



Ridgmont Lower School

Science Curriculum

Intent:

Children have lots of questions about the world around us and we aim to provide them with the necessary core scientific knowledge and investigative skills to answer their questions about those processes. Our curriculum provides a rich variety of learning enquiries that enable the learning of all the core scientific disciplines.

Implementation:

Science is carefully planned to allow links with other areas of the curriculum, allowing children to see how science affects everything in their world. All areas of science should be covered allowing children to acquire knowledge and make vital links which will allow them to be excellent scientists. Children will be encouraged to form their own questions where possible, which will be explored using a variety of investigative skills. They will become more familiar with each of the elements of the scientific method as they progress through the school. These include skills such as generating their own lines of inquiry, making predictions, fair testing, observing changes, overtime collecting results in a variety of ways, analysing results, drawing conclusions from their observations and evaluating their own method and the reliability of their results. Underpinning this is an emphasis on children actively participating in their own practical investigations and experiments, using the classroom and the wider school environment.

Impact:

Ridgmont Lower School will have scientists who:

- see themselves as scientists or engineers rather than passively observing
- recognise that their daily lives are shaped by science managing our health or understanding the need to recycle et cetera
- who ask challenging questions as they explore the world and form their own opinions
- ask questions, collect information, organise and test ideas, solve problems
- apply what they learn and make greater sense of their world increasingly shaped by science and technology
- develop the ability to communicate scientifically

National Curriculum Coverage

Early Years	Key Stage 1	Lower Key Stage 2
Understanding the world	Working Scientifically • Covered in all sub-topics Plants • Introduction to Plants • Plant Growth Animals, including Humans` • Sensitive Bodies • Comparing Animals • Life Cycles and Health Uses of Everyday Materials • Materials - Everyday Uses of Materials Seasonal Changes • Forces and Space Living Things and their Habitats • Habitats • Microhabitats Making Connections • Ocean Protectors • Fairytale Science	Working Scientifically • Covered in all sub-topics Plants • Plant Reproduction Animals, including Humans • Movement and Nutrition • Digestion and Food Rocks • Rocks, Fossils & Soils Light • Light & Shadow Forces and Magnets • Forces and Space Living Things and their Habitats • Classification and changing habitats States of Matter Sound • Sound and Vibrations Electricity • Electricity and Circuits Making Connections • How does wind force affect seed dispersal? • How does food affect muscle fatigue?

Skills Progression (Bold, black subheadings apply to the National Curriculum from KS1)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Begin to ask simple questions. Begin to observe and comment on what has been noticed.	I can ask simple questions and recognise that they can be answered in different ways. I can observe closely. I can perform simple tests. I can identify and classify. I can use observation to suggest answers for questions.	I can ask simple questions and recognise that they can be answered in different ways. I can observe closely. I can perform simple tests. I can identify and classify. I can use observation to suggest answers for questions. I can gather and record data and use this to answer questions.	I can ask relevant questions and using different types of scientific enquiries to answer them. I can set up simple practical enquiries, comparative and fair tests. I can gather, record, classify and present data in a variety of ways to help in answering questions. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. I can report on findings from enquiries, including oral and written explanations, displays	I can ask relevant questions and using different types of scientific enquiries to answer them. I can make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. I can gather, record, classify and present data in a variety of ways to help in answering questions. I can record findings using simple scientific language, drawings, labelled	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. I can use test results to make predictions to set up further comparative and fair tests. I can report and present findings	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. I can use test results to make predictions to set up further comparative and fair tests. I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written

				or presentations of results and conclusions. I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	diagrams, keys, bar charts, and tables. I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. I can identify differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their 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 identifying scientific evidence that has been used to support or Refute ideas or arguments	forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.
Plants Y1, Y2 & Y3	Begin to identify and name common plants. Begin to identify basic structure of plants.	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees.	I can observe and describe how seeds and bulbs grow into mature plants. I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. I can investigate the way in which water is transported within plants I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			

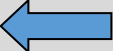
Animals Including Humans KS1 & 2	Begin to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. To name basic body parts.	I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	I can notice that animals, including humans, have offspring which grow into adults. I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air). I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	I can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.	I can describe the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans and their simple functions. I can construct and interpret a variety of food chains, identifying producers, predators and prey.	I can describe the changes as humans develop to old age.	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. I can describe the ways in which nutrients and water are transported within animals, including humans. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
Everyday Materials Y1 Use of Everyday Materials Y2 Properties and Changes of Materials Y5	Begin to describe materials. Begin to identify what is similar and different between materials. Begin to choose materials for different purposes. Begin to look at the properties of materials.	I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials. I can compare and group together a variety of everyday materials on the basis of their simple physical properties.	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.			I can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. I can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Seasonal Changes Y1	Begin to learn the four seasons and their order. Begin to understand the changes across the 4 seasons.	I can observe changes across the 4 seasons. I can observe and describe weather associated with the seasons and how day length varies.					
Living Things and their Habitats Y2, Y4, Y5 & Y6	Begin to look at the habitats of some indigenous animals.		I can explore and compare the differences between things that are living, dead, and things that have never been alive. I can identify that most living things live in habitats to which they are suited and describe how different		I can recognise that living things can be grouped in a variety of ways. I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	I can describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird. I can describe the life process of reproduction in some plants and animals.	I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organism, plants and animals. I can give reasons for classifying plants and animals based on specific characteristics.

			habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. I can identify and name a variety of plants and animals in their habitats, including microhabitats. I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		I can recognise that environment can change and this can sometimes pose dangers to living things.		
Rocks Y3	To begin to understand what rocks are.			I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I can recognise that soils are made from rocks and organic matter.			
Light Y3 & Y6	To begin to understand that light comes from the sun and other sources. Begin to understand what a shadow is and how it is formed.			I can recognise that we need light in order to see things and that dark is the absence of light. I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. I can find patterns in the way that the size of shadows changes.			I can recognise that light appears to travel in straight lines. I can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Forces & Magnets Y3 Forces Y5	To explore magnets and their properties.			I can compare how things move on different surfaces. I can notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. I can observe how magnets attract or repel each other and attract some materials and not others. I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. I can describe magnets as having 2 poles. I can predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I can identify the effects of air resistance, water resistance and friction that act between moving surfaces. I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	
States of Matter Y4	To understand when water freezes it becomes ice and when it melts it returns to its former state.				I can compare and group materials together, according to whether they are solids, liquids or gases. I can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
Sound Y4	To explore making sound using untuned percussion				I can identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases.		
Electricity Y4 & Y6	To understand that for some things to work they require an external power source.				I can identify common appliances that run on electricity.		I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

					I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can recognise some common conductors and insulators, and associate metals with being good conductors.		I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. I can use recognised symbols when representing a simple circuit in a diagram.
Earth & Space Y5 Evolution and Inheritance Y6	To know that our solar system houses the Sun, Moon and stars. To understand that Earth is our home.					I can describe the movement of the earth, and other planets, relative to the Sun in the solar system. I can describe the movement of the Moon relative to the Earth. I can describe the Sun, Earth and Moon a approximately spherical bodies. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	I can recognise that living things have changed over time and tat fossils provide information about living things that inhabited the earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

KS1 - FIRST YEAR

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum	Animals Including Humans		Plants		Living Things & Their Habitats	
Stimulus	Sensitive Bodies	Comparing Animals	Introduction to Plants	Plant Growth	Habitats	Microhabitats
Overview	Familiarising themselves with the basic parts of the human body, children investigate their senses through stimulating experiences that highlight how we interact with the world around us. They work scientifically, using their senses to make observations, spot patterns and use data to answer questions. They develop an understanding of how science can support those who have lost sensory function and consider how fire fighters use their senses at work.	Studying both local and global animals, children recognise common characteristics and physical features. They use this information to make comparisons and classify animals. Pupils consider the most effective way to collect data about class pets and record their findings in a block chart. They develop their understanding of classification by comparing the dietary habits of different animals and role play as Jane Goodall carrying out research into chimpanzees in the wild.	Venturing outside, children identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. They use magnifying glasses to observe and name plant parts and draw and label diagrams of flowers. Children closely observe leaves and sort them into groups based on their appearance. They use non-standard units to measure leaf length and record their observations in a table. Pupils investigate if beans need water for growth and identify edible plant parts.	Carrying out comparative tests, pupils identify the conditions required for seed germination and compare these to the survival needs of plants in later growth phases. Pupils use rulers to measure stem growth and record data in a table. They use their results to conclude that plants need water, light and a suitable temperature to grow and stay healthy. Children identify the stages in a plant's life cycle and discover how humans impact plants in the environment.	Considering the life processes that all living things have in common, pupils classify objects into alive, was once alive or has never been alive. They explore global habitats, naming plants and animals that can be found there and learn how a range of different living things depend on each other for food or shelter. They then explore this further by creating food chains to show the sequence that living things eat each other for energy to grow and stay healthy.	Developing their understanding of scientific enquiry, pupils learn that scientists use a range of skills to answer questions. They discover that microhabitats provide what minibeasts need to survive and carry out a survey to find out where different minibeasts live in the school grounds. They practise asking scientific questions and follow a method to investigate which conditions woodlice prefer. Pupils explore the job role of a botanist by identifying flowering plants.
Knowledge Progression	To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals). To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). To know the five main senses: sight, smell, hearing, taste and touch. To know that the skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing. To know that a carnivore is an animal that eats other animals and gives some examples. To know that a herbivore is an animal that eats only plants and give some examples. To know that an omnivore is an animal that eats animals and plants, and to give some examples.		To know a variety of common plants, and how they differ. To know that deciduous trees lose their leaves seasonally, but evergreen trees do not. To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees. To begin to understand how plants grow and change over time.	To know that seeds and bulbs grow into seedlings by producing roots and shoots. To know that seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. To know that seeds need water and warmth to germinate. To know that plants need water, light and a suitable temperature for growth and health.	To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes. To know a variety of plants and animals and describe some differences. To name a variety of habitats, including woodland, ocean, rainforest and seashore. To know that a habitat is the environment where an animal or plant lives/ grows, because it provides what they need to survive. To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.	
Vocabulary	Compare Group Hearing Pattern Sense(s) Sight Smell Taste Touch	Amphibian Bird Carnivore Compare Diet Difference Fish Group Herbivore Mammal Observe Omnivore Reptile Scientist Similarity	Bulb Deciduous Diagram Evergreen Flower Fruit Garden plants Group Growth Leaf Measure Observe Roots Seed Stem Trunk Wild plants	Bulb Diagram Energy Flower Germinate Growth Leaf Life cycle Measure Nutrient Observe Seed Shoot Stem	Alive Carnivore Dead Depend Diet Energy Food chain Growth Habitat Herbivore Life processes Mammal Omnivore Predator Prey Shelter Sort	Food chain Microhabitat Minibeast Research Results Test
Working Scientifically						
Posing questions	Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions.					
Planning	Beginning to recognise whether a test is fair. Deciding if suggested observations are suitable, with support. Ordering a simple method.					
Predicting	Suggesting what might happen, often justifying with personal experience.					
Observing (Qualitative data)	Using their senses to describe, in simple terms, what they notice or what has changed.					
Measuring (Quantitative data)	Using non-standard units to measure and compare. Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements.					
Researching	Gathering specific information from one simplified, specified source.					
Recording (tables)	Using a prepared table to record results including: - Numbers. - Simple observations. - Tally frequency.					
Grouping and Classifying	Grouping based on visible characteristics. Organising questions to create a simple classification key.					
Graphing	Representing data using pictograms and block graphs.					
Analysing and drawing conclusions	Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.					
Science in Action	To know about famous scientists throughout history. To know about a range of jobs and careers that use scientific knowledge and methods. To know about the work of modern-day scientists. To know about science in the news and recent discoveries. To know there are spiritual, moral, social and cultural links with Science.					

What children will have learnt by the end of the topic	How to draw and label human body parts To identify the body parts associated with each sense To compare and group body parts To begin to recognise patterns in data and use these to answer questions To record data in a table How to measure using non-standard units	To name and describe the physical features of a range of animals How to sort animals into groups based on their similarities and differences How to identify characteristics specific to mammals, birds, reptiles, amphibians and fish The diets of carnivores, herbivores and omnivores How to use a non-fiction text to find out about specific animals’ diets To recognise there are different ways to gather data To record data in a block graph and use this to answer questions What the scientist Jane Goodall was known for What some of Jane Goodall’s key findings were	To identify plants and their features To recall some of the roles that flowering plant parts have To name some trees and their parts To identify similarities and differences between deciduous and evergreen leaves To recall that seeds and bulbs come from plants To recognise that seeds need water for growth To raise questions about plants and respond to suggestions on how to set up an investigation to answer a question How to use a magnifying glass to observe the different parts of flowering plants How to draw and label a diagram of a flowering plant How to sort plants into groups based on specific criteria How to use non-standard units to measure leaf length How to recognise similarities and differences in seeds and bulbs To recognise that predictions do not always match observations To identify which parts of the plant can be eaten To recognise that scientific research into plants leads to important discoveries	To recall that seeds have all the necessary parts inside for plants to grow To recall that seeds need water and warmth to germinate To recognise that light is required for healthy plant growth To sequence the stages of a plant’s life cycle To recognise the importance of healthy plant growth To describe the influences humans have on plants in the environment How to set up comparative tests How to plan observations How to record plant growth in a table How to use rulers to measure and record stem height How to compare plant growth in different test conditions How to use a magnifying glass to observe and compare plants How to draw diagrams to represent stages of a plant’s life cycle	To recall some life processes, giving examples of how they apply to plants and animals To match different plants and animals to their habitats To give examples of how animals use their habitat for food and shelter To recall that plants produce their own food for energy To name living things that are producers and place a producer at the beginning of a food chain To use arrows to show the order in a food chain To classify objects into <i>alive</i>, <i>never been alive</i> and <i>was once alive</i>, giving reasons for choice made To carry out research to find answers to questions	To identify and and name a variety of plants and animals To recall that minibeasts live in microhabitats To describe microhabitats and their conditions To describe how microhabitats provide for the basic needs of animals and plants To describe the job role of a botanist To group minibeasts and create simple classification keys How to ask questions and recognise that they can be answered in different ways How to gather and record data and use it to answer questions How to plan what observations to make in an experiment How to order the steps of a method To describe the appearance of flowering plants To use an identification chart to name flowering plants
Cross Curricular Links	❖ Maths ❖ English ❖ British Values	❖ English ❖ Maths ❖ British Values	❖ English ❖ Maths ❖ Art ❖ Computing ❖ Music ❖ Geography ❖ History ❖ British Values	❖ Maths ❖ English ❖ British Values	❖ English ❖ Computing ❖ British Values	❖ English ❖ Geography ❖ British Values
Building on from... 	✓ Recognise some environments are different to where they live ✓ Explore the natural world around them ✓ Describe what they see, hear and feel outside ✓ Know and talk about factors that support overall health and wellbeing ✓ Understand the effect of changing seasons on the natural world around them ✓ Explore the natural world around them					

KS1 - SECOND YEAR

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum	Seasonal Changes	Making Connections	Everyday Materials		Animals Including Humans	Making Connections
Stimulus	Forces & Space	Ocean Protectors	Everyday Materials	Uses of Everyday Materials	Life Cycles and Health	Fairytale Science
Overview	Reflecting on their own experiences, children learn about the four seasons and the weather associated with each. They explore how seasonal changes affect trees, daylight hours and our choices about outfits. They plan and carry out their own weather reports, considering the knowledge required for this job.	Consolidating knowledge of life cycles, habitats and food chains, children explore the ocean and rock pools. They investigate what happens to litter when it is left in water to better understand the choices we make about materials available. Pupils role-play as marine biologists to collect data about population sizes to plot as pictograms and to better understand how we can protect the oceans.	Identifying the difference between objects and materials, children explore their surroundings to find examples of each. They work scientifically by planning tests, making observations and recording data. Pupils use results to answer questions and sort and group materials based on their properties.	Building on their knowledge of everyday materials and their properties, pupils recognise that materials are suited to specific purposes and explore how actions such as stretching and bending affect the shape of solid objects. They compare the suitability of materials; gather and record data in tables and block graphs and use their results to answer questions. Children also learn about the harmful effects of plastic and explore eco-friendly alternatives.	Studying the life cycles of various animals, children learn what animals need to survive and how they change over time. Pupils collect data that allows them to observe changes in their peers, while also developing their ability to take measurements and record data. They consider how scientific knowledge helps people to make healthy choices.	Using familiar fairytales, pupils develop their working scientifically skills through practical investigations. Prompted by 'The Tortoise and the Hare', children compare animal features and speed. Investigating materials with 'The Gingerbread Man', they test properties such as waterproofing and strength. Exploring 'Goldilocks', pupils investigate temperature differences and sensitivity of touch. With 'The Princess and the Pea', they record results and present findings using block graphs.
Knowledge Progression	To know the name and order of the four seasons; spring, summer, autumn and winter. To know that it is unsafe to look directly at the Sun. To know weather associated with the four seasons and how it changes (in the UK). To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	This unit revises the following key knowledge, building on the children's original point of access <u>INTRODUCTION TO PLANTS</u> To know ✓ A variety of common plants and how they differ ✓ The basic structure (including leaves, flowers, fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants including flowering plants and trees <u>SEASONONAL CHANGES</u> To know ✓ The name and order of the four seasons : spring, summer, autumn and winter ✓ The weather associated with the four seasons and how it changes (in the UK) ✓ That day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer <u>HABITATS</u> To know ✓ A variety of plants and animals and describe some differences ✓ A microhabitat is a very small habitat (e.g. stones, logs and leaf litter) ✓ A variety of habitats, including woodland, ocean, rainforest and coastal ✓ A habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive ✓ Living things depend upon each other (e.g. for food, shelter, etc.) ✓ A food chain can be used to show how animals obtain food from eating either plants and/or other animals <u>LIFE CYCLES AND HEALTH</u> To know ✓ Which offspring comes from which parent animal ✓ The stages in some animal life cycles ✓ Animals, including humans, need water, food and air to survive <u>PLANT GROWTH</u> To know ✓ Plants need water, light and a suitable temperature for growth and health	To know that objects are items or things. To know that a material is what an object is made from. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. To know that property refers to how a material can be described. To describe the physical properties of a variety of everyday materials. To understand that materials can be grouped based on their physical properties.	To know why objects are made from particular materials and to give examples of their suitability. To know that one material can be used for a range of purposes (and to give examples.) To know that different materials can be used for the same purpose (and to give examples.) To know why certain materials are unsuitable for particular objects. To know that a push or pull must be applied to change the shape of a solid object. To know that solid objects can be squashed, bent, twisted or stretched. To know that different solid objects may take a different amount of force to change shape.	To understand how living things change, and that animals have offspring that grow into adults To know which offspring comes from which parent animal To know the stages in some animal life cycles To know that animals, including humans, need water, food and air to survive To understand the importance of exercise, a balanced diet and hygiene for humans	This unit revises the following key knowledge, building on the children's original point of access <u>ANIMALS, INCLUDING HUMANS</u> To know ✓ A variety of common animals (including fish, amphibians, reptiles, birds and mammals) ✓ The five main senses: sight, hearing, touch, taste and smell ✓ The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks and shell) ✓ Skin is used for touch, the tongue is used for taste, the nose is for smell, the eyes are used for sight and the ears are used for hearing <u>LIVING THINGS & THEIR HABITATS</u> To know ✓ A habitat is the environment where an animal or plant lives/grows because it provides what they need to survive ✓ A microhabitat is a very small habitat (e.g. stones, logs and leaf litter) <u>EVERYDAY MATERIALS</u> To know ✓ A variety of everyday materials, including wood, plastic, glass, metal, water and rock ✓ Why objects are made from particular materials and to give examples of their suitability ✓ That different materials can be used for the same purpose (and to give examples) ✓ Property refers to how a material can be described ✓ One material can be used for a range of purposes (and to give examples) ✓ Why certain materials are unsuitable for particular objects ✓ The physical properties of a variety of everyday materials
Vocabulary	Deciduous tree Evergreen tree Season Weather	Compare Depend Difference Egg Food chain Habitat Invention Life cycle Live young Observe Predict Results Scientist Season Similarity Table Test	Absorbent Fabric Glass Group Material Metal Object Plastic Rock Tough Waterproof Wood	Elastic Fabric Flexible Glass Material Metal Object Plastic Property Rock Suitable Wood	Basic needs Egg Health Hygiene Life cycle Live young Pupa Spawn Survive Teenager Toddler Tadpole	Absorbent Amphibian Bird Compare Difference Fish Group Hearing Mammal Material Measure Object Oberve Predict Property Research Reptile Sight Similarity Smell Suitable Table Taste Test Touch Waterproof

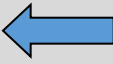
Working Scientifically						
Posing questions	Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions.					
Planning	Beginning to recognise whether a test is fair. Deciding if suggested observations are suitable, with support. Ordering a simple method.					
Predicting	Suggesting what might happen, often justifying with personal experience.					
Observing (Qualitative data)	Using their senses to describe, in simple terms, what they notice or what has changed.					
Measuring (Quantitative data)	Using non-standard units to measure and compare. Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements.					
Researching	Gathering specific information from one simplified, specified source.					
Recording (tables)	Using a prepared table to record results including: ● Numbers. ● Simple observations. ● Tally frequency.					
Grouping and Classifying	Grouping based on visible characteristics. Organising questions to create a simple classification key.					
Graphing	Representing data using pictograms and block graphs.					
Analysing and drawing conclusions	Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.					
Science in Action	To know about famous scientists throughout history. To know about a range of jobs and careers that use scientific knowledge and methods. To know about the work of modern-day scientists. To know about science in the news and recent discoveries. To know there are spiritual, moral, social and cultural links with Science.					
What children will have learnt by the end of the topic	The names of the four seasons in order and how to describe the typical weather in each To name some activities and events in the four seasons To describe the appearance of a tree’s leaves in each season To recall that summer has the most daylight hours and winter has the least daylight hours How to record data about the temperature across the four seasons How to label a map of the UK with capital cities and seasonal weather symbols How to complete a pictogram and use it to answer simple questions How to record data about the temperature across the four seasons	How to describe how some living things in a rock pool have their needs met and how the conditions change How to order the stages of different animal life cycles To be able to identify similarities and differences between different animal life cycles To be able to recall different types of litter that affect ocean habitats and describe some of the problems linked with ocean litter To suggest ways to reduce how human litter affects the ocean To be able to recall how to write a food chain and produce an example of an ocean food chain To describe how litter affects a food chain	To name objects and identify the materials they are made from To recognise that objects are made from materials that suit their purpose To recall that a property is how a material can be described To be able to sort objects based on the materials they are made from To be able to group materials based on their properties To suggest ways to test materials for their properties To make predictions and recognise whether they were accurate How to use their observations to answer questions How to begin to recognise if a test is fair	To name objects with the same use that are made from different materials To name materials that are used to make objects with different uses To recognise that stretching, twisting, bending and squashing can cause some solid objects to change shape To name properties that make materials suitable for their use How to be able to measure using non-standard units How to record results in a table How to use data to answer a simple question How to record results in a block graph	To identify stages in the life cycles of different animals, including humans To describe the basic survival needs of animals To explain how to take care of personal hygiene To describe some positive effects of exercise To identify foods in different food groups How to measure using simple equipment How to record results in a table How to use data to answer a simple question How to record using secondary sources	To compare and describe animal features To describe the properties of everyday materials To use natural materials to build a gingerbread man home To use the senses to observe and describe How to use a stopwatch to measure and compare How to order a simple method How to plan how to carry out a test How to decide what observations to record How to show results in a block graph
Cross Curricular Links	❖ Maths ❖ Geography ❖ English ❖ British Values	❖ English ❖ Maths ❖ Geography ❖ British Values	❖ English ❖ British Values	❖ Design & Technology ❖ English ❖ Maths ❖ British Values	❖ English ❖ Maths ❖ Design & Technology ❖ PSHE ❖ PE ❖ British Values	❖ Maths ❖ Design & Technology ❖ British Values
What comes next..? 	Pupils will be enabled and supported to broaden their scientific view of the world around them. This will be done through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. Children will ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.					

LKS2

FIRST YEAR

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum	Rocks	States of Matter	Plants	Making Connections	Electricity	Living Things and Their Habitats
Stimulus	Rocks and Soils	States of Matter	Plant Reproduction	How Does Wind Force Affect Seed Dispersal?	Electricity and Circuits	Classification and Changing Habitats
Overview	Studying rocks and their properties, children learn how to classify rocks and identify how they were formed. They look at the work of paleontologists to learn about fossil formation and use models to explore how fossils tell us about the past. Pupils investigate the physical properties of rocks and link these to their particular uses and explore soil formation, separate soil using a sedimentation jar and test soil drainage	Investigating the properties of solids, liquids and gases, children learn about the different states of matter. They explore changes of state using relatable examples and use this to explain changes to water through the water cycle. Pupils investigate the relationship between temperature and rate of evaporation while broadening their experience of working scientifically.	Building on their prior knowledge of plant structures, children describe the functions of named parts and use evidence to explain their significance in plant development. They investigate factors that may affect plant growth and how water is transported. They explore how seeds vary and create models to show seed dispersal methods.	Using different wind speeds to disperse seeds, pupils measure how force affects the distance they travel. They consider how seeds are shaped differently and how this links with the way they are dispersed. Extending the enquiry, pupils measure the volume of different wind speeds to better explain their results. They explore bio mimicry, considering how seed shapes have contributed to product design.	Exploring appliances that use electricity, children learn how to work with electricity safely and build circuits. They investigate electrical conductors and insulators and explore the relationship between the number of bulbs and bulb brightness. Real scenarios and historical discoveries inform children about scientific progression and home safety	Identifying different ways to group living things, children make classification keys to explore which grouping methods are most effective. Pupils study how habitats change over time and understand that humans can have both positive and negative effects on their surroundings. They play the role of conservationists and design conservation pamphlets.
Knowledge Progression	To know that rocks can be grouped based on their appearance or properties, (e.g. colour, texture, hardness, permeability) To know that rocks may contain grains, crystals or fossils To know that grains and crystals appear differently and can be used to classify rocks To know that soils are made from rocks and dead matter To understand the relationship between the properties of rocks and their uses To know that fossils can form from the remains of living things To know that rocks can change over time (e.g. erosion, weathering)	To know that all substances around us can exist as solids, liquids and gases To know that a property of a solid is that it keeps its shape unless a force is applied to it To know that a property of a liquid can flow freely and take on the shape of a container To know that a property of a gas does not have a fixed shape and can escape from an unsealed container To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating) To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing) To know that water can exist as a solid, a liquid or a gas To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius To know that water flows around the world in a continuous process called the water cycle To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour To know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation To know that the rate of evaporation increases as temperature rises	To understand the functions of the basic parts of a plant and the relationship between structure and function To know that water is transported within a plant from the root, through the stem, to the leaves To know that plants need water, light, air, nutrients and a suitable temperature for growth and health To understand that the needs for growth and health vary from plant to plant To know the life cycle of a plant from seed to mature plant To know that flowers are the reproductive organ of a plant To know that the process of pollination is the transfer of pollen to the female (part of the) flower To know that the process of seed formation is the growth of a seed after pollination To know some different methods of seed dispersal and the benefits of each	This unit revises the following key knowledge, building on the children’s original point of access <u>FORCES AND MAGNETS</u> To know ✓ Examples of contact and non-contact forces ✓ Some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism) ✓ Friction is a contact force that acts between two surfaces to slow an object down <u>STATES OF MATTER</u> To know ✓ All substances around us can exist as solids, liquids and gases ✓ A property of a liquid can flow freely and take on the shape of a container ✓ A property of a solid is that it keeps its shape unless a force is applied to it ✓ A property of a gas does not have a fixed shape and can escape from an unsealed container <u>SOUND AND VIBRATIONS</u> To know ✓ Sound is a result of vibrations ✓ A variety of ways to change the pitch or volume of a sound ✓ Vibrations from sounds travel through mediums to the ear ✓ Stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds <u>CLASSIFICATION AND CHANGING HABITATS</u> To know ✓ Living things can be grouped in different ways ✓ Flowering plants include grasses and non-flowering plants include ferns and mosses ✓ Plants can be grouped into flowering or non-flowering varieties <u>PLANT REPRODUCTION</u> To know ✓ The functions of the basic parts of a plant and the relationship between structure and function ✓ The life cycle of a plant from seed to mature plant ✓ The process of seed formation is the growth of a seed after pollination/fertilisation ✓ Plants need water, light, air, nutrients/fertiliser and a suitable temperature for growth and health ✓ Flowers are the reproductive organs of a plant ✓ Some different methods of seed dispersal and the benefits of each	To know that all electrical appliances need a power source, including batteries or mains electricity To know that an electrical circuit needs a complete path for the electrical charge to flow through To know the main components in a simple series circuit To know the precautions for working safely with electricity To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals) To know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic) To know that metals are used for cables and wires because they are good conductors of electricity To know that plastic is used to cover cables and wires because it is a good insulator To understand that an open switch breaks a series circuit so the components will be off To understand that a closed switch completes a series circuit so the components will be on To understand the relationship between bulb brightness and the number of bulbs in a circuit	To know that living things can be grouped in different ways To know that a classification key can be used to group and identify plants and animals To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone To know that plants can be grouped into flowering or non-flowering varieties To know that flowering plants include grasses and non-flowering plants includes ferns and mosses To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish To know that invertebrate groups include snails, slugs, worms, spiders and insects To know that habitats can change throughout the year and this can be dangerous for living things To know that humans can have both a positive and negative impact on the environment
Vocabulary	Bar chart Conclusion Crystal Diagram Fossil Grain Group Hard Hardness Observe Predict Record Research Rock Sediment	Boiling point Climate change Compress Condensation Condensing Condensing point Drought Evaporating Evaporation rate Flood Force Freezing Freezing point Gas Gaseous	Bar chart Conclusion Female Flowering plant Male Pattern Pollen Pollination Predict Record Reproduction Results table Seed dispersal Transport Variable	Bar chart Conclusion Conservation Control variable Deforestation Fair Flowering plant Force Friction Investigation Measure Method Motot Pattern Pollution Predict	Appliance Battery/cell Bulb Buzzer Circuit Conclusion Electrical conductor Electrical insulator Electricity Mains Method Motot Pattern Power source Predict	Classify Conservation Deforestation Endangered Fish Flowering plants Group Habitat Insect Invertebrate Mammal Nature reserve Non-flowering plant Observe Pollution

	Sedimentary rock Sedimentation Soft Soil	Liquid Matter Melting Melting point Precipitation Rate Solid State Steam Temperature Thermometer The water cycle Volume Water vapour		Proof Record Results table Seed Seed dispersal Sound Trustworthy Variable Vibration Volume	Property Results table Switch Wire Variable	Reptile Research Slug Snail Spider Vertebrate Worm
Working Scientifically						
Posing questions	Beginning to raise further questions during the enquiry process Considering what makes a testable question Beginning to recognise that there are different types of enquiry and that they are suitable for different questions Beginning to make suggestions about how different questions could be answered					
Planning	Beginning to select from options which variables will be changed, measured and controlled Beginning to suggest what observations to make and how long to make them for Planning a simple method, verbally and in writing Beginning to write a simple method in numbered steps Selecting and beginning to decide what simple equipment might be used to aid observations and measurements					
Predicting	Making predictions about what they think will happen by: - Using scientific knowledge and/or personal experience to explain their prediction (because...) - Beginning to consider cause and effect when making predictions, where appropriate - Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel)					
Observing (Qualitative data)	Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed					
Measuring (Quantitative data)	Using standard units to measure and compare Using measuring equipment with increasing accuracy Reading scales with unmarked intervals between numbers					
Researching	Gathering specific information from a variety of sources					
Recording (diagrams)	Beginning to draw more scientific diagrams by: - Using some standard symbols - Drawing in 2D to produce simple line diagrams - Labelling with more scientific vocabulary					
Recording (tables)	Using a prepared table to record results including more detailed observations Using tables with more than two columns Identifying and adding headings to tables Beginning to design simple results tables.					
Grouping and Classifying	Grouping based on visible characteristics and measurable properties Populating a pre-prepared branching and number key Choosing appropriate questions for classification keys					
Graphing	Representing data using bar charts Drawing bars with greater accuracy Reading the value of bars with greater accuracy					
Analysing and drawing conclusions	Writing a conclusion to summarise findings using simple scientific vocabulary Beginning to suggest how one variable may have affected another Beginning to quote results as evidence of relationships Identifying data that does not fit a pattern (anomalous data) Recognising when results or observations do not match their predictions Beginning to use identified patterns to predict new values or trends					
Evaluating	Writing a conclusion to summarise findings using simple scientific vocabulary Beginning to suggest how one variable may have affected another Beginning to quote results as evidence of relationships Identifying data that does not fit a pattern (anomalous data) Recognising when results or observations do not match their predictions Beginning to use identified patterns to predict new values or trends					
Science ins Action	To know about the methods and equipment used by scientists throughout history and how these have led to modern methods To know how scientific knowledge has changed over time, leading to the current understanding of Science To know about current scientific research and what it aims to achieve in the future To know that collaboration and peer reviewing is essential for effective scientific progress					
What children will have learnt by the end of the topic	To be able to define the term rock To be able to describe the appearance of different rocks, indentifying both crystals and grains To be able to group rocks by their absorbency, hardness and reaction to acid rain (vinegar) To be able to list different factors that break down rocks To be able to describe fossil formation and identify rocks in fossils To be able to describe the	To identify solids, liquids and gases using their properties How to describe melting, freezing, condensing and evaporating To be able to describe the different stage of the water cycle To describe how temperature affects the rate of evaporation and, therefore, the water cycle How to ask relevant questions How to use results to draw	To identify what plants need to grow healthily To describe the structure and function of the parts of flowering plants To investigate how plants transport water How to describe the life cycle of a flowering plant To be able to explain seed dispersal methods How to pose relevant questions How to design and record in results tables	To recall knowledge from previous units To apply knowledge in new contexts To carry out a full scientific enquiry	To recall a range of electrical appliances, classify them as mains or battery-powered and explain why To explain how to test if a circuit works and identify when simple electric circuits will work To indentify symbols for open and closed switches and give examples of how switches are useful To predict whether a circuit will work based on whether the switch is open or closed and explain that it works by breaking and completing a circuit To describe that a material is a good electrical conductor when it is added to an electric circuit and the bulb lights and that a material is a good electrical	To group animals in various ways, including vertebrates (mammals, birds, reptiles, amphibians, fish) and invertebrates To group plants in various ways, including flowering and non-flowering plants To recognise and describe different habitats and their inhabitants To recognise the impact humans can have on habitats To recognise the impact of natural disasters on habitats To record data in different ways

	work of a palaeontologist To be able to name, describe and compare some different categories of soil To be able to list some of the benefits of earthworms to soil To be able to identify and describe the comparative size and weight of the layers in a sedimentation jar To be able to use a magnifying glass correctly to observe the appearance of a rock in detail To be able to use results to choose the appropriate rock for a specific use, suggest a better choice of rock for a specific use and predict how a rock will be affected by the weather To be able to research and present information on fossil formation using a single source To be able to use a model of the fossil record to determine the relative age of a fossil, to suggest how a living thing has changed over time and to suggest what living things were around at a certain era To be able to draw and label the bars on a bar chart To be able to accurately draw and label the layers of sediment in a sedimentation jar	simple conclusions How to use thermometers to take accurate measurements How to make predictions for new values How to record findings using labelled diagrams How to research using more than one source	How to plan a simple enquiry How to complete, read and interpret data in a bar chart How to identify and suggest changes to an enquiry How to use results to draw conclusions		insulator when it is added to an electric circuit and the bulb does not light To recall that metals, for example, are good electrical conductors and plastics, for example, are good electrical insulators To describe that the more bulbs added to a series circuit, the dimmer the bulbs will be and explain that they will be dimmer when more are added to a circuit, as less energy is transferred to each of them To describe precautions for working safely with electricity and explain some precautions using knowledge of circuit diagrams, electrical components, conductors or insulators To draw a results table and record a range of appliances under the correct headings 'Mains' or 'Batteries' To identify and draw simplified electric circuit symbols and use these to draw a simplified circuit diagram To write a method for the investigation that considers appropriate equipment, orders clearly written steps and considers safety To pose questions relating to bulbs in an electrical circuit To explain why a selected question is testable To suggest that new inventions will change safety advice	To apply and create classification keys To make careful observations To make and use classification keys To present information in different ways To research using an information sheet
Cross Curricular Links	❖ Maths ❖ British Values	❖ British Values	❖ English ❖ Maths ❖ Design & Technology ❖ British Values	❖ English ❖ Maths ❖ Design & Technology ❖ British Values	❖ English ❖ Design & Technology ❖ British Values ❖ PSHE	❖ Maths ❖ English ❖ British Values
Building on from... 	✓ Developing scientific skills including observation, prediction and experimentation ✓ Life processes and living things ✓ Materials and their properties ✓ Physical processes					

LKS2

SECOND YEAR

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum	Light	Sound	Forces & Magnets	Animals Including Humans	Animals Including Humans	Making Connections
Stimulus	Light & Shadow	Sound and Vibrations	Forces & Space	Movement and Nutrition	Digestion and Food	How does food affect muscle fatigue?
Overview	Identifying examples of light sources, children learn that light is needed to see and how its absence causes darkness. Children investigate reflection and shadow formation, including how different factors affect shadows. They explore how shadows can be used to entertain in the arts and create shadow puppets to recount how different people work or experiment with light.	Exploring different ways of producing sounds, children learn about the relationship between vibrations and what they hear. They study dolphins and whales to develop their understanding of how sound travels between objects and investigate the role of insulation to protect our ears. Pupils explore how pitch and volume can be altered and make their own musical instruments to demonstrate these principles.	Investigating the movement of vehicles on different surfaces, children learn about the impact of friction and compare uses and drawbacks. They broaden their experience in writing scientific methods and recording data as they investigate contact and non-contact forces. Pupils explore the properties of different magnets and use this to understand their uses.	Studying the human skeleton, children identify key bones and compare them to other animals explaining the role within the body. Pupils explore how changes in muscles result in movement and the implications these discoveries have in the scientific development of prosthetic limbs. They study how energy is used by the body, what constitutes a balanced diet in humans and how research contributes to nutritionist expertise.	Using models, children describe the function of key organs in the digestive system. They identify the types of human teeth to create their own model and investigate factors that impact our dental health. They compare human teeth to other animals' and consider this in the light of prior knowledge about predators, prey and food chains. Children take on the role of a naturalist investigating animal faeces for clues about diet, digestion and dentition.	Using practical investigations, pupils develop their working scientifically skills by exploring how food influences muscle fatigue. Revisiting learning on digestion, nutrition and energy, they plan and carry out a comparative test, measuring muscle endurance before and after eating. Gathering and recording data carefully, pupils analyse their findings and evaluate the reliability of their test. They extend their understanding by investigating whether food can provide chemical energy to power an electrical circuit, before presenting their results clearly to others.
Knowledge Progression	To know that light travels from a source (e.g. the Sun, light bulbs and torches) To know that light is needed to see things and that dark is the absence of light To know that light from the Sun can be dangerous and how to protect their eyes To know that all materials reflect light To know that shadows are formed when the light from a light source is blocked by an opaque object To know that shadows change as a result of different factors: - Changing the position of the light source - Changing the distances between the light source, object and surface To know that shadows change position and length throughout the day as the Sun changes position in the sky	To understand that sound is a result of vibrations To know that vibrations from sounds travel through mediums to the ear To know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds To know that different materials provide different amounts of insulation against sound To know a variety of ways to change the pitch or volume of a sound To know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds To know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds To know that sounds get fainter as the distance from the sound source increases	To know some examples of contact and non-contact forces To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism) To know the North and South poles of a magnet To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other To know some different examples of magnets, including bar, horseshoe, button and ring To know some uses of magnets To know that friction is a contact force that acts between two surfaces to slow an object down To know that magnetism is a non-contact force that affects objects containing magnetic metal To understand that the opposite poles of a magnet attract one another and like poles repel one another To know that rougher surfaces have more friction between them than smoother surfaces To understand that the strength of different magnets may vary	To know that animals can be grouped based on the presence of a skeleton To know that the skeleton in humans and some animals is used for movement, protection and support To know that the muscular system in humans and some animals works with the skeleton for movement To know the main bones in the body To know that animals, including humans, need the right types and amount of nutrition To understand that humans cannot make their own food and therefore eat to get the nutrition needed To know the main nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions To know that a balanced diet should include all nutrient groups To describe the diets of different animals	To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions To know that teeth can be damaged, including the effect of sugary and acidic food To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly To describe the teeth of carnivores and herbivores, and understand why they are different To know that predators hunt for their food and prey are the animals being hunted To know that producers make their own food To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on	This unit revises the following key knowledge, building on the children's original point of access <u>MOVEMENT AND NUTRITION</u> To know ✓ The skeleton in humans and some animals is used for movement, protection and support ✓ The main bones in the body ✓ The main nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions ✓ The muscular system in humans and some animals works with the skeleton for movement ✓ Animals, including humans, need the right types and amount of nutrition ✓ A balanced diet should include all nutrient groups ✓ Humans cannot make their own food and therefore eat to get the nutrition needed <u>DIGESTION AND FOOD</u> To know ✓ The main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions ✓ Food chains begin with a producer followed by consumers and arrows to show energy passed on <u>ROCKS AND SOIL</u> To know ✓ Soils are made from rocks and dead matter <u>ELECTRICITY AND CIRCUITS</u> To know ✓ All electrical appliances need a power source, including batteries of mains electricity ✓ The main components in a simple series circuit ✓ That some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals) ✓ An electrical circuit needs a complete path for the electrical charge to flow through ✓ The precautions for working safely with electricity ✓ A closed switch completes a series circuit so the components will be on <u>LIGHT AND SHADOW</u> To know ✓ Light travels from a source (e.g. the Sun, light bulbs, torches) ✓ All materials reflect light ✓ Light is needed to see things and that dark is the absence of light ✓ Shadows are formed when the light from a light source is blocked by an opaque object
Vocabulary	Cast a shadow Conclusion Control variable Dangerous Light source Luminous	Air Bar chart Eardrum Insulator Observe Pitch	Attract Contact force Electromagnet Force Friction Magnet	Balanced diet Bone Carbohydrate Conclude Diet Endoskeleton	Canine Carnivore Conclusion Control variable Diagram Digest	Bar chart Battery Bulb Circuit Conclusion Control variable

	Non-luminous Opaque Protect Prove Reflect Reflection Reflective (shiny) Relationship Shadow Shadow puppet Translucent Transparent Variable	Plan Predict Proof Record Research Results table Sound Trustworthy Vibration Volume	Magnetic material Magnetism Non-contact force Non-magnetic material North pole Repel South pole	Energy Exoskeleton Fat Fibre Invertebrate Joint Measure Mineral Movement Muscle Nutrient Pelvis Protection Protein Ribs Skeleton Skull Spine Support Vertebrate Vitamin Water	Digestive system Thics Faeces Food chain Fair test Group Herbivore Incisor Large intestine Molar Mouth Nutrient Oesophagus Omnivore Pattern Plan Predator Premolar Prey Producer Proof Eord Results table Saliva Small intestine Stomach Trustworthy Variable	Fair Joint Light source Opaque Pattern Predict Shadow Trustworthy Variable
Working Scientifically						
Posing questions	Beginning to raise further questions during the enquiry process Considering what makes a testable question Beginning to recognise that there are different types of enquiry and that they are suitable for different questions Beginning to make suggestions about how different questions could be answered					
Planning	Beginning to select from options which variables will be changed, measured and controlled Beginning to suggest what observations to make and how long to make them for Planning a simple method, verbally and in writing Beginning to write a simple method in numbered steps Selecting and beginning to decide what simple equipment might be used to aid observations and measurements					
Predicting	Making predictions about what they think will happen by: - Using scientific knowledge and/or personal experience to explain their prediction (because...) - Beginning to consider cause and effect when making predictions, where appropriate - Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel)					
Observing (Qualitative data)	Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed					
Measuring (Quantitative data)	Using standard units to measure and compare Using measuring equipment with increasing accuracy Reading scales with unmarked intervals between numbers					
Researching	Gathering specific information from a variety of sources					
Recording (diagrams)	Beginning to draw more scientific diagrams by: - Using some standard symbols - Drawing in 2D to produce simple line diagrams - Labelling with more scientific vocabulary					
Recording (tables)	Using a prepared table to record results including more detailed observations Using tables with more than two columns Identifying and adding headings to tables Beginning to design simple results tables.					
Grouping and Classifying	Grouping based on visible characteristics and measurable properties Populating a pre-prepared branching and number key Choosing appropriate questions for classification keys					
Graphing	Representing data using bar charts Drawing bars with greater accuracy Reading the value of bars with greater accuracy					
Analysing and drawing conclusions	Writing a conclusion to summarise findings using simple scientific vocabulary Beginning to suggest how one variable may have affected another Beginning to quote results as evidence of relationships Identifying data that does not fit a pattern (anomalous data) Recognising when results or observations do not match their predictions Beginning to use identified patterns to predict new values or trends					
Evaluating	Writing a conclusion to summarise findings using simple scientific vocabulary Beginning to suggest how one variable may have affected another Beginning to quote results as evidence of relationships Identifying data that does not fit a pattern (anomalous data) Recognising when results or observations do not match their predictions Beginning to use identified patterns to predict new values or trends					
Science in Action	To know about the methods and equipment used by scientists throughout history and how these have led to modern methods To know how scientific knowledge has changed over time, leading to the current understanding of Science To know about current scientific research and what it aims to achieve in the future To know that collaboration and peer reviewing is essential for effective scientific progress					
What children will have learnt by the end of the topic	To recall examples of light sources, objects that do not give out light and that darkness is the absence of light To describe ways to protect the eyes from harm	To describe how sounds are made To describe how sounds are heard through different mediums To explain the relationship	To identify examples of pushes, pulls and twists To define a force, including describing, naming and classifying contact and non-contact forces	To recall the three key functions of the skeleton (movement, support and protection) To describe a vertebrate, invertebrate, endoskeleton and exoskeleton	To label key organs found in the digestive system and describe each of their functions To describe the functions of the four different types of adult human teeth using key vocabulary	To recall knowledge from previous units To apply knowledge in new contexts To carry out a full scientific enquiry

	To describe what happens when light reflects, give examples of reflective surfaces or materials and describe factors that may affect the quality of a reflected image To describe how shadows form and identify patterns between groups of materials and the shadows produced To recall factors that affect the way a shadow appears, including what causes shadows to change throughout the day and factors that change the size of a shadow To describe the pattern of changing shadows throughout the day To describe how the light source’s distance affects the shadow’s size To explain why a particular material is appropriate for making a shadow puppet and use knowledge of shadows to animate it	between vibration strength and volume To describe pitch and how to change it To explain how insulating materials can be used to muffle sound To observe closely how different instruments create a sound To research how whales and dolphins communicate under water To represent results using a bar chart To suggest which variables to measure and for how long To design simple results tables To identify when results or observations do not match predictions	To describe the relationship between friction and the roughness of a surface To identify examples of friction being useful or not To predict attraction and repulsion between like and opposite poles To identify examples of magnetic and non-magnetic materials To name some examples of types of magnets and compare their strengths To describe some examples of the uses of magnets To use arrows and scientific vocabulary to show the direction of a contact force To use evidence to support conclusions To identify the variables to change, measure and control To write a method to explain how to use a magnet to sort and classify materials as magnetic or non-magnetic To label axes of a bar chart To draw bars on a chart accurately To identify key information from a source To use more than one source to research a question	To identify and name the skull, spine, ribs and pelvis on a diagram To recall that muscles cause movements in the body, some of which we control by choice and they they cause a movement by shortening and pulling on a bone To recall that animals, including humans, need to eat food to survive To describe some examples of how energy is used by the body and make comparisons about the energy demands between people To list some of the seven nutrient groups, name foods that are good sources of them and describe what they are needed for in the body To compare two different meals and explain which is more balanced by naming the nutrient groups and commenting on the relevant proportions To use information about skeletons to group animals To record measurements of different bones and use the data to sort them into size order Describe some ways scientific research has improved the field of bionics/prosthetics, such as the choice of materials or linking their movement to muscles in the arm Find relevant data on food packaging and make numerical comparisons Summarise key information using secondary sources To describe some changes to scientific knowledge and jobs that require this information	To know that good dental care involves brushing their teeth twice a day with toothpaste and a soft toothbrush To produce a food chain that begins with a plant and has arrows that move up the food chain To define a producer, predator and prey and indentify examples in the food chain To describe digestion, teeth and diets when talking about the observed poo clues To write a letter that uses a range of scientific vocabulary from the unit To evaluate a strength or weakness of the digestive system model To describe an example of evidence that can be used to study teeth To evaluate a method by considering its limitations To recall that scientific research needs repeated results before being used in society To identify trends in predators and prey To draw a results table that has space for observations about different poo samples	
Cross Curricular Links	❖ English ❖ Maths ❖ Geography ❖ British Values	❖ Music ❖ English ❖ Maths ❖ British Values	❖ English ❖ Maths ❖ British Values	❖ Maths ❖ English ❖ Design & Technology ❖ British Values	❖ English ❖ Maths ❖ British Values ❖ Geography	❖ English ❖ Maths ❖ Design & Technology ❖ PSHE ❖ PE ❖ Geography ❖ British Values
What comes next..? 	Please refer to your child’s chosen middle school for a detailed breakdown of how the statutory aspects of UKS2 Science will be covered.					