Science

Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Science – Year One

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Everyday Materials	
Theme content:	Burwell and Beyond	
Scientist:	Charles Mackintosh (Optional)	
Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock	Working scientifically, pupils can: ✓ identify and classify materials in school at home or in the school's locality e.g. wood, plastic, glass, metal, water and rock. Progression • Pupils can identify a limited number of materials with prompting. • Pupils can identify up to 6 materials with prompting questions. • Pupils can identify over 6 materials with confidence and certainty.	Pupils present findings in simple templates provided for them or orally and draw or photograph evidence and label with support. Greater Depth: Pupils make some choices about how to present findings from a range offered to them.
Describe the simple physical properties of a variety of everyday materials	Working scientifically using their observations pupils can; ✓ describe materials in school at home or in the school's locality as being: hard/ soft, stretchy or stiff, shiny/ dull; rough/ smooth; bendy or stiff; waterproof/ non waterproof; absorbent/non-absorbent; opaque/see-through. Progression • Pupils can describe at least one physical property of a limited number of materials with prompting e.g. metals are heavy. • Pupils can describe some physical properties of a limited number of materials e.g. metals are heavy, wood floats, plastic is bendy; gathering and recording data to support in answering questions. • Pupils can identify the physical properties of a wide range of materials with confidence and certainty, gathering and recording data to support in answering questions.	Pupils observe objects, living things, events and the world around them closely, using their senses. Greater Depth: Where appropriate, Pupils use equipment with whole number scales. With support, Pupils discuss what they have seen or found out.
Compare and group together a variety of everyday materials on the basis of their simple physical properties	Working scientifically to identify and classify, perform simple tests and gather and record data pupils can: ✓ give a reason(s) why material(s) are the same or different. Progression • Pupils can group together similar materials e.g. various different objects all made of metals. • Pupils sort a range of materials into groups with prompting questions. • Pupils sort a range of materials accurately and consistently	Pupils present evidence they have collected in simple templates provided for them to support in answering questions. Pupils draw or photograph evidence and label with support. Greater Depth: Pupils present evidence, with support, using simple tables, charts or diagrams.

	into groups explaining their reasoning.	
Distinguish between an object and the material from which it is made	Working scientifically using their observations and ideas pupils can: ✓ name a number common objects found in home or school and suggest what material each is made from. Progression • Identify simple objects made of one material e.g. a ruler, being made of wood or plastic. • Make the distinction between the object and the material it is made from e.g. a drinking glass or a plastic beaker. • Can identify combination materials with confidence and certainty e.g. a wood handle on a metal saucepan.	Pupils ask simple questions stimulated by their exploration of their world. Greater Depth: Pupils use what they see and their own ideas to offer answers to questions. Pupils with support can identify evidence needed to answer a question.

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Plants	
Theme content:	London Calling	
Scientist:	NA	
Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees **(Expectation to revisit across academic year in link to Seasonal Changes)**	Working scientifically to identify and classify pupils can: ✓ Identify plants in the school's locality: e.g. daffodils, poppies, dandelions, sunflowers, snowdrops, beans, carrots, tomatoes, strawberries, mint. ✓ Identify trees: e.g. oak, ash, horse chestnut, sycamore, fruit tree, spruce, pine, conifer, holly, blackberry or hawthorn. Progression • Pupils can name a limited number of plants with prompting. • Pupils can name up to 10 common plants and /or trees with little prompting, asking simple questions and recognise that they can be answered in different ways e.g. Daffodils can be identified as tall Spring flowers like tulips or yellow Spring flowers like crocuses. • Pupils can name over 10 common plants and trees with confidence and certainty gathering and recording data to support in answering simple questions. E.g. which flowers or trees would you expect to see in Spring?	Pupils present findings in simple templates provided for them or orally and draw or photograph evidence and label with support. Greater Depth: Pupils make some choices about how to present findings from a range offered to them.

Identify and describe the basic structureofavarietyof common flowering plants, including trees	Workingscientifically by observingclosely pupilscan: ✓ identifyaplant's: Leaves, flowers, petals, fruit, roots, seed, stem and a tree's blossom, leaves, fruit, roots, buds, trunk, branches, twigs seeds. Progression • Pupils can name some plant/tree parts with prompting. • Pupils can name most plant/tree plants by selecting correct labels to pictures answering simple questions. • Pupils can name all common plants and trees via verbal or written labelling of pictures and diagrams: asking simple questions and suggesting labels for tricky examples such as mushrooms, grasses or cacti. • Using their (pupils) observations and ideas to relate parts of plants to food stuffs: e.g. roots- potatoes and carrots; stems-rhubarb or celery; leaves-cabbage or lettuce; flowers–broccoli or cauliflower; fruits and nuts.	Pupils observe objects, living things, events and the world around them closely, using their senses. Greater Depth: Where appropriate, Pupils use equipment with whole number scales. With support, Pupils discuss what they have seen or found out.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Animals Including Humans	
Theme content:	Amazing Animals	
Scientist:	Rachel Carson (Ocean Pollution) **Famous Scientist** Linda Brown Buck (Senses)	
Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals **(Expectation to revisit across academic year in link to Seasonal Changes)**	Workingscientifically pupilscan: ✓ identifyandclassify, acrossa rangeofcontextsand opportunities, common animals seen in school, at home, on television, on holiday or at garden centre, wood or zoo e.g. ✓ Food fish (cod, trout, tuna)	Pupils recognise basic features, similarities and differences of objects or living things Pupils sort and group objects or living things in different ways with support. Greater Depth: Pupils sort everyday objects or living things into overlapping groups based on simple features, e.g. Venn diagrams

	clownfish, shark; fish: goldfish, koi. ✓ Amphibians: frog, toad, newt. ✓ Birds: blackbird, robin, starling, sparrow, tit, pigeon, duck, penguin, ostrich, swan, chicken. ✓ Mammals: Humans, wild animals such as primates, (ape, gibbon, gorilla, orangutan, chimpanzee) monkey, lion, tiger, elephant, zebra, giraffe etc. Farm animals: cow, horse, sheep, goat, donkey. Pet animals: cat, dog, hamster, mouse, guinea pig: Woodland animals: badger, fox, deer, squirrel. Progression • Pupils can identify and classify a limited number of animals with prompting. • Pupils can identify and classify up to 20 animals with prompting. • Pupils can identify and classify over 20 animals with confidence and certainty.	
Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Working scientifically pupils can: ✓ identify, across a range of contexts and opportunities, using their observations and ideas to ask simple questions about what animals eat: ✓ Carnivores- meat eaters- tiger, wolf, orca, owl, eagle, hawk ✓ . Herbivores-plant eaters- rabbit, zebra, sheep, horse, cow: ✓ Omnivores-plant and meat eaters- Human, bear, badger, ape. Progression • Pupils can describe the different types of things that animals eat and give an example of a meat-eater, a plant eater and a plant and meat eater. • Pupils can group common animals into groups by what they eat e.g. all cats are carnivores. • Pupils can accurately ascribe	Pupils ask simple questions stimulated by their exploration of their world. Greater Depth: Pupils use what they see and their own ideas to offer answers to questions. Pupils with support can identify evidence needed to answer a question.

	the terms carnivore, omnivore or herbivore to most animals.	
Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Working scientifically by closely observing, pupils can: ✓ describe the main structural characteristics of common animals and suggest differences and similarities. Progression • Pupils can describe all common chordate animals as having an internal skeleton of bones covered by flesh with visible sense organs, eyes, ears, nose, tongue etc. • Pupils can correctly describe mammals and birds as warm blooded covered with fur and feathers, and fish, reptiles and amphibians as cold blooded; fish as having scales, reptiles and amphibian as having rough or smooth skin. • Using their observations pupils can describe most mammals, reptiles and amphibian as having four limbs (arms and) legs or flippers) and suggest examples of those that do not obviously show these e.g. whales, dolphins, snakes or slow worms.	Pupils recognise basic features, similarities and differences of objects or living things Pupils sort and group objects or living things in different ways with support. Greater Depth: Pupils sort everyday objects or living things into overlapping groups based on simple features, e.g. Venn diagrams
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Pupils can: ✓ identify their: head, neck, shoulders, arms, elbows, wrist, fingers, chest, abdomen, legs, thighs, knees, shins, feet, toes. Pupils can: ✓ associate the body part with one of the senses i.e. tongue-taste, nose-smell, ears- hearing, eyes-sight, skin-touch. Progression • Pupils can identify body parts with prompting. • Pupils can identify most body parts by selecting correct labels to pictures etc. • Pupils can identify all body parts accurately drawing and	Pupils present evidence they have collected in simple templates provided for them to support in answering questions. Pupils draw or photograph evidence and label with support. Greater Depth: Pupils present evidence with support using simple tables, charts or diagrams.

	labelling pictures and/or diagrams associating the correct parts with one (or more) of the five senses.	

Aspect	Knowledge	Skills
Term:	All Terms	
Science Unit Name:	Seasonal Changes	
Theme content:	All Terms	
Scientist:	NA	
Observe changes across the four seasons **(Expectation to revisit across academic year)**	Working scientifically, pupils make: ✓ on-going observations, perform simple tests, take measurements, gather and record data, across the year, relating to weather, environmental changes (e.g. plant or animal activity), or temperature. Pupils can: ✓ describe the changing seasons with a number of indicators e.g. We make snowmen in winter or we play cricket in summer. Progression ✓ Pupils can identify general seasonal change as trends across the year and can identify general characteristics of the seasons e.g. winter being cold or summer being hot. ✓ Pupils can describe the changing seasons with a number of indicators e.g. We make snowmen in winter or we play cricket in summer. ✓ Pupils can associate the changing seasons with a number of indicators to animal and plant behaviour. e.g. leaves fall off deciduous trees in autumn, hedgehogs hibernate in the winter etc.	Pupils use their ideas to suggest answers to questions. Pupils say what has changed when observing objects, living things or events. Greater Depth: Pupils begin to recognise links between observations and answers to questions. Pupils perform simple tests to explore a question or idea suggested to them, with support. Greater Depth: With support, pupils say what to look for and what to measure in their test. Pupils make measurements using non-standard units of measure. Pupils observe objects, living things, events and the world around them closely, using simple equipment Greater Depth: Where appropriate, pupils use equipment with whole number scales. With support, Pupils discuss what they have seen or found out.
Observe and describe weather associated with the seasons and how day length varies. **(Expectation to revisit across academic year)**	Working scientifically pupils make: ✓ on-going observations, perform simple tests, take measurements, gather and record data, across the year, relating to weather, environmental changes (e.g.	Pupils respond to suggestions to connect what has been observed with possible further actions or observations. Greater Depth: Pupils make suggestions to connect what has been

	plant or animal activity), or temperature Pupils can: ✓ relate the weather typically associated with each season across a year. e.g. winter snow and frost, spring showers, warm summer sun, autumn rain and winds. Describe winter days as short and summer days as long. Progression ✓ Pupils can name the four seasons as Spring, Summer, Autumn and Winter. And can identify general characteristics of the seasons e.g. winter being cold or summer being hot. ✓ Pupils can relate the weather typically associated with each season across a year. e.g. winter snow and frost, spring showers, warm summer sun, autumn rain and winds. Describe winter days as short and summer days as long. ✓ Pupils can give a numerical equivalence to the temperature of the seasons. e.g. using the rhyme "5, 10, 21- winter, spring and summer sun". Explain how the daylight hours vary between mid-winter and mid-summer. Pupils describe appropriate clothing for the season.	observed with possible further actions or observations.

Science – Year Two

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Living Things and Their Habitats	
Theme content:	Great Explorers	
Scientist:	NA	
Explore and compare the differences betweenthings that are living, dead, and thingsthathaveneverbeen alive	Asking simple questions and recognising that they can be answered in different ways pupils can: ✓ explain that living things undertake all of these processes; grow, move, reproduce, sense, use nutrition (have a source of energy for food), excrete waste products, respire. Pupils understand that: ✓ dead things used to undertake all of these processes. Pupils understand that: ✓ things that have never been alive do not and have not ever undertaken all of these processes. Progression • Pupils can identify and classify some things that are living, dead and have never been alive and can identify one of the processes used to inform their sorting with prompting questions. • Pupils can identify and classify some things that are living, dead and have never been alive and can identify two or three of the processes used to inform their sorting with prompting questions. • Pupils sort things that are living, dead and have never been alive accurately and consistently into groups explaining their reasoning by referring to more than three of the processes used to inform their sorting.	Pupils ask simple questions about their experiences and observations of objects, living things or events and with support use these observations to suggest ways to discover an answer or solve a problem, recognising that some can be answered in a variety of ways. Greater Depth: Within a group, pupils listen to others suggestions and make their own about how to discover an answer Pupils answer questions/solve problems using their own experience or what they have found out. Pupils suggest an alternative way to answer questions/solve problems when appropriate.
Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other	Using their observations and ideas to suggest answers to questions pupils can: ✓ explain that a habitat is a natural environment or home of a number of different plants and animals and can give examples of some habitats. Pupils describe: ✓ the features of different habitats and explain how those	Pupils use their observations and ideas to suggest answers to questions and to make predictions. Pupils respond to suggestions to identify some evidence needed to answer a question. Greater Depth: Pupils use scientific evidence and ideas to answer questions,

	features provide for the basic needs of different animals and plants, including needs for appropriate nutrition and shelter e.g. habitats within the school grounds, woodland, seashore, oceans, rainforest. Pupils explain how: ✓ animals are suited to their habitat, e.g. a badger's claws enable it to dig a sett in the ground; a camel is adapted to be able to survive for long periods without drinking; a giraffe is adapted to enable it to reach the leaves of trees that other herbivores cannot reach; a cactus is adapted to conserve water in a dry habitat; mosses on the frozen tundra are dark in colour to enable them to maximise any solar heat. Progression • Pupils match some animals and plants to their habitats and give some reasons for their matching with prompting questions. • Pupils match a range of animals and plants to the most appropriate habitats and give reasons for their matching with prompting questions. • Pupils explain the relationship between animals and plants living in habitats, giving examples from more than two contrasting habitats.	
Identify and name a variety of plants and animals in their habitats, including micro- habitats	Pupils can: ✓ identify and classify animals and plants living within different habitats and using their observations and ideas explain the relationships between the features of the habitats and the needs of the animals and plants. (link to physical geography on the	Pupils make comparisons between basic features or components of objects, living things or events to support identification and/or classification. Pupils sort and group objects, living things or events on the basis of their observations and explain why. Greater Depth: Pupils identify differences, similarities or changes

	location of the Equator and the North and South Poles) ✓ e.g. lions, penguins, polar bears live in a habitat with sufficient prey, appropriate climate, adequate shelter and opportunities to reproduce. ✓ e.g. foxes live in habitats with sufficient prey and/or scavenging opportunities, shelter, soil conditions to dig earths and opportunities to reproduce. ✓ e.g. woodlice live in a micro-habitat with appropriate and sufficient sources of food, adequate shelter, climate conditions and opportunities to reproduce. ✓ e.g. fungi grow in damp habitats, cacti grow in dry habitats. Pupils can: ✓ explain that a micro-habitat is a very small habitat and can give examples of micro-habitats e.g. school pond, wormery, greenhouse, leaf litter. Progression ✓ Pupils sort animals and plants into two contrasting habitats. ✓ Pupils identify the animals and plants which live in two contrasting habitats. ✓ Pupils identify the animals and plants which live a range of contrasting habitats and explain the features of the habitats which meet the needs of those animals and plants.	within things to do with science. Pupils make drawings of things in the real world.
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	Working scientifically , closely observing and gathering and recording data from secondary sources pupils understand that: ✓ different animals obtain their food from different sources and that the sources of food can be illustrated by using a food chain. Pupils understand that: ✓ working backwards from knowledge of what herbivores,	Pupils gather and record data in appropriate ways with increasing independence to support in answering questions. Greater Depth: Pupils draw tables and bar charts

	carnivores or omnivores eat to understand that plants are at the beginning of food chains. Pupils use: ✓ their developing understanding of food chains for carnivores to create and explain a food chain for a school dinner e.g. shepherd's pie, fish fingers, chips and peas. Progression • From a number of deconstructed food chains pupils can identify that a plant is at the beginning of each. • Draw and label a diagram of a simple food chain for a carnivorous animal and for a human meal. • Draw and label diagrams of food chains using appropriate scientific vocabulary for a human meal and at least two carnivorous animals.	

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Animals including Humans	
Theme content:	Great Explorers	
Scientist:	Louis Pasteur (Hygiene)	
Notice that animals, including humans, have offspringwhich growinto adults	Pupils learn: ✓ about the development of humans from babies to older adults, thinking about the capabilities at different stages of development. Pupils use understanding of what has been observed or own experience to predict outcomes of further actions or observations: ✓ in which they identify parents and offspring of animals where the offspring look similar to the parent, and move on to identify parents and offspring which look initially dissimilar. Pupils investigate: ✓ the lifecycle of some animals, using opportunities for first hand observation where available, undertaking some guided research involving secondary sources.	Pupils use understanding of what has been observed or own experience to predict outcomes of further actions or observations. Greater Depth: Pupils recognise when results meet predictions or not. Pupils ask a new question based on observations or own experience.

	Progression • Pupils match some parents and offspring, including human babies and adults and animals where parents and offspring look similar e.g. calf – cow, lamb - sheep. • Pupils match a wider range of parents and offspring, including examples where parents and offspring look dissimilar e.g. egg – chicken, spawn – tadpole-frog. Pupils can sort pictures of humans at key stages of development e.g. baby – toddler – child – teenager – adult – older adult, and can identify some changes in capabilities at the different stages. • Pupils demonstrate awareness of the lifecycles of a wider range of animals, including examples where parents and offspring look dissimilar, e.g. butterfly, dragonfly, frog.	
Find out about and describe the basic needs of animals, including humans, for survival(water, foodandair)	Working scientifically using their observations and ideas, pupils think about: ✓ the basic needs of humans and the signals experienced to indicate hunger and thirst. They undertake practical investigation in PE lessons to identify that humans become out of breath when they undertake vigorous exercise. Pupils are taught that: ✓ humans eat different types and amounts of food at different stages of development, e.g. babies drink milk and toddlers eat smaller quantities of food than adults. Pupils learn that: ✓ all animals have similar basic needs for water, food and air, although the types and amounts of food that they eat and amounts of water drunk vary considerably, e.g. investigate the dietary needs of an elephant, a camel, a mouse. Pupils discuss some familiar examples, e.g. discussing how to look after different pets. Progression • Pupils identify that animals need water, food and air for survival. • Pupils can identify and explain the signals they experience when feeling thirsty, hungry and out of breath. Pupils can give a suggestion as to the health implications of lack of food, water or air. Pupils show understanding of how to care for a pet. • Pupils know that different animals require different amounts of food and water to survive. Pupils can describe why humans eat different types and amounts of food at different stages of development.	Pupils make measurements using non-standard units of measure. Pupils observe closely. Greater Depth: Pupils make increasingly accurate measurements. Pupils choose some equipment correctly and appropriately for the materials/events being observed/measured.

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Pupils can: ✓ explain the importance for humans of undertaking exercise and the consequences of not taking sufficient exercise for health. Pupils know that: ✓ the heart is a major organ and working scientifically perform simple tests using simple equipment to discover that its pumping action can be heard or felt as a pulse. Pupils learn about: ✓ the different food groups and find out what role of those food groups is for keeping the body healthy (including fruits and vegetables; meat, fish nuts and eggs, dairy, fats and sugars, grains, cereals and potatoes – extending to use scientific terminology of carbohydrates, proteins, vitamins and minerals). Pupils understand: ✓ the concept of a balanced diet for human health. Pupils learn about: ✓ hygiene in relation to food preparation and eating, and the importance of hand washing after using the toilet. Progression • Pupils know that humans need exercise to keep healthy. Pupils can select from a range of foods some which make up a balanced meal. Pupils know that they should wash their hands before eating. • Pupils know that their heart pumps faster when they exercise and that they can feel this as a pulse. Pupils can identify the main food groups and can plan their own balanced meal. Pupils explain why they should wash their hands before preparing and eating food. • Pupils can identify how exercise impacts positively on the body in relation to heart and circulation of blood and oxygen, and some consequences of taking insufficient exercise. Pupils can explain the consequences for human health of not eating a balanced diet and can name all of the main food groups and their role in keeping the body healthy. Pupils know that germs can make humans unwell and can identify how the spread of germs can be reduced.	Pupils identify things to measure or observe that are relevant to the questions or ideas they are investigating using a simple test. Pupils suggest a practical way of how to find things out, or collect data to answer a question or idea they are investigating. Greater Depth: Pupils recognise that some ways of investigating a question or idea are more appropriate than others.

Aspect	Knowledge	Skills
Term:	Spring	

Science Unit Name:	Using Everyday Materials	
Theme content:	Historic Heroes	
Scientist:	Mae Jameson (Space)	
Identify and compare the suitability of a variety of materials, including wood, metal, plastic, glass, brick, rock,paperand cardboard for particularuses	Working scientifically pupils can: ✓ identify and classify a number of different materials that could be used to make an object or part of it, e.g. a window frame can be made from wood, plastic or metal. Pupils evaluate: ✓ how appropriate different materials would be for particular uses by thinking about the functions of the object and properties of the material that make them suitable or unsuitable for a particular purpose, e.g. a rule or spoon can be made from plastic, wood or metal, but not glass; a waterproof coat can be made from plastic and some fabrics with appropriate properties, but not from paper or metal. Pupils find out that: ✓ many materials are used for more than one thing, e.g. metal can be used to make coins, parts of a car body and engine, food and drink cans, parts of furniture; wood can be used to make tables, shelves, pencils, picture frames. Pupils use: ✓ the vocabulary learned in year 1 to describe the properties of materials and sort materials into groups - hard/soft, stretchy/stiff, shiny/dull; rough/smooth; bendy /stiff; waterproof/ non waterproof; absorbent/non-absorbent; opaque/see-through and extend their vocabulary e.g. using terms – transparent, flexible, rigid to apply to their explanations. Pupils learn about: ✓ specific materials e.g. using simple tests that the properties of some metals influences their use – copper is a good conductor of electricity so is used in electric cables; aluminium, durable, malleable, lightweight and abundant so is used for food packaging. Progression • Pupils identify that materials can be used to make a number of different things. Pupils can give suggestions as to why a material would be unsuitable for an object e.g. metal is unsuitable to make a window pane. • Pupils identify three objects which can be made from a number of different materials, can give examples of other materials that are unsuitable to make those objects and are able to say why they are unsuitable in terms of their properties. • Pupils can give more than three examples showing their understanding that a range of materials can be used to make many different objects, clearly explaining the relationship between the properties of the materials and the function of the objects in scientific terms.	Pupils report on and record findings as drawings, photographs, labelled diagrams, orally, as displays, or in simple prepared tables or charts. Greater Depth: Pupils use appropriate simple scientific vocabulary when reporting or recording findings.

	Pupils could invent a new material which has a number of useful properties.	
Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Pupils make predictions and working scientifically perform simple tests and use simple equipment to investigate how materials can be changed by squashing, bending, twisting and stretching, recording the results of their investigations. Pupils make further predictions about the properties of other materials based on their initial investigations of similar materials. Progression • Pupils can describe how the shapes of some objects can be changed by squashing and know that some objects are too hard to be squashed by hand. • Pupils can describe and record their observations of how some objects are changed by bending, twisting or stretching. Pupils know that the properties of some objects mean that they cannot be bent, twisted or stretched by hand. • Pupils relate their knowledge of the properties of objects to their functions, e.g. wood is a suitable material from which to make a table because it cannot ordinarily be squashed, bent, twisted or stretched; wood is rigid, hard, non-absorbent, waterproof and through the manufacturing process can be made smooth.	Pupils use their observations and ideas to suggest answers to questions and to make predictions. Pupils respond to suggestions to identify some evidence needed to answer a question. Greater Depth: Pupils use scientific evidence and ideas to answer questions.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Plants	
Theme content:	Ready, Steady, Grow!	
Scientist:	George Washington Carver (Growth) **Famous Scientist**	
Observe and describe how seeds and bulbs grow into mature plants (Expectation to revisit across academic year)	Working scientifically observing closely, using simple equipment and performing simple tests pupils: ✓ plant a variety of seeds and bulbs, including flowering and vegetable seeds, gathering and recording data on how the seeds and bulbs grow into mature plants. Pupils learn that: ✓ seeds can be gathered from some mature plants, e.g. sunflower seeds, tomato seeds, beans, and be replanted to begin the plant lifecycle again. Progression • Pupils record their observations of how seeds and bulbs grow through drawings or photographs, matching simple labels to the correct stage of a plant's growth. • Pupils draw and label diagrams to record their observations and record simple measurements of how seeds and bulbs grow. • Pupils take and record using standard measures to show their understanding of how seeds and bulbs grow. Pupils can	Pupils identify things to measure or observe that are relevant to the questions or ideas they are investigating using a simple test Pupils suggest a practical way of how to find things out, or collect data to answer a question or idea they are investigating. Greater Depth: Pupils recognise that some ways of investigating a question or idea are more appropriate than others.

	explain the lifecycle of a plant they have studied, including the replanting of harvested seeds to grow a new plant.	
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Working scientifically using simple equipment and performing simple tests pupils: ✓ plant seeds and bulbs and plan an investigation to enable them to observe the growth and health of the plants under conditions where the water, light and temperature vary, including gathering and recording data of plant growth. Pupils use: ✓ what they learn from their observations to plan further investigations to test their emerging understanding of the optimal conditions for plant growth. Progression • Pupils observe and record through drawings or photographs how different conditions of water, light and temperature affect the growth and health of plants. • Pupils give simple explanations why the plants in different conditions grow differently. • Pupils make predict, test, and record, through drawings or photographs, and explain their observations to show understanding of the optimal conditions that plants need to grow and stay healthy. Pupils use their understanding from this investigation to make predictions about what will happen when a different type of plant is studied under varying water, light and temperature conditions and test their predictions through further investigations.	Pupils use understanding of what has been observed or own experience to predict outcomes of further actions or observations. Greater Depth: Pupils recognise when results meet predictions or not. Pupils ask a new question based on observations or own experience, which may be testable.

Science – Year Three

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Forces and Magnets	
Theme content:	History	
Scientist:	NA	
Compare how things move on different surfaces	Pupils recognise: ✓ there are forces in action when items are moved on different surfaces (friction) and working scientifically recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables. Progression • Investigates surface friction and can conclude that some surfaces slow objects down and others cause them to move more quickly than others. • Investigates surface friction and can conclude that rough surfaces slow you down and smooth surfaces don't slow you as much. • Apply understanding to grips on tyres and shoes; skiing and ice-skating, etc.	Pupils gather and present evidence and data using simple scientific language and vocabulary as writing, drawing, labelled diagrams, display, through ICT, keys, bar charts or tables (using ranges and intervals chosen for them) to help in answering questions. Greater Depth: Pupils make some independent choices about an appropriate way to record data.
Notice that some forces need contact between two objects, but magnetic forces can act at a distance	Pupils consider: ✓ the characteristics of magnetism and how forces act at a distance:. Pupils use: ✓ photographic evidence of forces in action to show how manipulation of forces has enabled advantageous inventions/structures This can be modelled simply and/or applied to relatively new technologies such as electromagnetic repulsion e.g. Japanese bullet trains. Progression • Recognise that the unusual property of a force that can act from a distance can be used	Within a group, pupils suggest relevant questions that can be explored/investigated further using different types of science enquiry. Greater Depth: Pupils identify 'testable' questions and questions that are not testable in the primary classroom.

	to make pictures move 'magically'. • Recognise that the unusual property of a force that can act from a distance can and is used for both simple and advanced technologies. • Pupils use their knowledge and understanding of magnets acting at a distance to explain the 'hanging paperclip' and then relate that to everyday situations like self-closing wardrobe doors.	
Observe how magnets attract or repel each other and attract some materials and not others	Using secondary sources, pupils observe: ✓ the image of the magnetic field made by iron filings when like and not like poles are placed close together. Pupils investigate: ✓ the attraction of a variety of materials by a magnet. Progression • Explain in their own terms what happens when poles are brought together, e.g., the magnets 'stick' or 'push' each other away and is aware that materials made of metal will be attracted to a magnet. • Independently can describe the effect of magnetism by using the terms attraction and repulsion, and is aware that there are only a few metals that are magnetic, but may not know all names. • Can describe magnetism using correct scientific vocabulary and recognises that not just iron, but also steel, nickel and cobalt can be magnetic and will attract.	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to recognise when a test is not fair and suggest improvements.
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	Working scientifically, setting up simple practical enquiries, comparative and fair tests pupils can: ✓ sort and test a variety of everyday materials on the basis of their magnetic attraction. Progression	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to

	• Recognises that when an object 'sticks' to the magnet that it is a magnetic material and not all materials do this. • Can independently group and compare everyday objects by testing for magnetism and recognise that certain metal items or items made with a mix of these metals (lodestone) are magnetic whilst some are not. • Question why and determine how to test to find out which metals are magnetic.	recognise when a test is not fair and suggest improvements.
Describe magnets as having two poles	Working scientifically, setting up simple practical enquiries, comparative and fair tests pupils discover that: ✓ every magnet has two opposite poles called, for convenience, North and South. Progression • Pupils can identify the opposite poles of a bar magnet. • Labels a range of magnets to show the two poles; recognises that these align themselves with the earth's magnetic north. • Investigate a range of different shaped magnets identifying the correct pole when referred to a norm and explain why when a bar magnet is halved it makes two new magnets.	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to recognise when a test is not fair and suggest improvements.
Predict whether two magnets will attract or repel each other, depending on which poles are facing	Working scientifically, setting up simple practical enquiries, comparative and fair tests pupils discover: ✓ what happens when like poles of a magnet and unlike poles of a magnet are presented together. Progression • Recognises that the magnet needs turning around if it doesn't attract or repel as expected. • Pupils can explain that opposites attract (N and S) and like repel (S and S; N and N). • Pupils can accurately and	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to recognise when a test is not fair and suggest improvements.

	consistently predict the outcome of placing the poles of known magnets together.	

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Light	
Theme content:	History	
Scientist:	Maria Telkes (Optional)	
Recognise that they need light in order to see things and that dark is the absence of light	Pupils recognise that: ✓ we see things when light from a source enters our eyes, and without light we are unable to see. Progression • Can explain that light is needed to see and apply this in simple terms such as: when eyes are closed we no longer see as light cannot enter our eyes. • Pupils can recognise that light can come in many forms including the colours of the rainbow (natural and man-made) and without light we cannot see. • Recognise that blocking of light by a solid (opaque) object is what makes a shadow and link this to eclipses and other natural and everyday phenomena.	Pupils take simple accurate measurements and/or careful observations using whole number standard units relevant to questions or ideas under investigation. Pupils use a range of equipment for measuring and observing, including thermometers and data loggers. Greater Depth: Pupils use standard units over an increasing range. Pupils begin to make appropriate choices of equipment available for observing and measuring closely
Notice that light is reflected from surfaces	Working scientifically using straightforward scientific evidence to answer questions or to support their findings pupils notice that: ✓ some surfaces, including the moon, are better reflectors than others. Progression • Pupils can show using pictures or simple diagrams that a reflection is due to light "bouncing" off the surface of the object and if the light is lessened or the surface is not shiny then the clarity of the reflection will be diminished.	Pupils report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions with support/as a group. Pupils record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables with support/as a group. Greater Depth: Pupils participate actively in reporting on findings as part of a group. Pupils make suggestions on appropriate ways to record findings either as a group or individually

	• That light reflects off shiny, light and smooth materials better than dull, dark and rough materials that do not reflect light well. • Application of this understanding to the use of reflectivity in everyday usage; bicycle reflectors, car mirrors, ships' periscopes, high visibility vests/coats.	
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	Pupils recognise that: ✓ even scientists never look directly at the sun and instead use specially adapted telescopes or observe images sent from unmanned space-probes, millions of miles away in space. Progression • Pupils MUST KNOW that looking directly at the sun can be dangerous and cause permanent damage even if wearing sunglasses. • Pupils recognise that eyes need protection from the sun just as skin does and that is why sunhats with a peak or sunglasses are worn. • Pupil use secondary sources to explore the consequences to eyesight and general health of prolonged exposure to sunlight.	Pupils use straightforward scientific evidence to answer questions and make predictions. Pupils say whether what happened was what they expected, acknowledging any unexpected outcomes. Greater Depth: Pupils support what they have found out using their own experience and evidence. Pupils recognise a result that seems odd compared with other results.
Recognise that shadows are formed when the light from a light source is blocked by a solid (opaque) object	Working scientifically reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions pupils recognise that: ✓ light rays travel in a straight line and if they hit an object they might: pass through, bounce off or be blocked completely. ✓ When light is blocked a shadow is formed. Progression • Recognise that shadows are formed when light is blocked by a solid (opaque) object. • Recognise how shadows are formed and that the position of the light source determines	Pupils report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions with support/as a group. Pupils record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables with support/as a group. Greater Depth: Pupils participate actively in reporting on findings as part of a group. Pupils make suggestions on appropriate ways to record findings either as a group or individually

	the shape and size of the shadow. • Recognise that translucent objects can also make a shadow but this might be indistinct and less clear.	
Find patterns in the way that the size of shadows change	Working scientifically, making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, pupils investigate: ✓ shadow length, ✓ sharpness of edges, ✓ position on the ground Progression • Recognise that shadows are similar in shape to the objects forming them and make simple observations of changes, EG, have got longer/smaller/sharper etc. • Recognise and describe how shadows from a source change when the source is moved..e.g. shadows from the sun over the course of a day. • Apply this to statements such as, "The higher the sun in the sky the shorter the shadow."	Pupils take simple accurate measurements and/or careful observations using whole number standard units relevant to questions or ideas under investigation. Pupils use a range of equipment for measuring and observing, including thermometers and data loggers. Greater Depth: Pupils use standard units over an increasing range. Pupils begin to make appropriate choices of equipment available for observing and measuring closely

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Rocks	
Theme content:	Sceince	
Scientist:	Mary Anning **Famous Scientist** Inge Lehmann	
Compareandgrouptogether different kinds of rocks on thebasisoftheir appearance and simple physical properties	Working scientifically, setting up simple practical enquiries, comparative and fair tests pupils can: ✓ sort a range of metamorphic, igneous and sedimentary rocks using a variety of characteristics and say why they are the same and different: ✓ smooth/rough; ✓ hard/soft; permeable/impermeable; ✓ heavy/light; ✓ inclusion of crystals, grains, fossils, Progression • With support, pupils can sort using at least 2 attributes. • Using own observations, pupils can compare and group rocks using a range of plausible criteria, not necessarily with accurate scientific vocabulary. • Can describe using appropriate scientific vocabulary.	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to recognise when a test is not fair and suggest improvements. Pupils identify and group objects, living things, processes or events by linking them to the characteristics of known objects, living things, processes or events. Greater Depth: Pupils explain which characteristics have caused them to identify or classify objects, living things processes or events by indicating similarities or differences in components or properties.
Describe in simple terms how fossils are formed when things that have lived are trapped within rock	Pupils can: ✓ describe that fossils are the traces or impressions of living things from past geologic ages, or the traces of their activities, such as dinosaur footprints. Progression • Pupils show an increased awareness of the many millions of years a fossil takes to make and that a fossil is a mould of a creature's body or activity, not a creature turned to stone. • Pupils know fossils only form in sedimentary rocks and can describe in simple terms the chronology of the stages of fossilisation being: E.g. - initial entrapment of a creature in a sediment so they do not rot, a	Pupils identify and group objects, living things, processes or events by linking them to the characteristics of known objects, living things, processes or events. Greater Depth: Pupils explain which characteristics have caused them to identify or classify objects, living things processes or events by indicating similarities or differences in components or properties.

	quick burial and then repeated layering of sediment, etc. • Using the correct scientific vocabulary pupils can sequence the formation of fossils.	
Recognise that soils are made from rocks and organic matter	Working scientifically, setting up simple practical enquiries, comparative and fair tests pupils can: ✓ recognise that soils are different depending on their constituent parts; this is in turn dependant on the local geology and varies across the country. Progression • With support recognise that pebbles and stones are broken rocks and organic matter is animal and plant debris and a mix of these helps make soil. • Pupils can describe that soils are a mixture of tiny particles of rock, dead plants and animals, air and water; the amount of which can vary. • Pupils explain that sandy, clay, chalky and peat based soils are different mixes of components and that different plants could thrive in them.	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating, with support. Greater Depth: Pupils choose from a list at least one variable that needs to be kept the same when conducting a fair test. Pupils carry out simple enquires with a group of peers. Pupils begin to recognise when a test is not fair and suggest improvements.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Animals Including Diet	

Theme content:	Geography	
Scientist:	Marie Curie (Skeleton) (Optional)	
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	Building on the work in year 2 concerning the criteria for living things and food chains, pupils demonstrate awareness that: ✓ animals are unable to produce their own food internally, but need to eat in order to take in nutrients. Working scientifically, pupils undertake research, including making systematic and careful observations, gathering and presenting survey data, to: ✓ identify that animals, including humans, need the right amount and type of nutrition to keep healthy. Building on learning about the food groups in year 2 pupils extend: ✓ their knowledge using scientific terminology of carbohydrates, proteins, vitamins and minerals and the role of these food groups for keeping the human body healthy. Progression • Pupils recognise that animals including humans need energy that is provided by eating food. Pupils understand that eating too much food or the wrong types of food can make you gain weight and this is unhealthy. • Pupils can name the different food groups from which food should be selected in order to provide a healthy, balanced diet for humans. • Pupils can identify the main food groups and explain the role of each food group in keeping the body healthy. Pupils apply their knowledge of the different food groups to planning a healthy menu and can explain the consequences for human health of not eating a balanced diet.	Pupils gather and present evidence and data using simple scientific language and vocabulary as writing, drawing, labelled diagrams, display, through ICT, keys, bar charts or tables (using ranges and intervals chosen for them) to help in answering questions. Greater Depth: Pupils make some independent choices about an appropriate way to record data.
Identify that humans and some animals have skeletons and muscles for support, protection and movement	Working scientifically using models, diagrams and other secondary sources pupils compare: ✓ a range of animals' skeletal structures; ✓ how the bones and muscles interact and combine to allow	Pupils identify and group objects, living things, processes or events by linking them to the characteristics of known objects, living things, processes or events. Greater Depth: Pupils explain which characteristics have caused them to

	movement and afford protection. Pupils recognise that: ✓ invertebrates have an external skeleton and vertebrates have skeletons inside them. Progression • Identify that some animals (including humans) have skeletons from pictures/x-rays of skeletons. Identify a limited number of bones and muscles. • Recognise that that all vertebrates have a skeletal and muscular system that enables movement, support and protections. Pupils can identify some key human bones e.g. skull, spine, ribcage and muscles e.g. biceps, triceps. Pupils explore the simple mechanics of contraction and relaxation of muscles in combination with bones at joints in vertebrate movement. • Increased awareness of the adaptations of invertebrates and how they might be protected, e.g. exoskeletons, shells, etc. and how not having a skeleton enables different movement.	identify or classify objects, living things processes or events by indicating similarities or differences in components or properties.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Plants	
Theme content:	Geography	
Scientist:	NA	
Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers	Working scientifically to identifying differences or similarities pupils can: ✓ name the parts of a range of well-known flowering plants ✓ know that the function is the same despite a difference in appearance, for example a sunflower's stem compared to a daisy's. Progression • With prompting, pupils recognise the roots, stem, leaves and flowers of a range of everyday flowering plants and know that these have a particular function.	Pupils identify and group objects, living things, processes or events by linking them to the characteristics of known objects, living things, processes or events. Greater Depth: Pupils explain which characteristics have caused them to identify or classify objects, living things processes or events by indicating similarities or differences in components or properties.

	• Independently, pupils identify roots, stem, flower and leaves on plants including root vegetables within child's experience. Recall that the root takes in water and can anchor the plant , the stem aids limited movement and supports plant; leaves are necessary as "the factories" to make sugars and the petals and flowers attract insects and identify these on given plants. • Pupils apply the functions to more unusual plants such as a cactus, deciduous trees, etc and consider adaptations of a function such as the leaf in a pitcher plant or Venus Fly-trap.	
Explore 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	Working scientifically asking relevant questions and using different types of scientific enquiry pupils can: ✓ explore requirements for healthy growth making systematic and careful observations of a range of plants and their preferred growing conditions. Pupils consider: ✓ how germination might be affected by heat ✓ how plants in desert climates grow with limited water ✓ how water lilies grow in ponds Progression • Pupils to plan an experiment that shows that limiting a plant's essential requirements may affect its growth. Pupils should predict; simply record results and draw conclusions on the essential requirements for healthy plant growth. • Pupils will have a working knowledge of requirements and will use this to plan and investigate the requirements for healthy plant growth. Pupils recognise that plants in the local environment will all have these requirements but the rates of germination, growth, flowering, etc varies between, varieties, species and locations. • Pupils' investigations inform them of further questions/investigations needed. Pupils recognise that plants globally have essential	Within a group, pupils suggest relevant questions that can be explored/investigated further using different types of science enquiry. Greater Depth: Pupils identify 'testable' questions and questions that are not testable in the primary classroom.

	requirements for growth but these might be specially adapted.	
Investigate the way in which water is transported within plants	Working scientifically, pupils investigate using a variety of tasks and straightforward scientific evidence: ✓ to show water movement from its absorption at the roots, through the xylem in the stem and out through the stomata in the leaves. Progression • Pupils describe how water is taken in at the root and exits the plant at the leaf. • Pupils explain that the root, stem and leaves of a plant all transport water and will become wilted (flaccid) if lacking in water. • Pupils link the transportation of water through a plant to the transportation of minerals.	Pupils use results of enquiries to consider whether they meet predictions and explain why. With support, Pupils use results, observations or own experience to prompt new questions and predictions for a further test. Greater Depth: Pupils recognise the connection between the original question, enquiry results and whether they answer the question. Pupils consider if further results can be predicted from present data
Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Pupils use evidence: ✓ to look for plant parts common to all: ✓ from: research; ✓ from observations of flowers in situ; ✓ from deconstructing a range of flowers and seed pods Pupils use evidence: ✓ to explore the role of flowers in the pollination and fertilisation of flowering plants; ✓ looking for links between the structure of the fruits and how the seeds are dispersed: e.g. dandelion by wind, blackberries by birds in faeces, teasels in animal fur. Progression • Pupils can describe that flowering plants have a life-cycle with defined stages. • Pupils can explain that flowering plants have a life cycle with defined stages, some of which are the same in flowering plants such as pollination but other aspects are different such as seed formation and dispersal.	Pupils use results of enquiries to consider whether they meet predictions and explain why. With support, Pupils use results, observations or own experience to prompt new questions and predictions for a further test. Greater Depth: Pupils recognise the connection between the original question, enquiry results and whether they answer the question. Pupils consider if further results can be predicted from present data

	• Pupils use the correct scientific vocabulary for the processes: germination, pollination, fertilisation and seed dispersal.	

Science – Year Four

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Animals including Humans	
Theme content:	Anicent Civilisations	
Scientist:	Washington Sheffield (Toothpaste Inventor)	
Describe the simple functions of the basic parts of the digestive system in humans	Working scientifically using secondary sources, pupils: ✓ draw diagrams or construct models to describe the tissues and organs of the digestive system in humans. Progression • List the main parts of the digestive system e.g.: mouth, teeth, tongue, oesophagus, stomach, pancreas, small and large intestines, appendix, rectum and anus. • Accurately label a diagram of the digestive system correctly sequencing the named tissues and organs. • Describe the functions of the organs in the human digestive system in terms of: ingestion as taking in food; digestion as physically or chemically breaking food down into soluble nutrients; absorption as taking nutrients into the blood for transport and egestion as getting rid of undigested waste.	Pupils report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Pupils record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Greater Depth: Pupils display increasing independence in choices of how to report on or record findings Pupils use more complex scientific language in reporting and recording findings
Identify the different types of teeth in humans and their simple functions	Using diagrams, models, biological samples or secondary sources pupils can: ✓ name the four types of teeth as: canine, incisor, premolar and molar. ✓ Progression Pupils can identify the types and functions of teeth. Pupils relate the position of the teeth in the human mouth to the mechanical processes of eating describing the functions of the teeth in simple terms such as cutting or grinding.	Pupils identify differences, similarities or changes related to simple scientific ideas or processes and more complex groups of objects, living things and events. Greater Depth: Pupils complete sorting diagrams or simple tables, keys or databases to classify objects, living things or events.

	Pupils accurately ascribe the function of the four types of human teeth explaining how the structure and shape is adapted to the job it has.	

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Electricity	
Theme content:	Defining Discoveries/ Ingenious Inventors	
Scientist:	Garrett Morgan (Traffic Lights) **FAMOUS SCIENTIST**	
Identify common appliances that run on electricity	Pupils can: ✓ identify, across a range of contexts and opportunities, common electrical appliances seen in school, home, or local community that could be used in a variety of given situations and can sub-divide these into mains power and battery driven appliances. Progression • Pupils list a number of common appliances such television, washing machine, torch, radio, computer, toaster, oven, vacuum cleaner and explain how they would ensure their and others' safety when used. • Pupils can identify electrical appliances that could be used in a variety of given situations and can sub-divide these into mains power and battery driven appliances. • Pupils can construct a comprehensive list of electrical appliances found in a wide range of situations and make comparative judgements into the advantages and disadvantages of using mains or battery power.	Pupils identify differences, similarities or changes related to simple scientific ideas or processes and more complex groups of objects, living things and events. Greater Depth: Pupils complete sorting diagrams or simple tables, keys or databases to classify objects, living things or events.
Construct a simple series electrical circuit identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	Undertaking practical activities pupils work scientifically to: ✓ assemble simple series circuits that contain a varying number of cells, bulbs, switches and buzzers. Progression • With help pupils can safely construct simple series circuits that work and can give some simple statements about how changing components affected the circuit and with prompting can name the components they used.	Pupils report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Pupils record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Greater Depth: Pupils display increasing independence in choices of how to report on or record findings Pupils use more complex scientific language in reporting and recording findings

	• With little help pupils can construct working circuits undertake simple 'fair test' investigations and make general quantitative statements about the results of their changes. • Pupils work independently, problem solving as necessary, to consistently construct circuits that work carrying out simple investigations accurately recording and reporting their findings using correct scientific vocabulary.	
Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	Undertaking practical activities pupils work scientifically to: ✓ assemble simple series circuits that contain switches in a variety of places. Progression • Pupils add one switch to a circuit and explain in terms of completing the circuit whether the lamp will light when the switch is open or closed. • Pupils can add a number of switches to a circuit and explain in terms of completing a circuit that all switches have to be closed for the lamp to light. • Pupils construct a number of different types of switch e.g. gate switch or pressure switch and suggest where these would be best positioned within a circuit to fulfil a specific task e.g. a pressure switch under a carpet in a burglar alarm.	Pupils plan and carry out simple practical enquires, comparative and fair tests relevant to the questions or ideas they are investigating. Pupils identify one or more control variables from those provided when conducting a fair test. Greater Depth: Pupils carry out a range of enquiries with increasing confidence Decide whether a fair test is the best way to investigate their question or idea.
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.	Using a variety of physical, virtual or diagrammatic representations of simple series circuits pupils can: ✓ decide whether a lamp will light. Progression • Pupils can correctly predict the outcome when given a	Pupils ask relevant questions that can be answered by the appropriate scientific enquiry, research or experiment or test. Greater Depth: Pupils refine the question asked so a test can give a more appropriate outcome.

	representation that can be followed with a finger and with some prompting. • Pupils can independently correctly predict the outcome when using standard representations. • Pupils accurately and consistently predict the outcome using a wide variety of representations of series circuits.	
Recognise some common conductors andinsulators, and associate metals with being good conductors	Working scientifically pupils undertake practical activities, gathering, recording, classifying and presenting data in a variety of ways to: ✓ assemble simple series circuits that can be used to test the electrical conductivity of a number of materials, Progression • Pupils can relate the results of experimentation to say whether a material is an electrical conductor or insulator. • Using the results of experimentation pupils can predict whether similar substances to those tested are electrical conductors or insulators e.g. all metals are conductors or all plastics are insulators. • Pupils can predict the electrical conductivity of a number of different materials including composite materials and use their knowledge and understanding of conductivity to explain the structure of electrical component such as wires orswitches.	Pupils gather and present simple scientific data in a variety of ways as Year 3 including tables and bar charts where intervals and ranges agreed through discussion, to help in answering questions. Greater Depth: Pupils select the most useful ways of presenting information given a range of choices

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Sound	
Theme content:	Defining Discoveries/ Ingenious Inventors	
Scientist:	Alexander Graham Bell (Telephone)	
Identify how sounds are made, associating some of them with something vibrating	Working scientifically setting up simple practical enquiries, comparative and fair test pupils can: ✓ describe a number of different ways that a sound can be made e.g. by hitting, rubbing, shaking or blowing a number of objects and/or musical instruments. Progression • By observing and reporting pupils say, in simple terms, what happens when an object that is making a noise e.g. a tuning fork, is placed against the skin, into water or onto a suspended ping pong ball. • Pupils conduct a sound survey and relate the rapid movement of the object or one piece of an object to an individual sound. • Pupils identify which part of a musical instrument 'makes' the noise, describing it as vibrating.	Pupils plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating. Pupils identify one or more control variables from those provided when conducting a fair test. Greater Depth: Pupils carry out a range of enquiries with increasing confidence Decide whether a fair test is the best way to investigate their question or idea.
Recognise that vibrations from sounds travel through a medium to the ear	Working scientifically setting up simple practical enquiries, comparative and fair test pupils describe how: ✓ the sound from a vibrating object or musical instrument reaches the ears. Progression • Pupils place their ears on a table and state what they hear when another pupil lightly taps on the other end of the table giving reasons. • Pupils explain why they can hear music when in the bath or how whales and dolphins can communicate at sea. • Using a particle model pupils can give reasons why little or no sound is heard when a bell is	Pupils use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Greater Depth: Pupils identify when repeated results may be appropriate.

	placed in a vacuum jar.	
Find patterns between the pitch of a sound and features of the object that produced it	Building upon the Year 2 work on everyday uses of materials; pupils work scientifically asking relevant questions and using different types of scientific enquiries to answer them investigate the outcomes in terms of pitch of changing the physical dimensions or materials of the object making the sound. Progression • Pupils describe in simple terms what happens when the length of the sound producer is changed e.g. cutting straw oboes with scissors, blowing down different sized tubes, hitting different length nails or pipes. • Pupils change the material an object is made from. Do plastic pipes make the same sound as metal pipes? Does a glockenspiel sound the same as a xylophone? • Pupils use their knowledge and understanding of the patterns of pitch linked to the physical properties of objects to design and/or construct their own variable pitch musical instrument.	Pupils take accurate measurements using more complex standard units and parts of units. Pupils choose from a range provided, appropriate equipment for measuring and observing including data loggers. Pupils make systematic and careful observations of objects, living things and events. Greater Depth: Pupils become accurate in using units of length, mass, volume, weight, time, heat. Pupils make appropriate choices of equipment to observe and measure and explain why they are appropriate to the task.
Find patterns between the volume of a sound and the strength of the vibrations that produced it	Building upon earlier work on how sounds are made; pupils undertake a range of fair test practical activities to: ✓ investigate the outcomes in terms of volume of changing the physical dimensions of the action creating the sound. Progression • Pupils describe in simple terms that the bigger the action the louder the sound produced e.g. hitting a drum harder will produce a louder sound. • Pupils can give reasons in terms of vibrations why playing loud music might be bad for their ears. Pupils can suggest ways they could soundproof their	Pupils use straightforward scientific evidence to support their findings, make further predictions and explain their findings. Pupils identify scientific evidence they have used in drawing conclusions. Greater Depth: Pupils use scientific language to describe processes and observations. Pupils use scientific facts when describing processes and observations.

	bedrooms. • Using a particle model; pupils can give reasons why a bell that is muffled and then hit will not be as loud as a bell that is hit without a muffler. Pupils can suggest reasons why a car exhaust silencer works and what materials might be inside the silencer.	
Recognise that sounds get fainter as the distance from the sound source increases	Pupils work scientifically making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, for example data loggers or sound meters to: ✓ investigate how volume is effected by distance. Progression • Pupils produce graphical representations of their findings and report in simple terms that volume decreases as distance from the sound source increases. • Pupils can explain in a number of different contexts how the knowledge of the relationship between volume and distance from source is useful e.g. when crossing the road at night or fog sirens giving the proximity to dangerous rocks. • Using a particle model pupils can explain how the vibrations/ displacement decreases as the sound energy dissipates.	Pupils take accurate measurements using more complex standard units and parts of units. Pupils choose from a range provided, appropriate equipment for measuring and observing including data loggers. Pupils make systematic and careful observations of objects, living things and events. Greater Depth: Pupils become accurate in using units of length, mass, volume, weight, time, heat. Pupils make appropriate choices of equipment to observe and measure and explain why they are appropriate to the task.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Living Things and Their Habitats	
Theme content:	Geography - Brazil	
Scientist:	David Attenborough (Classification) Gerald Durrell (Environmental Change)	
Recognise that living things can be grouped in a variety of ways	Working scientifically identifying differences, similarities or changes related to simple scientific ideas and processes and building upon the work on Plants and Animals, including humans undertaken in Key Stage 1, pupils use a variety of secondary resources and	Pupils identify differences, similarities or changes related to simple scientific ideas or processes and more complex groups of objects, living things and events. Greater Depth: Pupils complete sorting diagrams or simple tables, keys or

	conduct surveys of their local environment to: ✓ produce a list of living things (both plant and animal) which they then sort into groups. Progression • Pupils identify simple ways in which plants and animals could be sorted e.g. flowering and non-flowering plants ; warm and cold blooded animals. • Pupils use a number of different methods to sort plants or animals using more than one physical characteristic or environmental factor e.g. whether the plant is wind or animal pollinated or if the animal is a herbivore or carnivore. • Pupils begin to routinely and accurately ascribe plants and animals according to their taxonomic group. E.g. chordate animals as mammals , reptiles, amphibian, birds or fish.	databases to classify objects, living things or events. Pupils make systematic and careful observations of objects, living things and events. Greater Depth: Pupils make appropriate choices of equipment to observe and explain why they are appropriate to the task.
Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Working scientifically pupils closely observe and research: ✓ a variety of plants and/or animals using straightforward scientific evidence of characteristics that can be used to identify them and use these observed characteristics to sort them into groups, e.g. ✓ colour of flowers' petals ✓ shape of leaf, ✓ number of legs, ✓ where the animal lives Progression • Pupils use one observable characteristic to sort animals and plants into groups. • Pupils use more than one observable characteristic to sort animals and/or plants using simple Venn or Carroll diagrams to construct a simple branched identification. • Pupils use interconnecting Venn diagrams or Carroll	Pupils identify differences, similarities or changes related to simple scientific ideas or processes and more complex groups of objects, living things and events. Greater Depth: Pupils complete sorting diagrams or simple tables, keys or databases to classify objects, living things or events. Pupils make systematic and careful observations of objects, living things and events. Greater Depth: Pupils make appropriate choices of equipment to observe and explain why they are appropriate to the task.

	diagrams with two criteria to construct branched or number identification keys to sort animals and plants.	
Recognise that environments can change and that this can sometimes pose dangers to living things	Building upon the work done in Year 2 on habitats pupils work scientifically to observe change within a local environment or habitat and then report their findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions: ✓ noting any impact upon the population or distribution of living things within that habitat. Progression • Pupils make observations and draw simple conclusions e.g. paths are made where we walk because the plants cannot live when they are trampled. • Pupils identify one factor that has changed within the environment or habitat and note the effect that this has had on the chances of survival of those organisms which rely on it. E.g. the school pond has become full of algae so that the fish have less oxygen. • Pupils can explain that a number of different factors can affect the diversity or abundance of plant or animal growth and can ascribe these factors to the positive or negative influence of human activity.	Pupils use straightforward scientific evidence to support their findings, make further predictions and explain their findings. Pupils identify scientific evidence they have used in drawing conclusions. Greater Depth: Pupils use scientific language to describe processes and observations. Pupils use scientific facts when describing processes and observations.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Animals including Humans	
Theme content:	Geography - Brazil	
Scientist:	NA	
Construct and interpret a variety of food chains, identifying producers, predators and prey	Building upon the work done in Year 1 where pupils group animals by what they eat describing the animal as an herbivore, carnivore or omnivore, Pupils construct: ✓ simple food chains from observation, pictures, stories or secondary research. Progression	Pupils report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Pupils record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.

	• Pupils start each food chain with a plant describing this plant as a producer. Food chains are of one or two steps e.g. grass- cow or lettuce – rabbit - fox. • Pupils construct food chains of a variety of lengths correctly identifying the producer, a predator and a prey animal. • Pupils consistently and accurately construct food chains within a defined habitat, correctly identifying: the producer, specific predator/prey relationships and the top predator. Pupils add arrows to show energy flow within the food chain.	Greater Depth: Pupils display increasing independence in choices of how to report on or record findings Pupils use more complex scientific language in reporting and recording findings

Science – Year Five

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Animals Including Humans	
Theme content:	Geography - Africa	
Scientist:	Leonardo Da Vinci (Human Body)	
Describe the changes as humans develop to old age.	Pupils use observations, discussion with parents, grandparents and other adults as well as secondary sources to: ✓ create a human growth time line. Progression • Pupils can describe the development of humans over time in simple terms such as being a baby; being a child being and adult. • Pupils can ascribe approximate ages to the development of humans when: an infant; child; adolescent (teenager); adult; pensioner. • Pupils construct a detailed timeline ascribing significant processes to the thresholds between one phase of development and another e.g. the boundary between infant and child being the ability to walk or child to adolescent being the ability to survive without support.	Pupils recognise when scientific evidence is for or against an argument. Pupils recognise when scientific evidence supports an idea or not and use this to support predictions. Greater Depth: Pupils comment on how reliable their data is in supporting their conclusion. Pupils recognise the need for repeat measurements and observations to produce reliable data.

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Living Things and Their Habitats	
Theme content:	Geography - Africa	
Scientist:	Eva Crane (Reproduction in Bees) Jane Goodall (Reproduction in Chimpanzees)	
Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Pupils compare: ✓ the life cycles using the processes of fertilisation, and development to adulthood; ✓ Mammal: internal fertilisation; internal development; live birth; infant; child; adolescent; adult; ✓ Amphibian: external fertilisation; egg; external development; tadpole; frog-let; adult* ✓ Insect: external fertilisation;	Pupils classify objects, living things and events creating and using simple tables, keys or databases with support. Greater Depth: Pupils use classification tables, keys and databases independently

	egg; pupa; chrysalis; imago; adult* ✓ Bird: internal fertilisation: egg: chick; fledgling; adult- capable of reproduction Progression • Pupils can describe in general terms the stages of development in one type of animal. • Pupils can compare the life cycles of two or more types highlighting similarities e.g. amphibians, birds and insects all lay eggs. • Pupils can accurately detail the life cycles of all types of animals comparing similarities and differences and making conclusions to the advantages and disadvantages of these differences.	
Describe the life process of reproduction in some plants and animals	Pupils observe nature, conduct practical activities and use secondary sources to: ✓ describe the processes of reproduction in plants and animals. **Progression** • Pupils can state that plants can reproduce sexually to produce seeds or asexually from bulbs and cuttings. Animals reproduce sexually to give other animals. Micro-organisms e.g. bacteria reproduce asexually to produce exact copies. • Pupils describe sexual reproduction as involving male and female parts from two or more plants or animals (of the same species). • Pupils can accurately describe the processes of plant and animal sexual reproduction using the correct scientific vocabulary. Identifying the sexual components of flowering plants. With reference to Burwell school policy on sex education.	Pupils select appropriate ways of gathering and presenting scientific data from models, writing, drawing, display, through ICT, tables or graphs (choosing appropriate ranges and intervals). Pupils use correct scientific symbols where appropriate in recording. Greater Depth: Pupils select the most useful ways of recording and presenting information.

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	States Of Matter	
Theme content:	History – The Greeks	
Scientist:	Stephanie Kwolek	
Compare and group materials together, accordingtowhetherthey are solids, liquids or gases	Workingscientificallyidentifying differences, similarities orchanges relatedtosimplescientificideasand processes pupils closely observe and can describe the properties of: ✓ Solids- as having a fixed shape, non-flowing and incompressible. ✓ Liquids - as having no fixed shape, flowing to fill the bottom of a container and incompressible. ✓ Gases - as having no fixed shape, completely filling any container and compressible. Progression • From observations and/or research pupils can sort a number of common objects into S/L/G. • Pupils can consistently and accurately sort a wide range of objects into S/L/G. • Pupils can use knowledge of the physical properties of solids, liquids and gases to determine whether tricky substances such as mists, foams, gels, pastes are S/L/G.	Pupils classify objects, living things and events creating and using simple tables, keys or databases with support. Greater Depth: Pupils use classification tables, keys and databases independently
Identifythepartplayedby evaporation and condensation in the water cycle andassociatetherate of evaporation with temperature	Workingscientificallyusingresultsfrom practical activities pupils investigate: ✓ the physical results of heating and cooling water. Pupils draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. Progression • Pupils can make general statements from the outcomes of observations or practical activities such as; puddles evaporate in the sunshine or condensation forms on the windows when it is cold outside.	Pupils use test results to draw conclusions, recognising that the test may need improvements to improve reliability. Pupils use test results to prompt new questions and make predictions for setting up further tests. Greater Depth: Pupils draw conclusions from and consider improvements to a range of enquiries including and beyond fair tests. Pupils recognise and explain why results are reliable or not.

	• Pupils relate the water evaporating from seas and lakes to the formation of clouds; when it rains water vapour condenses into raindrops; relate the rate of evaporation to the ambient temperature of the surroundings. • Pupils research or construct models to show how water is constantly evaporating and condensing in different local and geographical areas to set up the water cycle and weather patterns. Pupils can identify that: snow, sleet, hail and rain are all forms of condensed water.	
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)	Working scientifically, pupils undertake practical activities making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers to: ✓ investigate the physical results of heating and cooling on a range of materials found in the classroom and home. Progression • Pupils can describe the effect of heating some substances as melting and/or boiling. • Pupils can describe the effect of heating and cooling some substances as melting, boiling, freezing and condensing and construct a simple temperature chart showing the changes of state from solid to liquid or liquid to gas. Pupils observe that the melting and freezing point of substances are the same. • From practical investigation and secondary research pupils construct a temperature scale mapping the melting and boiling points of a wide range of substances e.g. alcohol, mercury, water, cooking oil, tar, gases including air and/or oxygen. (link to negative numbers in mathematics).	Pupils take measurements using a range of scientific equipment with increasing accuracy and precision identifying the ranges and intervals used. With support, Pupils recognise that some measurements and observations may need to be repeated. Greater Depth: Pupils repeat sets of observations or measurements where appropriate selecting suitable ranges and intervals.

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Properties and Changes to Materials	
Theme content:	History – The Greeks	
Scientist:	Stephanie Kwolek	
Compareandgroup together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets	Working scientifically pupils compare through testing, categorising and recording data and results of increasing complexity and using with decision tree diagrams to: ✓ sort a range of materials according to properties. Progression • Pupils can say why with reference to tabulated results why materials are grouped together. • Pupils demonstrate awareness that some properties will be categorised by everyday intended use e.g. wooden or plastic handles can be used on saucepans stating the need for the pan to conduct heat whilst the handle needs to insulate. • Pupils demonstrate a greater awareness that some properties will be categorised by intended use e.g. a plastic ruler can be transparent and flexible but durable whereas glass is transparent, durable but brittle. Electrical wire comprises a metal conductor that is flexible and is covered with an insulator. (relate to work undertaken on electrical conductors/insulators in Year 4).	Pupils plan enquiries deciding when it is appropriate to carry out a fair test or another type of practical enquiry from a range suggested. Pupils identify one or more control variables in investigations when conducting a fair test. Greater Depth: Pupils clarify which are control, dependent or independent variables in a fair test which they conduct. Pupils decide which type of practical enquiry is most appropriate for the question or idea being investigated.
Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Pupils make a series of observations working scientifically taking measurements and using a range of scientific equipment, with increasing accuracy and precision to: ✓ demonstrate which materials will dissolve to form a clear solution; ✓ materials that dissolve and colour the solution; ✓ material that with form a mixture. Progression	Pupils take measurements using a range of scientific equipment with increasing accuracy and precision identifying the ranges and intervals used. With support, Pupils recognise that some measurements and observations may need to be repeated. Greater Depth: Pupils repeat sets of observations or measurements where appropriate selecting suitable ranges and intervals.

	• Pupils can name three common materials that dissolve in liquid and explain that filtration and sieving will not separate them but the process of evaporation will. • Pupils will know that not all materials will dissolve whilst others do. Pupils can name examples of common materials that dissolve including examples i.e. instant coffee specifically designed to. Pupils can explain the process of evaporation to separate them. • Pupils know that not all materials will dissolve whilst others do even if a discoloured solution is the result. Pupils can name examples of common materials that dissolve including examples i.e. Steradent Tablets specifically designed to. Pupils can explain the process of evaporation to separate them and know that with addition heat the process can be accelerated.	
Use knowledge of solids, liquids and gases to decide how mixtures might be separated,including through layering, decanting, filtering, sieving and evaporating	Using familiar substances pupils explore: ✓ reversible changes, including, evaporating to separate dissolved solids. Pupils use filtering to: ✓ demonstrate that a material dissolved in a liquid cannot be separated by such means and the evaporation process is necessary. Pupils can: ✓ investigate mixtures comprising solids with solids; ✓ solids with liquids; ✓ liquids with liquids (i.e. cooking oil and water). **Progression** • Pupils can explain how to separate to solids mixed together and how to filter a liquid and solid. Offer a reason why evaporation might be appropriate. • Pupils will respond with a suitable method to separate a given mixture saying why they have selected it. E.g. evaporation is needed for a sugar solution because it is a solution that cannot be	Pupils refine a scientific question so that it can be investigated/tested, choosing an appropriate type of science enquiry to provide the best evidence. Greater Depth: Pupils recognise that some questions may not be answered by the investigation chosen and suggest changes to the question or investigation.

	separated by filtering but demonstrate when a filter would be practical. • Pupils will explain using for example that separating sugar strands from chick peas could be accomplished in two ways. By 1)sieving a dry mixture or 2) adding water and filtering them, using their knowledge of evaporation to recover the sugar.	
Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Building on work in Year 1 and Year 2 where pupils identify materials used in their environment, Pupils investigate: ✓ material properties investigating a range of properties including conductivity and insulation properties (Thermal and electrical). ✓ They will note through comparative testing material properties such as flexibility, ✓ if magnetic, ✓ suitability to be immersed in water; ✓ hardness. Working scientifically Pupils will report and present findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations§ using test results to make predictions to set up further comparative and fair tests to: ✓ categorise materials by properties identified through investigation. **Progression** • Pupils explain with annotated sketches and tabulated results of categorisation material uses. • Pupils state why, using material properties e.g. their chair has a metal frame with plastic seat whilst the table with metal legs has a wood top covered with a smooth hard surface. Pupils will demonstrate a choice of material to act as an insulator or conductor. • Pupils use a range of criteria pupils justify choices of material for particular uses,	Pupils plan enquiries deciding when it is appropriate to carry out a fair test or another type of practical enquiry from a range suggested. Pupils identify one or more control variables in investigations when conducting a fair test. Greater Depth: Pupils clarify which are control, dependent or independent variables in a fair test which they conduct. Pupils decide which type of practical enquiry is most appropriate for the question or idea being investigated.

	accurately and consistently explaining in terms of material properties.	
Demonstrate that dissolving, mixing and changes of state are reversible changes **(N.B. A considerable amount of prior work has been completed with respect to dissolving and mixing)**	Pupils investigate: changes of state that are reversible to: ✓ demonstrate the significant difference between melting and dissolving. ✓ Using chocolate, butter, candle wax and record with annotated sketches effects of heating and cooling; ✓ Make comparisons with heating a salt water solution to evaporate the water, condensing the vapour to recover the salt free liquid and the salt, the original components. Pupils to: ✓ demonstrate what happens when dissimilar liquids shaken or stirred and left to settle due to different densities. **Progression** • Name an everyday material that will melt if heated and will then solidify if cooled. • Pupils can name four materials that when heated will change state from solid to liquid and explain that cooling will be necessary to reverse the change. Pupils will name two materials that will dissolve and explain how to recover the original component liquid and solid/liquid. • Pupils can relate reversible change to the water cycle and relate this to removal of salt from a solution created in the classroom using correct scientific vocabulary and simple models to describe scientific ideas.	Pupils present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Pupils identify causal relationships in reporting outcomes where appropriate. Greater Depth: Pupils explain findings reported and recorded using scientific language and understanding.
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	Pupils investigate: ✓ change associated with heating mixtures to affect permanency with the change i.e. ✓ using ingredients to cook small cakes recording distinct changes. ✓ mixing a non-Newtonian fluid and record observations.	Pupils use test results to draw conclusions, recognising that the test may need improvements to improve reliability. Pupils use test results to prompt new questions and make predictions for setting up further tests. Greater Depth: Pupils draw conclusions from and consider improvements to a

	✓ Following guidelines for health and safety, demonstrating the effect or burning of materials i.e. wood. ✓ Observeing the effect of leaving steel/steel wool to rust and show examples of material change in the environment i.e. coins or copper left to form patina. Class teacher to show video or safely demonstrate an exothermic reaction: ✓ i.e. Low percentage peroxide and yeast catalyst reaction. Pupils investigate and record outcome compare to the action of acid on bicarbonate of soda. Progression • Pupils plan a safe demonstration to show a permanent change in a material. • With reference to annotated drawings pupils explain permanent material change caused by heating, burning as a chemical reaction. • Pupils explain the processes of cooking in terms of mixing solids and liquid then heating to effect a permanent change. If bread is baked explain the effect of proving the dough prior to baking; bread mouldering or other food decay as chemical change.	range of enquiries including and beyond fair tests. Pupils recognise and explain why results are reliable or not.

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Forces (Air Resistance)	
Theme content:	History – The Greeks	
Scientist:	Sir Isaac Newton	
Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Pupils investigate and record data for a range of comparative tests: ✓ using parachutes and paper helicopter designs of different dimensions ✓ dragging and rolling objects on different textural surfaces ✓ using a variety of boat designs ✓ dropping different sized and shaped plasticine objects in a tube/column of water. Progression	Pupils use test results to draw conclusions, recognising that the test may need improvements to improve reliability. Pupils use test results to prompt new questions and make predictions for setting up further tests. Greater Depth: Pupils draw conclusions from and consider improvements to a range of enquiries including and beyond fair tests. Pupils recognise and explain why results are reliable or not.

	• Explain with diagrams for reference that movement of objects is affected by an additional force. As the resistance to movement increases the outcome can be observed and recorded. • Draw and annotate diagrams to illustrate forces acting on an object including the direction to show friction acts in the opposing direction to motion. • Explain with reference to investigations that frictional force opposes motion in the form of either air, water or between two surfaces in contact. Explain with reference to annotated sketches and graphs of data that surface area has an effect on force due to friction.	

Aspect	Knowledge	
Term:	Summer	
Science Unit Name:	Earth and Space	
Theme content:	Science – Mission to the Moon	
Scientist:	Neil deGrasse Tyson (Solar System) Katherine Johnson **FAMOUS SCIENTIST** Margaret Hamilton (Space Travel)	
Describe the movement of the Earth and other planets relative to the Sun in the solar system	Building upon the work in Year 3 pupils can: ✓ explain why it is not safe to view the sun directly, even with sunglasses. ✓ describe the sun as Sol, a heliocentric star at centre of our solar system along with eight orbiting planets. Progression • Explain that looking directly at the sun is unsafe without specific reason. Using models (no necessary reference to scale) or suitable secondary source, demonstrate planetary motion. • Explain that looking directly at the sun is harmful and can damage the eye. Using appropriate models (no necessary reference to scale) or suitable secondary source, demonstrate planetary motion and moon orbit with anticlockwise motion. • Explain that looking directly at the sun is harmful and can	Pupils present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Pupils identify causal relationships in reporting outcomes where appropriate. Greater Depth: Pupils explain findings reported and recorded using scientific language and understanding.

	damage the eye permanently. Using models (no necessary reference to scale) or suitable secondary source, demonstrate planetary motion with anticlockwise motion complete with an explanation of the earth's axial spin. The Earth along with other planets orbit the Sun with approximate concentric paths.	
Describe the movement of the Moon relative to the Earth	Working scientifically pupils use a simple model to describe the moon's orbit as describing a circular anticlockwise circle in a flat plane with duration of 29.5 days. either: 1. one produced or acted out in class; 2. an orrery; or 3. an appropriate secondary source, to describe the orbital motion of the moon. Progression • Describe the moon's orbit as describing a circular anticlockwise circle in a flat plane. • Describe the moon's orbit as describing a circular anticlockwise circle in a flat plane with duration of 29.5 days. • Describe the moon's orbit as describing an approximate circular anticlockwise path in a flat plane with duration of 29.5 days with a single axial spin on its own axis.	Pupils present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Pupils identify causal relationships in reporting outcomes where appropriate. Greater Depth: Pupils explain findings reported and recorded using scientific language and understanding.
Describe the Sun, Earth and Moon as approximately spherical bodies	Working scientifically using models pupils refer to: ✓ a globe or appropriate spherical model ✓ compare with an equally sized rotating flat circle geographical map representation the sun, moon and earth and describe the difference, using the term spherical. Progression • Describe with analogous terminology as being, for example ball shaped. • Describe the Sun, Earth and moon as spherical.	Pupils present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Pupils identify causal relationships in reporting outcomes where appropriate. Greater Depth: Pupils explain findings reported and recorded using scientific language and understanding.

	• Describe the sun and moon as approximately spherical and the earth as an oblate spheroid.	
Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Referring to a globe or appropriate spherical model and single light source, pupils describe: ✓ the shadow and how by rotating the spherical object parts will be illuminated Pupils use the model to: ✓ explain that part will be in darkness and part illuminated and this will change with rotation anticlockwise. Pupils plot observation of a sundial gnomon to : ✓ track and record the Sun's apparent movement ✓ compare to a model to demonstrate with a small vertical gnomon appended to a spherical object moved in a circular path that it is possible to record a similar effect. ✓ Observe effect using computer simulation e.g. Celestia. Progression • Describe how shadows change as the Sun appears to move across the sky. • With reference to models and observations explain in terms of the rotation of the Earth why shadows change and the Sun appears to move across the sky during the course of the day. • Explain times of sunrise and sunset in graphs and shadows can assist in demonstrating the Sun's apparent movement.	Pupils plan enquiries deciding when it is appropriate to carry out a fair test or another type of practical enquiry from a range suggested. Pupils identify one or more control variables in investigations when conducting a fair test. Greater Depth: Pupils clarify which are control, dependent or independent variables in a fair test which they conduct. Pupils decide which type of practical enquiry is most appropriate for the question or idea being investigated.

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Forces (Gravity)	
Theme content:	Science – Mission to the Moon	
Scientist:	Neil deGrasse Tyson (Solar System) Katherine Johnson **FAMOUS SCIENTIST** Margaret Hamilton (Space Travel)	
Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Pupils make observations: ✓ of range of objects of different mass and shape dropped without addition thrust or downward force to record effect.	Pupils recognise when scientific evidence is for or against an argument. Pupils recognise when scientific evidence supports an idea or not and use this to support predictions. Greater Depth: Pupils comment on how reliable their data is in supporting their

	✓ Use secondary sources and models to discuss and report on the notion that independent of placement above the surface of the earth all objects that have mass will fall towards the earth's surface. Progression • Explain that any object dropped will fall towards the ground (outside) or floor surface inside. • Explain with the aid of diagrams, that objects that have mass will fall to the earth's surface once released. This will include reference in annotated diagrams to objects not necessarily falling in a linear path i.e. comparing a sycamore seed with paper cup cake case. • Explain with the aid of annotated diagrams of observations, that objects that have mass will fall to the earth's surface once released. Explain the effect of gravitational force in terms it how effects natural phenomena e.g. precipitation, Autumn leaves falling, and intermediate forces demonstrating with sketches the effect of dropping a ball that bounces or temporary up-thrust from wind.	conclusion. Pupils recognise the need for repeat measurements and observations to produce reliable data.

Science – Year Six

By the end of the year children will know:

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Electricity	
Theme content:	Local History – Olaudah Equiano	
Scientist:	Steve Jobs Thomas Edison	
Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	Pupils build upon the work on electric circuits in Year 4 to: design and assemble simple series circuits that contain a varying number of cells, lamps and buzzers. Progression • Pupils can safely and independently construct simple series circuits giving some general statements about how changing the number of cells changes observable results. • Pupils can undertake simple 'fair test' investigations and make general quantitative statements about how increasing or decreasing the number of cells affects the brightness of the lamps or loudness of the buzzers. • Pupils work systematically to investigate the quantitative results of increasing the total voltage of the cells used in the circuit on the brightness of lamps or the loudness of buzzers; producing reliable and repeatable results; accurately recording and reporting their findings.	Pupils recognise significant variables in investigations selecting the most suitable to investigate controlling variables where appropriate. Pupils recognise which type of practical enquiry is most appropriate to the question or idea being investigated, before planning and carrying out the enquiry. Greater Depth: Pupils explain why variables are significant in the context of the enquiry undertaken. Pupils justify the choice of practical enquiry made as being most appropriate.
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	Pupils build upon the work on electric circuits in Year 4 to: design and assemble simple series circuits that contain cells, lamps, buzzers and switches in varying positions around the circuit. Progression • Pupils can safely and independently construct simple series circuits giving some general statements about how changing order of the components or opening and closing switches changes observable results. • Pupils can undertake simple 'fair test' investigations and make general quantitative	Pupils use test results to make predictions for setting up further comparative and fair tests. Pupils compare their results with others and give reasons why they may be different. Greater Depth: Pupils suggest reasons for limitations or inconsistencies in results and decide whether they impact on the conclusions drawn.

	statements about how changing the positions or order of the components affects the brightness of the lamps or loudness of the buzzers. • Pupils work systematically to design and investigate a circuit to fulfil a specific task by changing the position of components, the total voltage of the switches or cells used in the circuit noting the brightness of lamps or the loudness of buzzers; recording and reporting their findings. Pupils might suggest additional components and explore the effects of adding additional components e.g. a dimmer switch (variable resistor).	
Use recognised symbols when representing a simple circuit in a diagram	Pupils represent electrical components with pictures or symbols by: ✓ using a mixture of pictures, symbols of their own design and standard symbols to represent electrical components including a key Progression • Pupil representations of electrical components are a mixture of pictures and symbols of their own design with or without a key. • Pupils use a mixture pictures, symbols of their own design and standard symbols to represent electrical components including a key. • Pupils accurately and consistently use standard symbols. Wires connecting components are drawn with straight lines.	Pupils decide on the most appropriate formats to present sets of scientific data such as using line graphs for continuous variables. Pupils record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Greater Depth: Pupils explain what type of presentation is best for the data or task.

Aspect	Knowledge	Skills
Term:	Autumn	
Science Unit Name:	Light	
Theme content:	Local History – Olaudah Equiano	
Scientist:	Stephen Hawking	
Recognise that light appears to travel in straight lines	Pupils report findings from practical observations: ✓ evidencing that light travels in straight lines. Progression • Pupils can make simple statements evidencing that	Pupils recognise significant variables in investigations selecting the most suitable to investigate controlling variables where appropriate. Pupils recognise which type of practical enquiry is most appropriate to the question or idea being investigated, before planning and carrying out the enquiry.

	light travels in straight lines e.g. if I put an opaque solid object in front of the light source the light is blocked and the object forms a shadow. • Pupils make statements about how light appears to travel based on observable evidence. e.g. light appears to travel in straight lies from a laser pointer or when seen in dust. • Pupils build/use more complex arguments with evidence from a number of sources to explain how light appears to travel in straight lines.	Greater Depth: Pupils explain why variables are significant in the context of the enquiry undertaken. Pupils justify the choice of practical enquiry made as being most appropriate.
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	Pupils draw conclusions from practical observations to: ✓ evidence that objects are seen because light travels in straight lines and use diagrams or models to illustrate their ideas. Progression • Pupils can explain that in order for an object to be seen it either needs to give out or reflect light. e.g. they describe that they cannot be seen in a dark room until the light is turned on or they shine a torch at the observer. • Pupils can explain what is meant by a field of view and investigate ways in which they can widen this field of view using mirrors. • Pupils can suggest or devise demonstrations that show proof that light appears to travel in straight lines e.g. set up a series of card windows where a candle/light can be seen in straight lines only arrange a set of mirrors so that an image can be viewed from behind a screen at various points in a room.	Pupils identify scientific evidence that has been used to support or refute ideas or arguments. Pupils recognise scientific questions that do not yet have definitive answers. Pupils provide straightforward explanations for differences in repeated measurements or observations. Greater Depth: Pupils describe evidence which supports or disproves accepted or developing scientific ideas.
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	Pupils draw conclusions from practical observations to: ✓ evidence that objects are seen because light travels from a light source to their eyes in straight lines and use diagrams or models to illustrate their reasoning. Progression	Pupils decide on the most appropriate formats to present sets of scientific data such as using line graphs for continuous variables. Pupils record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

	• Pupils can identify a range of different light sources and confidently state whether the light is emanating from the source or is reflected light from a different source e.g. things in the night sky stars. aircraft lights as direct sources of light and the moon or satellites as light reflected. • Pupils can represent light as a line on diagram showing the path travelled as a straight line from the object to the eye. • Pupils can construct models or draw complex diagrams showing the path that light would take in a series of reflections in plane mirrors that would be found in a periscope to see over walls, around corners or behind yourself.	Greater Depth: Pupils explain what type of presentation is best for the data or task.
Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Pupils can: ✓ describe the positional interrelationship between light source, object and image in the production of shadows. Progression • Pupils can describe the size and shape of the shadow made by a number of different simple geometrical shapes i.e. a big square object will produce a big square shadow and a small triangular shape will produce a small triangular shadow. • Pupils can explain how the size of a shadow can be adjusted by moving the object closer or further away from the light source e.g. position two different sized squares so that they produce shadows of the same size. • Pupils can adjust the relative positions of objects and light sources including placing them at different angles from the perpendicular to change the size and dimensions of shadows at will as in a puppet theatre.	Pupils recognise significant variables in investigations selecting the most suitable to investigate controlling variables where appropriate. Pupils recognise which type of practical enquiry is most appropriate to the question or idea being investigated, before planning and carrying out the enquiry. Greater Depth: Pupils explain why variables are significant in the context of the enquiry undertaken. Pupils justify the choice of practical enquiry made as being most appropriate.

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Living Things and Their Habitats	
Theme content:	Science: The Theory of Evolution	
Scientist:	Libbie Hyman Carl Linnaeus Alexander Fleming	
Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Pupils can: ✓ observe characteristics for animals including: ✓ habitat, ✓ diet, ✓ physical features e.g. endoskeleton or exoskeleton, number of legs Pupils can: ✓ observe characteristics for plants including: ✓ flowering/non flowering, ✓ habitat, ✓ wind or animal pollinated, ✓ deciduous or evergreen Progression • Pupils distinguish between plants and animals grouping them in general terms. • Give examples of the five taxonomic groups of vertebrate animals: amphibians, reptiles, fish, birds and mammals or invertebrate: insects. arachnids, crustacean, worms etc. using keys . • Pupils write multi-step identification keys to classify an appropriate range of plants and animals. Pupils suggest criteria that distinguish microscopic plants from microscopic animals e.g. the presence of chlorophyll in euglena.	Pupils use tables, keys and databases to classify or identify specific objects, living things or events by their characteristics. Pupils begin to identify some positives and some limitations of specific forms of classification. Greater Depth: Pupils use a variety of secondary sources to support identification and classification. Pupils create more complex forms of tables, keys and databases used for classification.
Give reasons for classifying plants and animals based on specific characteristics	Pupils use evidence from observations or secondary sources to: ✓ explain reasons for classification, giving reasons Pupils describe animals as: ✓ having live births or laying eggs, in water or out; ✓ living on land or in water. ✓ having hair, fur, scales or feathers. Pupils describe plants as: ✓ annual, biennial or perennial; ✓ fruit, cereal or vegetable Progression	Pupils recognise scientific questions to which they do not yet have definitive answers using a range of scientific enquiries to explore possible answers. Greater Depth: Pupils use observations or data gathered to construct a further testable or research question.

	✓ Pupils describe plants as being flowering or non-flowering; deciduous or evergreen: wind or animal pollinated. Animals as being vertebrate or invertebrate, warm or cold blooded. ✓ Pupils describe animals as: having live births or laying eggs, in water or out; living on land or in water. Having hair, fur, scales or feathers. Pupils describe plants as: annual, biennial or perennial; fruit, cereal or vegetable giving reasons. ✓ Pupils explain their own methodologies of classification of animals or plants using more than one factor.	

Aspect	Knowledge	Skills
Term:	Spring	
Science Unit Name:	Evolution and Inheritance	
Theme content:	Science: The Theory of Evolution	
Scientist:	Charles Darwin **FAMOUS SCIENTIST** Mary Leakey **FAMOUS SCIENTIST**	
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Building on the work undertaken in Year 3 on the use of fossil records to find fuels. Pupils can: ✓ analyse a number of different fossils ✓ identify features that might suggest which modern animals might have evolved from them. Progression • Pupils describe how a fossil was formed and that some have common identifiable features with living things. legs, feathers, leaves, shells. • Pupils analyse a number of different fossils and identify features that might suggest which modern animals might have evolved from them. • Pupils compare fossils of different species within a genus suggesting how the families have changed over time. E.g. the tooth size of big cats or equine hoof shape (or where appropriate skull shape and size from Cro- Magnon to human) or instances where there has been little change over millions of years e.g.	Pupils identify scientific evidence that has been used to support or refute ideas or arguments. Pupils recognise scientific questions that do not yet have definitive answers. Pupils provide straightforward explanations for differences in repeated measurements or observations. Greater Depth: Pupils describe evidence which supports or disproves accepted or developing scientific ideas.

	spiders in amber or fossils of ferns in sandstone.	
Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	By building upon the work in Year 2 on offspring and personal experience of family and friends and by comparing images from a variety of secondary sources, Pupils can: ✓ identify a distinguishing characteristic within family groups. Eg. Roman nose or Hapsburg jaw. Progression • Pupils can identify by reference to physical characteristics how human children look like parents and siblings. • Pupils can identify a distinguishing characteristic within family groups. Eg. Roman nose or Hapsburg jaw. • Pupils can describe varying characteristics within breeds e.g. curly haired Poodle and straight haired Labrador and predict what coat a Labradoodle has. What makes a rose a rose? Stripy zebra have uniquely striped offspring.	Pupils use tables, keys and databases to classify or identify specific objects, living things or events by their characteristics. Pupils begin to identify some positives and some limitations of specific forms of classification. Greater Depth: Pupils use a variety of secondary sources to support identification and classification. Pupils create more complex forms of tables, keys and databases used for classification.
Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Building upon work in Year 2, pupils use evidence from practical investigations, observations or research from secondary sources to: ✓ give reasons why a plant or animal might be suited to its environment, by linking a number of adaptations of a plant or animal has that increases its suitability to the environment e.g. an Arctic Fox having thick white fur as insulation and as camouflage to hide from predators or prey. Progression • Pupils can describe in simple terms the term adaptation and relate this to one factor e.g. deciduous trees lose their leaves in winter, coniferous trees have small needle shaped leaves cacti have fleshy stems to store water in a dry environment to reduce water loss. Elephants have big ears to help them stay cool.	Pupils report and present findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written form such as displays and other presentations. Greater Depth: Pupils make increasingly appropriate choices about effective recording and reporting of findings using scientific language, understanding and vocabulary confidently.

	• Pupils can link a number of adaptations of a plant or animal has that increases its suitability to the environment e.g. an arctic fox having thick white fur as insulation and as camouflage to hide from predators or prey. • Pupils consider a number of different adaptations and make links to them being essential for survival over rivals thus leading to evolution e.g. research Galapagos finches or giant tortoise.	

Aspect	Knowledge	Skills
Term:	Summer	
Science Unit Name:	Animals Including Humans	
Theme content:	Geography - India	
Scientist:	Daniel Hale Williams Mary Maynard Daly	
Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Building on work in Years 3 and Year 4 on the main body parts and internal organs; using secondary sources, models and analogies describe the circulatory system in terms of transport of essential materials around the body, Pupils can: ✓ accurately label a diagram of the circulatory system, annotating the heart as a 'double pump' with arteries running away from the heart, capillaries linking arteries to veins(in organs) and veins running towards the heart Progression • Pupils list the main parts of the circulatory system including: heart, vein, artery, arteriole, capillary. • Pupils accurately label a diagram of the circulatory system, annotating the heart as a 'double pump' with arteries running away from the heart, capillaries linking arteries to veins(in organs) and veins running towards the heart. • Pupils identify the materials carried by the blood using correct vocabulary i.e. nutrients not food, oxygen and carbon dioxide not air, water, waste, urea.	Pupils report and present findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written form such as displays and other presentations. Greater Depth: Pupils make increasingly appropriate choices about effective recording and reporting of findings using scientific language, understanding and vocabulary confidently.

Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Building on work in Year 2 on the importance for health of exercise and eating the right amounts of food; pupils use evidence from observations of practical activities or research from secondary sources to: describe the impact on the way their bodies functions of ✓ diet, ✓ exercise, ✓ drugs ✓ and lifestyle Pupils can: ✓ describe the potential detrimental effects of under or over eating: i.e. ✓ underdevelopment, ✓ anorexia, ✓ obesity leading to increased risk of type II diabetes, ✓ heart disease Progression • Pupils list a number of factors both positive and negative that lifestyle might have on health. • Pupils describe the potential detrimental effects of under or over eating i.e. underdevelopment, anorexia, obesity leading to increased risk of type II diabetes, heart disease etc. • Pupils detail in scientific terms what is meant by a balanced diet and what the outcomes of having too much or too little of one particular food group might be. Pupils explain the physiological effect of a drug e.g. in terms of raised heart rate the effects of caffeine. Analyse the effects a range of lifestyle choices on health.	Pupils decide whether it is appropriate to repeat observations or measurements and explain how this impacts on data collection. Pupils choose and use appropriate equipment to support observation and data collection with increasing accuracy. Greater Depth: Pupils recognise that data that can be collected may be unreliable and describe what they could do to make it more reliable.
Describe the ways in which nutrients and water are transported within animals, including humans	Pupils use evidence from observations or research from secondary sources to: ✓ explain how water is absorbed into the body through ingested material. Progression • Pupils state that soluble nutrients and water are carried in blood (plasma). • Pupils describe that nutrients and water are transported from the digestive system to all	Pupils report and present findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written form such as displays and other presentations. Greater Depth: Pupils make increasingly appropriate choices about effective recording and reporting of findings using scientific language, understanding and vocabulary confidently.

	cells, tissues and organs through the circulatory system. • Pupils associate the soluble nutrients from ingested and digested food: sugars from carbohydrates; lipids from fats and amino acids from proteins that are transported.	
Aspect	**Knowledge**	**Skills**
Term:	Summer	
Science Unit Name:	Forces (Levers and Pulleys)	
Theme content:	Geography - India	
Scientist:	NA	
Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	Pupils make observations and measurements using force meters of 1, 2 and 3 pulley systems to: ✓ investigate mechanical advantage lifting 1 kg mass vertically. Pupils make observations and measurements using force meters to: ✓ investigate simple lever mechanisms on both mechanical advantage and distance travelled, regarding load and position of fulcrums. Pupils can: ✓ identify a range of household and everyday machines which allow a small force to have a greater effect: e.g. bottle openers can openers, wheelbarrow. Progression • Draw and annotate diagrams. • Draw and annotate diagrams with generic terms i.e. lever, fulcrum, and pivot - tabulated results of investigation. • Draw and annotate diagrams with explanation– line graph results.	Pupils decide whether it is appropriate to repeat observations or measurements and explain how this impacts on data collection. Pupils choose and use appropriate equipment to support observation and data collection with increasing accuracy. Greater Depth: Pupils recognise that data that can be collected may be unreliable and describe what they could do to make it more reliable