Nutgrove Methodist 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. The scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with science, encouraging inquiry-based learners. The experience of pupils using scientific methods of investigation should develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities to developing children's questioning. The National Curriculum will provide a structure and skill development for the science curriculum taught throughout the school. We endeavour to ensure that the Science curriculum we provide, will give children the confidence and motivation to continue to further develop their skills into the next stage of education and adulthood.

Roles and responsibilities

- The Science Lead is responsible for providing an overview of the subject across the school to inform staff planning and to offer advice of how the curriculum can be delivered in an effective and engaging way.
- They should have an up-to-date knowledge of the subject requirements and ensure that these are met across the school, as well as having an overview of assessment.
- They are responsible for ensuring that an overview of the subject is available on the school website.
- The Science Lead also has a sound knowledge of the resources, which are available within school, and will advise the Head Teacher of any action needed to ensure that resources are replenished and updated as necessary.
- The Science Lead will work closely with class teachers in the planning of any science related events.
- The Science Lead will monitor the teaching and learning of science throughout the school.
- The governor for science is responsible for ensuring there is a good professional dialogue with the subject leader throughout the school year.

Intent:

The intent of our science curriculum is to deliver a curriculum which is accessible to all and that will maximise the outcomes for every child so **that they know more, remember more and understand more.**

Science teaching at Nutgrove Methodist Primary school intends to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of science, today and for the future.

At Nutgrove Methodist Primary School, scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school. Topics, such as 'Plants', are taught in Key Stage One and studied again in further detail throughout Key Stage Two. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory.

Pupils will be provided with the opportunities to explore, discover and investigate. These first hand experiences will in turn enable them to understand more about the world they live in. We aim to ensure such experiences will be appropriate, relevant, challenging and satisfy the children's curiosity.

We aim to:

• Build on the children's natural curiosity and develop an enthusiasm and enjoyment of scientific learning and discovery.
• Teach the children scientific knowledge and conceptual understanding through the specific disciplines of Biology, Physics and Chemistry.
• Teach the children scientific skills.
• Stimulate them to investigate, question and develop attitudes of science.
• Teach them to communicate ideas using appropriate scientific language.

Knowledge and Understanding

Children should:

- Be curious about things they observe, experience and explore the world about them with all of their senses.
- Use this experience to develop their understanding of key scientific ideas and make links between different phenomena and experiences.
- Begin to think about models to represent things they cannot directly experience.
- Try to make sense of phenomena, seeking explanations and thinking critically about claims and ideas.

Processes and Skills

Children should:

- Acquire and refine the practical skills needed to investigate questions safely.
- Develop skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work.
- Practical mathematical skills in real contexts.
- Learn why numerical and mathematical skills are useful and helpful to understanding.

Language and Communication

Children should:

- Think creatively about science and enjoy trying to make sense of phenomena.
- Develop language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds.
- Use scientific and mathematical language including technical vocabulary and conventions and draw diagrams and charts to communicate scientific ideas.
- Read non-fiction and extract information from sources such as reference books, CD-ROMs or the Internet.

Values and Attitudes

Children should:

- Work with others, listening to their ideas and treating these with respect.
- Develop respect for evidence and evaluate critically ideas, which may not fit evidence available.
- Develop a respect for the environment and living things and for their own health and safety.

Implementation:

Individual teachers are responsible for the day-to-day planning, delivery and assessment of the science curriculum. The curriculum is taught in units through a combination of whole class teaching, group and individual work. The units are based on the 2014 National Curriculum for Science KS1 & KS2 (see long term plan) with scope for teacher's own initiatives and ideas. Curriculum Maestro is used in all classes to aid planning and to ensure progression. Teaching and learning should show progression across all key stages within the strands of science (see progression document).

Teachers will encourage the children to have skills of observation, discussion, debate and research. In order to ensure the children receive a balanced science curriculum, it is essential that elements from each of the Attainment Targets be taught each year, with particular emphasis on working scientifically. Throughout our science teaching we hope that our children will develop a sense of awe and wonder about the world around them.

Principles of good science

- Children's curiosity is encouraged and valued; they are excited and enthusiastic when anticipating in their science lessons.
- Science is practical and hands on and children enjoy learning through exploration and questioning; they have the opportunity to use good quality resources.
- Enrichment events/school visits/workshops happen regularly.
- Progression of science skills is evident and taught throughout the school.
- Children confidently use accurate scientific vocabulary in context.
- Teachers use different assessment strategies during science lessons.
- All pupils are actively engaged in a science enquiry; using a variety of enquiry strategies, independently making decisions, answering their own questions.

Considering the principles of good science, teachers will provide:

- A dedicated science lesson per week or a blocked unit of work per half term – each class has a focus in science which follows the National Curriculum and science progression document.
- An opportunity for children to revisit previous learning.
- The opportunity for children to build on prior knowledge and link ideas together.
- A cycle of lessons for each subject, which carefully plans for progression and depth.
- A knowledge organiser which outlines knowledge (including key vocabulary) all children must master.
- The opportunity to obtain and present evidence through observations, comparisons and collected data.
- Quizzes which assess learning in an informal manner.
- Challenge questions for pupils to apply their learning.
- Trips and visits from experts who will enhance the learning experience.

Foundation Stage

During the Foundation Stage children begin to explore the world around them, with specific Science work covered through the Early Learning Goal 'Understanding of the World'.

Assessment

Formative assessment is used to guide the progress of individual pupils in science. It involves identifying each child's progress in each area of the science curriculum, determining what each child has learnt and what therefore should be the next stage in his/her learning. Teachers in the course of their teaching usually carry out formative assessment informally.
Suitable tasks include:

- Small group discussions, usually in the context of a practical task.
- Specific arrangements for particular pupils.
- Individual discussions in which children are encouraged to approve their own work and progress.

Wherever possible experimental and investigative work should form the basis for the teaching of science. Children should be given as many opportunities as possible to carry out investigations and experiments. During each term a 'working scientifically' assessment should be carried out.

Summative assessment takes place at the end of each unit of work using Curriculum Maestro tests which are completed at the end of each topic.

Inclusion

At Nutgrove, teachers ensure that they adopt an inclusive approach to their science planning and teaching; ensuring that pupils of all abilities and backgrounds have an equal opportunity to make good progress and enjoy science.

Special Educational Needs

All children are encouraged and supported to develop their full potential in science. Some children may require extra support in the classroom and opportunities for consolidation and reinforcement. Activities are scaffolded to meet the needs of all pupils.

Equal Opportunities

All children are entitled to access to the science curriculum in line with the school's policy for equal opportunities. Children who show a particular ability and flair for science will have their learning extended through the use of more challenging problems and investigations.

Impact

- Children enjoy and are enthusiastic about science at Nutgrove.
- There is clear progression of children's work and teacher's expectations.
- Children's work shows a range of topics and evidence of the curriculum coverage for all science topics.
- Children are developing independence in science lessons and there are some pupil led investigations.
- Children will work collaboratively and practically to investigate and experiment.
- Most children will achieve age related expectations in science at the end of each topic.
- Children will retain knowledge.
- Children will be able to question ideas and reflect on knowledge.
- Children will be able to explain the process they have taken and be able to reason scientifically.

How SMSC are integrated in the Science curriculum.

Pupils' spiritual, moral, social and cultural education is considered a whole school issue. Spiritual, moral, social and cultural development is promoted not only through all the subjects of the curriculum but also through the ethos of the school, through the development of positive attitudes and values and planned time for reflection. This policy supports and reinforces the aims of Nutgrove School, valuing all children and staff equally and as individuals.

At Nutgrove, science contributes to children's SMSC development through:

Spiritual Education

Spiritual education is enhanced through a variety of practical and enquiring processes within science. Pupils are encouraged to reflect on the wonder of the natural world. They are encouraged to ask questions about how living things rely on and contribute to their environment. This promotes openness and confidence to voice an opinion. Through science, pupils are achieving a sense of enjoyment and fascination about themselves, others and the world around them.

Moral Education

Moral education involves pupils having awareness of the ways that science and technology can affect society and the environment. Pupils develop an interest in investigating and offering reasoned views about moral issues. Pupils are given the chance to consider the wonder of the natural world and the inventions, which have made the world a better place. Teaching allows opportunities for pupils to speculate about how science has both a positive and sometimes a negative result on their own environment.

Social Education

Social education involves students working within a group, listening and respecting the views of all the members. They need to work cooperatively within practical activities. Often they will have to show respect for differing opinions. Through learning about our environment, pupils will be exploring the social dimension of scientific advances and energy processes with time to reflect upon their impact.

Cultural Education

Cultural education in science means pupils may have the opportunity to learn about the ways in which scientific discoveries from around the world have affected their own lives. Raising awareness that scientific developments are the product of many different cultures.

Resources

Central resources in science are the responsibility of the Science Lead who has a budget available.

Science equipment is audited annually. Consumables are replaced and discussions with staff determine if there are any other pieces of equipment required in order to enhance the teaching and learning of science. All science equipment is stored in the designated science cupboards in the resource room. Children are encouraged to value and take care of all equipment.

Whole year science overview

Listed below are the units which need to be covered in each year group. The order of the units can be changed to fit in with other curriculum topics.

Nutgrove Methodist Primary School

LONG TERM SCIENCE CURRICULUM PLAN 2023/2024

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1	Everyday Materials Materials; Natural materials; Human-made materials; Grouping materials; Properties of materials; Venn diagrams; Comparing and testing materials; Working scientifically – Identifying and classifying, Observing changes over time, Comparative test, Pattern seeking, Research	Human senses This project teaches children that humans are a type of animal, known as a mammal. They name body parts and recognise common structures between humans and other animals. They learn about the senses, the body parts associated with each sense and their role in keeping us safe.	Seasonal changes Seasons; Seasonal changes in deciduous and evergreen trees; Seasonal changes in animals; Weather; Seasonal weather; Day length; Investigating the Sun; Measuring wind; Measuring temperature; Measuring precipitation; Weather forecasting; Working scientifically – Observing changes over time, Identifying and classifying, Pattern seeking, Comparative test, Research	Seasonal changes Seasons; Seasonal changes in deciduous and evergreen trees; Seasonal changes in animals; Weather; Seasonal weather; Day length; Investigating the Sun; Measuring wind; Measuring temperature; Measuring precipitation; Weather forecasting; Working scientifically – Observing changes over time, Identifying and classifying, Pattern seeking, Comparative test, Research	Plant Parts Wild and garden plants; Seasonal changes; Plant parts; Seeds and bulbs; Investigating leaves; Importance of plants; Working scientifically – Identifying and classifying, Observing changes over time, Pattern seeking, Research, Comparative test	Animal parts Animals' body parts; Animal groups – amphibians, birds, fish, invertebrates, mammals, reptiles; Carroll and Venn diagrams; Pets; Carnivores, herbivores and omnivores; Earthworms; Working scientifically – Identifying and classifying, Comparative test, Pattern seeking, Research
YEAR 2	Human survival Human life cycle; Human needs for health and survival; Healthy lifestyle; Bodily hygiene routines; Handwashing investigation; How germs spread; Working scientifically	Habitats This project teaches children about habitats and what a habitat needs to provide. They explore local habitats to identify and name living things and begin to understand how	Uses of materials Identifying materials and their properties; Shaping materials; Uses of materials; Linking properties to use; Sustainability and recycling; Working scientifically –	Plant survival Plant parts; Seasonal changes in plants; Investigating germination; Investigating plant growth; Unusual plants; Working scientifically – Observing changes	Animal survival Habitats; Invertebrates and invertebrate groups; Microhabitats; Animal needs for survival; Food chains; Human impact on habitats; Animal	Animal survival Habitats; Invertebrates and invertebrate groups; Microhabitats; Animal needs for survival; Food chains; Human impact on habitats; Animal offspring;

	– Identifying and classifying, Observing changes over time, Comparative test, Pattern seeking, Research	they depend on one another for food and shelter.	Identifying and classifying, Pattern seeking, Comparative tests, Research	over time, Identifying and classifying, Pattern seeking, Comparative test, Research	offspring; Lifecycles – amphibians, birds, invertebrates, mammals and reptiles; Seasonal changes in animals; Habitat improvements; Working scientifically – Identifying and classifying, Observing changes over time; Pattern seeking; Research	Lifecycles – amphibians, birds, invertebrates, mammals and reptiles; Seasonal changes in animals; Habitat improvements; Working scientifically – Identifying and classifying, Observing changes over time; Pattern seeking; Research
YEAR 3	Animal Nutrition and the Skeletal and muscular systems Living things; Carnivores, herbivores and omnivores; Human diet; Human nutrition and food groups; Fatty foods; Seasonal changes in animals' diets; Human skeleton; Joints; Muscles; Skeleton types – endoskeletons and exoskeletons; Working scientifically – Identifying and classifying, Observing changes over time, Comparative test, Pattern seeking, Research	Animal Nutrition and the Skeletal and muscular systems Living things; Carnivores, herbivores and omnivores; Human diet; Human nutrition and food groups; Fatty foods; Seasonal changes in animals' diets; Human skeleton; Joints; Muscles; Skeleton types – endoskeletons and exoskeletons; Working scientifically – Identifying and classifying, Observing changes over time, Comparative test, Pattern seeking, Research	Forces and magnets Pushing and pulling forces; Contact forces; Friction; Force meters; Bar charts; Non-contact forces; Magnetism; Magnetic attraction and repulsion; Magnetic fields; Magnetic properties; Magnetic Earth; Uses of friction and magnetism; Working scientifically – Identifying and classifying, Pattern seeking, Comparative tests, Research	Rocks; Fossils; Soils (Rocks Relics and Rumbles) Science investigations: How do fossils form? What is sand? What is soil?	Plant nutrition and reproduction Plant parts; Root systems; Stems; Water transport; Investigating leaves; Life cycle of flowering plants; Flower parts; Researching pollination; Seed formation and dispersal; Variation in plant needs; Working scientifically – Identifying and classifying, Observing changes over time, Pattern seeking, Research, Comparative test	Light and Shadows Light; Light sources and reflectors; Reflective and non-reflective materials; Sun safety and protection; Shadows; Opaque, transparent and translucent materials; Changes in shadows; Working scientifically – Identifying and classifying, Observing changes over time, Comparative tests, Pattern seeking, Research
YEAR 4	Food and the Digestive system Producers and consumers; Ecosystems; Food chains and food webs; Changes in ecosystems; Digestive system; Teeth types – incisors, canines, premolars, molars;	Sound This project teaches children about sound and how sounds are made and travel as vibrations through a medium to the ear. They learn about pitch and volume and find out how both can	States of Matter Classifying solids, liquids and gases; Unusual materials; Particle theory; Change of state; Melting, freezing, evaporation and condensation; States of water; Measuring temperature;	Grouping and classifying Types of classification; Taxonomy; Understanding and creating classification keys; Animal kingdom; Plant kingdom; Classifying new discoveries;	Electrical circuits and conductors Science: Sources of electricity; Electrical devices; Electrical components; Series circuits; Complete and incomplete circuits; Conductivity;	Electrical circuits and conductors Science: Sources of electricity; Electrical devices; Electrical components; Series circuits; Complete and incomplete circuits; Conductivity;

	Teeth health and dental hygiene; Working scientifically – Identifying and classifying, Observing changes over time, Comparative test, Pattern seeking, Research	be changed.	Investigating melting; Line graphs; Researching melting and boiling points; Working scientifically – Observing changes over time, Identifying and classifying, Pattern seeking, Comparative test, Research	Working scientifically – Identifying and classifying, Pattern seeking, Research	Conductors and insulators; Wired plugs; Incandescent light bulbs; Future of electricity; Working scientifically – Identifying and classifying, Pattern seeking, Comparative test, Research	Conductors and insulators; Wired plugs; Incandescent light bulbs; Future of electricity; Working scientifically – Identifying and classifying, Pattern seeking, Comparative test, Research
YEAR 5	Forces and Mechanisms Contact and non-contact forces; Gravity; Mass and Weight; Discovering gravity – important scientists; Friction; Air resistance; Water resistance; Mechanisms – levers, pulleys, gears; Investigating forces and mechanisms; Working scientifically – Identifying and classifying, Observing changes over time, Comparative tests, Research, Pattern seeking.	Earth and space This project teaches children about our Solar System and its spherical bodies. They describe the movements of Earth and other planets relative to the Sun, the Moon relative to Earth and the Earth's rotation to explain day and night.	Human reproduction and ageing Animal life cycles; Stages and processes; Classifying mammals; Mammalian life cycles; Interpreting scatter graphs; Human life cycle; Human gestation stage; Human juvenile stage; Human adolescent stage; Puberty; Venn diagrams; Interpreting line graphs; Human sexual reproduction; Human ageing; Working scientifically – Observing changes over time, Identifying and classifying, Pattern seeking, Comparative test, Research	Human reproduction and ageing (Sow Grow and Farm) Animal life cycles; Stages and processes; Classifying mammals; Mammalian life cycles; Interpreting scatter graphs; Human life cycle; Human gestation stage; Human juvenile stage; Human adolescent stage; Puberty; Venn diagrams; Interpreting line graphs; Human sexual reproduction; Human ageing; Working scientifically – Observing changes over time, Identifying and classifying, Pattern seeking, Comparative test, Research	Properties and changes of materials Properties of materials; Thermal conductivity; Measuring temperature; Thermal insulators; Solubility; Heterogeneous and homogeneous mixtures; Sieving; Filtration; Evaporation; Separating unusual mixtures; Reversible and irreversible changes; Innovative materials; Working scientifically – Identifying and classifying, Observing changes over time, Comparative tests, Research, Pattern seeking	Properties and changes of materials Properties of materials; Thermal conductivity; Measuring temperature; Thermal insulators; Solubility; Heterogeneous and homogeneous mixtures; Sieving; Filtration; Evaporation; Separating unusual mixtures; Reversible and irreversible changes; Innovative materials; Working scientifically – Identifying and classifying, Observing changes over time, Comparative tests, Research, Pattern seeking.
YEAR 6	Circulatory system Bodily systems; Circulatory system – role and main parts; Heart – structure and	Circulatory system Bodily systems; Circulatory system – role and main parts; Heart –	Electrical circuits and components Science: Series circuits; Circuit components;	Adaptation (Frozen Kingdoms) **Science:** Classifying living	Light theory Light facts; How light travels; Light, sight and the human eye; Visible	Evolution and inheritance Five kingdoms, microorganisms and viruses; Classifying fossils;

	function; Blood – components and functions; Blood vessels – structure and function; Measuring heart rate; Proving a hypothesis; Heart rate investigation; Classifying foods; Effects of smoking, alcohol and drugs; Heart rate recovery investigation; Working scientifically – Identifying and classifying, Comparative test, Pattern seeking, Research	structure and function; Blood – components and functions; Blood vessels – structure and function; Measuring heart rate; Proving a hypothesis; Heart rate investigation; Classifying foods; Effects of smoking, alcohol and drugs; Heart rate recovery investigation; Working scientifically – Identifying and classifying, Comparative test, Pattern seeking, Research	Recognised circuit symbols; Investigating circuit components; Electric current; Voltage; Researching cells and batteries; Investigating voltage changes; Working scientifically – Identifying and classifying, Pattern seeking, Comparative test, Research. Computing: Programming; Animating LEDs; Introducing repeats; Sensors and monitoring. D&T: Sensors and monitoring; Designing and making home devices; Incorporating programming and circuits in products.	things; Classification keys; Adaptation; Investigations. **Science investigations:** Can we slow cooling down? How do animals stay warm?	light; Perceiving colour; Shadows; Reflections; Plane, concave and convex mirrors; Measuring light; Refraction; Working scientifically – Identifying and classifying, Comparative tests, Pattern seeking, Research	Theory of evolution and evolutionary tree diagrams; Inheritance and variation – continuous and discontinuous variation; Natural selection and survival of the fittest; Adaptations in birds' beaks; Adaptations in plants; Artificial selection; Testable hypothesis; Working scientifically – Identifying and classifying, Comparative test, Pattern seeking, research