

SCIENCE WHOLE SCHOOL OVERVIEW



*Love, Care, Share...
Love learning as friends;
Care for our community as
neighbours;
Share our faith in Jesus as disciples.*



St. Ethelbert's RCP

Whole School Overview for Science

SCIENCE STATEMENT OF INTENT

At St. Ethelbert's Primary School, we aim to give our children a strong understanding of God's world, whilst developing the subject-specific knowledge and skills to help them to think scientifically; to gain an understanding of scientific processes and an understanding of the uses and implications of Science today and for the future. Our science curriculum is progressive and inclusive for ALL children.

Scientific enquiry skills are developed throughout each topic and these are re-examined and embedded throughout their time at school. For example, Light is taught in Year 3 and studied again in further detail in Year 6. This model allows children to build upon their prior knowledge whilst increasing their enthusiasm and confidence for the topics, embedding this information into their long-term memory.

All children are encouraged to develop and use a range of skills including reading, observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific-based questions.

Subject-specific vocabulary for each topic is taught, built up and reinforced throughout the Key Stages. Effective questioning to explore ideas is encouraged, with enquiries focussing on the key features of scientific enquiry so that pupils learn to use a variety of approaches to answer scientific questions.

PREVIOUSLY COVERED IN EYFS

WORKING SCIENTIFICALLY

- To feel confident to answer simple questions about observable properties of objects and people, animals and plants around them.
- To compare objects in their environment and talk about similarities and differences.
- To ask questions about the world around them, and seek to find their own answers.

KEY KNOWLEDGE & SKILLS

- To know what a plant and a flower is, where you may see them and describe different plants and flowers.
- To know what an animal is, name different animals and know the names of body parts of humans and different animals they have experience of.
- To recognise that different everyday object are made from different materials and to describe how the look and feel.

- To know about different types of weather and observe seasonal changes in trees and plants.

KS1 National Curriculum: Working Scientifically

Pupils should be taught to:

- ask simple questions and recognising 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

Autumn Term	Spring Term	Summer Term
UNIT: Animals, Including Humans (Me)	UNIT: Everyday Materials (Three Little Pigs)	UNIT: Animals, Including Humans (Animals)
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will identify and name the main parts of the human body and learn which body part is linked to each of the five senses. They will investigate sight, hearing, taste, touch and smell through simple practical activities and observations. Pupils will ask simple scientific questions, identify and classify body parts, carry out simple tests and use their observations to answer questions.	In this unit, pupils will identify and compare a range of everyday materials, including wood, plastic, metal, glass, rock, paper and fabric. They will investigate the properties of materials, such as whether they are hard, soft, strong, transparent, absorbent or waterproof, and explore why different materials are suitable for different purposes. Throughout the unit, pupils will observe, compare, identify and classify materials, carry out simple tests and use evidence to answer scientific questions.	In this unit, pupils will identify and classify a variety of common animals, including mammals, birds, fish, amphibians and reptiles. They will compare animals by their features, explore the difference between wild animals and pets, and learn how animals can be grouped by what they eat. Throughout the unit, pupils will observe, compare and classify animals, using evidence to answer scientific questions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know the names of the main parts of the human body. • Know that we use our eyes to see. • Know that we use our ears to hear. • Know that we use our nose and tongue to smell and taste. • Know that we use our skin to feel and touch.	• Know the names of common materials: wood, plastic, metal, glass, rock, paper and fabric. • Know that different materials have different properties. • Know that some materials are waterproof, while others absorb water. • Know that different materials are suitable for different purposes.	• Know that mammals have hair or fur. • Know that birds have feathers. • Know that fish have scales. • Know that reptiles have dry scales and amphibians have moist skin. • Know that carnivores eat meat, herbivores eat plants and omnivores eat both. • Know that wild animals live in natural habitats and pets are cared for by people.

	• Know that scientists compare and classify materials by their properties.	• Know that scientists group animals by their features.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
• Ask simple scientific questions. • Observe carefully using the five senses. • Identify and classify body parts and senses. • Carry out simple tests. • Use observations to answer scientific questions.	• Observe materials carefully. • Identify and classify materials by their properties. • Carry out simple comparative tests. • Record observations using pictures and simple tables. • Use observations to answer scientific questions.	• Observe animals carefully. • Identify and classify animals into groups. • Compare animals by their features. • Record observations using pictures and simple tables. • Use observations to answer scientific questions.

Throughout the year

UNIT: Seasonal Changes

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will observe and describe the changes that occur across the four seasons and explore the different types of weather associated with each season. They will investigate how day length changes throughout the year and learn how weather can be measured using simple equipment, such as a rain gauge. Throughout the unit, pupils will observe over time, identify patterns, carry out simple tests and record their findings to answer scientific questions.

KEY STICKY KNOWLEDGE

- Know that there are four seasons: spring, summer, autumn and winter.
- Know that the weather changes with the seasons.
- Know that the length of the day changes throughout the year.
- Know that some plants and trees change with the seasons.
- Know that animals change their behaviour with the seasons, for example hibernating in winter.
- Know that rainfall can be measured using a rain gauge.

WORKING SCIENTIFICALLY

- Observe seasonal changes over time.
- Ask simple scientific questions.
- Identify and classify seasonal changes.
- Carry out simple tests using a rain gauge.
- Gather, record and use data to answer scientific questions.

UNIT: Plants

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will identify and name common wild and garden plants, including deciduous and evergreen trees. They will identify the main parts of flowering plants and investigate what plants need to grow and stay healthy. Pupils will observe how plants grow over time and recognise that many fruits and vegetables come from plants. Throughout the unit, pupils will ask simple scientific questions, observe plants over time, identify and classify plants, and gather and record data to answer scientific questions.

KEY STICKY KNOWLEDGE

- Know the main parts of a plant: roots, stem, leaves and flower.
- Know that roots take in water and hold the plant in the ground.
- Know that plants need water, light and soil to grow.
- Know that deciduous trees lose their leaves and evergreen trees keep theirs all year.
- Know that seeds grow into plants.
- Know that fruit and vegetables come from plants.

WORKING SCIENTIFICALLY

- Ask simple scientific questions.
- Observe plants closely and over time.
- Identify and classify common plants and trees.
- Gather and record data using simple equipment.
- Use observations to answer scientific questions.

Year 2

Autumn Term

Spring Term

Summer Term

UNIT: Animals Including Humans (Growth)

UNIT: Living Things and Their Habitats

UNIT: Plants

KEY KNOWLEDGE & SKILLS:

KEY KNOWLEDGE & SKILLS:

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will learn about the basic needs of animals, including humans, for survival. They will explore the importance of healthy eating, exercise and hygiene in keeping our bodies healthy. Pupils will investigate what makes a balanced diet and how different food groups help our bodies. Throughout the unit, they will use observations, simple tests and evidence to answer scientific questions.

In this unit, pupils will explore the differences between living, dead and never-living things. They will investigate a variety of habitats and microhabitats, learning how plants and animals are suited to the places where they live. Pupils will also explore simple food chains and discover how animals depend on plants and other animals for food. Throughout the unit, they will observe closely,

In this unit, pupils will investigate how seeds and bulbs grow into mature plants. They will find out what plants need to grow and stay healthy by carrying out simple investigations. Pupils will observe how plants change over time and explore the life cycle of a plant from seed to mature plant. Throughout the unit, they will observe closely, perform simple tests and use evidence to answer scientific questions.

	identify and classify living things, and use evidence to answer scientific questions.	
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that animals, including humans, need food, water and air to stay alive. • Know that humans need a balanced diet to stay healthy. • Know that different foods belong to different food groups. • Know that exercise helps keep us healthy and strong. • Know that good hygiene helps stop germs spreading.	• Know that some things are living, some are dead and some have never been alive. • Know that different plants and animals live in different habitats because they meet their needs there. • Know that a microhabitat is a small habitat where living things can survive. • Know that animals depend on plants or other animals for food. • Know that a simple food chain shows how food passes from one living thing to another.	• Know that seeds and bulbs grow into mature plants. • Know that plants need water, light and a suitable temperature to grow and stay healthy. • Know that plants grow and change as they get older. • Know that flowering plants produce seeds that can grow into new plants. • Know that scientists use fair tests to find out what plants need to grow.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
• Ask simple scientific questions. • Observe plants closely and over time. • Identify and classify common plants and trees. • Gather and record data using simple equipment. • Use observations to answer scientific questions.	• Observe closely using simple equipment. • Identify and classify living things. • Ask simple scientific questions. • Gather and record data to answer questions. • Use observations and evidence to answer scientific questions.	• Observe closely using simple equipment. • Ask simple scientific questions. • Perform simple comparative tests. • Gather and record data to answer questions. • Use observations and evidence to answer scientific questions.
UNIT: Animals Including Humans (Life Cycles)	UNIT: Living Things and Their Habitats (Around the World)	UNIT: Uses of Everyday Materials
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will explore how animals, including humans, grow and change as they develop into adults. They will compare the life cycles of different animals, including frogs, butterflies and chickens, and identify similarities and differences between young animals and their parents. Throughout the unit, pupils will observe, identify patterns and use evidence to answer scientific questions.	In this unit, pupils will explore habitats from around the world and investigate how animals and plants are suited to the environments in which they live. They will compare a range of habitats, including rainforests, oceans, deserts and polar regions, and consider how living things depend on one another for survival. Pupils will use observations, identify and classify living things, and gather evidence to answer scientific questions.	In this unit, pupils will investigate the properties of everyday materials and explore why different materials are suitable for different purposes. They will compare materials, carry out simple tests and investigate how some materials can be changed by squashing, bending, twisting and stretching. Throughout the unit, pupils will use observations, perform simple tests and gather evidence to answer scientific questions
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	

- Know that animals, including humans, have offspring that grow into adults.
- Know that young animals often look like their parents but are not exactly the same.
- Know that humans grow and change throughout their lives.
- Know that different animals have different life cycles.
- Know that living things grow, change and reproduce.

- Know that different habitats provide the things plants and animals need to survive.
- Know that plants and animals are suited to the habitats where they live.
- Know that living things depend on each other in a habitat.
- Know that habitats around the world are different.
- Know that habitats can change and this can affect the plants and animals living there.

- Know that different materials are suitable for different purposes.
- Know that materials have different properties, such as hard, soft, waterproof and flexible.
- Know that some materials can be changed by bending, twisting, squashing and stretching.
- Know that some materials are better suited to a job than others.
- Know that scientists compare and test materials to find the most suitable one.

WORKING SCIENTIFICALLY

- Observe closely and identify similarities and differences.
- Identify and classify living things.
- Ask simple scientific questions.
- Gather and record data to answer questions.
- Use observations and evidence to answer scientific questions.

WORKING SCIENTIFICALLY

- Observe closely and identify similarities and differences.
- Identify and classify living things.
- Ask simple scientific questions.
- Gather and record data to answer questions.
- Use observations and evidence to answer scientific questions.

- Observe closely and compare materials.
- Ask simple scientific questions.
- Perform simple comparative tests.
- Gather and record data to answer questions.
- Use observations and evidence to answer scientific questions.

Lower KS2 National Curriculum: Working Scientifically

Pupils should be taught to:

- ask relevant questions and using 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, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering 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.

Year 3

Year 3		
Autumn Term	Spring Term	Summer Term
UNIT: Forces and Magnets	UNIT: Animals Including Humans (Skeletons and Muscles)	UNIT: Light and Dark
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how different forces affect the movement of objects. They will explore pushes, pulls and friction through practical investigations before investigating magnetic forces and identifying which materials are magnetic. Pupils will learn about the properties of magnets, including poles and attraction, and will use scientific enquiry to make predictions, carry out fair tests and present their findings.	In this unit, pupils will investigate how skeletons and muscles help animals and humans to move, support and protect their bodies. They will identify different types of skeletons, explore how bones and muscles work together to create movement, and compare vertebrates and invertebrates. Pupils will investigate patterns, take measurements, record results and use evidence to answer scientific questions about the human body.	In this unit, pupils will investigate how light enables us to see and identify different sources of light. They will explore how light is reflected from surfaces, learn about ultraviolet (UV) rays from the Sun and investigate how sunscreen helps protect our skin by carrying out comparative tests. Pupils will discover how shadows are formed and change through practical investigations. Throughout the unit, they will observe over time, identify patterns, carry out comparative tests and use evidence to answer scientific questions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know that a force is a push or a pull which can change the movement of an object. - Know that friction is a force that slows objects down. - Know that magnets attract some materials but not others. - Know that every magnet has a north pole and a south pole, where opposite poles attract and like poles repel. - Know that scientists make predictions and carry out fair tests to answer questions.	- Know that the skeleton supports the body, protects organs and helps us move. - Know that muscles work in pairs by contracting and relaxing to move bones. - Know that bones grow as we grow but stop growing when we become adults. - Know that vertebrates have a backbone, while invertebrates do not. - Know that some animals, such as crabs and insects, have an exoskeleton on the outside of their body.	- Know that we need light to see and that darkness is the absence of light. - Know that light is reflected from surfaces and some materials reflect light better than others. - Know that the Sun is our main source of light and we must protect our eyes from its rays. - Know that shadows are formed when an object blocks light. - Know that the closer an object is to a light source, the bigger its shadow becomes.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
- Ask scientific questions and make sensible predictions before investigating. - Plan and carry out comparative (fair) tests to answer scientific questions.	- Ask scientific questions and recognise that there are different ways to answer them. - Take careful measurements and look for patterns in data.	- Ask scientific questions and plan simple investigations. - Make careful observations and record results over time.

• Make careful observations and take accurate measurements where appropriate. • Record results using tables, charts and labelled diagrams. • Use evidence to draw conclusions and explain findings using scientific vocabulary.	• Record results using tables, bar charts and graphs. • Use evidence to identify patterns and draw conclusions. • Present and communicate findings using appropriate scientific vocabulary.	• Identify patterns from observations and measurements. • Record results using tables, diagrams and charts. • Use evidence to explain findings and answer scientific questions.
UNIT: Rocks, Soils and Fossils	UNIT: Animals Including Humans (Nutrition and Diet)	UNIT: Plants
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate and compare different types of rocks by observing and testing their physical properties. They will identify and classify igneous, sedimentary and metamorphic rocks before exploring how fossils are formed and what they tell us about the past. Pupils will also investigate different types of soil and recognise that soil is made from rocks and organic matter. Throughout the unit, they will use scientific enquiry to observe, classify, record and explain their findings.	In this unit, pupils will investigate why humans need a balanced diet to stay healthy. They will identify the different food groups, explore the nutrients found in foods and compare the nutritional value of different foods using food labels. Pupils will investigate scientific questions by sorting, classifying and carrying out fair tests before recording, interpreting and communicating their findings.	In this unit, pupils will investigate the structure and function of flowering plants and explore how different parts help plants grow and survive. They will identify and classify plants in their local environment before investigating what plants need to grow. Pupils will explore pollination, seed formation and different methods of seed dispersal through practical enquiries. Throughout the unit, they will observe over time, identify patterns, carry out comparative tests and use evidence to answer scientific questions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that rocks can be grouped as igneous, sedimentary or metamorphic. • Know that different rocks have different properties which make them suitable for different purposes. • Know that fossils are the preserved remains or traces of plants and animals from millions of years ago. • Know that soil is made from rocks and organic matter and helps plants grow. • Know that scientists observe, identify and classify rocks using their properties.	• Know that humans need a balanced diet to stay healthy. • Know that carbohydrates give us energy. • Know that proteins help our bodies grow and repair. • Know that fats store energy and help keep our bodies warm. • Know that food labels can help us compare the nutritional value of foods.	• Know the names of the main parts of a flowering plant: roots, stem, leaves and flowers. • Know the functions of the roots, stem, leaves and flowers. • Know that plants need water, light, air and nutrients from the soil to grow well. • Know that pollination is needed for flowering plants to make seeds. • Know that seeds are dispersed in different ways to help new plants grow.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
• Make careful observations and use simple tests to compare the properties of rocks and soils.	• Ask scientific questions and decide how they can be investigated. • Sort and classify foods using different criteria.	• Identifying and classifying • Observation over time

- Identify, classify and group rocks using evidence from observations. - Record observations and results using tables, labelled diagrams and simple charts. - Use evidence to explain why different rocks are suitable for different purposes. - Ask scientific questions and use findings to draw simple conclusions.	- Carry out comparative (fair) tests and make careful observations. - Record and interpret results using tables, charts and graphs. - Use evidence to explain findings and communicate conclusions using scientific vocabulary.	- Comparative (fair) testing - Observing and measuring - Interpreting and communicating results
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Year 4

Autumn Term	Spring Term	Summer Term
UNIT: Animals Including Humans	UNIT: Electricity	UNIT: Living Things and their Habitats
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate the human digestive system and learn about the functions of its main organs. They will explore the different types of human teeth and their roles in digestion, as well as investigate how different drinks can affect tooth decay. Pupils will also construct and interpret food chains and food webs, learning about producers, consumers, predators and prey. Throughout the unit, they will make careful observations, record findings and use evidence to answer scientific questions.	In this unit, pupils will investigate how electricity is used in everyday life and learn about electrical safety. They will construct and test simple series circuits using cells, wires, bulbs, buzzers and switches. Pupils will investigate which materials are electrical conductors and insulators and explore how switches control a circuit. Throughout the unit, they will carry out comparative tests, record their findings and use evidence to answer scientific questions.	In this unit, pupils will investigate how living things can be grouped in different ways. They will learn how scientists classify plants and animals using observable characteristics and use simple classification keys to identify living things in the local and wider environment. Pupils will also explore how living things are adapted to their habitats. Throughout the unit, they will gather, classify and present data and use evidence to answer scientific questions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know the main parts of the digestive system: mouth, oesophagus, stomach, small intestine and large intestine. - Know that incisors cut, canines tear and molars grind food. - Know that good dental hygiene helps keep teeth healthy.	- Know that a complete circuit is needed for electricity to flow. - Know that a simple series circuit is made using components such as a cell, wires, bulb, buzzer and switch. - Know that a switch opens and closes a circuit.	- Know that living things can be grouped according to their characteristics. - Know that vertebrates have a backbone and invertebrates do not. - Know that classification keys help identify and group living things.

- Know that food chains begin with a producer and show how energy passes between living things. - Know that food webs show how living things depend on one another.	- Know that metals are good electrical conductors and materials such as plastic and rubber are electrical insulators. - Know that electricity should always be used safely.	- Know that living things have adaptations that help them survive in their habitat. - Know that scientists classify living things to help identify and study them.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
- Make systematic and careful observations. - Set up simple practical enquiries and comparative tests. - Record findings using scientific diagrams, tables and charts. - Use results to draw simple conclusions and answer questions. - Report findings using scientific language.	- Ask relevant scientific questions. - Set up comparative and fair tests. - Make systematic and careful observations. - Record findings using tables, diagrams and charts. - Use results and evidence to draw conclusions.	- Identify differences, similarities and changes. - Gather, record and classify data in a variety of ways. - Use and create simple classification keys. - Record findings using tables, charts and diagrams. - Use evidence to answer questions and explain scientific ideas.
UNIT: Sound	UNIT: States of Matter	UNIT: Living Things and their Habitats (Conservation)
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how sounds are made and how vibrations travel through different materials to reach the ear. They will explore how the volume and pitch of a sound can change and investigate how sounds become fainter as the distance from the source increases. Throughout the unit, pupils will carry out comparative tests, take accurate measurements and use evidence to answer scientific questions.	In this unit, pupils will compare and classify solids, liquids and gases and investigate how materials change state when heated or cooled. They will explore melting, freezing, evaporation and condensation and learn about the water cycle. Throughout the unit, pupils will measure temperature, carry out comparative investigations and use evidence to explain changes in state.	In this unit, pupils will investigate how environments can change over time and how these changes can affect living things. They will explore how human activities, such as pollution and deforestation, can have both positive and negative effects on habitats and biodiversity. Pupils will also investigate ways people can protect the environment and conserve living things. Throughout the unit, they will gather evidence, present findings and use scientific knowledge to answer questions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know that sounds are made when objects vibrate. - Know that sound travels through solids, liquids and gases as vibrations.	- Know that materials can be solids, liquids or gases. - Know that heating and cooling can change the state of a material.	Know that changes to habitats can affect the plants and animals living there.

• Know that louder sounds are made by stronger vibrations. • Know that pitch depends on how fast an object vibrates. • Know that sounds become quieter as you move further away from the source.	• Know that melting changes a solid into a liquid and freezing changes a liquid into a solid. • Know that evaporation changes a liquid into a gas and condensation changes a gas into a liquid. • Know that the water cycle includes evaporation, condensation, precipitation and collection.	• Know that human activities can have both positive and negative effects on the environment. • Know that pollution can harm living things and their habitats. • Know that conservation helps protect habitats, plants and animals. • Know that everyone can help care for and protect the environment.
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WORKING SCIENTIFICALLY

- Make systematic and careful observations.
- Set up comparative and fair tests.
- Take accurate measurements using appropriate equipment.
- Record findings using tables, charts and diagrams.
- Use results to draw conclusions and answer scientific questions.

WORKING SCIENTIFICALLY

- Gather, record and classify data in a variety of ways.
- Make systematic and careful observations.
- Take accurate measurements using thermometers.
- Carry out comparative and fair tests.
- Use evidence to answer questions and explain scientific ideas.

WORKING SCIENTIFICALLY

- Gather, record and present data in a variety of ways.
- Make systematic and careful observations.
- Use evidence to answer scientific questions.
- Record findings using tables, charts and labelled diagrams.
- Report and explain conclusions using scientific vocabulary.

Upper KS2 National Curriculum: Working Scientifically

Pupils should be taught to:

- 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 and a degree of trust in results, 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

Year 5

Autumn Term

Spring Term

Summer Term

UNIT: Properties of Materials

UNIT: Living Things and their Habitats

UNIT: Earth and Space

KEY KNOWLEDGE & SKILLS:

KEY KNOWLEDGE & SKILLS:

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will investigate and compare the properties of everyday materials. They will explore hardness, transparency, conductivity, magnetism and solubility before investigating how mixtures can be separated using filtering, sieving, evaporation and magnets. Pupils will use evidence from comparative and fair tests to explain why different materials are suitable for different purposes.	In this unit, pupils will understand the life process of a plant. They will learn about the life cycles of different mammals and make comparisons between different animal classifications, such as mammals, amphibians, insects & birds. Pupils will learn about the life & work of Jane Goodall & David Attenborough. They will research and present the life cycle of a creature.	In this unit, pupils will investigate the Earth, Moon and Sun as part of the Solar System. They will explore how the Earth rotates on its axis to create day and night and how the Earth and other planets orbit the Sun. Pupils will investigate the movement of the Moon relative to the Earth and use models and evidence to explain observations. Throughout the unit, they will use scientific evidence, make observations and present explanations using scientific vocabulary.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know that materials have different properties which make them suitable for different uses. - Know that some materials dissolve in water to form a solution, while others are insoluble. - Know that dissolved materials can be recovered by evaporation. - Know that mixtures can be separated by filtering, sieving, evaporation or magnets. - Know that scientists compare the properties of materials to choose the most suitable material for a purpose.	- Know that all living things have a life cycle. - Know that the life cycles of mammals, birds, amphibians and insects are different. - Know that flowering plants reproduce sexually by pollination and fertilisation. - Know that some plants can reproduce asexually, for example by runners or bulbs. - Know that offspring inherit characteristics from their parents.	- Know that the Sun is a star and that the Earth and other planets orbit around it. - Know that the Earth rotates on its axis once every 24 hours, causing day and night. - Know that the Earth orbits the Sun once every year. - Know that the Moon orbits the Earth. - Know that the Sun, Earth and Moon are approximately spherical.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
- Plan different types of scientific enquiries. - Carry out comparative and fair tests. - Take accurate measurements using appropriate equipment. - Record data using tables, graphs and scientific diagrams. - Use evidence to explain results and justify conclusions.	- Plan different types of scientific enquiries. - Identify scientific evidence that supports or refutes ideas. - Record and present findings using scientific diagrams, tables and graphs. - Compare life cycles and identify patterns. - Use evidence to explain similarities and differences between living things.	- Use scientific evidence to support or refute ideas. - Use models to explain scientific ideas. - Take accurate measurements where appropriate. - Record and present findings clearly. - Use evidence to explain observations and answer scientific questions.
Changes of Materials	UNIT: Animals Including Humans	UNIT: Forces
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how some materials change when they are mixed, heated or cooled. They will explore reversible changes, such	In this unit, pupils will investigate the changes humans experience throughout their lives, from birth to old age. They will explore the stages of	In this unit, pupils will investigate the forces that act on moving objects. They will explore gravity, air resistance, water resistance and friction through

as dissolving and changes of state, and irreversible changes, where new materials are formed through chemical reactions. Pupils will carry out comparative investigations, use evidence to identify different types of change and explain their conclusions using scientific vocabulary.	human development, including foetal development, childhood, puberty, adulthood and old age. Pupils will compare growth and development, investigate how humans change over time and use evidence to answer scientific questions.	practical investigations before learning how simple mechanisms, including levers, pulleys and gears, can make work easier. Pupils will carry out fair tests, take accurate measurements and use evidence to explain how different forces affect movement.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that some changes are reversible and some are irreversible. • Know that dissolving and changes of state are reversible changes. • Know that some chemical reactions form new materials and cannot usually be reversed. • Know that burning, rusting and reacting acids with bicarbonate of soda are examples of irreversible changes. • Know that scientists use observations and evidence to identify whether a change is reversible or irreversible.	• Know that humans grow and develop through different stages of life. • Know that babies develop inside the uterus before they are born. • Know that puberty is the stage when a child's body begins to change into an adult's body. • Know that humans continue to change throughout adulthood and old age. • Know that growth and development can be measured and compared over time.	• Know that friction is a force that opposes movement between two surfaces in contact. • Know that air resistance is a force that opposes movement through air. • Know that water resistance is a force that opposes movement through water. • Know that gravity pulls unsupported objects towards the Earth. • Know that levers, pulleys and gears are mechanisms that allow a smaller force to have a greater effect.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
• Plan different types of scientific enquiries. • Carry out comparative and fair tests. • Make careful observations and use scientific evidence. • Record findings using tables, diagrams and graphs. • Use evidence to explain results and justify conclusions.	• Take accurate measurements and record data. • Use tables, graphs and charts to present results. • Identify patterns and relationships in data. • Use evidence to answer scientific questions. • Report and explain findings using scientific vocabulary.	• Plan comparative and fair tests, recognising and controlling variables. • Take accurate measurements using appropriate equipment. • Record results using tables, graphs and labelled diagrams. • Identify patterns and relationships in data. • Use evidence to explain findings and draw conclusions.

Year 6

Autumn Term	Spring Term	Summer Term
UNIT: Living Things and their Habitats	UNIT: Animals including Humans	UNIT: Light
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how living things are classified into broad groups based on common observable characteristics and similarities. They will learn about the five kingdoms and use classification keys to identify plants, animals and microorganisms. Pupils will investigate microorganisms, including bacteria and fungi, and explore how some fungi reproduce by spore dispersal. Throughout the unit, they will use evidence to classify living things and explain their reasoning using scientific vocabulary.	In this unit, pupils will investigate the human circulatory system and understand the functions of the heart, blood vessels and blood. They will explore how water, nutrients and oxygen are transported around the body and investigate the effects of diet, exercise, drugs and lifestyle on keeping the body healthy. Throughout the unit, pupils will collect and analyse data, use scientific evidence and explain how the circulatory system helps the body function.	In this unit, pupils will investigate how light travels and explain how we see objects. They will explore reflection and use this understanding to explain how mirrors work. Pupils will investigate how shadows are formed and why they have the same shape as the objects that cast them. They will also explore how light can be refracted and use scientific evidence to explain observations. Throughout the unit, pupils will carry out fair tests, use scientific diagrams and present evidence to support their conclusions.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know that living things can be classified into groups based on their characteristics. - Know that classification keys help identify and group living things. - Know that microorganisms are living things that are too small to be seen without a microscope. - Know that bacteria and fungi are examples of microorganisms. - Know that some fungi reproduce by releasing spores.	- Know that the heart pumps blood around the body. - Know that arteries carry blood away from the heart and veins carry blood back to the heart. - Know that blood transports oxygen, nutrients and water around the body. - Know that regular exercise, a balanced diet and a healthy lifestyle help keep the circulatory system healthy. - Know that drugs, alcohol and smoking can have harmful effects on the body.	- Know that light travels in straight lines. - Know that we see objects because light travels from a light source, reflects off objects and enters our eyes. - Know that mirrors reflect light. - Know that shadows are formed when light is blocked by an opaque object and have the same shape as the object casting them. - Know that light can change direction when it passes between different materials (refraction).
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
- Use classification keys to identify living things. - Record and present findings using scientific diagrams, tables and graphs. - Use evidence to justify classifications. - Identify similarities, differences and patterns.	- Plan scientific enquiries and identify variables. - Take accurate measurements and record data. - Present findings using tables, graphs and scientific diagrams. - Use evidence to explain observations and draw conclusions.	- Plan comparative and fair tests, recognising and controlling variables. - Use scientific diagrams and ray diagrams to communicate ideas. - Record and present findings using tables and graphs.

Report findings using appropriate scientific vocabulary.	Report findings using appropriate scientific vocabulary.	- Use evidence to explain observations and draw conclusions. - Identify patterns and relationships in results.
UNIT: Evolution and Inheritance	UNIT: Electricity	Unit: Looking After Our Environment Enrichment Unit (Non statutory)
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how living things have changed over time through evolution. They will explore how offspring inherit characteristics from their parents and why individuals of the same species are not identical. Pupils will learn how plants and animals adapt to suit their environments and how adaptation can lead to evolution over many generations. They will also investigate how fossils provide evidence of life from millions of years ago and use scientific evidence to explain evolutionary ideas.	In this unit, pupils will investigate how the components of electrical circuits affect how they function. They will build and compare series circuits, explore how the number and voltage of cells affects the brightness of bulbs and the volume of buzzers, and investigate how different components influence a circuit. Pupils will use circuit diagrams to represent electrical circuits and apply their understanding to design, build and evaluate simple electrical systems. Throughout the unit, they will carry out fair tests, collect data and use evidence to explain how electrical circuits work.	In this unit, pupils will investigate how human activities affect the environment and explore ways to reduce their impact. They will learn about climate change, renewable and non-renewable energy sources, recycling and reducing waste. Pupils will investigate how burning fossil fuels affects the atmosphere and explore how individuals, communities and governments can help protect the environment. Throughout the unit, they will analyse data, use evidence to support conclusions and evaluate possible solutions to environmental issues.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
- Know that offspring inherit characteristics from their parents, but are not identical to them. - Know that inherited characteristics can be passed from parents to offspring. - Know that plants and animals adapt to suit their environment. - Know that adaptation over many generations can lead to evolution. - Know that fossils provide evidence of living things that existed millions of years ago.	- Know that circuit diagrams use recognised symbols to represent electrical components. - Know that increasing the number or voltage of cells can make bulbs brighter or buzzers louder. - Know that the brightness of a bulb or the volume of a buzzer depends on the components in the circuit. - Know that changing components in a circuit can change how the circuit functions. - Know that conductors allow electricity to pass through them and insulators do not.	- Know that burning fossil fuels releases greenhouse gases into the atmosphere. - Know that greenhouse gases contribute to climate change. - Know that renewable energy sources can reduce the use of fossil fuels. - Know that reducing, reusing and recycling can reduce waste sent to landfill. - Know that people can make choices that help protect the environment.
WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY
Use scientific evidence to support or refute ideas.	- Plan comparative and fair tests, recognising and controlling variables. - Take accurate measurements and record data.	- Analyse and interpret scientific data. - Use evidence to support conclusions. - Identify patterns and trends in data.

- Recognise that scientific ideas change as new evidence is discovered.
- Record and present findings using scientific diagrams, tables and graphs.
- Use evidence to explain observations and draw conclusions.
- Report findings using appropriate scientific vocabulary.

- Present findings using tables, graphs and circuit diagrams.
- Identify patterns and relationships in results.
- Use evidence to explain how changes affect the function of a circuit.

- Present findings using tables, graphs and scientific vocabulary.
- Evaluate solutions to environmental problems using evidence.