

All Saints CoFE - Science Overview 2023-2024

Early Years Foundation Stage			
<p>Nursery 3-4</p> <p>Repeat actions that have an effect. Explore materials with different properties. Explore natural materials, indoors and outside. Explore collections of materials with similar and/or different properties Talk about the differences between materials and changes they notice.</p> <p>Explore and respond to different natural phenomena in their setting and on trips.</p> <p>Understand the effect of changing seasons on the natural world around them. Describe what they see, hear and feel whilst outside</p> <p>Use all their senses in hands-on exploration of natural materials. Talk about what they see, using a wide vocabulary.</p> <p>Explore and talk about different forces they can feel.</p>			
	Autumn Term	Spring Term	Summer Term
Books linked to talk investigations	<p>The 3 Little Pigs <i>What materials do we use to build houses?</i></p> <p>Pumpkin soup <i>Where do vegetables grow? Discuss Healthy and unhealthy food.</i></p> <p>Peace at last <i>What are your senses?</i></p> <p>Little Hedgehog and the Big Outdoors <i>What is the weather like (autumn and winter)?</i></p>	<p>Mrs Armitage on Wheels <i>How do things move?</i></p> <p>When the wind blows <i>How do things get dried?</i></p> <p>The biggest muddy puddle in the world <i>What is the weather like (spring)?</i></p> <p>Somebody swallowed Stanley <i>Why is it important to Recycle?</i></p>	<p>A home for a Ladybird <i>Where do minibeasts live?</i></p> <p>Ten Seeds <i>How do plants grow?</i></p> <p>Penguin on Holiday <i>What is the weather like (summer) ?</i></p>
Substantial Knowledge	<p>What materials do we need to build a house? Names of materials – linked to story of 3 little pigs What materials are strong? Food Where do vegetables come from? What vegetables do we know? What is healthy eating and unhealthy to eat? Senses: Talk about the 5 senses and the body parts associated with them. Seasons: Talk about changes in the environment and changes in the weather (from autumn to winter). Talk about the changes you can see on the trees.</p>	<p>Recycling Talk about materials and what we do with them once we are finished.</p> <p>On the Farm Talk about different animals.</p> <p>Seasons: Talk about changes in the environment and changes in the weather (from winter to spring). Talk about the changes in temperature. Stand in the rain with umbrellas. Use hats, coats and gloves to protect from the cold. Splash in puddles. Watch the snow fall, touch the snow and make things with it.</p>	<p>Lifecycles, Experience the changes in living things such as a flowering plant (daffodils) or a tadpole turning into a frog.</p> <p>Minibeasts & Look for worms and mini beasts Visit and explore different habitats (the park, woodlands) Carefully handle worms and learn to return the dug-up soil to its natural place. Look and foster the curiosity for finding woodlice and other living things under logs.</p> <p>Plants Carefully plant and water plants that they have grown from seeds. Walking through tall grass Seek daffodils and tree blossoms</p> <p>Reception Ready (growing) Make connections between their families and other families. Include positive images of people who are disabled. Confront gender stereotypes. Talk about their own life story, children to re-tell what their parents told them about their life-story and family.</p>
Key Vocabulary	<p>What materials do we need to build a house? Wood, brick, straw, hard, soft, strong, weak</p> <p>Food Healthy, unhealthy, vegetables, carrots, onions, peas, potatoes, leeks, pumpkin</p> <p>Senses: Sight, hear, touch, smell, taste, body parts, mouth, eyes, ears, hands, nose</p> <p>Seasons: Autumn, leaves, orange, cold, rain, wind, winter, snow</p>	<p>Recycling: Recycle, waste, bin, used, re-used</p> <p>Farm: Pig, sheep, chicken, horse, cow</p> <p>Seasons: Winter, Spring, snow, splash, ice, cold, puddles</p>	<p>Lifecycles: Seed (bulb), plant, flower, Tadpole, froglet, frog</p> <p>Minibeasts Woodlice, butterflies, bees, worms, logs, soil, dig, grass</p> <p>Plants: Seed (bulb), plant, flower, dig, water,</p>
<p>Reception 4-5</p> <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Recognise some environments that are different from the one in which they live.</p> <p>Understand the effect of changing seasons on the natural world around them.</p> <p>ELG: The Natural World</p>			

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Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			
	Autumn Term	Spring Term	Summer Term
Books linked to talk investigations	<p>Dachy's Deaf – <i>Can you help Dachy's friends find out about loud and quiet sounds</i></p> <p>Goddilocks and the Three Bears – Which cereal will be the soggiest when the bears get bak from their walk?</p> <p>Peace at Last – <i>Can you help make it quiet for Mr Bear to sleep?</i></p> <p>Stickman –Can you describe how the outdoor environment has changed?</p>	<p>Astro Child – can you launch a rocket into space?</p> <p>Look Up – can you use the stars to find your way around the night sky?</p> <p>Rabbit's Pancake Picnic – what do you need to make a picnic? Can you follow a recipe?</p> <p>Counting Creatures – What animals can you see? Counting to 10 and links to other</p>	<p>Mr Archimedes' Bath – Can you fill the bath without spilling any water?</p> <p>How to find Gold – can you make a boat to help Anna and Crocodile find the sunken gold?</p> <p>Cora Caterpillar – Can you observe any changes? What is happening to the caterpillar?</p> <p>The tiny seed/The Extraordinary Gardener – what happens when we plant a seed? Why are plants growing?</p>
Substantial Knowledge	<p>Its Good to be me Discussions around snack time and lunch time - healthy eating choices. Discussions around healthy living choices including: washing hands, brushing teeth, eating and exercise. Story time and circle time to explore books focusing on staying healthy and the human body: Funnybones, Germs, What makes me, me and The Little Book of Manners. Naming body parts through songs: if you're happy and you know it and head, shoulders, knees and toes... Talking about our pets at home and drawing out pets in our family portraits.</p> <p>Seasonal changes – Autumn: Exploring school's grounds and observing seasonal changes in the Autumn. Exploring natural autumnal resources in a Tuff Tray, asking questions and making/drawing observations. Explore hibernation and migration, looking at contrasting environments/animals around the world in the autumn. Explore harvest time in the UK and farming at harvest time. Observe seasonal weather changes and longer nights in the autumn compared to the summer. Observe and explain decomposition of pumpkins Light and dark Nocturnal animals Winter – exploring ice</p> <p>A2 Lets Celebrate Observe changes – colour Observe changes in ice Explore light and dark</p> <p>Seasonal Changes Winter: Exploring schools' grounds and observing seasonal changes in the winter Explore compare/contrast our environment with polar regions Discuss global warming and the impact on polar regions Observe seasonal weather changes in the winter (ice exploration) Observe, question and draw spring plants/spring growth Explore natural winter resources in Tuff Tray, asking questions and making/drawing observations winter walk around School grounds describing and discussing what is found</p>	<p>Super Scientists Change of state water turning into ice ice melting a runny cake mixture turning into a solid cake malleable salt dough turning hard in the oven Wax melting and then setting</p> <p>Processes such as: Sound being felt as a vibration light being able to travel through transparent objects but not opaque objects Objects casting shadows Magnets being attracted to some materials and not others That some objects are able to float whilst others sink That some objects will be changed when they are burned That most objects will fall to the ground when they are dropped That some things need power (e.g. batteries, plugging them in) to make them work</p> <p>Seasonal Changes Spring: Exploring schools' grounds and observing seasonal changes in the spring Observe seasonal weather changes in the spring Observe, question and draw spring plants/spring growth Explore natural spring resources in Tuff Tray, asking questions and making/drawing observations Spring walk around School grounds describing and discussing what is found Explore the life cycle of frogs and butterflies Explore the life cycle of plants Still life observations and drawings of spring flowers</p> <p>Sp2 The UK outdoors: Explore, observe and identify UK minibeasts. Look after our local environment – build minibeast houses Animals and their babies Food from plants and animals Growing sun flower seeds Farm trip</p>	<p>Amazing Animals Observe, explore and compare contrasting natural environments around the world: rain forest, great barrier reef, Kenya Explore, compare, contrast, observe, draw and discuss animals native to Australia, polar regions and Africa. Knowing where different animals come from. Explore creatures that live in the sea.</p> <p>Seasonal Changes – Summer: Exploring schools' grounds and observing seasonal changes in the summer Observe seasonal weather changes in the summer</p> <p>Summer 2: Dangers and Delights of the sea Experiment with and talk about, floating and sinking – making boats Investigation – magnetic/ non magnetic – treasure investigation Name sea creatures</p>
Key Vocabulary	<p>Healthy, unhealthy, germs, head, legs, arms, hands, feet, shoulders, face, eyes, ears, mouth, tongue, teeth heart, brain, bones, skin. Animal names Autumn, winter, spring, summer, weather, hot, cold, snowing, freezing, warm, wet, cloudy, harvest, farming, leaves, light, dark, desert, polar. Plants, grow, soil, sunlight, fruit, vegetable, tree, flower, bush, water. Life cycle, grow, change, tadpole, froglet, frog, larva, caterpillar, chrysalis, cocoon.</p>	<p>Changes of state: Water, ice, melting, freezing, liquid, runny, solid, heat, cooling down Vibration, light, travel, transparent, opaque, shadow, magnet, sink, float, power Spring, rain, warmth, flowers, Eggs (frogspawn) – tadpole – froglet – frog Caterpillar – chrysalis – butterfly * depends on the species of butterfly! Mini-beasts: Woodlands, environment, woodlice, butterfly, ants, worms, caterpillars, salamanders,</p>	<p>Rain forest, rain, wet, great barrier reef, coral, fish, underwater, dessert, hot, very little water, Polar regions, snow, ice, icebergs Animals: Rain forest, frogs, toucans, birds, Desert, camel, cactus, Great Barrier Reef, coral, fish Polar regions, polar bear, penguins, seals</p>











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	Material, float, sink, plastic, fabric, wood, strong, waterproof, bendy, light. Pollution, recycle, rubbish, environment, community. Minibeast, ant, spider, worm, snail, habitat.	Plants: Seed, seedling, plant, leaf, flower. Water, soil, sunshine.	
Opportunities for C.P			

Biology	Chemistry	Physics
Animals Including Humans	Materials	Light
Living Things and their Habitats	States of Matter	Forces and Magnets
Plants	Rocks	Electricity
Seasonal Changes		Sound
Evolution and inheritance		Earth and Space

KSI Working Scientifically	<ul style="list-style-type: none"> a) asking simple questions and recognising that they can be answered in different ways b) performing simple tests c) observing closely, using simple equipment d) identifying and classifying e) gathering and recording data to help in answering questions. f) using their observations and ideas to suggest answers to questions 								
Year 1	Autumn 7 + 7 weeks			Spring 6 + 7 weeks			Summer 4 + 7 weeks		
Lessons	The human body Knowledge Assessment 1. Name and identify the parts of the human body. 2. Draw and label parts 3. Sight 4. Sound 5. Taste 6. Touch 7. Smell	Seasonal Changes 1. Changes in Autumn 2. Collect and record data Knowledge Assessment	Materials Knowledge Assessment 1. Explore materials – wood, plastic, glass and metal 2. Explore materials – rock. 3. Objects and materials 4. Melt and freeze 5. Float or sink? 6. Does it absorb water? 7. Investigate materials	Seasonal changes 1. Changes in Winter 2. Collect and record data Knowledge Assessment	Animals Knowledge Assessment 1. Mammals 2. Birds 3. Fish 4. Amphibians 5. Reptiles 6. Compare and Group Animals 7. Carnivores 8. Herbivores 9. Omnivores	Seasonal Changes 1. Changes in Spring 2. Collect and record data	Planting? Ask PIA Bedworth in September	Plants 1. Plant Parts 2. Tree Parts 3. Wildflowers and garden plants 4. Deciduous trees 5. Evergreen trees 6. Trees in my local area Plants in my local area (trip to Bedworth Park PIA)	Seasonal Changes 1. Changes in Summer 2. Gather and record data 3. What are the main changes in each season?
Strand	Biology	Biology	Chemistry	Biology	Biology	Biology	Biology	Biology	Biology
Curriculum Objectives Working Scientifically	Pupils should be taught to: <ul style="list-style-type: none"> • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. a. Asking simple questions and recognising that they can be answered in different ways. f. Using their observations and ideas to suggest answers to questions b. Performing simple tests. 	Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the 4 seasons. • observe and describe weather associated with the seasons and how day length varies. c. observing closely, using simple equipment 	Pupils should be taught to: <ul style="list-style-type: none"> • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of everyday materials on the basis of their simple physical properties. f. Using their observations and ideas to suggest answers to questions b. Performing simple tests e. gathering and recording data to help in answering questions 	Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the 4 seasons. • observe and describe weather associated with the seasons and how day length varies. c. observing closely, using simple equipment e. gathering and recording data to help in answering questions 	Pupils should be taught to: <ul style="list-style-type: none"> • Identify and name a variety of common animals, including fish, amphibians, reptiles, birds and mammals • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. a. Asking simple questions and recognising that they can be answered in different ways. d. Identifying and classifying. e. gathering and recording data to help in answering questions f. Using their observations and ideas to suggest answers to questions 	Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the 4 seasons. • observe and describe weather associated with the seasons and how day length varies. c. observing closely, using simple equipment 		Pupils should be taught to: <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; • identify and describe the basic structure of a variety of common flowering plants, including trees. d. Identifying and classifying. e. gathering and recording data to help in answering questions f. Using their observations and ideas to suggest answers to questions 	Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the 4 seasons. • observe and describe weather associated with the seasons and how day length varies. c. observing closely, using simple equipment
Substantial Knowledge	Body Parts: •The body has lots of parts. • Each of these body parts has a name. • Most	• There are four seasons in one year.	• Objects are made from different materials. • Materials have different textures	• There are four seasons in one year.	• There are different types of animals. • Animals have different features.	• There are four seasons in one year.		• There are different plants in our local area. • Flowering plants have flowers, stems, roots and leaves.	• There are four seasons in one year.








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	<p>bodies have a neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth.</p> <p>Sight: • Humans use their eyes to see. • You can see when there is light. • You cannot see in the dark. • Some people cannot see.</p> <p>Sound: • Humans use their ears to hear sounds. • When sounds are quiet, they can be hard to hear. • When sounds are loud, they are easier to hear.</p> <p>Taste: • The tongue helps humans to taste. • The tongue is in the mouth. • There are five basic tastes – sweet, salty, sour, bitter and savoury.</p> <p>Touch: • The skin is the body part that helps us to sense touch. • Skin covers the whole body. • We can sense touch using different body parts.</p> <p>Smell: • The nose helps us to sense smell. • The nose is on the face. • Some items have a stronger smell than others.</p>	<p>• The seasons are spring, summer, autumn and winter.</p> <p>• In autumn, the days are starting to become shorter and the nights are starting to become longer. • Some trees lose their leaves in autumn.</p>	<p>• Some objects are made from different materials depending on what they are used for.</p> <p>• Rocks: There are different types, shapes, sizes and textures of rocks, rocks can be used to build things such as walls or buildings.</p> <p>• Water: When water freezes it turns to ice, when it melts, it turns to water.</p> <p>• Some materials float in water, This means they stay at the top.</p> <p>• Some materials sink in water. This means they fall to the bottom,</p>	<p>• The seasons are spring, summer, autumn and winter</p> <p>• In winter, there are fewer hours of daylight and the nights are longer. • The weather is often colder in winter.</p>	<p>• Mammals have fur or hair on their bodies, some can be kept as pets some live in the wild.</p> <p>• Birds have beaks, wings and feathers, some birds can fly, some birds cannot fly, some birds can swim, some birds cannot swim.</p> <p>• Fish live in water. Some fish have scales on their bodies. Fish have fins to help them swim. Most fish have gills that help them breathe underwater.</p> <p>• Amphibians live on land and in water. They have webbed feet. Frogs, toads and newts are amphibians.</p> <p>• Reptiles have dry skin and have scales on their bodies. Lizards, snakes, crocodiles and turtles are reptiles.</p> <p>• Some animals are carnivores. Carnivores eat other animals. Many carnivores have sharp teeth and claws.</p> <p>• Some animals are herbivores. Herbivores eat plants including grass, fruits and vegetables. Some herbivores eat seeds and nuts. Herbivores have flat teeth for chewing plants.</p> <p>• Omnivores eat other animals and plants..</p>	<p>• The seasons are spring, summer, autumn and winter</p> <p>• In spring, plants start to grow. Some trees re-grow their leaves. There are more hours of daylight and the nights are shorter. The weather changes quickly in spring.</p>		<p>• Wildflowers have not been chosen by humans to grow in their garden. Most wildflowers have not been planted by humans.</p> <p>• Garden plants have been chosen by humans to grow in their gardens.</p> <p>• Trees are a type of plant and can be different shapes and sizes.</p> <p>• Trees have roots, a trunk, branches and leaves. Some trees have fruit.</p> <p>• Deciduous trees lose their leaves in autumn. • Horse chestnut, sycamore and oak trees are all deciduous. • Leaves that grow on deciduous trees change colour in autumn.</p> <p>• Evergreen trees keep their leaves all year round. • Holly and pine trees are evergreen.</p>	<p>• The seasons are spring, summer, autumn and winter</p> <p>• Summer is the warmest season.</p> <p>There are most daylight hours in summer and the nights are shorter.</p> <p>Many plants grow in summer.</p> <p>There are more animals active in summer.</p>
<p>Enquiry Questions</p>	<p>Research </p> <p>How do humans use their (body part) to ____?</p>	<p>Observing over time </p> <p>What is changing this season?</p>	<p>Identify, Classify & Group </p> <p>How can we sort these materials?</p> <p>Perform Simple Tests </p> <p>How can we change this water into ice? How can we melt this ice?</p> <p>How do you know if an object will float or sink?</p> <p>Which material will absorb more water? What do we keep the same? What do we change?</p>	<p>Observing over time </p> <p>What is changing this season?</p>	<p>Identify, Classify & Group </p> <p>Can you identify if an animal is an omnivore, carnivore or herbivore?</p>	<p>Observing over time </p> <p>What is changing this season?</p>	<p>Observing over time </p> <p>What does a seed need to grow into a plant?</p>	<p>Pattern Seeking Enquiry </p> <p>How can we sort these plants in different groups?</p>	<p>Observing over time </p> <p>What is changing this season?</p>
<p>Key vocabulary</p>	<p>Body Parts: Hair Eye Nose Mouth Elbow Leg Hand Knee Arm Neck Teeth Ear Feet</p> <p>Sight: • Eyes Light Dark Blind</p> <p>Sound: • Ears Hear Loud Quiet Noisy.</p> <p>Taste: Sweet, Salty Sour Bitter Savoury</p> <p>Touch: • Skin Rough Smooth Hard Soft</p> <p>Smell: Nose Smell Scent Sniff Stench</p>	<p>Season: One of 4 parts of the year.</p> <p>Autumn: The season after summer and before winter.</p> <p>Daylight: When it is light outside.</p> <p>Night: When there is no daylight. •</p> <p>Weather: The conditions outside</p>	<p>Object material – plastic, metal, wood, glass, rock, wool</p> <p>• soft • hard • shiny • dull • heavy • light • rough</p> <p>• smooth</p> <p>Solid, liquid, melt, freeze, float, sink, heavy, light, absorb, transparent, opaque</p> <p>Independent variable Dependent variable Controlled variable</p>	<p>Season Winter: The season after autumn and before spring.</p> <p>Daylight, weather, rain, cloud, frost, sun, snow</p>	<p>Omnivore, Carnivore, Herbivore</p> <p>Reptile: Scales, lizard, crocodile, turtle</p> <p>Amphibian: webbed feet, frog, toad, newt</p> <p>Fish: fin, tail, scales, gills</p> <p>Bird: wings, beak, feathers, webbed feet, flipper</p> <p>Mammal: fur, wild mammal, pet</p>	<p>Season Spring: The season after winter and before summer.</p> <p>Daylight, weather, rain, cloud, sleet, sun, wind, snow</p>		<p>Flowering Plants: flower, petals, leaf, stem, root</p> <p>Wildflower: nettle, buttercup dandelion, daisy</p> <p>Garden plant: sunflower, rose</p> <p>Trees: leaf, trunk, branch, roots,</p> <p>Deciduous: Horse chestnut, Oak, Sycamore</p> <p>Evergreen: Holly, Pine (needle leaves)</p>	<p>Season Summer: The season after spring and before autumn.</p> <p>Daylight, night, weather, rainy, cloudy, sunny, windy,</p>

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Year 2	Autumn 14 weeks	Spring 13 weeks		Summer 11 weeks			
Lessons	Animals Needs for Survival 1. Mammals 2. Birds 3. Fish 4. Amphibians 5. Reptiles 6. Humans	Materials 1.Explore materials 2.Wood, paper and cardboard +3.Brick and rock 4.Glass and Plastic 5. Metal 6. Fabrics 7. Same object, different material 8.Test Materials – bend, squash, twist and stretch 9. Plan – waterproof experiment 10. Investigate – waterproof experiment	Living things and their habitats 1.Habitats in my local area 2.Arctic habitats 3.Desert habitats 4.Marine habitats 5 UK forest habitats 6.Microhabitats 7.Habitats and diet 8. Food Chains 9. Draw food chains 10. Living, dead or never alive? 11. Group – living dead or never alive?	Plants (light and dark) 1.Explore plants 2.Plant parts 3.What do plants need to grow? 4. Plan – light and dark 5. Plant – light and dark	Plants (bulbs and seeds) 1.Bulb or seed? 2.What do plants need to grow? 3.Plan – bulbs and seeds 4.Plant – bulbs and seeds	Humans 1.Exercise2.Food 3.Hygiene4. Teeth	Growing up 1.Mother and offspring 2.Life cycle of humans 3.Life cycle of different mammals 4.Life cycle of amphibians 5. Life cycle of a butterfly 6. Are there patterns between the life cycles of different animals?
Strand	Biology	Chemistry	Biology	Biology	Biology	Biology	Biology
Curriculum Objectives Working Scientifically	Pupils should be taught to: • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). e.Gathering and recording data to help in answering questions. d. Identifying and classifying. f.Using their observations and ideas to suggest answers to questions.	Pupils should be taught to: • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. a.Asking simple questions and recognising that they can be answered in different ways. d. Identifying and classifying. b. Performing simple tests c. observing closely, using simple equipment f.Using their observations and ideas to suggest answers to questions.	Pupils should be taught to: • 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. • Identify and name a variety of plants and animals in their habitats, including microhabitats. c. observing closely, using simple equipment d. identifying and classifying. e. Gathering and recording data to help in answering questions. f. Using their observations and ideas to suggest answers to questions.	Pupils should be taught to: • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. a. Asking simple questions and recognising that they can be answered in different ways. b. Performing simple tests c. observing closely, using simple equipment. e. Gathering and recording data to help in answering questions.	Pupils should be taught to: • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. a. Asking simple questions and recognising that they can be answered in different ways. b. Performing simple tests c. observing closely, using simple equipment.	Pupils should be taught to: • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. e.Gathering and recording data to help in answering questions. d. Identifying and classifying. c. observing closely, using simple equipment	Pupils should be taught to: • Notice that animals, including humans, have offspring which grow into adults. a. Asking simple questions and recognising that they can be answered in different ways. d. Identifying and classifying.
Substantial Knowledge	Mammals: • Mammals have fur or hair on their bodies. • All mammals need air, water, food and shelter to survive. • Mammals are carnivores, herbivores or omnivores. Birds: • Birds have feathers, wings and beaks. • Some birds can fly. • Some birds cannot fly. • Birds need air, water, food and shelter to survive. Fish: • Fish are animals that live in water. • Fish need air, water, food and shelter to survive. • Fish have gills that they use to breathe. Amphibians: • Amphibians live on land and in water. • Amphibians do not have scales on their bodies. • Some amphibians have webbed feet. • Amphibians need air, water, food and shelter to survive. Reptiles: • Reptiles have dry scales on their bodies. • They need air, water, food and shelter to survive. • Reptiles need direct heat to survive. Humans • A mammal has fur or hair on its body. • Humans are mammals. • Humans need air, water, food and shelter to survive. • All animals need air, water, food and shelter to survive.	Materials: • Objects can be made from different materials. • Materials have particular uses. Some materials are natural such as sand, wood and wool. • Some are man-made such as plastic and brick. • Some materials are recyclable and can be used again... • Some objects can be made from different materials. • Some materials are suitable/unsuitable for an object. • Some materials can change shape and some cannot by being bent, twist, squashed, stretched. Wood, paper and cardboard: • Paper and cardboard are made from wood. And come from trees. • There are different strengths of wood paper and cardboard. • Wood, paper and cardboard can all be recycled and used again. Brick and Rock: Rocks are a natural material. • Bricks are a man-made material. • Rocks and bricks can be used to build houses, buildings and roads. Glass and Plastic: Glass is hard and brittle. • Plastic can be flexible or hard. • Some plastic can be recycled. • All glass is recyclable. Metal: Metal comes in many forms and colours. • Some metals are flexible and can easily change shape. • Some metals cannot change shape easily. • Metal can be used to make many different objects. Fabrics: • Fabrics can be natural. • Fabrics can be man-made. • Fabrics have different uses.	• A habitat is where a plant or animal lives. • A habitat provides everything a plant or animal needs to survive. • All animals and plants have a habitat. • There are different habitats in my local area. Polar Habitats: Polar animals can survive in extremely cold weather. • Some polar animals are carnivores and herbivores. Desert Habitats: • Desert animals can survive in extremely hot weather. • Some plants can survive for a long time without water. Ocean Habitats: • Ocean animals include fish, mammals and reptiles. • Some animals eat plants and others use plants for shelter or to hide from other animals. Woodland habitats: • Animals and plants live in woodland habitats. • In woodlands, some animals eat plants and others use plants for shelter. Microhabitats: • A microhabitat is a very small habitat. • Insects, snails, worms and spiders all live and survive in microhabitats. • A food chain shows how different living things rely on each other. • A food chain normally starts with plants. • Animals eat other living things for energy. • Animals are carnivores, herbivores, omnivores. • Animals, plants and humans are living things . • Living things need certain things to survive, such as water, food, shelter and air. • Living things can die. • When something is dead, it was once living. • Some things were never alive, such as rocks, water or toys.	• A plant is a living thing. • There are many different types of plants. • Many plants have flowers or fruit. • Parts of some plants can be eaten. • Flowering plants have roots, a stem, leaves and petals. • Trees have roots, a trunk, branches and leaves. • Many trees have blossom or fruit. • Plants need water and light to grow and stay healthy. • If plants do not have water and light, they may become weak and not grow properly.	• Many plants grow from bulbs or seeds. • Bulbs and seeds come in different shapes and sizes. • Seeds can be found inside the fruit or on the outside of the fruit. • Bulbs store food for plants to use when they grow again. • Plants need water, light and a suitable temperature to grow. • Plants will not be healthy if the conditions are not right.	Exercise: improves physical and mental health. • Exercising daily makes your heart stronger. Food: A healthy diet includes fruit, vegetables and other healthy food. An unhealthy diet is a diet that is high in fat, sugar or fried food. It is important to eat the right amounts of different types of food. • Hygiene: Germs can make you unwell and are spread easily from unwashed hands. • You should wash your hands, sneeze into a tissue and have regular baths or showers. Teeth: You should brush your teeth twice a day with water, a toothbrush and toothpaste. Plaque can build up on your teeth and can damage your teeth and gums.	Parents and Offspring: • Most mammals give birth to live young. These are their offspring. • Reptiles, amphibians, birds and most insects lay eggs. These are their offspring. • The offspring of many animals have a different name to the adult. Life cycles – Humans/mammals: • A mammal is an animal with fur or hair on its body, which gives birth to live young and feeds its young on milk. Humans are mammals. • Different mammals have different life cycles. • Most mammals grow up quicker than humans and become adults sooner • Humans follow these stages of the life cycle – baby, child, teenager and adult. • The body changes and grows throughout the life cycle. Life cycles – amphibians: • Most animal life cycles share similarities. • Frogs are amphibians. This means that they can live on land and in water. • Frogs lay eggs. • A frog's life cycle is eggs (frogspawn), tadpole, young frog (froglet) and adult frog. Life cycles – butterfly • Butterflies lay eggs (usually on a leaf), which hatch into caterpillars. • Once a caterpillar has grown, it will change into a pupa and form a hard case to protect itself. The pupa will change into a butterfly. Once the butterfly is fully formed, it will hatch










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							from its casing. Once the butterfly has hatched, it is ready to fly and start the life cycle again.
Enquiry Questions	<p>Identify, Classify & Group </p> <p>How can we group these animals based on their needs for survival?</p>	<p>Perform Simple Tests -Comparative </p> <p>Which material would be most suitable for ____?</p>	<p>Research </p> <p>What different habitats are there on planet Earth and what lives in each habitat?</p>	<p>Perform Simple Tests -Comparative </p> <p>Do plants grow healthier in the light or dark?</p>	<p>Observing over time </p> <p>How do bulbs and seeds change over time?</p>	<p>Pattern Seeking Enquiry </p> <p>How can we sort these food items?</p>	<p>Pattern Seeking Enquiry </p> <p>Are there patterns between the life cycles of different animals?</p>
Key vocabulary	<p>Mammals: Mammal, fur, carnivore, herbivore, omnivore, Birds: • Bird, Feathers, Beak, Insect, Insectivore Fish: • Fish, Scales, Gills, Fin Amphibian: Amphibian, Webbed feet, frog, toad, newt. Reptiles: • Reptile, Scales, Carnivore, Herbivore Humans: Mammal, Adult, Baby, Shelter</p>	<p>• material, natural material, man-made material, recycle. Rock • stone • pebble • brick fabric smooth • rough • flexible • smooth • rigid • brittle, • flexible • transparent • translucent • opaque hard, shiny, dull, flexible, tough, lightweight, soft, hard, waterproof, light, breakable squash, bend, twist, stretch</p>	<p>Mammal, bird, deciduous or evergreen tree, habitat: Polar: carnivore, herbivore, arctic plants, hibernate Desert: reptile, cactus, rain fall Ocean: fish, mammal, seagrass, Woodland: fern, mammal, bird, moss Microhabitat: insect, spider, snail</p> <p>Food chains, carnivore, herbivore, omnivore, diet</p> <p>Living, dead, never alive, plant, animal</p>	<p>Plant, flower, fruit, vegetable, herb, blossom, stem, leaf, trunk, branch, seed, plant, sunlight, compost</p> <p>Independent variable Dependent variable Controlled variable</p>	<p>Plant, bulb, seed, shoot, roots, sunlight, temperature, growth, compost, measurement, observe</p>	<p>Exercise: Heart, Physical health, mental health. Food: Healthy diet, Unhealthy diet, Meat, Vegetables, Fruit, Sugar Hygiene: Germs, disease, doctor Teeth: plaque, filling, gums</p>	<p>Offspring, growth, egg, adult, parent, baby, teenager, adolescent, adult, life cycle, mammal, amphibian, frogspawn, tadpole, froglet, caterpillar, pupa, butterfly</p>

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Lower Ks2 Working Scientifically	<ul style="list-style-type: none"> a) asking relevant questions and using different types of scientific enquiries to answer them b) Setting up simple practical enquiries, comparative and fair tests c) making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers d) gathering, recording, classifying and presenting data in a variety of ways to help in answering questions e) recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables f) reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions g) using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions h) identifying differences, similarities or changes related to simple scientific ideas and processes i) using straightforward scientific evidence to answer questions or to support their findings. 								
Year 3	Autumn 14 weeks			Spring 13 weeks			Summer 11 weeks		
Lessons	<p style="text-align: center;">Skeletons</p> <ol style="list-style-type: none"> 1.Name and identify the bones in the human body 2.Functions of the skeleton 3.Name and identify bones in a range of animals 4.Animals with and without spine 5.Are all skeletons the same? <p style="text-align: center;">Movement</p> <ol style="list-style-type: none"> 1.Joints 2.How we move. 	<p style="text-align: center;">Nutrition and Diet</p> <ol style="list-style-type: none"> 1.Food Groups 2.Understand the five food groups. 3.Balanced diets 4.Compare diets 5.Animal diets 	<p style="text-align: center;">Rocks</p> <ol style="list-style-type: none"> 1.Identify rocks 2.Group Rocks 3.Test Rocks 4.Local rock survey. 	<p style="text-align: center;">Fossils</p> <ol style="list-style-type: none"> 1.Looking at fossils 2.Fossil information 	<p style="text-align: center;">Soils</p> <ol style="list-style-type: none"> 1.Explore soil 2.The importance of soil 3.Plan-soil experiment 4. Investigate – soil experiment 5.Make conclusions – soil experiment 	<p style="text-align: center;">Light</p> <ol style="list-style-type: none"> 1.Light sources 2.The sun 3.How we see 4.Shadows 5.Opaque, translucent or transparent? 6.Plan-shadow experiment. 7. Investigate – shadow experiment. 8. Evaluate – shadow experiment. 	<p style="text-align: center;">Plants</p> <ol style="list-style-type: none"> 1.Plants of a plant and their functions 2.Plant dissection 3.Plan –growing experiment 4.Plant- growing experiment 5.The stem and water transportation 6.Looking at seeds 7.Reproductive parts in plants 8.Pollination 9.Seed dispersal 10.Life cycle of plants 	<p style="text-align: center;">Forces</p> <ol style="list-style-type: none"> 1.Explore forces 2.Friction 3.Plan - friction experiment 4. Investigate – friction experiment 	<p style="text-align: center;">Magnets</p> <ol style="list-style-type: none"> 1.Magnets 2.Magnetic and non-magnetic materials 3.Investigate metals 4.North and South Poles – attract and repel
Strand	Biology	Biology	Chemistry	Chemistry	Chemistry	Physics	Biology	Physics	Physics
Curriculum Objectives Working Scientifically	<p>Pupils should be taught to:</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>a)Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>e)Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Pupils should be taught to:</p> <p>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.</p> <p>i) using straightforward scientific evidence to answer questions or to support their findings.</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>h)identifying differences, similarities or changes related to simple scientific ideas and processes</p>	<p>Pupils should be taught to:</p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>c) making systematic and careful observations</p> <p>d)gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p>	<p>Pupils should be taught to:</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>a)Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Pupils should be taught to:</p> <p>Recognise that soils are made from rocks and organic Matter</p> <p>b) Setting up simple practical enquiries, comparative and fair tests.</p> <p>c) making systematic and careful observations</p> <p>i) using straightforward scientific evidence to answer questions or to support their findings.</p> <p>g) using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Recognise that they need light in order to see things and that dark is the absence of light. • Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes. • Notice that light is reflected from surfaces. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change. <p>a)Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>d)gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>h)identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>e)Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>g) using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>a)Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>b) Setting up simple practical enquiries, comparative and fair tests.</p> <p>i) using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Compare how things move on different surfaces. <p>h)identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>i) using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. • 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. • Observe how magnets attract or repel each other and attract some materials and not others • Describe magnets as having 2 poles and predict whether 2 magnets will attract or repel each other, depending on which poles are facing. <p>b) Setting up simple practical enquiries, comparative and fair tests.</p> <p>d)gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>h)identifying differences, similarities or changes related to simple scientific ideas and processes</p>
Substantial Knowledge	<p>Human Skeleton: • Humans have skeletons which are made up of lots of different bones. • An adult human typically has 206 bones that make up the skeleton. • The skull, spine (backbone), ribcage, pelvis and femur are bones within the</p>	<p>Food Groups: Humans need the right types and amount of food. • Humans get their nutrition from what they eat. • Food can be sorted into five food groups – <i>fruit and</i></p>	<ul style="list-style-type: none"> • Rocks can be sorted in different ways: • Some have grains. • Some have crystals. • Some have 	<ul style="list-style-type: none"> • A fossil is the remains or trace of a living thing that lived a long time ago. • Both animals and plants can become fossils. 	<ul style="list-style-type: none"> • Organic matter is the remains of dead plants and animals. • Soils are made from rocks, organic matter and water. 	<ul style="list-style-type: none"> • Humans and other animals need light to see. • Darkness is the absence of light. 	<ul style="list-style-type: none"> • Plants are made up of different parts, which have different functions. • The roots absorb water from the soil and hold the plant in place. 	<ul style="list-style-type: none"> • Forces are pushes or pulls. • A contact force is a push or a pull that affects objects which are touching. 	<ul style="list-style-type: none"> • A magnetic force is a non-contact force. • Magnets have two poles – a north and south pole.








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	<p>skeleton. • Bones have specific functions. • The skull protects the brain. • The femur helps humans to stand and move. • The pelvis helps to support the spine. • The spine helps humans to twist and be held upright. • The ribcage protects the heart and lungs.</p> <p>Bones: • Mammals, birds, fish, amphibians and reptiles have skeletons. • There are some similarities and differences in skeletons of different animals. • Animal skeletons are made up of lots of different bones.</p> <p>Spine or No spine? All mammals, birds, fish, reptiles and amphibians have a spine. • Some animals do not have spines. • Skeletons provide support, protection and allow movement. • Some animals have an exoskeleton. • An exoskeleton provides support and protection.</p> <p>Joints: • A joint is where two or more bones meet. • There are different joints in the human body. • The knees and elbows are hinge joints. • The shoulders and hips are ball and socket joints.</p> <p>Movement: • Muscles are attached to bones. • Muscles can only pull on bones and cannot push. • Muscles work in pairs by contracting and relaxing. • Bones, muscles and joints work together to allow movement.</p>	<p><i>vegetables, carbohydrates, protein, dairy and alternatives and fats and sugars.</i></p> <p>Fruit and vegetables provide the body with essential vitamins. • Carbohydrates provide the body with energy. • Protein helps with muscle growth and repair. • Dairy products contain calcium, which is good for teeth and bones. • Fats can be grouped into healthy and unhealthy fats.</p> <p>Diet: Humans need to eat a healthy, balanced diet to maintain good health. • Humans should eat a wide variety of foods and consume the right amount to maintain a healthy body weight. • The Eatwell Guide shows how much of each food group we should eat to achieve a healthy and balanced diet.</p> <p>There are a variety of human diets including vegan, vegetarian, pescatarian and omnivorous diets. • People who eat a vegan diet get protein from sources that are not animal products.</p> <p>Animals need the right type and amount of nutrition. They cannot make their own food, instead they get their nutrition from what they eat.</p>	<p>layers. • Some are light and some are heavy. Some are hard. • Some react with acid. • Some are brittle. • Some float and some sink.</p> <p>Rocks are used as building materials. • Rocks have different textures and appearances. • Some rocks change over time.</p>	<ul style="list-style-type: none"> Older fossils are found deeper underground. Fossils are usually formed from the shells or bones of living things. Animal footprints and tracks can also form fossils. Fossilisation is the process that explains how a fossil is formed. Fossilisation is a rare process that only occurs under certain conditions. When an animal dies, the soft parts of its body break down, leaving behind the hard parts such as the skeleton. The process of fossilisation takes thousands of years. 	<ul style="list-style-type: none"> There are different types of soil including sandy, chalk, clay and peat soil. These soils have different properties. Many living things need soil to survive. Soils can act as a habitat for many small animals. Soils provide nutrients for plants. Soils can also prevent flooding, as they absorb water. 	<ul style="list-style-type: none"> Natural light sources are objects in nature that give out light, such as the Sun. Artificial light sources are made by humans. Without the Sun, living things would not be able to live and grow on planet Earth. Light from the Sun can be dangerous. There are ways to protect your eyes from the Sun. Light travels from a light source to an object. • The light is then reflected from the object into our eyes. • Reflection is the return of light from a material or surface. Shadows are formed when the light from a light source is blocked by an object. Opaque materials do not let light rays pass through. • Translucent materials allow some light to pass through but do not form clear, defined shadows. • Transparent materials allow light to pass through. 	<ul style="list-style-type: none"> The stem carries water to different parts of the plant. • There are small tubes inside the stem that transport the water to different parts of a plant, such as to the leaves and flowers. The leaves absorb sunlight to make food for the plant. The flowers help the plant to reproduce and create new life. A dissection is the method of separating something into its parts. Germination is the process of a seed breaking its coating and sending out its first leaves and roots. Seeds need water and the correct temperature to germinate. As a seed absorbs water, the seed coating swells and breaks. The stamen is the male parts of a plant. The stamen produces pollen. The pistil is the female parts of a plant. The pistil receives the pollen in the fertilisation process. Pollination is the transfer of pollen from the male part of a flowering plant to the female part of a plant, so that the plant can reproduce. The pollen and the egg join to make a seed. The aim of pollination is to create offspring. Seed dispersal is the movement of seeds away from the parent plant for the life-cycle process to begin again. The most common methods of seed dispersal are by wind, water, animals and explosion. The stages in a plant's life are called its life cycle. Some plants start as a seed, which germinates under the right conditions. A germinated seed grows roots and shoots, which then grow leaves. As plants grow, they produce flowers and can reproduce through pollination. Once a seed is produced it can be dispersed to start the life cycle again. 	<ul style="list-style-type: none"> Friction is a contact force that is caused by one object being pushed across the surface of another. Friction can stop or slow down a moving object. Smooth surfaces, such as ice, wood, and plastic, have lower levels of friction. Rough surfaces, such as concrete, sand and carpet, have higher levels of friction. 	<ul style="list-style-type: none"> Magnets can have different shapes, such as a bar magnet or a horseshoe magnet. A magnetic force is a non-contact force. Some materials are magnetic and some are not. Plastic is not a magnetic material. Wood is not a magnetic material. Paper is not a magnetic material. Some metals are magnetic materials. Magnets are objects that can attract some other metals. Some metals are magnetic. Some metals are not magnetic. Magnetic metals include iron and steel. Non-magnetic metals include aluminium. Magnets are objects that can attract some other metals. All magnets have two poles – a north pole and a south pole. The opposite poles on two magnets will attract each other. The same poles on two magnets will repel each other.
Enquiry Questions	<p>Identify, Classify & Group </p> <p>How can we sort and group animals based on their skeletons?</p>	<p>Research </p> <p>What is a balanced diet and why is it important?</p>	<p>Identify, Classify & Group </p> <p>How can we identify and sort rocks based on their properties?</p>	<p>Research </p> <p>How are fossils formed?</p>	<p>Comparative </p> <p>Which soil absorbs the most water?</p>	<p>Fair test </p> <p>How does the distance between the light source and the object affect the size of a shadow?</p>	<p>Observing over time </p> <p>How is water transported within plants?</p>	<p>Pattern Seeking Enquiry </p> <p>How does the material on the ramp affect the distance a car travels?</p>	<p>Pattern Seeking Enquiry </p> <p>Are all metals magnetic?</p>
Key vocabulary	<p>Bones: Skeleton, Skull, Ribcage, Spine, Pelvis, Femur.</p> <p>Animals: Mammal, Bird, Fish, Amphibian, Reptile</p> <p>No spine: Spine, Antennae, Insect, Exoskeleton, Skeleton</p> <p>Joints: joints, hinge joint, ball and socket joint, skeleton</p> <p>Movement: joint, muscle, bicep and tricep, contracting, relaxing,</p>	<p>Fruit and vegetables, carbohydrates, protein, dairy, fats, sugar</p> <p>Diet: balanced, nutrition, Eatwell Guide, herbivore, carnivore, omnivore, vegan diet, pescatarian diet, omnivorous diet, vegetarian diet.</p>	<p>Granite, pumice, sandstone, chalk, marble, gneiss,</p> <p>Texture, crystals, grains, layers, reaction, hardness, float, sink, brittle, weathering</p>	<p>Fossil, rock, skeleton, shell, fossilisation, sediment</p>	<p>Soil, sandy soil, clay soil, peat soil, chalky soil, organic matter, nutrients, habitat loss, deforestation, habitat, independent variable, controlled variable, dependent variable, conclusion, evaluation, data, absorb, data, filter paper, filter funnel, measuring cylinder</p>	<p>Light, eyes, light sources, natural light sources, artificial light sources, sun, sunglasses, protect, reflection, shiny, dull, opaque, translucent, transparent, shadow, independent variable, dependent variable, controlled variable, distance, conclusion, evaluation</p>	<p>leaf, stem, roots, flower, soil, dissection, independent variable, dependent variable, controlled variable, soil, seed, scales, measuring cylinder, water transportation, seedling, seed coating, germination, petals, stamen, pollen, pistil, eggs, reproductive organs, pollination, pollinators, wind dispersal, animal dispersal, water dispersal, explosion dispersal, seed dispersal</p>	<p>Force, friction, contact force, smooth, rough, independent variable, dependent variable, control variable, data, prediction.</p>	<p>Magnet, magnetic, poles, iron, magnetic force, metal, non-metal, attract, magnetic, steel, aluminium, repel</p>

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Year 4	Autumn 14 weeks		Spring 13 weeks		Summer 11 weeks		
Lessons	<p>Group and Classify Living things</p> <ol style="list-style-type: none"> Group animals Vertebrates and invertebrates Classification Key (animals) Group Plants Classification Key (plants) 	<p>States of Matter</p> <ol style="list-style-type: none"> Explore solids, liquids and gases. Think differently, - solids, liquids and gases Change states Use equipment Plan- measure temperature changes Investigate – measure temperature changes The water cycle Plan – evaporation experiment Investigate – evaporation experiment Evaluate – evaporation experiment 	<p>Sound</p> <ol style="list-style-type: none"> Vibrations The ear Investigate sounds Explore pitch Explore volume Plan – volume experiment Investigate – volume experiment Findings – volume experiment. 	<p>Electricity</p> <ol style="list-style-type: none"> Explore electricity Common appliances that use electricity Build and draw a series circuit What has gone wrong? Conductors and insulators. Conductivity within a circuit. 	<p>Habitats</p> <ol style="list-style-type: none"> Living things and their habitats. Classification keys (animals) Classification keys (plants). Human impact on habitats. 	<p>The digestive System</p> <ol style="list-style-type: none"> Teeth – carnivores, herbivores and omnivores Human teeth Layers of the teeth Plan-tooth decay experiment The digestive system – mouth and oesophagus. The digestive system – stomach and small intestine. The digestive system – large intestine and rectum. The digestive system. Findings – tooth decay experiment 	<p>Food Chains</p> <ol style="list-style-type: none"> What is a food chain? Interpret food chains Draw food chains What would happen if?
Strand	Biology	Chemistry	Physics	Physics	Biology	Biology	Biology
Curriculum Objectives <i>Working Scientifically</i>	<p>Pupils should be taught to:</p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>a) Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>d) Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Pupils should be taught to:</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases. 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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>a) Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>h) Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>c) Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>b) Setting up simple practical enquiries, comparative and fair tests</p> <p>d) Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>g) Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Recognise that vibrations from sounds travel through a medium to the ear Identify how sounds are made, associating some of them with something vibrating Find patterns between the pitch of a sound and features of the object that produced it. Recognise that sounds get fainter as the distance from the sound source increases. <p>b) Setting up simple practical enquiries, comparative and fair tests</p> <p>c) Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>e) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>g) Using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</p> <p>h) Identifying differences, similarities or changes related to simple scientific ideas and processes</p>	<p>Pupils should be taught to:</p> <p>Identify common appliances that run on electricity.</p> <ul style="list-style-type: none"> Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. <p>a) Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>e) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>g) Using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change, and that this can sometimes pose dangers to living things <p>a) Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>d) Gathering, recording, classifying, and presenting data in a variety of ways to help in answering questions</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Identify the different types of teeth in humans and their simple functions Describe the simple functions of the basic parts of the digestive system in humans. <p>a) Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>b) Setting up simple practical enquiries, comparative and fair tests</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>g) Using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Construct and interpret a variety of food chains, identifying producers, predators and prey. <p>e) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>f) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>i) Using straightforward scientific evidence to answer questions or to support their findings.</p>
Substantial Knowledge	<p>Animals: • Animals with a spine are called vertebrates. • All mammals, birds, fish, amphibians and reptiles are vertebrates. • Each animal group has different physical features.</p> <p>Vertebrates or Invertebrates: • Animals with a spine are called vertebrates. • Animals without a spine are called invertebrates. • Insects have three body sections, six legs and antennae. • Spiders have two body sections and eight legs. • Slugs and snails are soft bodied invertebrates. All mammals, birds, fish, reptiles and amphibians have a spine. • Some animals do not have spines. • Skeletons provide support, protection and allow movement. • Some animals have an exoskeleton. • An exoskeleton provides support and protection.</p>	<p>Solids, Liquids and Gases: Solids have a defined shape and volume. A solid material will keep its shape if it is transferred from one container to another. • Liquids have no fixed shape and will take on the shape of the container they are transferred into. The volume will remain the same. • Gases have no fixed shape and no fixed volume. They will spread out and fill any available space. Some solids, such as sand, salt, flour and rice, can be poured but they are still classified as solid materials. • Liquids maintain the same volume if transferred to different containers. • Some liquids, like water, flow easily while other liquids, do not flow as easily.</p> <p>Change states: Some materials can change states between solids, liquids and gases. • Water can be a solid (ice), liquid (water) or a gas (water vapour). • When heat is applied to ice, it melts and turns to water. When water</p>	<ul style="list-style-type: none"> A vibration is a quick back-and-forth movement. Sounds are made when objects vibrate. The vibrations travel from the object through the air to our ears so we can hear them. The outer ear funnels the vibrations into the ear canal. • The vibrations move down the ear canal. • The vibrations are passed to the ear drum. • The vibrations from the ear drum are passed along the ear bones and into the cochlea. • Signals are then sent to the brain, where they are processed and interpreted as sounds we understand. Sound volume is measured in decibels (dB). A decibel is a measure of the loudness of sounds. We use a decibel meter to measure this. If humans are exposed to loud sounds too often, their hearing can be damaged. 	<ul style="list-style-type: none"> Many appliances use electricity and must be plugged into a socket for the electricity to pass through the circuit. Other appliances may need batteries to power the energy around a circuit. • Some appliances use electricity to heat things up (cooker hobs) and cool things down (fridges and freezers). Electricity can be extremely harmful. Liquids and wet hands should be kept away from electrical appliances and circuits. A circuit must have a closed path so that electrical energy can pass through. 	<ul style="list-style-type: none"> Habitats usually provide everything an animal or plant needs. • There are lots of different types of habitats, including fields, woodland, urban areas and aquatic habitats. • Animals and plants live within different habitats, depending on what they need to survive. • Rural and urban habitats can both be biodiverse but are not suitable for every animal. Animals and plants can be sorted and classified in many ways. • Classification keys can be used to classify animals and plants. • Closed questions are used in classification keys. 	<ul style="list-style-type: none"> Carnivores have long, sharp teeth to help them with ripping and tearing through meat. Herbivores have large, flat teeth to grind and chew through grasses and plants. Omnivores have a combination of sharp and flat teeth, allowing them to tear through meat and grind plants. Humans have four different types of teeth – incisors, canines, premolars and molars. The incisors are used for biting into food. The canine teeth are sharp and pointed to help with ripping and tearing. The premolars are teeth between the canines and molars. They are used for guiding food towards the molars at the back of the mouth. 	<ul style="list-style-type: none"> A food chain shows an order of living things, to show how energy is transferred when one living thing eats another. The arrows in a food chain show the energy transfer from one food source to another. A food chain consists of producers, consumers, predators and prey.








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	<p>Plants: • Non-flowering plants include mosses and ferns. • Flowering plants can produce flowers and fruit. • Deciduous trees lose their leaves annually. • Evergreen trees keep their leaves all year round.</p> <p>Classification Keys: They are used to classify animals and plants accurately. • Closed questions are used in classification keys.</p>	<p>is heated it turns into a gas. Water has a boiling point of 100°C. • To change water vapour (gas) back to water (liquid) it needs to be cooled down as it returns to its liquid state. • To change water to ice, it needs to be frozen. Water freezes at 0°C.</p> <p>The water cycle: • A large amount of planet Earth is covered in water. • Water is in constant movement through a process called the water cycle. As the water moves it can be in different states of matter. • Evaporation is one stage of the water cycle. Evaporation is where a liquid changes state to a gas. • Condensation is when a gas changes state to a liquid.</p>	<ul style="list-style-type: none"> • The louder the sound, the bigger the vibration. • The quieter the sound, the smaller the vibration. • Pitch means how high or low a sound is. • High-pitched sounds produce faster or more frequent vibrations. • Low-pitched sounds produce slower or less frequent vibrations. 	<ul style="list-style-type: none"> • Circuits can include bulbs, wires, switches, buzzers and cells connected in one loop. • If a circuit does not have a source of energy, such as a cell or battery, then electricity cannot flow around it. • A conductor is a material which allows energy to flow through it. • Metals are good conductors. • An insulator does not allow energy to flow through it. • Materials which are insulators are rubber, plastic and wood. • Some materials can be used to connect a gap in a circuit, others cannot. 	<ul style="list-style-type: none"> • Humans can have both positive and negative effects on the natural environment. • Rewilding increases biodiversity by providing a greater range of habitats by returning a damaged habitat to how it used to be. • Nature reserves offer a protected space for plants and animals to live and grow. • Natural resources can be limited and over-using them can damage the environment. 	<ul style="list-style-type: none"> • The molars are the large teeth at the back of the jaw. They are used for grinding and chewing food. • Human teeth have layers which include enamel, pulp and roots. • Enamel protects the sensitive parts of the tooth underneath. • The human mouth is full of different germs which feed on sugar in the mouth and can cause plaque to build up. • If plaque is not removed from the teeth, it can cause the enamel layer to rot away, exposing the sensitive layers underneath. • We can look after our teeth by brushing them twice a day, reducing our sugar intake and visiting the dentist regularly. • The digestive system allows the body to take in nutrients from food as it passes through the body. • Digestion is the breaking down of larger pieces of food into smaller pieces so the body can use it for energy. The digestion process begins when food is bitten by the teeth. • Saliva turns smaller pieces of food into a more liquid substance so it travels smoothly down the oesophagus to the stomach. • The stomach churns the food, and adds acid to break it down further before the partially digested food passes to the small intestine. • The small intestine absorbs nutrients from the food and passes the remaining food to the large intestine. • The large intestine absorbs water from the remaining food, and then passes the remaining waste to the rectum. 	<ul style="list-style-type: none"> • Food chains can be different lengths depending on the living things within a habitat. • Producers are living things such as plants that make their own food. • Consumers eat plants and/or animals. • If food chains are affected by human activity, it can cause many issues for living things within a habitat. • Humans may have a negative impact on food chains and habitats through farming, destroying habitats, hunting, and over-fishing. This could even lead to the extinction of some living things.
Enquiry Questions	<p>Identify, Classify & Group </p> <p>How can we group and classify living things?</p>	<p>Fair Tests </p> <p>How does the temperature of the water affect the time it takes for ice to melt?</p>	<p>Fair Tests </p> <p>How does the distance from the sound source affect the volume of the sound?</p>	<p>Pattern Seeking Enquiry </p> <p>What materials are conductors or insulators of electricity and is there a pattern?</p>	<p>Research </p> <p>What impacts do humans have on different habitats?</p>	<p>Observing over time </p> <p>What will happen to the egg over time (enamel) in different liquids?</p>	<p>Research </p> <p>How has human activity affected food chains?</p>
Key vocabulary	<p>Animals: Vertebrate, Mammal, Bird, Fish, Amphibian, Reptile</p> <p>Vertebrates and Invertebrates: Vertebrate, Invertebrate, Exoskeleton, Insect, Spider, Soft-Bodied invertebrate</p> <p>Plants: Flowering plants, non-flowering plants, stamen, carpel, pollination, fern, moss</p>	<p>States of matter, solid, liquid, gas, volume, flow, freezing, melting, condensation, evaporation, thermometer, temperature,</p> <p>The water cycle, precipitation, atmosphere, global warming, water vapour</p> <p>Dependent variable, independent variable, controlled variable, observation, data, conclusion</p>	<p>Vibration, ear, sound, volume, pitch, outer ear, ear bones, cochlea, ear canal, ear drum, decibel (dB), decibel meter, insulate, high-pitched, low-pitched, sound,</p>	<p>Appliances, plug, socket, cell, electrocuted, circuit, switch, cell, battery, buzzer, battery, conductor, insulator, metal, material</p>	<p>Habitat, rural habitat, urban habitat, biodiversity, classification key, vertebrate, invertebrate, flowering plant, non-flowering plant, biodiversity, natural resources, deforestation, rewilding, nature reserve</p>	<p>Teeth, carnivore, herbivore, omnivore, incisors, canines, premolars, molars, germs, enamel, root, plaque, decay, digestive system, mouth, oesophagus, stomach, rectum, intestines, saliva</p>	<p>Food chain, producer, predator, prey, consumer, habitat, farming, over-fishing, hunting,</p>

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Upper KS2 Working Scientifically	<ul style="list-style-type: none"> a. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary b. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate c. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs d. using test results to make predictions to set up further comparative and fair tests e. reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations f. identifying scientific evidence that has been used to support or refute ideas or arguments. 						
Year 5	Autumn 14 weeks		Spring 13 weeks			Summer 11 weeks	
Lessons	Forces 1.Friction 2.Air resistance 3.Plan-parachute experiment 4.Investigate – parachute experiment 5.Evaluate – parachute experiment 6.Plan – water resistance 7. Investigate – water resistance 8.Explore gravity 9. Use small forces for greater effects.	Space 1.The solar system 2.The planets 3.Modelling 4.Motion of the Earth and planets 5.The solar system-ideas over time 6.Planet Earth 7.Night and day 8.The Moon	Properties of materials 1.Test materials – magnetic, transparency and hardness. 2.Test materials – electrical conductivity 3.Plan – insulating heating experiment 4.Test – insulating heat experiment 5.Evaluate – insulating heat experiment 6.Uses of everyday materials – plastic, wood and metal	Animals including Humans 1.The human life cycle 2.Babies and children 3.Adolescence and puberty 4.Adults and the elderly 5.Gestation periods of mammals 6.Gestation periods and lifespan.	Life cycles 1.Lifecycles of mammals 2.Life cycles of amphibians (frogs) 3. Life cycle of insects 4. Life cycle of birds 5. Comparing life cycles	Reproduction 1.Sexual reproduction in animals 2.Reproductive parts in plants 3.Pollination 4.Asexual reproduction 5. Plan -cloning plants 6.Plant -cloning plants	Reversible and Irreversible changes 1.Dissolving 2.Separate materials – filtering and sieving 3.Solutions and evaporating 4.Reversible changes 5.Irreversible changes – burning 6.Irreversible changes – acid
Strand	Physics	Physics	Chemistry	Biology	Biology	Biology	Chemistry
Curriculum Objectives Working Scientifically	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Identify the effects of air resistance, water resistance and friction that act between moving surfaces. • Explain that unsupported objects fall towards the Earth because of gravity acting between the Earth and the falling object. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. <p>a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results.</p> <p>b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>f) Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Describe the Sun, Earth and Moon as approximately spherical bodies. • Describe the movement of the Earth and other planets relative to the Sun in the Solar System. • Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky. • Describe the movement of the Moon relative to the Earth. <p>e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>f) Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. <p>a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>d) Using test results to make predictions to set up further comparative and fair tests</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Describe the changes as humans develop to old age. <p>a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results.</p> <p>f) Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals. <p>a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results.</p> <p>f) Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • 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 <p>b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>d) Using test results to make predictions to set up further comparative and fair tests</p> <p>f) Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>
Substantial Knowledge	<p>Friction: • Friction can stop or slow down a moving object. • A stationary object will only move when the force applied is greater than the friction, which acts in the opposite direction to the movement. • Friction produces heat, which we feel when we rub our hands together. • Friction can cause some materials to wear away, such as pencils. • Friction has many useful applications, such as in vehicle brakes, using sandpaper and walking on firm ground.</p> <p>Air Resistance: • Air resistance is a friction force between the air and a moving object. • Air resistance is greater when the surface area of the</p>	<p>Solar system: • The Sun, Earth, Moon and other planets are approximately spherical bodies. • The Solar System is a collection of planets, moons and the Sun. • The Sun is a star which releases heat and light. • The Sun is at the centre of the Solar System.</p> <p>The planets: • There are eight planets that orbit the Sun. • Mercury, Venus, Earth and Mars all have solid surfaces. • Jupiter, Saturn, Uranus and Neptune have gas surfaces. • Pluto is considered a dwarf planet.</p> <p>Modelling: • Scientific models are physical representations of ideas or processes. • Models can be created in different ways to represent the Solar System and planets.</p>	<ul style="list-style-type: none"> • Materials can be transparent, translucent or opaque. • A harder material will scratch a softer material. • Most metals are non-magnetic. Only a few metals are magnetic, such as iron and steel. • An electrical conductor is a material that allows electricity to flow through it. • An electrical insulator is a material that does not allow electricity to flow through it. 	<ul style="list-style-type: none"> • The human life cycle has six main stages – foetus, baby, child, adolescent, adult and elderly adult. • All humans start their life as a foetus inside their mother’s womb and go through the same life stages in the same order. • Babies are dependent on adults for food, warmth and comfort. • Most babies and toddlers hit certain milestones in their first two years of life, such as crawling and walking. • Throughout childhood, children grow and develop at a rapid rate in terms of 	<ul style="list-style-type: none"> • The life cycle of a mammal has four main stages: foetus, young, adolescent and adult. • Most mammals give birth to live young and have mammary glands that produce milk to feed their young. • When mammals become adults, they are able to reproduce. • Amphibians are small vertebrates that need water or a moist environment to survive. • The life cycle of a frog has four main stages: frogspawn, tadpole, froglet 	<ul style="list-style-type: none"> • Sexual reproduction involves two parents producing offspring. • Offspring produced by sexual reproduction are not identical to the parents. • Fertilisation is the process by which a sperm cell joins with an egg cell to create a new life. • The female part of a flowering plant is called the pistil, which consists of the stigma, style and ovary. • The female sex cells in a plant are called ovules and are found in the ovary. • The male part of a flowering plant is called the stamen, which consists of the anther and filament. 	<ul style="list-style-type: none"> • A soluble substance can dissolve in a liquid. • Salt and sugar are soluble in a liquid. • An insoluble substance cannot dissolve in a liquid. • Sand and flour are insoluble in a liquid. • To make a solution, a substance is dissolved into a liquid. • Increasing the temperature of the liquid increases the rate of dissolving. • Stirring the liquid increases the rate of dissolving. • Sieving can be used to separate a mixture of different-sized solids. • Filtering can be used to separate an








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	<p>moving object is large. • Parachutes have a large surface area, so they have a greater air resistance and slow the skydiver down. • Air resistance increases with speed.</p> <p>Gravity: • Gravity is a non-contact force. • Gravity is an invisible force that pulls things to the centre of the Earth (or other planets). • Heavier objects do not fall to the ground quicker than lighter objects.</p> <p>Using Forces: • Levers, pulleys and gears are all mechanisms that will allow a smaller force to have a greater effect. • Gears are wheels with teeth that allow a small force to produce a larger force with greater speed. • A lever is a machine that allows movement of heavy objects. • Pulleys use a rope or cable through a wheel to allow lifting of heavy objects.</p>	<p>Motions: • The Sun is the largest object in the Solar System and has the greatest gravitational pull. This keeps all the planets in orbit around the Sun. • The Earth takes 365 days, or one year, to complete one full orbit. • Other planets take different amounts of time to complete a full orbit around the Sun. This is relative to their distance from the Sun.</p> <p>Ideas over time: • Different scientists and mathematicians have contributed to our understanding of the Solar System over time. • It was initially thought that the Earth was at the centre of the Solar System. • Through scientific advances, we now know that the Sun is at the centre of the Solar System.</p> <p>Earth: • The Earth's axis is an imaginary line (that is slightly tilted) that runs from the North to the South Pole. • The Earth rotates once around its axis in a 24-hour period. • Earth is the only known planet to support plant and animal life. • The four seasons occur on planet Earth because the Earth's axis is tilted.</p> <p>Night and Day: • The Earth spins on its axis. • It takes 24 hours for it to spin on its axis and complete one full rotation. This is why one day is 24 hours long. • When part of the Earth faces the Sun, it is day. • When part of the Earth faces away from the Sun, it is night.</p> <p>The Moon: • The Earth has one Moon, and it takes approximately 27 days for the Moon to orbit the Earth. • Without the Earth's gravitational pull, the Moon would float into space. • The Moon is not a light source, it reflects light from the Sun onto Earth.</p>	<ul style="list-style-type: none"> • Metals are good electrical and heat conductors. • Plastic, wood and paper are electrical insulators. • Materials have specific uses. 	<p>their mass, height and brain development.</p> <ul style="list-style-type: none"> • Puberty is the process that prepares humans for reproduction. • Hormones are chemicals that are released by your body during puberty which cause physical and emotional changes. • Key changes that happen to females during puberty include the start of periods, growth of underarm and pubic hair, mood swings, spots and growth of breasts. • Key changes that happen to males during puberty include growth of body hair, growth of the penis and testicles, spots, mood swings and deepening of the voice. • A person is classed as an adult from age 18 onwards. • A person is classed as an elderly adult from approximately 65 • When a person enters adulthood, their rate of growth slows down and their body is fully developed. • The human body gradually changes with age. For example, skin loses elasticity, resulting in wrinkles, bones may become weaker and height may decrease. • Humans are mammals because they are warm-blooded, give birth to live young and feed their offspring on milk. • Gestation is the period of time that a foetus develops in its mother's womb. • The gestation period of a human is approximately nine months. • The lifespan of an animal is how long the animal is alive. • Usually, the longer the gestation period of an animal, the longer the lifespan. • Humans have a relatively short gestation period compared to their lifespan. 	<p>and adult frog. • Tadpoles have gills to help them to breathe under water, a tail to help them to swim and a mouth to feed. • Tadpoles take around 14 weeks to transform into frogs. • An adult frog has no tail and is fully equipped to live both on land and in water.</p> <ul style="list-style-type: none"> • Insects are small animals that have three body sections, six legs and antennae, and usually lay eggs. • There are four main stages of the life cycle of an insect: egg, larva, pupa and adult. • Larvae are the young form of insects. • Pupae are insects in the stage of development between larvae and adults. • Birds are vertebrates with wings, feathers and a beak. • The life cycle of birds includes five stages: egg, hatchling, nestling, fledgling and adult bird. • Birds reproduce by laying eggs. • Eggs are incubated by parents until they hatch. • An adult bird is able to reproduce and will have all its feathers. 	<ul style="list-style-type: none"> • The male sex cells in a plant are called pollen grains and are found on the anthers. • Plants reproduce sexually through pollination. • Pollination involves the transfer of pollen from the male anther of a flowering plant to the female stigma of a flowering plant. • Pollen grains attach to the sticky stigma and travel down the style into the ovary. • Asexual reproduction involves only one parent. Offspring produced by asexual reproduction are identical to the parent. • Some plants reproduce asexually by producing new plants at the end of runners or by producing bulbs or tubers. • A starfish is an example of an animal that reproduces asexually. 	<p>insoluble solid from a liquid. • Filtering cannot be used to separate a soluble solid from a liquid.</p> <ul style="list-style-type: none"> • A liquid will pass through filter paper, but an insoluble solid will not. • Evaporation is the change of state from a liquid to a gas which happens slowly from the surface of a liquid. It can be used to separate a soluble solid from a liquid. • The three states of matter are solids, liquids and gases. • Some changes can be reversed, such as dissolving, mixing and changes of state. • Changes of state include freezing, melting, evaporation and condensation. • If you can retrieve the substances that you started with, then the change is reversible. • An irreversible change is when a change cannot be undone to get the same substances back again. • Irreversible changes result in new substances being made. • When a new substance is made, a chemical reaction has taken place. • Burning is an example of an irreversible change. • When a substance fizzes, a gas has been made.
Enquiry Questions	<p>Pattern Seeking Enquiry </p> <p>Does the surface area of a parachute affect how long it takes for it to fall to the ground?</p> <p>Does the shape of an object affect the time it takes to sink?</p>	<p>Research </p> <p>How have our ideas about the Solar System changed over time?</p>	<p>Comparative Tests </p> <p>Which material is the best insulator of heat?</p>	<p>Pattern Seeking Enquiry </p> <p>Are there patterns linking gestation periods and lifespans?</p>	<p>Research </p> <p>How are the life cycles of animals similar and how are they different?</p>	<p>Observing over time </p> <p>Which plant cutting produces the tallest plant?</p>	<p>Identify, Classify & Group </p> <p>Which changes are reversible, and which are irreversible?</p>
Key vocabulary	<p><u>Friction:</u> Force, Contact Force, Friction, Motion</p> <p><u>Air resistance:</u> Air resistance, Drag, Parachute, Force,</p> <p><u>Experiments:</u> Independent variable, dependent variable, controlled variables, air resistance, streamline, repeatability, precision, surface area, anomalous result, water resistance</p> <p><u>Gravity:</u> Gravity, weight, contact force, non-contact force</p> <p><u>Using Forces:</u> Lever, Gear, Pulley, Machine,</p>	<p><u>The solar system:</u> The solar system, Planets, Spherical, Stars, Sun,</p> <p><u>Planets:</u> Planets, Orbit, Surface, Appearance</p> <p><u>Modelling:</u> Sun, Planets, Model, Orbit</p> <p><u>Motions:</u> Gravity, Gravitational Pull, Orbit, Heliocentric</p> <p><u>Ideas over time:</u> Geocentric, Heliocentric, Spherical, Planets</p> <p><u>Earth:</u> Axis, Rotation, North pole, South pole, Orbit</p> <p><u>Night and Day:</u> Axis, Rotation, night, day,</p> <p><u>The moon:</u> Satellite, Moon, Gravity, Gravitational Pull, Orbit</p>	<p>Transparent, translucent, opaque, magnetism, hardness, electrical conductor, electrical insulator, circuit, cell, independent variable, dependent variable, controlled variable, thermal insulator, thermometer, control beaker, temperature, data, conclusion, anomalous result, properties, wood, metal, plastic, lifespan</p>	<p>Adolescent, baby, foetus, elderly adult, adult, life cycle, milestone, baby, toddler, child, womb, period, reproduce, puberty, hormone, life expectancy, gestation, mammal, offspring, lifespan, correlation, anomaly</p>	<p>Monotreme, offspring, mammary gland, mammal, life cycle, amphibian, frogspawn, tadpole, froglet, metamorphosis, larva, pupa, chrysalis, insect, egg, hatchling, nestling, fledgling, adult bird,</p>	<p>Fertilisation, embryo, sperm cells, egg cells, sexual reproduction, anther, filament, stigma, style, ovule, ovary, pollen, stamen, pistil, pollination, clone, runner, tuber, bulb, asexual reproduction, independent variable, dependent variable, controlled variable, cutting, parent plant, compost, asexual reproduction</p>	<p>Dissolve, soluble, insoluble, solution, substance, sieve, filter paper, mixture, insoluble, filtering, funnel, evaporation, states of matter, dissolve, reversible change, reverse, chemical reaction, burning, heating, irreversible change, vinegar, bicarbonate of soda</p>

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Upper KS2 Working Scientifically	a. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary b. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate c. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs d. using test results to make predictions to set up further comparative and fair tests e. reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations f. identifying scientific evidence that has been used to support or refute ideas or arguments.						
Year 6	Autumn 14 weeks		Spring 13 weeks			Summer 11 weeks	
Lessons	Living things and their habitats 1. Conditions for life 2. Group organism 3. Classify animals 4. Classify plants 5. Microorganisms 6. Classify microorganisms	Electricity 1. Construct and draw series circuits using symbols. 2. Complete and incomplete circuits. 3. Variations within circuits 4. Plan – voltage experiments 5. Investigate – voltage experiments 6. Evaluate – voltage experiments	Light 1. How we see 2. Light and straight lines 3. Shadow formation 4. Plan – shadow experiment 5. Investigate – shadow experiment 7. Refraction 8. Explore light	The circulatory system 1. The circulatory system 2. The heart 6. Dissection of the heart 3. Blood flow in the heart 4. Oxygenated and deoxygenated blood 5. Blood	Diet Drugs and lifestyle 1. Diet 2. Drugs 3. Cigarettes 4. Plan – heart rate experiment 5. Investigate – heart rate experiment 6. Evaluate – heart rate experiment.	Variation 1. Variation 2. Characteristics. Adaptation: 1. Animal adaptations 2. Plant adaptations 3. Evolution 5. Natural Selection 4. Charles Darwin 6. Darwin’s finches 7. How have plants and animals evolved over time to adapt to their environment?	Fossils 1. Fossil formation 2. Comparable fossils 3. Explore fossils (Mary Anning)
Strand	Biology	Physics	Physics	Biology	Biology	Biology	Biology
Curriculum Objectives Working Scientifically	Pupils should be taught to: <ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. f) Identifying scientific evidence that has been used to support or refute ideas or arguments. e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results. 	Pupils should be taught to: <ul style="list-style-type: none"> Use recognised symbols when representing a simple circuit in a diagram 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. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. d) Using test results to make predictions to set up further comparative and fair tests. 	Pupils should be taught to: <ul style="list-style-type: none"> 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. 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. Recognise that light appears to travel in straight lines. a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. f) Identifying scientific evidence that has been used to support or refute ideas or arguments. 	Pupils should be taught to: <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Describe the ways in which nutrients and water are transported within animals, including humans. e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. 	Pupils should be taught to: <ul style="list-style-type: none"> Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. a) Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. b) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. d) Using test results to make predictions to set up further comparative and fair tests. f) Identifying scientific evidence that has been used to support or refute ideas or arguments. 	Pupils should be taught to: Variation Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents <ul style="list-style-type: none"> Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Adaptation: <ul style="list-style-type: none"> Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. c) Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. f) Identifying scientific evidence that has been used to support or refute ideas or arguments. 	Pupils should be taught to: <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. e) Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.
Substantial Knowledge	Conditions for life: • A living organism moves, reproduces, grows and excretes. • The stem of a plant moves towards the strongest light source and the roots move away from light. • Plants can reproduce sexually and asexually. Grouping: • Vertebrates can be grouped as mammals, birds, fish, amphibians and reptiles. • Plants can be grouped as flowering and non-flowering. Flowering plants produce flowers and fruits. Non-flowering plants do not. • Scientists group organisms to organise animals and plants based on their features. • Grouping organisms can help us understand how organisms are related to each other.	Circuits: • A series circuit is where all the components are in one continuous loop. • Components in a series circuit include the battery, buzzers, wires, bulbs and switches. • Each component in a circuit has a symbol. • Current is the flow of electricity in a circuit. • Voltage is a measure of how strong the current is in a circuit. Voltage is provided by the cell/battery. Complete and incomplete circuits: • For a circuit to be complete, all the components, including a battery, are connected by wires and the switch is closed. • An incomplete circuit may have a break in the wires, a switch may be open or the battery is the wrong way in the holder. • The current does not flow at all in an incomplete circuit.	<ul style="list-style-type: none"> Luminous objects emit light and non-luminous objects do not emit light. Humans can see objects because a light source produces light. Light travels in straight lines. Light travels from a light source to an object. Light reflects from an object to the eye. • Light passes through the pupil to the retina. A reflection is where light rays bounce off an object. When light rays from a light source travel to an opaque object, they cannot pass through and a shadow is formed. The blocked light rays create an area of darkness behind the object, which is the shadow. • They are always dark because they are areas from which light has been blocked. 	<ul style="list-style-type: none"> The circulatory system moves blood around the body. • It is made up of the heart, blood vessels and blood. • The blood vessels that move blood towards the heart are called veins. • The blood vessels that move blood away from the heart are called arteries. • Capillaries are small blood vessels that link veins and arteries together. Blood transports nutrients and oxygen to all parts of the body, and takes waste, such as carbon dioxide, away. Nutrients are carried in the plasma to provide the nourishment cells need to repair themselves and grow. 	<ul style="list-style-type: none"> A balanced diet is made up of the right amounts of carbohydrates, fats, proteins, vitamins, minerals, fibre and water. Fats can be classified as unsaturated, saturated or trans fats. Unsaturated fats provide the body with energy and allow humans to absorb some vitamins. Saturated and trans fats can cause weight gain and heart disease. A drug is a chemical that can change the way your body or brain functions. Painkillers help the body to dull pain. 	<ul style="list-style-type: none"> An organism is a living thing such as an animal, plant, bacterium or fungus. • A species is a group of similar organisms where two parents can create offspring. Variation is the differences between organisms. • All species show variation. Characteristics are the features of an organism, used to identify individuals or a group. Parents pass on characteristics to their offspring such as hair and eye colour. This process is called inheritance. • Humans can breed animals such as dogs for desirable characteristics. Adaptations are characteristics which improve an animal’s chances of survival in a habitat. 	<ul style="list-style-type: none"> Fossils are formed when an animal or plant dies. When an animal dies the soft parts decompose and leave the skeleton. The skeleton is buried by sediment which compacts over time. • Water seeps down into the rock and replaces the skeleton with minerals found in the water. • This produces an imprint in a rock of a living thing. • Older fossils tend to be smaller and simpler compared to newer fossils. • Newer fossils tend to be larger and more complex.

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	<p>Animals: • Classification keys are used to classify animals. • Classification keys can be used to identify different unknown animals based on their features, such as number of legs, having fur or scales. • A classification key is made up of several questions with yes or no answers. • These questions can then lead to further questions and answers until the identity of the animal is determined.</p> <p>Plants: • Classification keys can be used to classify plants. • They can be used to identify different unknown plants based on their features. • Plants can be classified in several ways. • Trees can be classified as deciduous, evergreen and coniferous.</p> <p>Microorganisms: A microorganism is tiny and can be seen using a powerful microscope. • Bacteria are simple, invisible (to the eye) microorganisms. Some bacteria can cause diseases and infections. Humans have good bacteria in their bodies which help to digest food. • Viruses are invisible (to the eye) microorganisms and need a host. They can cause diseases such as flu or a common cold. • Some fungi are microorganisms which may cause infections. Some can be involved in bread making. • Microorganisms such as bacteria, viruses and fungi can be classified. • The classification of microorganisms is based on their features or characteristics such as shape. • Bacteria, viruses and fungi have different shapes.</p> <p>Carl Linnaeus: • Carl Linnaeus was a Swedish botanist who wrote a book called Systema Naturae or System of Nature. • Linnaeus was famous for developing the first system to classify animals. The classification was based on physical characteristics. • Carl Linnaeus divided animals into six classes. These were mammals, birds, amphibians, fish, insects and worms.</p>	<p>Variations: • The more components there are in a circuit, the dimmer the bulbs and the quieter the buzzers. • The more components there are in a circuit, the more difficult it is for current to flow.</p>	<ul style="list-style-type: none"> • The shape of a shadow is determined by the shape of the object that blocks the light. • Light travels in straight lines. • When light passes from one medium to another, it can change direction. This is called refraction. • Refraction happens because light travels at different speeds in different substances. • A pencil looks bent when it is put into water because light travels at a different speed in water than it does in the air. • Isaac Newton and Ibn al-Haytham discovered that white light is made up of different colours. • A rainbow is a spectrum of light formed when sunlight passes through, and is refracted by, raindrops. 	<ul style="list-style-type: none"> • Oxygen is carried in red blood cells from the lungs to all cells in our body. • White blood cells help to fight bacteria and viruses in our body to prevent illness. • The heart is a muscle which beats regularly. As it beats, blood flows through it and it pumps blood around the body. • The heart is split into four chambers. It has two atria and two ventricles. • Veins carry blood towards the heart. They have valves to stop the blood flowing in the wrong direction. • Blood then flows through the right atrium, then out of the right ventricle to the lungs. • Blood from the lungs then flows into the left atrium and out of the left ventricle towards the rest of the body. • Oxygenated blood is blood that carries lots of oxygen. • Deoxygenated blood is blood that has little oxygen in it. • Oxygenated blood mostly travels from the heart through the arteries. • Deoxygenated blood mostly travels from the parts of the body back to the heart, through veins. • The left ventricle is thicker than the right ventricle because moving blood around the whole body requires more force than moving blood to the lungs. 	<ul style="list-style-type: none"> • Stimulants make a person feel more alert and awake. • Depressants make the body feel calm and drowsy. • Some drugs are legal and some are illegal. • Cigarettes contain tar, nicotine and other harmful substances. • Tar is a sticky, brown substance which can cause cancer. • Nicotine is highly addictive. • Carbon monoxide is a poisonous gas that stops the blood carrying as much oxygen. • Smoking can damage the body and cause breathing problems. <p>It also increases the risks of heart and lung disease.</p>	<ul style="list-style-type: none"> • Animals in cold environments have characteristics which allow them to survive. For example, they may have thick fur or blubber. • Animals in desert environments have characteristics which allow them to survive in extreme heat. Some of these include thin fur and long eyelashes. • Plants in desert environments have longer roots and larger stems, so they can absorb and store more water. This allows them to survive in hot, dry environments such as deserts, where there is not much water available. • Evolution is a change in characteristics in animals and plants over a long period of time. • Evolution allows animals and plants to better adapt to their environments or habitats so that they can survive. It explains how animals and plants have developed over time from simpler life forms that lived millions of years ago. • Charles Darwin suggested the 'Theory of Evolution'. • Darwin suggested that different species of animals had evolved from a shared ancestor. • Darwin also suggested that organisms change their characteristics over a long period of time, so that they can successfully adapt to their environment or habitat. • Organisms which are better adapted to their habitat are more likely to survive and reproduce and therefore pass these characteristics to the next generation. This theory is called "natural selection". 	<ul style="list-style-type: none"> • This supports Charles Darwin's theory of evolution that simple organisms evolved into more complex ones. • Mary Anning was a famous palaeontologist who discovered many fossils during the 1800s. • She made many discoveries such as finding plesiosaur, ichthyosaur and pterosaur fossils. • Mary Anning's discoveries made her famous but, because she was a woman, her findings were often presented as male scientists' work.
Enquiry Questions	<p>Identify, Classify & Group </p> <p>How can we identify, group and classify animals, plants and microorganisms?</p>	<p>Fair Tests </p> <p>How does the voltage in a circuit affect the brightness of a bulb and the loudness of a buzzer?</p>	<p>Comparative Tests </p> <p>How does the distance from a light source affect the size of the shadow?</p>	<p>Research </p> <p>What is the circulatory system and how does it work?</p>	<p>Fair Tests </p> <p>How does the duration of exercise affect heart rate?</p>	<p>Pattern Seeking Enquiry </p> <p>Is the type of food a bird eats related to the shape of its beak?</p>	<p>Research </p> <p>How have fossils changed over time and does this provide evidence for evolution?</p>
Key vocabulary	<p><u>Grouping and Classification:</u> organism, vertebrate, invertebrate, flowering plant, non-flowering plant, Classification, classification key, microorganisms.</p> <p><u>Animals:</u> Molluscs, arachnids</p> <p><u>Plants:</u> Flowering plants, non-flowering plants, deciduous trees, evergreen trees, coniferous trees,</p> <p><u>Microorganisms:</u> Organism, Microorganism, Bacteria, Viruses, Fungi</p> <p><u>Carl Linnaeus:</u> Classification, Characteristics, vertebrate, invertebrate</p>	<p><u>Circuits:</u> Series circuit, battery, bulb, current, voltage, buzzer, complete circuit, Incomplete circuit, switch,</p> <p><u>Voltage Experiment:</u> Independent variable, dependent variable, controlled variables, voltage, current, repeatability, accuracy, evaluation,</p>	<p>Light source, retina, iris, pupil, lens, light source, reflection, ray diagram, angle, periscope, shadow, opaque, translucent, transparent, solar eclipse, independent variable, dependent variable, controlled variable, conclusions, evaluate, refraction, medium, rainbow, prism, coloured filter, spectrum of light</p>	<p>Circulatory system, heart, blood vessels, veins, arteries, capillaries, red blood cells, white blood cells, lungs, nutrients, plasma, oxygen, atria, ventricles, left atrium, left ventricle, right atrium, right ventricle, oxygenated blood, deoxygenated blood, dissection</p>	<p>Balanced diet, calories, unsaturated fats, saturated fats, trans fats, drug, painkillers, stimulants, depressants, cigarette, vape, tar, nicotine, carbon monoxide, addiction, independent variable, dependent variable, controlled variable, circulatory system, heart, heart rate, duration, exercise</p>	<p>Organism, variation, species, offspring, characteristics, inheritance, desirable characteristics,</p>	