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 learn to identify, name and label the main parts of the human body. They will explore their five senses, linking each sense to the correct body part. Pupils will take part in simple investigations to find out how we use our senses and will describe similarities and differences between people. They will begin to ask and answer simple scientific questions about themselves and others, using their observations to suggest answers.	In this unit, pupils will identify & name a variety of everyday materials and describe their properties. They will identify objects that are natural and those that are manmade. They will predict and identify if an object will float or sink. Using the story of the 'Three Little Pigs', pupils will build a structure strong enough to withstand wind and a structure that is waterproof. They will learn about the properties of glass and its uses and understand that materials are used to create a variety of furniture. Pupils will explore a variety of fabrics and learn about their different properties. By the end of the unit, they will be able to explain the uses of materials and why they are suitable for different purposes.	In this unit, pupils will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They will sort animals according to what they eat, identifying carnivores, herbivores and omnivores. Pupils will describe similarities and differences between pets and wild animals and will group animals according to body features such as skin, fur, feathers or scales.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• know my body has different parts such as head, arms, and legs. • know I use my eyes to see, ears to hear, tongue to taste, nose to smell, and skin to touch.	• know the names of common materials: wood, metal, plastic, glass, water and rock. • know that materials can be hard, soft, smooth, rough, shiny or dull.	• know that mammals have fur and birds have feathers. • know that a carnivore eats meat, a herbivore eats plants and an omnivore eats both.

• know my heart pumps blood around my body. • know exercise helps to keep my body healthy. • know washing my hands helps stop germs from spreading.	• know some materials are natural and some are man-made. • know some materials are waterproof and some let water through. • know we choose materials for jobs because of their properties (e.g. glass for windows).	• know that fish live in water and have gills to breathe. • know that reptiles have dry scaly skin. • know that amphibians live both in water and on land.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• identify & classify • perform simple tests • gather & record data to help in answering questions • use observations & ideas to suggest answers to questions • group & sort	• ask simple questions • observe closely and use simple equipment • use observations & ideas to suggest answers to questions • identify & classify • gather & record data to help in answering questions • perform simple tests	• identify & classify • perform simple tests • gather & record data to help in answering questions • use observations & ideas to suggest answers to questions • group & sort

Throughout the year

UNIT: Seasonal Changes

KEY KNOWLEDGE & SKILLS:

In this unit, which runs throughout the year, pupils will observe and describe changes across the four seasons. They will record how weather patterns change, and how day length varies in each season. Pupils will collect and record simple data about temperature and daylight and observe changes in plants and animals over time. They will learn about keeping safe in the sun and the importance of protecting their eyes.

KEY STICKY KNOWLEDGE

- know there are four seasons: spring, summer, autumn and winter.
- know that days are longer in summer and shorter in winter.
- know the weather changes in each season.
- know that plants grow more in spring and summer.
- know it is not safe to look directly at the sun.

WORKING SCIENTIFICALLY

- use observations & ideas to suggest answers to questions
- identify & classify
- perform simple tests
- gather and record data

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 describe the basic structure of plants, naming parts such as roots, stems, leaves and flowers. Pupils will observe and record plant growth over time, understanding that seeds and bulbs grow into mature plants when given water, light and warmth. They will explore the differences between wild and garden plants.

KEY STICKY KNOWLEDGE

- know that plants need water, light and soil to grow.
- know that a seed grows into a plant.
- know that roots hold a plant in the ground and take in water.
- know that some trees lose their leaves in winter (deciduous) and others keep them (evergreen).
- know the parts of a plant: root, stem, leaf, flower and petal.

WORKING SCIENTIFICALLY

- perform simple tests
- use observations & ideas to suggest answers to questions
- identify & classify
- gather and record data

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 that animals, including humans, have offspring that grow into adults. They will find out about the basic needs of living things for survival, such as food, water and air. Pupils will explore the importance of exercise, hygiene and a balanced diet, investigating how these help the body to stay healthy. They will describe the changes that occur as humans and animals grow.	In this unit, pupils will explore & compare the differences between things that are living, dead or have never been alive. They will study world, local and microhabitats and how some animals have become adapted to the habitat where they live. Pupils look at where an animal's food comes from, in the context of food chains, and how this source links into a variety of different food chains	In this unit, pupils will observe plants and record what they see. They will have the opportunity to plant seeds/bulbs, care for them and observe how they grow. Pupils will study the lifecycle of a flower, using the language: seed, germinate, shoot, stem, leaf, flower, die and disperse. Through experimentation, pupils will investigate the things plants need to grow and be healthy.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**

• Animals, including humans, have offspring that grow into adults. • Some animals give birth to live young (humans and dogs) and some lay eggs (birds and crocodiles). • Animals, including humans, need air, food and water to survive. • To be healthy, humans need to eat lots of different of foods, have lots of exercise and to keep clean washing. • Humans need shelter and love to grow into happy adults.	• know that living things do the seven life processes: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. • know that a habitat is where an animal or plant lives. • know that animals get their food from plants and other animals. • know that food chains always start with a plant. • know that microhabitats are small places like under stones or in soil.	• The parts of a plant are: root, stem, leaves and flower. • Seeds and bulbs need water and a suitable temperature to germinate. • Plants get water from the soil using their roots. • Plants make their own food in their leaves using sunlight and water. • A seed germinates to produce a shoot, then a stem, leaves and a flower. The flower produces seeds to grow a new plant.
WORKING SCIENTIFICALLY	• **WORKING SCIENTIFICALLY**	• **WORKING SCIENTIFICALLY**
• identify & classify • perform simple tests • use observations & ideas to suggest answers to questions	• identify & classify • observe closely, using simple equipment • ask simple questions and recognise they can be answered in different ways • gather & record data to help in answering questions • use observations & ideas to suggest answers to questions	• identify & classify • observe closely, using simple equipment • ask simple questions and recognise they can be answered in different ways • perform simple tests • gather & record data to help in answering questions • use observations & ideas to suggest answers to 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 learn about how animals, including humans, change as they grow. They will explore the life cycles of different animals, such as frogs, butterflies and humans, identifying the stages of birth, growth, reproduction and death. Pupils will compare the life cycles of animals that lay eggs with those that give birth to live young, and they will observe changes over time in living things.	In this unit, pupils will explore a variety of world habitats, including deserts, rainforests, oceans, and polar regions. They will identify how different animals and plants are suited to their environments and describe how living things depend on each other for food and shelter. Pupils will compare local and world habitats, learning about how living things have adapted to survive in different climates and conditions. They will also continue to develop their understanding of food chains in global contexts.	In this unit, pupils learn to identify, classify and record the uses of everyday materials. They find out how some solid objects can change shape by squashing, bending, twisting and stretching, and how these properties affect their suitability to perform certain jobs – for example, to build a bridge. The pupils will learn about Charles Macintosh and explore how materials are suitable for different purposes.

KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	
• know that all living things have a life cycle that includes birth, growth, reproduction and death. • know that some animals lay eggs and others give birth to live young. • know that a caterpillar changes into a butterfly (metamorphosis). • know that a tadpole changes into a frog as it grows. • know that humans grow and change throughout their lives.	• know that different animals and plants live in different habitats around the world. • know that a polar bear is suited to the Arctic because it has thick fur and fat for warmth. • know that a cactus can survive in the desert because it stores water. • know that rainforests are warm and wet, and many animals live in the trees. • know that all living things depend on plants at the start of a food chain.	• Some materials can be used for making lots of different things – metal for coins, chair legs and cars. • Some objects can be made from lots of different materials – spoons can be made from metal, wood or plastic • Some materials cannot be used to make some objects – paper for cups, glass for tools. • Some objects can change shape by bending (pipe cleaner), twisting (drinks can), squashing (playdough) and stretching (elastic band). • Charles Macintosh invented the waterproof coat
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	
• asking simple questions • gather and record data • identify and classify • use observations & ideas to suggest answers to questions	• asking simple questions • gather and record data • identify and classify • use observations & ideas to suggest answers to questions	• Perform simple tests • gather & record data to help in answering questions • use observations & ideas to suggest answers to 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

Please note that currently, the Y3 curriculum is shaped by the school's involvement in the *Terri & the Time Machine* Project. Therefore, some of the content may change,

Autumn Term	Spring Term	Summer Term
UNIT: Rocks	**UNIT: Animals Including Humans (Skeletal and Muscular Systems)**	**UNIT: Light and Dark**
KEY KNOWLEDGE & SKILLS:	**KEY KNOWLEDGE & SKILLS:**	**KEY KNOWLEDGE & SKILLS:**
In this unit, pupils will compare and group different kinds of rocks, making systematic observations based on their appearance & simple physical properties. They will learn about weathering and how water contributes to this process. They will consider the suitability of rocks for different purposes. They will study the work of palaeontologist, Mary Anning, and understand the process of fossil formation. They will make observations of soil, recognising that it is made from rocks and organic matter.	In this unit, pupils will observe how different animals, including humans, have different types of skeletons and will identify how different parts of the skeleton have different roles. They will explore the role of muscles.	In this unit, pupils will identify the difference between a light source & a non-light source. They will learn that light comes from the sun and how to stay safe. They will explore reflective materials. In their work on shadows, they will discover how shadows are formed; how they change throughout the day and how the size of a shadow can be changed.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• Know the names of 3 types of rocks and identify their features – igneous (formed when molten lava cools), sedimentary (formed by layer upon layer of rock that's has been pressed together), metamorphic (formed when either igneous or sedimentary rock has been heated and cooled by magma) • Know that bones are any piece of the hard whitish tissue that makes up the skeleton in animals including humans and fossils are the preserved remains or traces of a dead organism. • Know that a palaeontologist studies fossils. • Know that Mary Anning discovered the first fossils of an ichthyosaur, a plesiosaur and a pterosaur.	• Know the names of 3 different types of skeleton - endoskeleton, exoskeleton, hydrostatic skeleton • Know the names of the main bones in the body. • Know that muscles allow movement by working in pairs. As one contracts, the other relaxes. • know that joints connect bones and allow movement. • know that without a skeleton we could not stand upright.	• Know that dark is caused by the absence of light. • Know that the sun, a candle and a torch are sources of light. • Know that light is reflected from surfaces and that mirrors are good reflectors. • Know that light from the sun can be dangerous and how to protect ourselves. • Know that shadows are formed when light is blocked by a solid object and the closer the object to the light source, the bigger the shadow.

• Know that the 4 processes of soil formation are: additions, losses, translocations and transformations		
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• Identify differences, similarities or changes related to simple scientific ideas & processes • make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • 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	• gather, record, classify and present data in a variety of ways to help in answering questions • use straightforward scientific evidence to answer questions or to support their findings. • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • identify differences, similarities or changes related to simple scientific ideas and processes	• 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 • identify differences, similarities or changes related to simple scientific ideas and processes
UNIT: Forces and Magnets	**UNIT: Animals Including Humans (Balanced Diet)**	**UNIT: Plants**
KEY KNOWLEDGE & SKILLS:	**KEY KNOWLEDGE & SKILLS:**	**KEY KNOWLEDGE & SKILLS:**
In this unit, pupils will notice that some forces need to make contact between two objects and when there is a push or a pull acting on an object. They will compare how things move on different surfaces. They will explore different types of magnets, their properties and the different types of everyday objects which are magnetic.	In this unit, pupils will identify that humans and animals cannot make their own food and will understand that they need the right amount and type of nutrition to be healthy. They will learn the consequences of eating the wrong amount of nutrients.	In this unit, pupils will compare the effect of different factors on plant growth. They will identify & describe the functions of different parts of a flowering plant and how they are used in photosynthesis. They will investigate how water is transported within plants and the part that flowers play in the life cycle of flowering plants. Pupils will learn about the pollination process and the ways in which seeds are dispersed.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• Know whether a force is a push or a pull. • Know that friction is a force that holds back the movement of an object. • Know that there are different types of magnet- bar magnet, horseshoe magnet and ring magnet.	• know that humans need a balanced diet to stay healthy. • know that food gives us energy to live, move and grow. • know that carbohydrates give energy, protein builds muscle and fat keeps us warm.	• Know the names and functions of the different parts of a flowering plant - roots, stem/trunk, leaves and flowers. • Know that plants need air, water, warmth, light and nutrients to grow well. • Know that the function of the stem is to support the plant and to transport water.

• Know that magnets attract some materials (iron, nickel and cobalt) and not others-non-magnetic- (wood, plastic and aluminium). • know that magnets have north and south poles.	• know that fruit and vegetables provide vitamins and minerals. • know that drinking water is important for good health.	• Name the different parts of a flower: petals, stamens, stigma, style & ovary. • Know and order the stages in the life cycle of a flowering plant: germination-pollination-seed formation-seed dispersal.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • setting up simple practical enquiries, comparative and fair tests • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• gather, record, classify and present data in a variety of ways to help in answering questions • use straightforward scientific evidence to answer questions or to support their findings. • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • identify differences, similarities or changes related to simple scientific ideas and processes	• 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 • 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

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 learn the names of the basic parts and simple functions of the digestive system. They will identify the different types of teeth in humans and their functions. They will be given the opportunity to investigate the causes and effects of tooth decay. Pupils will learn about food chains & food webs,	In this unit, pupils will explore electrical appliances and learn about electrical safety. They will learn about electrical components and investigate electrical circuits. Pupils will explore conductors & insulators and will learn about switches. In investigating circuits, they will identify how electrical components can changer within a circuit.	In this unit, pupils will explore and research different habitats. They will explore how animals can be classified, creating a classification key. They will use classification keys to group, identify and name a variety of living things in their local & wider environment, including pond plants.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**

• Know that the mouth, tongue, teeth, oesophagus, stomach and small and large intestine are involved in the human digestive system. • Know that incisors bite and cut food, canines tear and rip food, premolars hold and crush food and molars grind food. • Know that a food chain starts with a plant and shows the transfer of energy between organisms. • Know a food chain may contain a producer (plant), prey (caterpillar) and predator (bird)	• Know which objects are conductors (iron and steel) and which are insulators (plastic and wood). • Identify machines which need electricity to work – phone/tablet and microwave. • Construct a simple circuit and draw it, labelling cells, wires, bulbs, switches and buzzers. • Know that, in a circuit, a lamp needs to be part of a complete loop with a battery for it to light. • Know that an electrical switch works by opening and closing a circuit.	• Know how to group organisms in different ways (plants into flowering & non-flowering and animals into vertebrates and invertebrates) • Know that a vertebrate has a spine and an invertebrate doesn't • Know how to group vertebrates into mammal, fish, reptile, bird and amphibian. • Know and use a classification key to sort animals according to their characteristics (omnivore/carnivore/herbivore, number of legs). • Know and use a classification key to sort pond plants according to their characteristics
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • make systematic and careful observations • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • set up simple practical enquiries, comparative and fair tests • use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • use straightforward scientific evidence to answer questions or to support their findings • gather, record, classify and present data in a variety of ways to help in answering questions • 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 • ask relevant questions and using different types of scientific enquiries to answer them	• identify differences, similarities or changes related to simple scientific ideas and processes • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • 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
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 identify how sounds are made. They will explore how vibrations from sounds travel through a medium to the ear. They will	In this unit, pupils will compare and group materials together, according to whether they are solids, liquids or gases, learning how particles behave in	In this unit, pupils will explore how environments can change naturally and through human activity, and how these changes can pose dangers to living

explore sound insulation, volume and pitch. They will investigate sounds from near & far.	each state of matter. They will investigate how some materials change state when they are heated or cooled. Pupils will describe the different stages of the water cycle, including evaporation and condensation.	things. They will learn about endangered species and discuss ways that humans can help protect wildlife and habitats. Pupils will study real-life conservation efforts such as recycling, reforestation and protecting ocean life. They will learn how scientific knowledge can be used to make informed choices that support sustainability and care for the planet.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• Know that sounds are caused by vibrations and louder sounds have bigger vibrations. • Know that sound travels through solids, liquids and gases as a wave, vibrating the particles as it travels. • Know that the pitch of a sound is how high or low it is and the volume of a sound is how loud or quiet it is. • Know that sounds get fainter (quieter) as the distance from the source increases	• Know how to group substances according to whether they are a solid, liquid or gas. • Know that some materials change state when they are heated or cooled (water changes to a gas when heated and a solid when cooled). • Know the freezing point of water is 0°C and the melting point of wax is 50°C • Know that the water cycle involves evaporation and condensation • Know that the rate of evaporation gets faster when the temperature increases.	• know that habitats can change over time due to natural events or human actions. • know that deforestation and pollution can destroy animal habitats. • know that some animals and plants are endangered and need protection. • know that recycling and reducing waste helps care for the environment. • know that conservation helps living things to survive for future generations.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • identify differences, similarities or changes related to simple scientific ideas and processes • 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 • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• gather, record, classify and present data in a variety of ways to help in answering questions • use straightforward scientific evidence to answer questions or to support their findings. • make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	• gather, record, classify and present data • 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 conclusion • use straightforward scientific evidence to answer questions or to support their findings

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 compare and group materials based on their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. They will explore why materials are chosen for particular uses and learn to give reasons based on evidence from tests. Pupils will investigate conductors and insulators, explore which materials dissolve in water and understand how mixtures can be separated.	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 learn about the solar system & its planets, including the movement of the Earth & other planets relative to the sun. They will learn about the Earth's movement in space, using this knowledge to explain day & night and the apparent movement of the sun across the sky. Pupils will learn about the movement of the moon.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• know that materials have different properties, such as hardness, flexibility and magnetism. • know that some materials dissolve in water to form a solution. • know that metals are good conductors of heat and electricity. • know that insulators stop heat and electricity from passing through. • know that materials are chosen for uses based on their properties (e.g. glass for windows).	• Know how a plant is pollinated • Know that some plants reproduce asexually. • Know the stages in the process of sexual reproduction. • Know one difference between sexual and asexual reproduction. • Know the stages of the life cycles of mammals, birds, insects and amphibians.	• Know the names of the planets in the solar system. • Know how the planets orbit the Sun. • Know how night and day occur. • Know that night and day occur at different times in different places on Earth. • Know that the Moon orbits the Earth, not the Sun, and its cycle.

WORKING SCIENTIFICALLY	WORKING SCIENTIFICALLY	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 • 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 • use test results to make predictions to set up further comparative and fair tests	• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • 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	• identify scientific evidence that has been used to support or refute ideas or arguments • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • 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 • use test results to make predictions to set up further comparative and fair tests
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 state through heating, cooling, dissolving, mixing and chemical reactions. They will recognise that some changes are reversible, such as melting and evaporating, while others are irreversible, such as burning and rusting. Pupils will carry out practical investigations to separate mixtures and observe the effects of reversible and irreversible changes.	In this unit, pupils will identify the key stages of a mammal's life cycle and the gestation periods of different mammals. They will learn about foetal development and will investigate the hand span of different aged children. Pupils will learn about the changes experienced during puberty and during adulthood & old age.	In this unit, pupils will explore gravity & the work of Isaac Newton. They will examine the connection between air resistance & parachutes. They will explore the factors which affect an object's ability to resist water. Pupils will investigate the effects of friction on different surfaces. They will investigate mechanisms, such as levers, pulleys & gears to find out how these allow a smaller force to have a greater effect.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• know that some changes of materials are reversible and others are not. • know that heating and cooling can make materials change state.	• Know the stages of human development. • Know the main changes that occur during puberty. • Know the main changes that take place in old age.	• Know that forces are pushes and pulls. • Know that gravity is a force that pulls objects down. • Know about Isaac Newton's discoveries.

• know that dissolving, mixing and evaporating are reversible changes. • know that burning and rusting are irreversible changes that make new materials. • know that mixtures can be separated by filtering, sieving or evaporating.	• Know how to compare and present data using line graphs	• Know about the effects of friction, including air and water resistance, on moving objects. • Know that different mechanisms, such as levers, pulleys and gears, allow a smaller force to have a greater effect.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • 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 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	• 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 • 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	• 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 • 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 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 classify living organisms and understand the kingdoms of life. They will classify living things using the Linnaean system. They will identify the characteristics of different types of micro-organisms. They will also investigate asexual reproduction through spore dispersal.	In this unit, pupils will learn about the function of the heart & its role in the circulatory system. They will identify & compare blood vessels and learn about blood. Pupils will learn how the body transports water & nutrients. They will investigate what affects the heart rate and learn about the impact of drugs & alcohol on the body.	In this unit, pupils will explore how light travels. They will explore reflection and explain how it can be used to help us see. Pupils will investigate how shadows can change and use their understanding of how light travels to explain why shadows have the same shape as the object which cast them.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**

• Know how to sort and group animals, plants and microorganisms, based on their characteristics. • Know that the scientist, Carl Linnaeus, developed a classification system. • Know why living things are placed in one group and not another. • Know the names of different microorganisms. • Know that some microorganisms are harmful.	• Know the main parts of the circulatory system. • Know the main functions of the heart, lungs and blood vessels in the circulatory system. • Know how the digestive system breaks down nutrients. • Know what a healthy lifestyle looks like. • Know what effect drugs and alcohol have on the body.	• Know that light travels in straight lines. • Know that we can see objects because they give out light or reflect light into the eye. • know that mirrors reflect light at the same angle it hits them. • Know that shadows, of the same shape as the object, are formed when objects block out light. • know that shadows form when light is blocked.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • identify scientific evidence that has been used to support or refute ideas or arguments • 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 • 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	• record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • identify scientific evidence that has been used to support or refute ideas or arguments • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • 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	• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • 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
UNIT: Evolution and Inheritance	**UNIT: Electricity**	**Unit: Looking After Our Environment**
KEY KNOWLEDGE & SKILLS:	**KEY KNOWLEDGE & SKILLS:**	**KEY KNOWLEDGE & SKILLS:**
In this unit, pupils will learn how offspring vary and are not identical to their parents. They will learn about animal & plant adaptations. Pupils will explore what we can learn from fossils. They will also explore the theory of evolution.	In this unit, pupils will describe the parts of an electric circuit. They will explore voltage and its effect on an electrical circuit. They will apply their knowledge to identify & correct problems in a circuit.	In this unit, pupils will investigate how humans impact the environment both positively and negatively. They will explore pollution, recycling, renewable energy and conservation. Pupils will discuss how scientific understanding can help

		protect the planet and will plan small-scale projects to improve their school or local environment.
KEY STICKY KNOWLEDGE	**KEY STICKY KNOWLEDGE**	**KEY STICKY KNOWLEDGE**
• know that offspring inherit characteristics from their parents. • know that living things adapt to survive in their environment. • know that fossils show how living things have changed over time. • know that adaptations can lead to evolution. • know that evolution happens over many generations.	• Know how our understanding of electricity has changed over time. • Know and explain how major discoveries led to the widespread use of electricity. • Know the main circuit symbols and use these when drawing circuit diagrams • Know how to draw circuit diagrams using the correct symbols and label the voltage correctly. • Know the effect of increasing or decreasing the voltage on different parts of a circuit	• know that humans can harm or help the environment. • know that recycling reduces waste and pollution. • know that renewable energy comes from sources like wind and sunlight. • know that deforestation destroys animal habitats. • know that caring for our planet helps future generations.
WORKING SCIENTIFICALLY	**WORKING SCIENTIFICALLY**	**WORKING SCIENTIFICALLY**
• 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	• 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	• 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 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