

Our Mission: To drive personal and academic excellence; everyone, every day.

The Meadows Primary Academy



Science

Core Values: Resilience, Respect, Team Work, Aspiration, Kindness, Curiosity
Golden Threads of our Curriculum: R-A-I-S-E

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The Meadows Primary Academy - UTW- The Natural World

Playing & Exploring - Engagement		Active Learning - Motivation		Creating & Thinking Critically - Thinking								
Finding out & exploring Playing with what they know Being willing to 'have a go'		Being involved & concentrating Keep on trying Enjoying achieving what they set out to do		Having their own ideas (creative thinking) Making links (building theories) Working with ideas (critical thinking)								
Understanding the World- The Natural World ELG												
Explore the natural world around them, making observations and drawing pictures of animals and plants 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												
Focus	Seasonal changes	Everyday materials	Plants	Animals including Humans	Vocabulary- To be used daily.							
Nursery Skills	- Explore different habitats outdoors and talk about observations e.g., scent, colour & shape of flowers attracting bees - Observe growth & decay over time. Know trees that shed leaves and evergreens Begin to understand the need to respect & care for the natural environment & all living thingsForest School and outdoor learning Talk about what they see, using a wide vocabulary	- explore materials with different properties i.e., sand and water and play dough. \explore natural materials, indoors and outdoors. - Explore collections of materials with similar and/ or different properties. Talk about the differences between materials and changes that they notice.	- Observe plants closely through a variety of means e.g., magnifiers & photographs Planting beans (Broad and runner) and fruit (tomatoes and strawberries) - Begin to understand the need to respect & care for the natural environment & all living things - Extend vocabulary: leaves, petals, roots, bulb, trunk, branches, stem, garden plants, wild plants, seeds - Use all the senses in hands-on exploration of plants - Understand the key features of the life cycle of a plant	- Observe animals closely through a variety of means e.g., magnifiers & photographs - Look at key stages of development from birth to adult. Farm animals/farm visit. Wild Animals/animalsfox, hedgehog, rabbit, bats, badger - RSPB Big School Bird watch – recognise common garden birds - Observe & describe in words or actions the effects of physical activity on body - Understand the key features of the life cycle of a butterfly - Understand the key features of the life cycle of an animal. Observing metamorphosis	Senses, experiment, plants – leaf, stem, root, flower, animals, humans, materials, change, growth, environment, heavy, light, float, sink, baby, toddler, child, egg, caterpillar, chrysalis, seasons, melt, freeze, hard, soft, foal, calf, lamb, chick, duckling, etc							
Nursery Knowledge	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1		Summer 2	
	Ourselves – All About Me		Families & Celebrations		Traditional Tales		What a Wonderful World – Growing and Changing		What's the story		People Who Help Us	
	- Name & identify body parts- facials features, arms, legs, fingers and toes - Know the names of different body parts & what they do - Using images sequence the change from baby to child - Use some senses in hands-on exploration of natural materials		- Know the names of animal babies (farm) - Know that most plants start growing from a seed or bulb - Know all plants need water & light to grow & survive - Know how to care for plants - Know the names of the basic parts of a plant & tree - Know some correct terms to describe the life-cycle of a butterfly - Use a magnifying glass		- Know the names of some baby wild animals - Know & talk about the life-cycle of a plant - Know the effects of exercise on the body e.g., heart beats faster, get hotter - Know the different properties of material e.g., wood, plastic, metal - Know why some objects float & sink							

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	Know about the different seasons & the effect they have on plants, trees & creatures	Bird identification as part of annual RSPB School Bird watch	
Children to be exposed to key vocabulary daily in provision. High quality text to be chosen for story times that allow for questioning opportunities relating to key events. The outdoor classroom will be used as a key feature in our science learning through the natural world. Trips to the farm and the zoo will be used to enhance children experiences of animals and class experiences of hatching our own chicks and caring for our own caterpillars/butterflies.			
Experiences	SMSC	British Values	The Meadows Values
Trip to farm Chick Class caterpillars/butterflies	Spiritual- by asking questions about the world around them Moral – children are taught how to look after their environment during outdoor learning.	Respect is taught through the need to care for the natural environment Individual liberty is taught through actively encouraging the choices the make when exploring their environment	Team Work is taught when the children are working as part of a team during experiments. Respect and Kindness listening to others viewpoints. Respect– the environment around you

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The Meadows Primary Academy - UTW- The Natural World

Active Learning - Motivation		Active Learning - Motivation		Creating & Thinking Critically - Thinking		
Being involved & concentrating Keep on trying Enjoying achieving what they set out to do		Being involved & concentrating Keep on trying Enjoying achieving what they set out to do		Having their own ideas (creative thinking) Making links (building theories) Working with ideas (critical thinking)		
Understanding the World- The Natural World ELG Explore the natural world around them, making observations and drawing pictures of animals and plants 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						
Focus	Seasonal changes	Everyday materials	Plants	Animals including Humans		Vocabulary- To be used daily.
Reception Skills	- Describe what they see, hear & feel whilst outside - Observational drawings of the natural world - Discuss how to care for the living things & their habitats - Examine change over time - Express opinions on natural & built environments & opportunities to hear different points of view on the quality of the environment. Use words such as busy, quiet, pollution - Understand the effect of changing seasons on the natural world around them	- Explore collections of materials with similar and/ or different properties. - Talk about the differences between materials and changes that they notice - Characteristics of liquids & solids e.g., cooking eggs, melting chocolate Observe & interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object & a boat floating on water	- Extend vocabulary: blossom, buds, bulb, evergreen, deciduous - Describe what they see, hear & feel whilst outside - Name & describe some plants - Draw pictures of plants	- Shows some understanding that good practices with regard to exercise, eating, drinking water, sleeping & hygiene can contribute to good health - Describe what they see, hear & feel - Identify different parts of their body & animals Be able to show care and concern for living things - Know the effects exercise has on their bodies - Have some understanding of growth and change - Talk about things they have observed including animals Observational drawings of animals		Test, fair, why, senses, world, plants – leaf, stem, root, flower, animals, humans, materials - waterproof, natural, change, growth, decay, environment, heavy, light, float, sink, stretch, snap, magnetic, baby, toddler, child, teenager, adult, egg, caterpillar, chrysalis, bark, stick, branch, seasons, melt, liquid, solid, hard soft, kitten, puppy, foal, calf etc
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Ourselves – All About Me	Families & Celebrations	Traditional Tales	What a Wonderful World – Growing and Changing	What's the story	People Who Help Us
	• Name the properties of some materials such as – hard and soft, rough and smooth and shiny and dull. • Describe the most suitable materials for building and give explanations as to why. • Manipulate some materials such as Play-Dough and describe how they change – squash, stretch, bend, twist. • Look at a range of materials in the environment and describe how they feel. • Can name the characteristics of each season • Explore the changes to animals and plants in Autumn – leaves, trees, insects, animals, nocturnal animals. • Talk about weather changes in the seasons. • Talk about hedgehogs, birds, tortoise, fish and frogs and their habitats in Autumn and Winter – hibernation. (Hedgehogs, tortoise) fish and		• Explore the effects weather has on living things in Winter and Spring – leaves, trees, plants, insects, animals. Compare some similarities and differences between the seasons • Compare the effects heating and cooling has on ingredients such as melting and freezing. • Talk about animals in their habitats in Spring - comparing this to Autumn and Winter. • Understand that plants need space, water, light and air to grow. • Use correct terms when observing the life cycle of ladybirds • Observe and talk about the life cycle of a chicken using the correct terminology • Use language related to the life cycle of a chicken to explain the process – brooding, incubation, clutch of eggs. Explore the		• Explore the effects weather has on living things in Summer – leaves, trees, grass, plants, insects, animals. Talk about similarities and differences between each season. • Classify a set of objects by their materials - wood, plastic, fabric, sand and glass – Recycling. • Know the foods different animals might eat and how they find their food – whales hunt for krill. • Compare similarities and differences between animals' habitats – insects. • Talk about and compare how habitats change for animals during the Summer. • Understand and explain the life cycle of a plant. • Talk about some trees that are deciduous – oaks, maples, and beeches.	

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	frogs move down to the bottom of lakes and ponds and some even burrow into the mud. • Understand how to reduce the spread of germs – hand washing, cleaning. Understand how to look after ourselves – tooth brushing, healthy eating such as fruit and vegetables. • Name some of a human's body parts – legs, arms, head, knees, elbow. Identify some parts of the body and locate them on a map of themselves. • Talk about some animal's habitats in our immediate environment – where do the insects, chickens, foxes and hedgehogs live? Understand that familiar places can be habitats - the outdoor area, bug hotels. Explore our school outdoor environment and understand that it is a habitat for living things e.g. bats and insects	life cycle of humans and begin to compare this with the life cycle of a chicken. • Talk about routines in the morning and the evening and use language related to day and night. • Begin to talk about an animal's offspring – hen and chick, sealion and a pup, whale and a calf. • Use language relating to planting and plant sunflowers and bulbs in the outdoor area – seeds, plants, bulbs.'	
Seasonal changes	Everyday materials	Plants Animals including humans	
Children to be exposed to key vocabulary daily in provision. High quality text to be chosen for story times that allow for questioning opportunities relating to key events. The outdoor classroom will be used as a key feature in our science learning through the natural world. Trips to the farm and the zoo will be used to enhance children experiences of animals and class experiences of hatching our own chicks and caring for our own caterpillars/butterflies.			
Experiences	SMSC	British Values	The Meadows Values
Farm on wheels	Spiritual- by asking questions about the world around them Moral – children are taught how to look after their environment during outdoor learning.	Respect is taught through the need to care for the natural environment Individual liberty is taught through actively encouraging the choices the make when exploring their environment	Team Work is taught when the children are working as part of a team during experiments. Respect and Kindness listening to others viewpoints. Respect the environment around you Curiosity – children are encouraged to ask why questions throughout their exploration

Biology	Chemistry	Physics
Plants Animals including humans	Everyday materials	Seasonal Changes

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KS1 Cycle A: Science skills progression

POS

Living Things and their Habitats

Explore and compare the differences between things that are living, dead, and things that have never been alive.

Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the 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.

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Animals including humans – basic needs

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Notice that animals, including humans, have offspring which grow into adults

Animals including humans – classification

Identify and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals.

Identify and name a variety of common animals that are carnivores, herbivores, and omnivores.

Describe and compare the structure of a variety of common animals.

Identify, name, draw and label the basic parts of the human and say which part of the body is associated with which sense.

Working scientifically

Sort and classify things according to a variety of different features (e.g. I know it is a living thing because it...and it...).

Decide how to sort and group objects, materials or living things.

Observe, record, and make drawings to represent things in the real world with some accuracy.

Use simple scientific language in their recording.

Observe and describe simple processes/cycles with several steps e.g. growth cycle, simple food chain, saying how living things depend on one another.

Recognise and describe a series of changes over time (e.g. growth)

Make some choices on how to communicate their ideas to a range of audiences in a variety of ways.

With guidance, begin to notice patterns and relationships.

Begin to explain how they know using the word 'because' and suggest how and/or why things happen.

Draw on and use their results and own experiences to answer their questions.

Sort and classify things according to a variety of different features.

Record and communicate their findings in a range of ways with increasing independence e.g. talk/discuss; write/describe; draw pictures; take photographs; video; make/construct a variety of table, charts including simple bar charts produced as a group and displays.

Name and identify common examples and some common features.

Use their senses, simple measurements and equipment to gather data with increasing independence.

KS1 Cycle A- End Points	
Living Things and their Habitats	Know the difference between living (grow), dead (no longer alive) and never been alive (does not grow) including examples of each (TV, fallen leaves, bus, meat, dog, wasp). Never lived – never grown, breathed or eaten. Living – reproduce, drink water remove waste from themselves. Non-living – does not breathe or move but comes from something which used to. The 5 things all living things need – food, water, shelter, warmth, and space. Different habitats for plants and give an example – grassland (ryegrass, wild oats), forest (ferns, foxgloves), pots (tomatoes, peas), desert (prickly pear, aloe vera, cactus), river (pondweed, waterweed), and tundra (arctic moss, arctic poppy). Habitats for animals and give examples – grassland (elephant, zebra, lion), desert (camel, scorpion), river (turtle, fish, crab), tundra (polar bear, snowy owl), woodland (owl, squirrel, deer, bird), ocean (whale, octopus, seaweed) and rainforest (monkey, snake). A microhabitat is - a small, specialized habitat within a larger habitat – decomposing log (woodlouse, earthworm, centipede, beetle), temporary pool of water (water mites), and under rocks (worm, ant, cricket). Animals obtain food from other animals and plants. Explain a simple food chain and name various sources of food (worm, bird, cat) cat is predator and (grass, cow, human) human is predator. Predator eats another animal. Prey is eaten by another animal.
Animals including humans – Basic Needs	All animals, need food, water, air, and shelter. Food gives us energy and helps us to grow. Animals need to stay fit by eating sensibly and taking regular exercise. All animals, need to eat a balanced diet. The food groups are carbohydrates, proteins, fats, fruits and vegetables and dairy – include examples of each food type. All animals, have offspring which then grow into adults. Young cow is a calf, young dog is a puppy, young cat is a kitten, young pig is a piglet. Some offspring are different from their adults e.g., caterpillar-butterfly, tadpole frog. The four stages in a life are: birth, growth, reproduce and death. Human life cycle is: baby, toddler, child, teenager, adult. Animals also need exercise and sleep to keep a body healthy. Humans are hygienic to stop the spread of germs – handwashing, showering, teeth brushing. We brush teeth to: get rid of plaque, protect teeth, prevent toothache, prevent tooth decay.
Animals including	Animals can have different diets. The animal kingdom is classified into fish, amphibians, reptiles, birds, and mammals. Fish have gills to breathe through and fins. They are cold blooded. Reptiles have dry, scaly skin and lay eggs. They are cold blooded.

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humans – Classification	Birds have wings and feathers and lay eggs. They are warm blooded. Amphibians are moist, they have smooth skin and no scales. They are cold blooded. A carnivore feeds on other animals, examples are fox, shark, crocodile, frog, owl. A herbivore feeds on plants. Examples are cows, pigeon, tortoise, parrotfish. An omnivore feeds on both animals and plants, examples are lizards, bears, yellow-legged frog, crow, goldfish. Five of the senses are associated with the following: hands-touch; nose-smell; mouth-taste; eyes-see and ears-hear. Name examples of fish: trout, salmon, cod, plaice Name examples of amphibians: frog, newt, toad Name examples of reptiles: lizard, snake, turtle, alligator Name examples of birds: sparrow, blackbird, robin, chicken Name examples of mammals: humans, dog, rat, bear, deer Animals can be warm or cold blooded		
Strand	Living things and their habitats	Animals including humans – Basic Needs	Animals including humans - Classification
Vocabulary	living things, dead, alive, reproduces, drinks, waste, breathe, food, water, shelter, warmth, habitat, grassland, ryegrass, wild oats, forest, fern, foxglove, pot, tomatoes, peas, desert, prickly pear, aloe vera, cactus, river, pondweed, waterweed, tundra, arctic moss, arctic poppy, elephant, zebra, lion, camel, scorpion, turtle, fish, crab, polar bear, snowy owl, owl, squirrel, deer, bird, whale, octopus, seaweed, monkey, snake, microhabitat, decomposing log, woodlouse, earthworm, pool of water, water mites, rocks, worm, ant, cricket, food chain, predator, prey	animals, food, water, air, shelter, energy, grow, exercise, healthy eating, balanced diet, carbohydrates, protein, fat, vegetable, dairy, offspring, adults, cow, calf, dog, puppy, cat, kitten, pig, piglet, caterpillar, butterfly, birth, growth, reproduce, death, baby, toddler, child, teenager, adult, sleep, hygienic, germs, handwashing, showering, teeth, plaque.	animal kingdom, group, warm blooded, cold blooded, classified, amphibians, fish, reptiles, birds, mammals, gills, fins, scaly, eggs, wings, feathers, hair/fur, live young, moist, smooth skin, scales, diets, carnivore, herbivore, omnivore, meat, plants, hands, nose, mouth, eyes, ears, touch, smell, taste, sight, hear, sense

	Living things and their habitats	Animals including humans – Basic Needs	Animals including humans - Classification
Key Scientists	British ecologist Arthur Tansley who drew attention to the importance of transfers of materials between organisms and their environment.	Aristotle	Carl Linnaeus

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Career links	Environmental Climate scientist Wildlife biologists Conservationists	Wildlife biologist Sports scientist Medical physicist.	Zoologist Zookeeper
Linked Texts	The Big Book of Bugs – Yuval Zammer	Tadpole's Promise – Jeanne Wills & Tony Ross	Lots: The Diversity of Life on Earth – Nicola Davies & Emily Sutton

Experiences	SMSC	British Values	The Meadows Values
	Moral – all children have the right to clean water and food	Respect and Tolerance – animals and people have different diets (herbivore/vegetarian or vegan) Democracy – take turns when grouping vertebrates	Teamwork is taught when the children are working as part of a team. Respect and Kindness listening to the viewpoints of others. Respect the environment around you Teamwork is undertaken when children work as a team during experiments

Biology	Chemistry	Physics
Living things and their habitats Animals including humans – Basic Needs Animals including humans - Classification		

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KS1 Cycle B: Science skills progression

POS

Cycle B: Seasonal changes

Observe changes across the four seasons

Observe and describe weather associated with the seasons and how day length varies.

Cycle B: Everyday materials (Classification)

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.

Cycle B: Everyday materials (Properties and uses of)

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.

Cycle B: Plants (Basic Structure)

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.

Cycle B: Plants (seeds and bulbs)

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.

Working scientifically:

Decide how to sort and group objects, materials or living things. Record and communicate their findings using simple scientific language.

Name and identify a variety of common features and/or uses for objects, materials or living things.

Name and identify common examples and some common features

In a group, choose/suggest ways in which they might answer scientific questions.

Record and communicate their findings in a range of ways with increasing independence e.g. talk/discuss; write/describe; draw pictures; take photographs; video; make/construct a variety of table, charts including simple bar charts produced as a group and displays.

Begin to explain how they know using the word 'because' and suggest how and/or why things happen.

Observe, record, and make drawings to represent things in the real world with some accuracy.

Compare and contrast a variety of things (focusing on the similarities as well as the differences) including how different things change over different periods of time (objects, materials or living things)

Sort and classify things according to a variety of different features (e.g. I know it is a living thing because it...and it...).

Record and communicate their findings using simple scientific language.

Observe and describe simple processes/cycles with several steps e.g. growth cycle, simple food chain, saying how living things depend on one another.

Observe more accurately by measuring nonstandard and standard units.

Set up a comparative test.

Recognise and describe a series of changes over time (e.g. growth)

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	Use their senses, simple measurements and equipment to gather data with increasing independence. Record and communicate their findings in a range of ways with increasing independence e.g. talk/discuss; write/describe; draw pictures; take photographs; video; make/construct a variety of table, charts including simple bar charts produced as a group and displays.
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KS1 Cycle B- End Points	
Seasonal changes	There are four seasons: Winter, Spring, Summer and Autumn. The Sun provides Earth with warmth and light. Winter Winter months are December, January and February. Winter is usually the coldest season. Winter has the fewest hours of daylight and the longest nights. In Winter, it gets dark early in the evening. In some places, Winter brings freezing temperatures, snow and ice. People wear warm clothes such as gloves and scarves. A sunflower would not grow in Winter because it is not warm enough and there is not enough daylight. Spring Spring months are March, April and May. The weather becomes warmer, but Spring is not the hottest season. Dormant plants begin to grow again. New seedlings sprout from the ground and plants grow new leaves. Hibernating animals wake up. Many animals have babies in Spring, such as chicks and lambs. You may not always need to wear a coat in Spring. Summer Summer months are June, July and August. Summer is usually the hottest season. Summer has the most hours of daylight. The Sun rises very early in the morning. Spending a long time sunbathing at midday is not safe. You can stay safe in the sun by wearing sun cream before going outside to play. It is important to drink plenty of water in hot weather. Autumn Autumn months are September, October and November. The weather becomes cooler, but Autumn is not the coldest season. The leaves of many trees change colour and fall to the ground. Horse chestnut trees drop conkers in Autumn. Plants stop making food and many begin to die back. Animals prepare for the colder months ahead. Comparing the seasons We have different amounts of daylight throughout the year.

	We have more daylight in Summer than in Winter. In the UK, the day length is longest in Summer and shortest in Winter.
Everyday materials (Classification)	Objects are things we can see or touch. A material is what an object is made from. Objects can be made from one or more materials. Everything is made from materials. Objects can be made from different materials Some objects are made from one material. Some examples of objects made from one material are: ○ A pencil is made from wood. ○ A window is made from glass. ○ A jumper is made from wool. ○ A screw is made from metal. Some objects are made from more than one material. Some examples of objects made from more than one material are: ○ Glasses can be made from plastic and glass. ○ A snow globe can be made from water and glass. ○ A hammer can be made from wood and metal. ○ A chair can be made from wood and fabric. Natural and manufactured materials Materials can be natural or manufactured. A natural material comes from plants, animals or the ground. Examples of natural materials include wood, water, rock, cotton, iron and leather. A manufactured material is made by people. Examples of manufactured materials include plastic, glass, brick, paper, fabric and foil. Materials are used to make objects Glass is used to make objects such as windows, jars and drinking glasses. Brick is used to make walls. Foil is used to make foil cartons. Plastic is used to make cups. Wood is used to make boxes. Properties of materials Materials can be grouped according to their properties. Different materials have different properties. Some materials are hard or soft. Some materials are stretchy or stiff. Some materials are shiny or dull.

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	Some materials are rough or smooth. Some materials are bendy or not bendy. Some materials are waterproof or not waterproof. Some materials are absorbent or not absorbent. Some materials are opaque or transparent. Choosing materials for different jobs Waterproof materials keep water out. Umbrellas, raincoats and buckets are waterproof. Umbrellas need to be waterproof and lightweight. Shiny objects can often be identified just by looking at them. Transparent materials are see-through. Glass is a transparent material and is often used to make windows and bottles. Some objects, such as jars, mugs and plates, have smooth surfaces.
Everyday materials (Uses)	Wood comes from trees. Plastics are materials made from chemicals. They are strong and waterproof, can be made into any shape by applying heat. Glass is made by melting sand and other minerals together at extremely hot temperatures. Glass is normally transparent and can be made into different shapes. A shampoo bottle is made out of plastic. A can is made from metal. Magazines are made from paper. The same object can be made using varied materials e.g. spoons can be made from wood, metal, plastic Materials are picked for a specific purpose because of their properties. Pans made from metal are strong, hard, and shiny. Furniture made from wood is strong, flexible and long lasting. Thick glass can be strong but thin glass breaks easily. Wood is suitable for table tops because it can be made smooth. Different fabrics have different properties. Fabric can be stretchy (a pair of tights), insulating (a woollen coat) or absorbent (a towel). Fabrics are used to make clothes as they are flexible, warm and do not wear out easily. Some shapes of objects can be changed by squashing, bending, twisting, or stretching. Rubber can be twisted and stretched. Rock cannot be twisted and stretched. A hair bobble needs to be made out of a material that can be twisted and stretched. A can, dishcloth and plastic bottle can be squashed. A brick cannot be squashed.

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	Wood is strong so can be used to make a garden fence. Paper is the most suitable material for an envelope because it is light, flexible and able to be written on. Brick is used to build houses because it is strong and sturdy. Plastic is a good material to store in water because it is waterproof. A shelf needs to be strong and not bendy so wood would be the best material for a shelf. Sponge is a suitable material for washing cars because it is absorbent. Metal can be used to make a bike frame. Paper can be used to wrap presents. Glass can be used to make a light bulb. Plastic is not a good material to make a frying pan because it would melt in the heat. It is important to be able to squeeze a sponge so that you can squeeze the water out. It is important that chair legs cannot be squashed so that they don't collapse when sat on. Wood is strong so can be used to make a garden fence. Wood is suitable for table tops because it can be made smooth. Brick is used to build houses because it is strong and sturdy. Metal can be used to make a bike frame.
Plants (Basic Structure)	The parts of a plant are flower, stem, leaves and roots. The flower is brightly coloured to attract insects. Wild plants grow without human intervention, and garden plants are planted by humans. Some common garden plants include sunflower, poppy, daffodil and tulip. Some common wildflowers are buttercup, bluebell, dandelion and daisy. The parts of a tree are leaves, branches, trunk and roots. Roots gather water from the soil Trees can be deciduous or evergreen. Leaves of deciduous trees change colour in autumn. Deciduous trees lose their leaves in winter. Evergreen trees keep their leaves throughout the year Some common trees include Scots pine, horse chestnut, oak and sycamore. The stages of plant growth are 1.seed is planted; 2.seed is watered; 3.the shoot grows; 4.the flowers appear. In autumn, leaves change colour and fall from a tree. In winter, there are no leaves left on trees. In spring, new leaves start to grow on trees. In summer, trees have a full set of green leaves. Plants need water, soil, light, sunlight, room and warmth to be able to grow.
Plants (seeds and bulbs)	The parts of a plant are flower, stem, leaves and roots. The stem connects the roots to the flower. The flower is brightly coloured to attract insects.

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	The roots gather water from the soil. Trees are kinds of plants. Plants need sunlight to grow. When seeds germinate, they use food from the seed to grow. Plants need water, air, nutrients and light to survive. Parts of a tree are leaves, branches, trunk and roots. Leaves have veins and grow out from the branches. The roots gather water from the soil. The branches grow out from the trunk. The life cycle of a sunflower is 1.seeds are planted in soil; 2.seedling grows; 3.the flower blooms; 4. The flower wilts and seeds fall. Plants can grow from seeds or bulbs. The life cycle of a daffodil is 1.bulb is planted in soil; 2.the bulb grows roots; 3.the bulb grows leaves; 4.the flower blooms. Seeds and bulbs have a store of food inside them. Types of seeds include sunflower apple, tomato, pea. Types of bulbs include daffodil, tulip, bluebells, onions, garlic.
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Core Values: Resilience, Respect, Team Work, Aspiration, Kindness, Curiosity
Golden Threads of our Curriculum: R-A-I-S-E

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Strand	Seasonal changes	Everyday materials (Classification)	Everyday materials (Uses)	Plants (Basic Structure)	Plants (seeds and bulbs)
Vocabulary	seasons, Winter, Spring, Summer, Autumn, Sun, Earth, light, warmth, daylight, day, night, longest, shortest, dark, months, December, January, February, March, April, May, June, July, August, September, October, November, weather, temperature, coldest, warmer, hottest, freezing, snow, ice, warm, coat, gloves, scarf, plants, grow, seedling, leaves, trees, flowers, hibernate, awake, animals, babies, conkers, safe, sun cream, water	object, material, natural, manufactured, wood, glass, wool, metal, water, rock, cotton, iron, leather, plastic, brick, paper, fabric, foil, property, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, opaque, transparent, see-through, lightweight, group, classify, compare, sort	material, materials, object, objects, properties, property, purpose, use, suitable, strength, strong, weak, hard, soft, shiny, dull, rough, smooth, bendy, stiff, flexible, stretchy, absorbent, waterproof, transparent, opaque, melt, heat, shape, change, squashing, bending, twisting, stretching, metal, wood, plastic, glass, paper, fabric, wool, rubber, rock, brick, spoon, bottle, can, magazine, fence, table, shelf, chair, pan, light, heat, trees, natural, chemical, manufactured	plant, flower, stem, leaf, leaves, root, roots, trunk, branch, branches, seed, shoot, petal, pollen, attract, insect, grow, tree, deciduous, evergreen, oak, sycamore, Scots pine, horse chestnut, wild plant, garden plant, wildflower, cultivated, sunflower, poppy, daffodil, tulip, buttercup, bluebell, dandelion, daisy, spring, summer, autumn, winter, season, change, fall, colour, water, soil, sunlight, light, warmth, space, room, germination, stage, cycle, observe, identify, plant, water, grow, change, fall, absorb	plant, flower, stem, leaf, leaves, root, roots, seed, seeds, bulb, tree, trunk, branch, branches, veins, grow, growth, germinate, germination, connect, support, absorb, gather, bloom, blossom, wilt, fall, life cycle, stage, seedling, sunlight, light, water, air, soil, nutrients, survive, sunflower, apple, tomato, pea, daffodil, tulip, bluebell, onion, garlic

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	Seasonal changes	Everyday materials (Classification)	Everyday materials (Properties and uses of)	Plants (Basic Structure)	Plants (seeds and bulbs)
Key Scientists	Aristotle (founder of meteorology)	Charles Mackintosh – chemist and inventor Jon Dunlop – inventor	John Dunlop John McAdam	Alexander von Humboldt	David Attenborough
Career Links	Meteorologist	Renewable materials engineer	Renewable materials engineer	Plant pathologist Floriculturist Horticulturist Plant geneticist Forestry consultant	Landscaper Tree Surgeon Plant photographer
Linked Texts	Out and About: A First Book of Poems – Shirley Hughes	Rosie Revere, Engineer – Andrea Beaty & David Robert	Somebody Swallowed Stanley – Sarah Roberts & Hannah Peck	A little guide to wildflowers – Charlotte Voake	Sunflower Shoots and Muddy Boots – Katherine Halligan & Grace Easton

Core Values: Resilience, Respect, Team Work, Aspiration, Kindness, Curiosity
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Experiences	SMSC	British Values	The Meadows Values
Growing plants from seeds and bulbs	Moral – it is our planet, and we should look after it Spiritual – sense of enjoyment and fascination of growing things	Respect – the children are taught about some differences between the plants that we grow in Britain and in other countries Individual liberty - children are encouraged to grow a plant of their choice	Teamwork is taught when the children are working as part of a team. Respect: Respecting nature and the world Respect– the environment around you Teamwork: Working as a team during experiments

Biology	Chemistry	Physics
Plants (Basic structure) Plants (Seeds and bulbs)	Everyday materials (classification) Everyday materials (properties and uses of)	Seasonal Changes

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LKS2 Cycle A: Science skills progression

POS

LKS2 Cycle A: Rocks

Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Describe in simple terms how fossils are formed when things that have lived are trapped within rock

Recognise that soils are made from rocks and organic matter

LKS2 Cycle A: Sound

Identify how sounds are made, associating some of them with something vibrating

Recognise that vibrations from sounds travel through a medium to the ear

Find patterns between the pitch of a sound and features of the object that produced it

Find patterns between the volume of a sound and the strength of the vibrations that produced it

Recognise that sounds get fainter as the distance from the sound source increases

LKS2 Cycle A: Animals including Humans – Digestive system including teeth

Describe the simple functions of the basic parts of the digestive system in humans

Identify the different types of teeth in humans and their simple functions

Construct and interpret a variety of food chains, identifying producers, predators and prey

LKS2 Cycle A: Forces and Magnets

Compare how things move on different surfaces

Notice that some forces need contact between two objects, but magnetic forces can act at a distance

Observe how magnets attract or repel each other and attract some materials and not others

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

Describe magnets as having two poles

Predict whether two magnets will attract or repel each other, depending on which poles are facing.

LKS2 Cycle A Electricity

Working scientifically:

Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics.

Record observations / explorations / processes using simple scientific language.

With support/as a group, set up simple practical enquiries including comparative and fair tests, e.g. make a choice from a list of at least one variable that needs to be kept the same when conducting a fair test.

Collect data from their own observations and measurements, using notes/simple tables/standard units.

Record and present findings using simple scientific language and vocabulary, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts

Develop simple descriptions from their observations using relevant scientific language to discuss their ideas.

Record findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, tables and bar charts (where intervals and ranges agreed through discussion), displays or presentations.

Use relevant scientific language to discuss, communicate, report their findings.

Notice/find patterns in their observations and data.

Carry out simple fair tests (with increasing confidence and make some of the planning decisions about what to change and measure/observe)

Make decisions on how best to communicate their findings in ways that are appropriate for different audiences

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Using straightforward scientific evidence to answer questions or to support their findings.

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Identify common appliances that run on electricity.
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers.
Identify whether a lamp will light in a simple series circuit, based on whether 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 a lamp lights in a simple series circuit.
Recognise some common conductors and insulators, and associate metals with being good conductors.

Identifying differences, similarities or changes related to simple scientific ideas and processes.
Describe the effect of something/different factors on something else.
Begin to select the most useful ways to record, classify and present data from a range of choices.
Investigate the effect of something on something else.
Read and spell scientific vocabulary correctly and with confidence.
Use their results to consider whether they meet predictions.
Recognise when a test is necessary.

LKS2 Cycle A End Points

Rocks	There are three main types of rocks and give an example – sedimentary (chalk, limestone, shale, sandstone), metamorphic (slate, marble, quartzite, anthracite) and igneous (basalt, granite, pumice, obsidian). Sedimentary rock is created by: waterways like rivers carry materials to the sea, the materials fall onto the sea bed, over a long period of time, more layers are added then the layers join themselves together. Metamorphic rock is made when sedimentary or igneous rock heats up. Igneous rock is made because of heat and pressure e.g. in a volcano. Concrete is a man-made rock. Granite is a hard rock, chalk is a soft rock, marble is a hard-wearing rock. Rocks can be group based on physical properties and can give examples – hard/soft, permeable/impermeable or durability A fossil is the preserved impression or remains of a dead organism. Fossils are formed when a plant, or animal dies in a watery environment, the plant or animal is buried in mud and silt, soft tissues quickly decompose leaving the hard bones or shells behind, over time sediment builds over the top and hardens into rock. Fossils are only formed in sedimentary rock. A footprint is a trace fossil, chemical fossils are from chemicals found in rocks, a body fossil is formed from the remains of a dead animal or plant. Soil is made from air, water, organic material and minerals. Organic matter is rotting plants. Types of soil include: clay, sandy, loamy, peaty, chalky, silty Compost can be made of decayed plant material that has rotted over a period of time.
Sound	Sounds are made by vibrations The sound vibrations send waves through the air and into the ear which is how we hear. Sound can travel through solids (metal, stone wood), liquid (water) and gas (air) The louder the sound the stronger the vibrations We hear thunder because lightning causes air particles to vibrate. As lightning moves close to us, the sound of the thunder is louder. Sounds are fainter when you are further away from the source of the sound. Sounds are louder when you are closer to the source of the sound. To reduce the loudness of a sound you could use ear muffs/cover your ears or increase the distance between you and the source of the sound. Earmuffs restrict the amount of sound entering the ears. A longer note on a glockenspiel would make a deep sound. A shorter note on a glockenspiel would make a high pitch sound. High pitch means fast vibrations Low pitch means slower vibrations

Animals including Humans – digestive system including teeth	The digestive system breaks down food and absorbs nutrients for the body. Saliva contains enzymes that help start the digestive process. The digestive system consists of mouth, tongue, oesophagus, stomach, small intestine, and large intestine <i>The digestive system of a chicken includes mouth, tongue, oesophagus, stomach, small intestine, and large intestine</i> <i>The digestive system of most reptiles and amphibians include mouth, oesophagus, stomach, small intestine, and large intestine</i> <i>The digestive system of a salmon includes mouth, teeth, tongue, oesophagus, stomach, intestine</i> Some animals have more than one stomach to aid digestion e.g. alligator, cow The mouth is where the teeth and tongue are found; food mixes with saliva here. Teeth are used to chew the food and break it up into bits. The tongue helps to chew the food and swallow it. The oesophagus is a long, muscular tube that transports food to the stomach. In the stomach digests food by mixing it with acids and enzymes. In the small intestine the nutrients from the food are absorbed into the blood which transports them around the body In the large intestine water is absorbed into the body There are four canines in the mouth, they have a sharp biting surface to tear food and form the corners of the mouth; they are often longer and more pointed than the other teeth. The premolars are designed to crush and grind food; they have a flat biting surface. The molar is the largest tooth; it has a flat surface used for chewing and crushing food. Brushing your teeth helps to prevent tooth decay because gets rid of the bacteria that damages your teeth. Carnivore teeth are good for eating meat, omnivore teeth are suitable for eating plants and meat, herbivore teeth are most suitable for eating just plants. Energy passes along the food chain All food chains, start with a plant which is a producer as it makes its own food with energy from the sun. An animal eaten by another animal is prey A predator feeds on other animals. Animals that eat plants are primary consumers. Primary consumers may be eaten by secondary consumers (predators). An example of a food chain – grass, grasshopper, frog.
Forces and Magnets	A force can make things slow down or speed up. A force is a push or a pull. Friction helps moving objects slow down. Two examples of friction are: a car braking and hands rubbing together. When an object moves on a surface, the texture of the surface and the object affect how it moves. Moving objects slow down quickly on rough surfaces. Moving objects do not slow down much on smooth surfaces. Carpets create more friction than wood.

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	For some forces to act, there must be contact e.g., a hand opening a door, the wind pushing the trees Magnets do not need to touch objects for a force to occur. Most magnets have a North pole (N) and a South pole (S) A North and South pole attract. A North Pole and North Pole will repel. A South Pole and South Pole will repel. Monopole magnets only have one pole Only some materials are attracted to magnets. Some magnetic objects are: cobalt knife, 50p coin, paper clip, iron nail. Some non-magnetic objects are: gold ring, bottle, pen, aluminium can
Electricity	The basic parts of a simple circuit are cells (batter), wires, bulbs, switches, buzzers. Some items such as toaster, and tumble dryer run on mains electricity. Some items such as a torch, camera and smart phone run on battery. A lamp in a simple circuit will light if the circuit is a complete loop. A lamp in a simple circuit will not light if there is a break in the circuit. An open switch will not light a bulb because the circuit is incomplete. A closed switch will light a bulb because the circuit is complete. Conductors easily allow electric to pass through Insulators do not let electricity pass through easily Examples of conductors are aluminium, copper, gold, water, people. Examples of insulators are rubber, plastics, wood, paper, polystyrene cup.

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Strand	Rocks	Sound	Animals including humans – Digestive system including teeth	Forces and Magnets	Electricity
Vocabulary	sedimentary, chalk, limestone, shale, sandstone, metamorphic, slate, marble, quartzite, anthracite, igneous, basalt, granite, pumice, obsidian, materials, seabed, layers, heats up, heat, pressure, volcano, concrete, man-made, hard, soft, permeable, impermeable, durable, fossil, preserved, impression, decompose, trace fossil, body fossil, chemical fossil, soil, clay, sandy, loamy, peaty, silty, compost, rotted	sounds, vibrations, waves, air, hear, travel, solids, liquids, gas, air particles, louder, fainter, reduce, increase, distance, source, restrict, ear, longer, shorter, high pitch, low pitch, fast vibrations, slow vibrations	digestive system, absorbs, nutrients, saliva, enzymes, mouth, tongue, oesophagus, stomach, small intestine, large intestine, digestion, teeth, chew, swallow, transports, acids, canines, biting, tear, premolars, crush, grind, molar, chewing, decay, bacteria, carnivore, omnivore, herbivore, energy, food chain, producer, prey, predator, primary consumer, secondary consumers	force, push / pull, friction, texture, rough surfaces, smooth surface, contact, magnets, North pole (N), South pole (S), attract, repel, monopole, magnetic, non-magnetic	circuit, cell (battery), wire, bulb, switch, buzzer, mains, complete circuit, closed switch, open switch, break, incomplete circuit, conductor, insulator, electricity

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	Rocks	Sound	Animals including humans – Digestive system including teeth	Forces and Magnets	Electricity
Key Scientists	Mary Anning	Galileo Galilei	William Beaumont, a surgeon in the US army 1785-1853	Galileo Galilei	Thomas Edison perfected the light bulb's operation so cities in Europe and the United States were able to install direct current electrical lighting systems
Career links	Palaeontologist Geologist	Audio engineer	Dentist Orthodontist Nurse Gastroenterologist	Mechanical engineer Civil engineer	electronics engineer aeronautical engineer
Linked Texts	A rock is lively – Dianna Hutts Aston & Sylvia Lively	Sonam and the Silence – Eddie Ayres & Ronak Taher	Gut Garden: A Journey into the Wonderful World of Your Microbiome – Katie Brosnan	The Lost Thing – Shaun Tan	When Charlie McButton Lost Power – Suzanne Collins & Mike Lester

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Experiences	SMSC	British Values	The Meadows Values
Local walk looking at uses of rocks.	Social – working with other pupils when completing experiments Cultural – British scientist Isaac Newton proven light theory that light is made up of coloured particles Moral – making the right choices to aid a healthy digestive system	Mutual respect and tolerance – through listening to others' opinions when working with together Individual liberty – to create a circuit made up of components of their choosing Democracy – turn-taking and collaboration when creating circuits, and sounds	Resilience – keep going when your experiments don't work the first time Respect– the environment around you Teamwork: Working as a team during experiments

Biology	Chemistry	Physics
Animals including Humans – Digestive system including teeth	Rocks	Sound Forces and Magnets Electricity

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LKS2 Cycle B: Science skills progression

POS

Animals including humans – Skeleton and Muscles

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
Identify that humans and some other animals have skeletons and muscles for support, protection, and movement.

Living Things - Classification

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

Light and Shadows

Recognise that they need light in order to see things and that dark is the absence of light
Notice that light is reflected from surfaces
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes
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

States of matter

Compare and group materials together, according to whether they are solids, liquids or gases.
Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.
Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Structure and Function of Plants

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.

Working scientifically:

Develop simple descriptions from their observations using relevant scientific language to discuss their ideas.
Describe the effect of something/different factors on something else.
Record findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, tables and bar charts (where intervals and ranges agreed through discussion), displays or presentations.
Use relevant scientific language to discuss, communicate, report their findings.
Use their observations to identify and classify.
Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics
Use guides or simple keys to classify/identify (local small invertebrates).
Investigate the effect of something on something else.
Begin to develop their ideas about relationships and interactions.
Investigate the effect of something on something else.

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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.

Notice/find patterns in their observations and data.
Reporting on findings from enquiries (beginning to identify the scientific facts in their data).
Learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius ($^{\circ}\text{C}$) using a thermometer.
Read and spell scientific vocabulary correctly and with confidence.
Observe and record relationships between structure and function.
Record similarities, differences or changes related to simple scientific ideas or processes or more complex groups of objects/living things/events and begin to give reasons for these

<u>LKS2 Cycle B End Points</u>	
Animals including humans – Skeleton and Muscles	Animals get their nutrients from what they eat. The right food is important for a healthy body. All animals need the right amount of nutrients from the food they eat. Carbohydrates provide energy (potatoes and pasta). Fats provide energy (walnuts and cheese). Proteins help with growth and repair and help build and maintain muscles. Vitamins and minerals keep cells healthy. Fibre helps food move through the gut. 70% of the body is water. Humans also need to drink water to be healthy. Bread is a good source of carbohydrates. Fruit provides vitamins and minerals. Milk helps keep teeth and bones healthy. Fish contains unsaturated fat and is good for a balanced diet. Chips are a source of carbohydrates that provide energy, help build muscle and help digestion. Unsaturated fat is most necessary for a healthy, balanced diet. If you eat too much unhealthy fats (saturated fats) then this is bad for your health. The skeleton (bones) does three jobs protecting the organs, supporting the body and allows movement. Bones have joints so the skeleton can bend. Humans have a rib cage to protect internal organs, help respiration and help support the chest and back. Muscles and joints allow movement Muscles are soft tissues that are joined to bones and always work in pairs. Muscles help movement and support the skeleton. Some of the bones in our skeleton are skull, ribs, pelvis, ankle bone, thigh bone, jaw, finger bone, collarbone, spine, kneecap. Animals with a backbone are called vertebrates. Humans, goldfish and dogs are examples of vertebrates. Animals with no backbone are called invertebrates. A worm has no skeleton. An inner skeleton grows as the animal grows. Animals with an outer skeleton shed their skin several times as they grow.
Living things - Classification	Living things can be grouped in different ways. Some ways to group living things include: can it fly, does it crawl, does it have an internal skeleton, number of legs? A classification key helps to group, identify, and name a variety of living things. Vertebrates have a backbone. Invertebrates do not have a backbone.

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	Vertebrates include amphibians, birds, fish, mammals, and reptiles. Mammals (e.g. sheep) have hair/fur, are warm-blooded and have an internal skeleton. Birds (e.g. osprey) have wings, a beak and an internal skeleton. Fish (e.g. trout, goldfish, shark) live in water, have gills for breathing and have an internal skeleton. Amphibians (e.g. frog) live on land and in water, have gills to breathe when young and an internal skeleton. Reptiles (e.g. lizard, crocodile, turtle) have lungs to breathe, are cold-blooded and have an internal skeleton. Invertebrates include annelids, sponges, echinoderms, insects, molluscs, crustaceans, arachnids. Arachnids have four pairs (8) of legs, jointed legs and no internal skeleton. Insects have antennae, 3 parts to their bodies (head, thorax, abdomen) and an external skeleton. Spiders and moths do not have an internal skeleton. A classification key helps to group, identify, and name a variety of living things. Environmental changes can potentially pose a danger to living things for example global warming, litter, oil spill, chemical pollution, deforestation, land development, water shortages. Environments can change. Some environmental changes have a negative impact on habitats and food. If a woodland was destroyed there would be less shelter for wildlife and pollution would endanger some wildlife. Environmental changes can have a positive effect on living things for example nature reserves, parks and gardens, community gardens and ponds. A spider and a hawk are carnivores. A moth and a cow are not carnivores. When weather turns colder, some birds migrate to a warmer climate because there is less food in a cold environment. Plants can be classified into flowering and non-flowering.
Light and Shadows	Light is a form of energy. Light sources give out light. Natural light sources are the Sun, stars, candle flame, fire. Artificial light sources are light bulbs, fluorescent lighting, computer screens, car headlights, lamp, TV screen. Some objects seem as though they are a light source but they are just reflecting light from elsewhere, for example the Moon, mirrors, and shiny objects. The eyes take in light so we can see. You cannot see anything when there is no light. If you need to create complete darkness in a room, you need to remove all sources of light. Light from the Sun is very strong and can damage your eyes. Never look directly at the sun. The eyes can be protected by wearing dark glasses or a cap. You should also protect your skin from bright sunlight. You can protect your skin by wearing sun cream, wearing clothes and staying in the shade. Some good things that sunlight can do for us is: provide vitamin D, helps plants make food and provide warmth for us.

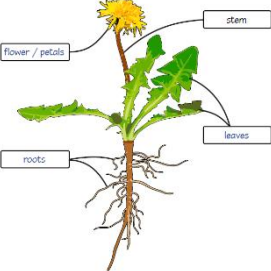
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	Some bad things that sunlight does to us is cause skin cancer and cause skin to wrinkle. A mirror reflects light to create an image that appears reversed from left to right. Light can pass through materials that are transparent e.g. glass. Some light passes through materials that are translucent like frosted glass but you cannot see clearly through it. Light cannot pass through opaque materials. The best material to make a blindfold would be opaque because you cannot see through it at all. When light is blocked by an opaque object, a shadow is formed. The size of the shadow changes depending on the position of the light source. The closer the light source to the object the larger the shadow will be. The further away the light source is from the object, the smaller the shadow will be.
States of matter	Materials can be solids, liquids, or gases (the three states of matter). Examples of solids are rocks and butter. Examples of liquids are cola and milk. Examples of gas are water vapour and air. Water is a liquid state. Water vapour is a gas state. Ice is a solid state. Liquid can be poured and keeps its volume. Solids can be cut. The shape and volume of a solid does not change unless a bit is broken off. The shape of a liquid can change depending on the container it is in, but its volume does not change. Most gases are invisible. The gas in a container completely fills the container so has the same shape and volume of the container it is in. Particles in a solid move a small amount and keep their shape. Particles in a liquid move and bump into each other and flow from one place to another. Particles in a gas move freely and bump into each other and they will escape from a container. Gases have the most active and energetic particles. Solids change into liquids when they are heated – this is called melting e.g. heating sand at elevated temperatures produces liquid glass. Heating turns ice to water. Liquids change into solids when they are cooled – this is freezing. Liquids change into gases when they are heated – this is evaporation. Boiling turns liquid into gas. Gases change into liquids when they are cooled – this is called condensation. Cooling turns water vapour into liquid.

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	The rate of evaporation depends on the temperature. Evaporation is slow when it is cold and fast when it is hot. An example of evaporation is a wet towel drying because water particles turn into a gas. An example of condensation is when water vapour inside a car hits the cold windscreen and returns to a liquid state. Gas is added to some drinks e.g. cola to make them fizzy. The water on Earth is constantly recycling using evaporation and condensation - this is the Water Cycle. Water is collected in the sea, lakes and rivers. The heat from the sun makes the water from the sea, lakes and rivers evaporate into water vapour. As the water vapour rises, it cools and condenses to form clouds, then falls as precipitation (rain).
Structure and Function of Plants	The basic parts of a plant are flower/petals, stem, roots and leaves. The root anchors the plant and soaks up water and minerals from the soil. Roots have tiny hairs which gather water from the soil. Plants get water from soil. The stem holds the plant upright towards the light and carries nutrients (and water) through the plant to the petals and leaves. Water travels up through the stem so if you put a flower in water with blue food colouring then the petals would turn blue. Leaves are needed for nutrition. Leaves use sunlight to create food for the whole plant. Water evaporates from leaves. Plants need food to stay healthy. Two important things for plants to grow are sunlight and water. The flower is needed for reproduction. Parts of the flower head produce pollen. The flower at the top of the stem attracts bees who collect pollen or nectar. The flower / petals produce sweet smells. The bright colours of the petals are attractive to insects. Seeds are dispersed by wind, water, animals or by explosion. Birds eating seeds can help to spread the seeds. It is better for the seeds to travel away from the parent plant. 

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Strand	Animals including humans – Skeleton and Muscles	Living things - Classification	Light and Shadows	States of matter	Structure and Function of Plants
Vocabulary	animals, nutrients, diet, healthy, food, carbohydrates, fats, proteins, vitamins, minerals, fibre, water, energy, skeleton, bones, joints, ribs, skull, spine, muscles, movement, vertebrate, invertebrate, backbone, organs, support, respiration, digestion, grow, healthy diet, saturated fat, unsaturated fat	living things, group, classify, classification, classification key, identify, organism, species, features, characteristics, vertebrate, invertebrate, backbone, skeleton, internal skeleton, external skeleton, mammal, bird, fish, amphibian, reptile, warm-blooded, cold-blooded, insect, arachnid, mollusc, annelid, crustacean, echinoderm, sponge, wings, beak, fur, hair, scales, gills, lungs, antennae, legs, joints, segments, environment, habitat, pollution, deforestation, climate change, global warming, habitat loss, nature reserve, carnivore, herbivore, omnivore, migrate, adaptation	light, energy, light source, natural, artificial, reflect, reflection, mirror, transparent, translucent, opaque, shadow, block, Sun, darkness, see, eyes, bright, sunlight, protect, vitamin D, skin, shade, sun cream, cap, dark glasses, glass, frosted glass, shiny, Moon, position, closer, further away, larger, smaller	materials, solid, liquid, gas, state of matter, water, water vapour, ice, particles, shape, volume, container, move, energetic, heated, cooled, melting, freezing, evaporation, boiling, condensation, temperature, water cycle, recycle, sea, lake, river, sun, cloud, precipitation, rain	plant, flower, petals, stem, roots, leaves, soil, water, sunlight, nutrients, nutrition, anchor, absorb, evaporate, reproduce, pollen, nectar, seed, disperse, minerals, root hairs, attract, insects, bees, grow, food, healthy, parent plant, wind, animals, explosion

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	Animals including humans – Skeleton and Muscles	Living things - Classification	Light and Shadows	States of matter	Structure and Function of Plants
Key Scientists	Leonardo da Vinci made first anatomical drawings	Carl Linnaeus	Sir Isaac Newton – light was made up of tiny particles	Ancient Greeks	David Attenborough Agnes Arber
Career links	Biochemist Orthopaedic doctor	Veterinary surgeon Biologist	Laser physicist	Materials scientist Water scientist	Plant Biologist
Linked Texts	Can I build another me? – Shinsuke Yoshitake	Botanicum (Welcome to the museum) – Kathy Willis & Katie Scott	You are light – Aaron Becker	Water dance – Thomas Locker	Plantopedia: Welcome to the Greatest Show on Earth – Adrienne Barman

Experiences	SMSC	British Values	The Meadows Values
Observing changes in a plant growing	Moral – eating the right nutrients for the body to function at its best Social – working with other pupils when completing experiments	Democracy – turn-taking and collaboration when creating shadows and sounds Mutual respect and tolerance – through listening to others opinions when working with together	Resilience – keep going when your experiments don't work the first time Respect– the environment around you Teamwork: Working as a team during experiments

Biology	Chemistry	Physics
Animals including humans – Skeleton and Muscles Living Things – Classification Structure and Function of Plants	States of Matter	Light and Shadows

Core Values: Resilience, Respect, Team Work, Aspiration, Kindness, Curiosity
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Year 5: Science skills progression

POS

Year 5 Properties and Changes of Materials

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

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

Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Demonstrate that dissolving, mixing and changes of state are reversible changes

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

Year 5 Earth and Space

Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.

Describe the movement of the Moon relative to the Earth.

Describe the Sun, Earth and Moon as approximately spherical bodies.

Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky

Year 5 Forces and Movement

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

Identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Year 5 Living things and their habitats

Working scientifically:

Use their developing scientific knowledge and understanding and relevant scientific language to discuss, communicate and explain their findings.

Recognise when it is appropriate to carry out a fair test and plan how to set it up.

Report findings from enquiries using discussion, drawings (annotated), oral and written explanations of results, and conclusions.

Explain which variables need to be controlled and why.

Recording data and results of increasing complexity.

Record data and results of increasing complexity using tables, bar and line graphs, and models.

Explore more abstract systems/functions/changes and record their understanding of these.

Use their developing scientific knowledge and understanding and relevant scientific language to discuss, communicate and explain their findings.

Look for patterns and notice relationships between things and describe these.

Make their own decisions about what observations to make or measurements to use and how long to make them for (recognising the need for repeat readings on some occasions).

Draw conclusions based on their data and observations.

Read and spell scientific vocabulary correctly and with confidence.

Present findings in written form, displays and other presentations.

Compare more complex processes, systems, functions (e.g. life cycles of different living things, organ systems of different animals).

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Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
Describe the life process of reproduction in some plants and animals

Year 5 Animals including Humans

Describe the changes as humans develop to old age.

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Year 5 End Points

Properties and change of materials	Heat travels from warmer materials to colder ones Some materials let heat pass through them easily; these are thermal conductors (metals and sedimentary rocks) Some materials do not let heat pass through them; these are called thermal insulators (plastic, cork, wood, cotton wool and fabrics) Soluble substances (such as coffee granules, sugar and salt) dissolve in water Insoluble substances (such as sand and cooking oil) do not dissolve in water Dissolving a solid in water makes a solution. A solute is the substance that is dissolved in a liquid e.g. when dissolving sugar in water, sugar is the solute. Many substances dissolve quicker in hot water than in cold water. There are three ways to separate mixtures: sieving, filtering, and evaporation Sieving is when you pass a mixture of solids of varied sizes through mesh e.g. small pebbles and sand. Filtering is when you pass a mixture of a solid and liquid through a mesh e.g. sand and water. Evaporation is the process of heating a liquid to leave a solid behind e.g. sugar and water A reversible change means a substance can return to its original state because the chemical properties do not change e.g. water freezing into ice, butter melting in heat chocolate melting in the heat and candle wax becoming liquid when it melts. An irreversible change means a substance cannot return to its original state because the chemical properties change e.g. wood burning on a fire, eggs cooking in a pan, metal rusting when left in the rain and setting paper on fire. Magnetism can be used to separate iron filings from sugar because the iron filings would be attracted to the magnet. All changes of state are reversible Mixing and dissolving are reversible changes Some things react and make new materials when you mix them (vinegar and bicarbonate of soda). When you mix bicarbonate of soda and vinegar together, carbon dioxide is produced. Some properties of materials are: flexible (toy car track), transparent (window pane), attracted to a magnet (metal pencil sharpener and nail) and absorbent (towel).
Earth and Space	The Sun is a star at the centre of our Solar System. Our solar system consists of our star, the Sun, and everything bound to it by gravity – the planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune (these are in order in distance from the sun closest first). Dwarf planets such as Pluto, dozens of moons, and millions of asteroids, comets and meteoroids are also within our solar system. All the planets in our solar system orbit the Sun. Earth, Mars, Jupiter, Saturn, Uranus and Neptune all have at least one moon. The Earth is a sphere (spherical). The Earth rotates on an axis as it travels around the Sun. The Earth makes one complete rotation on its axis every 24 hours (one day). When one side of the Earth faces the Sun, the other side faces space. The side facing the Sun is bathed in light and heat (daytime) and the side facing space is cooler and darker (night).

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	The Earth's rotation makes it appear as though the Sun moves across the sky. It takes approximately 365 days for the Earth to orbit the Sun. We call the time it takes a planet to orbit the Sun a year. The closer a planet is to the Sun, the less time it takes to orbit. Mercury has the shortest year because it is closest to the Sun. Neptune has the longest year because it is furthest from the Sun. The Earth's axis is tilted. The Earth's tilt on its axis causes the four seasons. Sometimes the Northern Hemisphere is tilted more towards the Sun and at other times more away from it. When the Earth is tilted towards the Sun, there are more hours of daylight and warmer temperatures (summer). The Moon orbits the Earth. The Moon takes approximately 28 days to orbit the Earth once. As the Moon orbits the Earth, its position changes relative to the stars. The force of gravity acts between the Earth and the Moon.
Forces and Movement	Friction is the force between surfaces that are touching. Rough surfaces, create lots of friction. Smooth surfaces do not create much friction. Friction produces heat. Friction acts in the opposite direction of the movement that it is slowing down. Air resistance is the force that slows down moving objects as they move through air. Objects, need to be streamlined to travel faster through the air. To travel slower through the air, you need a large surface area. Water resistance is the force that slows down moving objects as they move through water. If you want to travel more quickly through water, the shape needs to be streamlined e.g. a Dolphin has a streamlined body Buoyancy is an object's ability to float in water or air. The force of gravity pulls objects towards the centre of the Earth regardless of where you are on the planet. Sir Isaac Newton (a British scientist) devised the laws of gravity. A newton is a unit used to measure force. The size of the gravitational force is more or less the same all over the Earth. Levers, gears, and pulleys are simple mechanisms that enable a small force to have a greater effect A lever is made from a long pole and pivot (fulcrum) (examples are a see-saw, scissors, a wheelbarrow, and a stapler). A pulley is a rope running through a wheel (examples are window blinds, a flagpole and a well). Gears are wheels with teeth that fit together. When one wheel is turned, the other wheel turns too but in the opposite direction. A smaller gear will turn faster than a larger one
Living things and	There are distinct types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Sexual reproduction in animals needs two parents and the offspring has characteristics of both. Sexual reproduction in plants involves pollen from one flower fertilising the egg of another to produce a seed.

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their habitats	Pollen contains the male gametes (reproductive cells). The female gametes (reproductive cells are in the ovule). When a male gamete joins a female gamete it is called fertilisation. The petals are often brightly coloured to attract insects which helps with fertilisation. Asexual reproduction in plants happens without pollen or an egg. The new plant grows from cuttings from the parent plant. Asexual reproduction in plants only needs one parent and the offspring is a biological copy of the parent. The life cycle of a cat (mammal) – 1.the embryo grows in the cats womb; 2.the baby cat (kitten) is born and is fed milk from its mother; 3.the young cat develops and grows into an adult cat; 4.the adult cat is capable of mating with another cat. The life cycle of a frog (amphibian)- 1. female frog lays many eggs (frogspawn) that are fertilised by the male; 2. The eggs hatch into tadpoles; 3. The tadpole develop front legs and lungs; 4.the tail shrinks and the tadpole becomes a froglet 4. The froglet grows into an adult frog. The process of changing from a tadpole to an adult frog is called metamorphosis. The life cycle of a butterfly (insect) - 1. egg laid by the female insect; 2.eggs hatch and larvae (caterpillars) are born; 3.the caterpillars feed and grow, moulting as they get bigger; 4.after the final moult, the caterpillar forms a pupa (chrysalis); 5.inside the pupa the insect undergoes metamorphosis; 6. An adult butterfly emerges from the pupa and can reproduce. Some insects (grasshopper, dragonfly and common earwig) only have 3 stages: 1.egg; 2.hatches as a nymph; 3.changes into an adult The life cycle of a robin (bird) – 1. Egg fertilised and laid by the female; 2. chick hatches from the egg and is fed by the adult birds; 3. Development takes place and the chick grows; 4. The bird leaves the nest and grows into a mature adult. A bird egg consists of yolk, germinal disc, albumen and shell. The germinal disc is where the male sperm enters and moves to the middle of the egg. The shell protects the egg and is permeable to air. The yolk is made of fats and proteins and is where the embryo gets its main supply of food. The life cycle of an alligator (reptile) – 1.egg is laid by the female; 2.egg hatches into young alligator that is able to feed itself but stays with mother for at least a year; 3.the young alligators grow into juveniles; 4.the juveniles grow into adult alligators who reproduce. The gestation period is the time from fertilisation of the egg to birth (the amount of time that the mother is pregnant) Amphibians and insects go through metamorphosis.
Animals including humans	The human gestation period is around 9 months. Babies develop in the womb before they are born. Prenatal development has a germinal phase, an embryonic phase, and a foetal phase. Animals have different gestation periods – chimpanzee 240 days, giraffe 430 days, dog 61 days. The stages in a human's life, include infancy, childhood, adolescent, adulthood, and old age. The baby stage is when a human is first able to see and hear and they gain the ability to sit up and roll over, the main source of nutrition for a baby at birth is milk. The toddler stage is when a human starts to walk and talk and they start toilet training. The child stage is when a human attends school and baby teeth are replaced by adult teeth.

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	The adolescence stage is when puberty occurs. The adult stage is when a human reaches maximum height and is fully independent. Old age is the final stage of development for humans. Cell decline is part of becoming old Vision and hearing decline as animals get older Animals have different lifespans Changes take place during puberty A girl's hormonal changes cause the ovaries to release eggs, the monthly menstrual cycle is triggered, their breasts also grow, they grow taller. A boy's muscles become more developed, facial and body hair begins to grow, the voice deepens during puberty. A female stops producing eggs during the menopause.
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Strand	Properties and change of materials	Earth and Space	Forces and Movement	Living things and their habitats	Animals including humans
Vocabulary	materials, thermal conductors, thermal insulators, soluble, insoluble, dissolve, solution, solute, liquid, substances, separate, sieving, filtering, evaporation, magnetism, mixture, heating, solid, reversible, chemical properties, irreversible, react, properties, flexible, transparent, magnetic, absorbent	Sun, Solar System, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, gravity, orbit, moon, spherical, rotates, axis, complete rotation, daytime, night, tilt, seasons, Northern Hemisphere, Southern Hemisphere, force	friction, touching, rough surfaces, smooth surfaces, heat, opposite direction, movement, air resistance, slows, objects, streamlined, faster, surface area, water resistance, buoyancy, float, centre, Earth, newton, measure, gravitational force, lever, gear, pulley, mechanism, pivot/fulcrum, rope, wheel, opposite, force	reproduction, sexual, asexual, plants, animals, parents, offspring, characteristics, pollen, fertilising, egg, produce, seed, male gametes, female gametes, ovule, fertilisation, petals, attract, cuttings, parent plant, biological, life cycle, metamorphosis, yolk, germinal disc, albumen, shell, gestation, reproductive cells, embryo, hatch, adult, larvae, pupa (chrysalis), nymph	gestation, human, babies, womb, prenatal development, germinal phase, embryonic phase, foetal phase, infancy, childhood, adolescent, adulthood, old age, baby, nutrition, toddler, child, adolescence, puberty, independent, development, cell decline, vision, hearing, decline, lifespans, hormonal changes, ovaries, menstrual cycle, muscles, voice, facial hair, eggs, menopause

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	Properties and change of materials	Earth and Space	Forces and Movement	Living things and their habitats	Animals including humans
Key Scientists	Spencer Silver Ruth Benerito	Aristarchus (310 – 230 B.C.). He was the first to figure out that the Earth travels around the Sun. Nicolas Copernicus (1473 – 1543). Had the idea that Earth revolves on its axis and the Earth and other planets orbit around the Sun	Sir Isaac Newton Archimedes	David Attenborough Jane Goodall	Jean Purdy
Career Links	Materials engineer Chemist	Astronomer Physicist	Automotive engineer Civil engineer Mechanical engineer Robotic technician	Marine Biologist Veterinary Surgeon	Geriatric medicine paediatrician
Linked Texts	The Story of Inventions – Anna Claybourne & David Roberts	Once Upon a Star: The Story of Our Sun – James Carter & Mar Hernandez	The Explorer – Katherine Rundell	Where the world turns wild – Nicola Penfold	Nine Months – Miranda Paul

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Experiences	SMSC	British Values	The Meadows Values
Keele Observatory – Space	Social – working with other pupils when completing experiments Culture – understanding the importance of Isaac Newton's role in developing the principles of modern physics	Mutual respect and tolerance – through listening to others opinions when working with materials	Resilience – keep going when your experiments don't work the first time Respect– the environment around you Team Work: Working as a team during experiments

Biology	Chemistry	Physics
Living things and their habitats Animals including humans	Properties and changes of materials	Forces and Movement Earth and Space

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Year 6: Science skills progression

POS

Light and Seeing Things

Recognise that light appears to travel in straight lines

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

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 why shadows have the same shape as the objects that cast them

Living Things further Classification

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.

Electricity

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

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

Use recognised symbols when representing a simple circuit in a diagram

Evolution and Inheritance

Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Animals including humans

Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

Working scientifically:

Explore more abstract systems / functions / changes / behaviours and record their understanding of these (e.g. the relationship between diet, exercise, drugs, lifestyle, and health; evolutionary changes; burning, rusting; reflection and refraction of light)

Report findings from enquiries using discussion, drawings (annotated), oral and written explanations of results, explanations involving causal relationships, and conclusions.

Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models.

Use correct scientific knowledge and understanding and relevant scientific language to explain their findings and justify their scientific ideas.

Use and develop classification systems, keys and other information records (databases) to classify or identify.

Use their evidence to justify their ideas.

Plan enquiries, including recognising and controlling variables where necessary.

Look for different causal (cause and effect) relationships in their data (something affecting something else) and describe the pattern succinctly.

Select and plan the most appropriate type of science enquiry to use to answer scientific questions

Record data and results of increasing complexity.

Identify patterns that might be found in the natural environment over long periods of time and describe how these have been used to develop scientific theories (e.g. evolution)

Choose and use the most appropriate equipment to support observation, make measurements, collect data.

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Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the way in which nutrients and water are transported within animals, including humans.	
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Year 6 End Points

Light and Seeing Things

Light is a form of energy

A light source (such as the Sun, fireworks, stars, candles) creates light.

The moon is not a source of light as it reflects light from the Sun.

Light travels in straight lines

Light travels faster than sound.

Objects are seen because they emit or reflect light into our eyes.

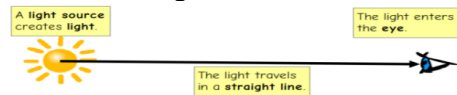
Light that is not reflected by a surface is absorbed.

Light is reflected from surfaces such as a stainless-steel spoon or foil wrapper.

Light travels from light sources to our eyes and from light sources to objects and then to our eyes

Because light travels in straight lines, shadows will have the same shape as the objects that cast them

I can use diagrams and models to describe how light travels in straight lines



I can use diagrams and models to describe how light travels in straight lines when reflected from other objects



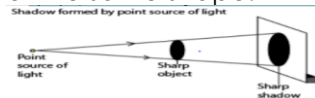
Shadows are made when an opaque object (such as a person, shoe, teddy bear, mug) blocks the light.

The closer the light source is to an opaque object, the larger the shadow.

Translucent objects (such as an empty glass jar) allow some light to travel through them.

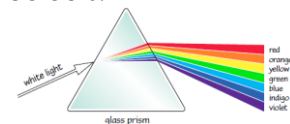
As the Sun rises higher in the sky towards midday, the light hits an object from a steeper angle which causes the shadow to become shorter.

I can use models and diagrams to describe light travelling in straight lines past an opaque/translucent object to cast a shadow of the same shape.



Rainbows are formed when sunlight shines onto raindrops.

Light shining onto a glass prism is a similar process to how rainbows are made; the glass prism separates the white light into colours.



When a pencil is placed into a jar of water, it appears to bend.

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Living Things further Classification	Mirrors are used to make periscopes that allow us to see over or around obstacles. Carl Linnaeus was an important scientist in the 1700s who classified everything in nature. Today some scientists use a modified Linnaean system to classify living things. It is important for scientists to be able to use a common system to classify living things so that they can be identified. Things can be classified as living or non living. Plants (daffodil) and animals (cow/hen) are living things. Solids (rocks), liquids (stream) and gases (air) are not living things. Animals can be classified as flying (dragonfly, butterfly, bat) and not flying (penguin, ostrich, dog). Flowering plants can be classified into: grasses, shrubs, cereals, and deciduous trees. Non-flowering plants can be classified into: algae, mosses, ferns, and coniferous trees. Animals can be classified as vertebrates and non-vertebrates. Vertebrates have backbones (birds, fish, reptiles, mammals, amphibians(frog)) Invertebrates do not have a backbone (molluscs(slug), annelids, arachnids, crustaceans, sponges, echinoderms, and insects(moth)) Mammals feed milk to offspring, are warm-blooded, breathe air through lungs, have hair or fur and have an internal skeleton. Humans and wolves are both mammals, Differences between humans and wolves are: humans are omnivores and wolves are carnivores, humans have 2 legs while wolves have 4. Fish are cold-blooded, live in water, use gills to breathe, have fins, are vertebrates, lay eggs in water and have scaly skin. Birds have feathers and lay eggs. Birds and reptiles both lay eggs on land. Echinoderms (starfish) are only found in sea water. Some plants and some animals are micro-organisms. Micro-organisms can be classified based on their similarities and differences. Some micro-organisms are helpful but some are harmful. Micro-organisms are microscopic. Micro-organisms can be found in water. Micro-organisms can be classified into bacteria, viruses, fungi, algae, and protozoa. Micro-organisms can be used in the production of food e.g. bacteria in yoghurt and yeast in bread. If meat isn't stored properly or handled properly then it can make humans ill because of harmful germs / bacteria that grow on it.
Electricity	The symbols of a simple circuit are:  Battery  Wire  Bulb  Buzzer  Motor  Switch (off)  Switch (on) A switch can be used to turn a bulb on or off in a circuit.

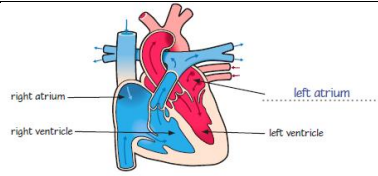
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	When a switch is open, the circuit is incomplete and the bulb will not light. When a switch is closed, the circuit is complete and the bulb will light. By adding more batteries, the bulb gets brighter or the buzzer becomes louder as there is a greater current. If you add more bulbs, the bulbs get dimmer because the flow of electricity is divided into more components. If you add more buzzers, they buzz more quietly because the flow of electricity is divided into more components. Several motors would each turn more slowly than just one because the flow of electricity is divided into more components. Current is the amount of electricity flowing through the circuit. The higher the voltage of a battery, the more powerful it is – the more current flowing through a circuit. Using higher voltage batteries causes a brighter bulb or a louder buzzer. Using longer wires between the components provides more resistance so bulbs become dimmer, buzzers quieten, and motors move slower. Using shorter wires between the components provides less resistance so bulbs become brighter, buzzers louder and motors more quicker. Conductors allow electricity to pass through them so a conductor in a circuit would allow a bulb to light up. Electricity can be dangerous. Electricity can give you an electric shock that can burn our skin and muscles. It would be unsafe to play with a kite by overhead power cables. It would be unsafe to use a hairdryer with wet hands. Tree trunks and branches can conduct electricity. In parallel circuits, electrical components are connected alongside one another, forming extra loops.
Evolution and Inheritance	Humans can live all over the world because they can wear clothes and build houses suited to different conditions Most plants and animals can only live in certain environments Animals and plants are adapted to their habitat Adaption is the change in a characteristic of a living thing as a result of natural selection. Living things can develop adaptations to suit the place they live. The living things that are best adapted to their habitat are more likely to survive. A cactus lives in hot, dry deserts where there is very little rainfall so it has thick stems that can store water, spines that reduce water loss and protect it from animals, a waxy coating that stops water evaporating and roots that spread out widely to collect water quickly when it rains A camel lives in hot, dry deserts with little water and very high temperatures so its hump stores fat which can be used for energy when food is scarce, it can survive for long periods of time without drinking water, it has long eye lashes and hairy ears to keep out sand and it has wide, padded feet to stop it sinking into the sand. A polar bear lives in the Arctic where it is extremely cold and covered with ice and snow for much of the year so it has thick fur and a layer of fat to keep it warm, white fur to help it blend into the snowy environment, large paws to help it walk on ice and swim in cold water and small ears to reduce heat loss from its body. Over time, animals and plants will end up with features that make them well-adapted to their habitat

Core Values: Resilience, Respect, Team Work, Aspiration, Kindness, Curiosity

Golden Threads of our Curriculum: R-A-I-S-E

	Animals and plants produce offspring that look like their parents Parent plants or animals pass on characteristics. Siblings inherit DNA from both parents. Siblings inherit characteristics from both parents, but how they combine makes each child unique. Variation is the differences between living things within the same species. A species is living things which reproduce to make offspring of the same type. Inherited characteristics are features that are passed from parents to their offspring through genes (eye colour, hair colour, dimples, blood group, skin colour). Acquired characteristics are learned or caused by the environment (speaking a particular language, riding a bike, having a scar, being good at playing an instrument, being an able swimmer). Learnt characteristics are learnt from others or experiences and not passed from parent to offspring e.g. a dog barking when its owner rattles a lead. Offspring are similar to the parents but not identical. Evolution is the process of living things gradually changing over time. Charles Darwin's (an English naturalist) scientific theory of evolution by natural selection became the foundation of modern evolutionary studies An example of evolution is Darwin's finches – beaks adapted over time based on food source. Charles Darwin observed that over many years, finches in different environments on the Galapagos Islands developed different beaks. He noticed that in one environment plants had large seeds. Here, finches with larger beaks could break the seeds open and eat them, but finches with smaller beaks could not. In the environment with large seeds, the larger-beaked finches would be more likely to survive as they could break them open to eat them; the number of smaller beaked finches here would decrease as they could not access the food. Survival of the fittest means that living things with features suitable for their environment are most likely to survive. Scientists believe that humans evolved over many, many years from the same species as apes. Fossils are the remains (or impression) of a dead animal or plant that was living long ago. There are 3 types of fossil: body fossil, trace fossil and chemical fossil. Fossils help scientist learn more about how species have adapted over time because they can tell us what animals were like in the past. Fossils show how living things have changed – how they have evolved
Animals including humans	The circulatory system is made up of blood, blood vessels and the heart. Blood vessels and the heart are vital for the circulatory system. The heart pumps blood around the body. The parts of the heart are:



The heart pumps blood to the lungs. There the blood collects oxygen from air that has been inhaled. After transporting oxygen to the body's cells, blood returns to the heart. The blood is then pumped back to the lungs, from where carbon dioxide is exhaled.

The circulatory system moves nutrients around the body to areas where they are required.

The muscular system enables movement of the body and maintains posture and position.

The digestive system is made up of organs which enable food to become energy and nutrients for the body.

The skeletal system provides rigid support, protection and assists with movement.

Blood moves food, waste oxygen and waste products around the body.

Blood contains plasma and platelets.

Water is transported around the body in the blood stream / blood vessels / in the circulatory system.

The body loses water through the digestive process (going to the toilet) and through sweating and breathing.

There are three kinds of blood vessels: capillaries, veins, and arteries

Arteries carry oxygenated blood away from the heart to the body

Veins carry de-oxygenated blood back to the heart

Exercise strengthens the muscles, develops the lungs, helps body coordination, uses up food for energy and can prevent the body getting fat and helps the body to sleep at nighttime.

Regularly increasing the heart rate by exercising helps oxygen move to the muscles more efficiently and helps the heart become more efficient at pumping blood.

Humans can survive with only one lunch.

Taking health risks can damage the body

Smoking causes heart attacks, blocked arteries, lung cancer, damage to lungs and breathing problems.

Cigarettes cause chemical changes which are harmful to the body.

Drinking alcohol slows down the reactions.

Heavy drinking damages the liver, heart, and stomach.

Drugs can be dangerous if misused and can cause damage to the brain.

Drugs can be addictive which means they make a human think they need more drugs.

Tobacco and some drugs are addictive.

A balanced diet means eating a variety of foods in the right proportions.

Proteins help us grow and build muscles.

Carbohydrates give us energy.

Our Mission: To drive personal and academic excellence; everyone, every day.

	Dairy is a source of calcium.
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	Fruit and vegetables are a source of vitamins.
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	If a human is overweight they could have problems with their blood pressure and develop heart disease.
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	As well as eating a balanced diet, humans can exercise, get enough sleep and not smoke to stay healthy.
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Strand	Light and Seeing Things	Living Things further Classification	Electricity	Evolution and Inheritance	Animals including humans
Vocabulary	light, energy, source, moon, reflects, straight line, objects, emit, eyes, reflected, absorbed, surfaces, shadows, cast, opaque, blocks, translucent, midday, steeper angle, shorter, rainbows, raindrops, glass prism, white light, colours, bend, mirrors, periscope, obstacles	Carl Linnaeus, classified, nature, Linnean system, living things, identified, living, non-living, plants, animals, solids, liquids, gases, flying, not flying, flowering plants, grasses, shrubs, cereals, deciduous trees, non-flowering plants, algae, mosses, ferns, coniferous trees, vertebrate, non-vertebrate, backbone, mammals, fish, birds, reptiles, echinoderms, micro-organisms, helpful, harmful, microscopic, bacteria, viruses, fungi, algae, food production, germs	circuit, symbols, battery (cell), wire, bulb, buzzer, motor, switch, open, closed, on, off, incomplete, complete, brighter, louder, faster, greater, current, dimmer, quieter, slower, components, electricity, flow, current, voltage, resistance, conductors, dangerous, electric shock, unsafe, parallel circuit, alongside	conditions, environments, adapted, habitat, adaption, characteristic, natural selection, survive, features, offspring, characteristics, siblings, inherit, variation, species, reproduce, inherited characteristics, genes, acquired characteristics, learned, learnt characteristics, evolution, finches, survival of the fittest, evolved, fossils, remains, impression	circulatory system, blood, blood vessels, heart, pumps, lungs, oxygen, air, inhaled, transporting, cells, carbon dioxide, exhaled, muscular system, movement, posture, position, digestive system, organs, energy, nutrients, skeletal system, support, protection, food, waste, plasma, platelets, water, blood stream, capillaries, veins, arteries, oxygenated, de-oxygenated, exercise, strengthens, heart rate, health risks, smoking, heart attack, chemical changes, harmful, damages, dangerous, addictive

	Light and Seeing Tings	Living Things further Classification	Electricity	Evolution and Inheritance	Animals including humans
Key Scientists	Thomas Edison	Carl Linnaeus	Georg Ohm Alessandro Volta	Charles Darwin Alfred Wallace	Alexander Fleming Lemuel Diggs
Career Links	Laser technician	Marine Biologist Veterinary Surgeon Plant Biologist	Electrician Electronics Power plant operator	Palaeontologist Evolutionary biologist	Vaccine Development

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Linked texts	Edison: The Mystery of the Missing Mouse Treasure – Torben Kuhlmann	Tiny: The Invisible World of Microbes – Nicola Davies	Cool Circuits and Wicked Wires – Susan Martineau	Story of Life: Evolution – Katie Scott	Knowledge Encyclopaedia: Human Body! - DK
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Experiences	SMSC	British Values	The Meadows Values
Heart surgeon	Social – working with other pupils when completing experiments Culture – understanding the importance of Carl Linnaeus's role in developing the classification system	Mutual respect and tolerance – through listening to others' opinions when working with materials	Resilience – keep going when your experiments don't work the first time Respect– the environment around you Teamwork: Working as a team during experiments

Biology	Chemistry	Physics
Animals, including humans Living Things: Further Classification Evolution and inheritance		Light and seeing things Electricity

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