EYFS – Science The most relevant statements for science, in the EYFS framework, are taken from the following Areas of Learning: • Communication and Language • Personal, Social and Emotional Development • Understanding the World			
Nursery	Communication and Language		-Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development		- Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World		-Use all their senses in hands-on exploration of natural materials. -Explore collections of materials with similar and/or different properties. -Talk about what they see, using a wide vocabulary. -Begin to make sense of their own life-story and family's history. -Explore how things work. -Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. -Begin to understand the need to respect and care for the natural environment and all living things. -Explore and talk about different forces they can feel. -Talk about the differences between materials and changes they notice
Reception	Communication and Language		-Learn new vocabulary. -Ask questions to find out more and to check what has been said to them. -Articulate their ideas and thoughts in well-formed sentences. -Describe events in some detail. -Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. -Use new vocabulary in different contexts
	Personal, Social and Emotional Development		-Know and talk about the different factors that support their overall health and wellbeing: – regular physical activity – healthy eating - toothbrushing – sensible amounts of 'screen time' – having a good sleep routine – being a safe pedestrian
	Understanding the World		-Explore the natural world around them. -Describe what they see, hear and feel while they are outside. -Recognise some environments that are different to the one in which they live. -Understand the effect of changing seasons on the natural world around them
	Communication and Language	Listening, Attention and Understanding	Make comments about what they have heard and ask questions to clarify their understanding

Early Learning Goal	Personal, Social and Emotional Development	Managing Self	Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	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 and changing states of matter

Understanding the World: Past and Present

Nursery (Cycle 1 and Cycle 2)

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Begin to make sense of life story — talk about toys and how preferences change over time Explore toys from the past — compare with toys children play with now (e.g. parents' toys) Use stories like *LuLu's First Day* and *That Rabbit Belongs to Emily Brown* to discuss personal memories and transitions Talk about seasonal change — autumn signs and weather Use simple time language: "before",	Explore seasonal change — autumn to winter through *Stickman*, *Frozen Planet*, *The Emperor's Egg* Talk about past and present celebrations — Bonfire Night, Christmas Use stories like *The Christmas Story* and *Jolly Christmas Postman* to explore traditions over time Begin sequencing and retelling stories — build understanding of time and order Use simple time language:	Explore different types of transport — compare old and new (e.g. *Mr Gumpy's Motor Car*, *The Train Ride*) Use recount language to talk about past experiences — e.g. going on a bus or train ride Retell and sequence traditional tales — *We're Going on a Bear Hunt*, *The Runaway Train* Begin to understand time-related vocabulary: "before", "after", "then", "next" Explore seasonal change	Explore seasonal change — compare winter and spring through stories like *Owl's Winter Rescue*, *Hello Spring!*, *Toby Toad Waits for Spring* Learn about Mary Anning — introduce the idea of people from the past who made discoveries Use simple time language: "before", "now", "then", "last season" Retell and sequence stories — *The Rhyming Rabbit*, *Come on Daisy*, *Harry and His*	Explore farming now and in the past — link to *Farmer Duck*, *What the Ladybird Heard* Talk about seasonal change — spring into summer, link to planting and growing Use simple time language: "before", "now", "then", "last week" Retell and sequence stories — *Jasper's Beanstalk*, *Jack and the Beanstalk*, *The Hungry Caterpillar* Explore life cycles — how animals and plants grow and	Use stories like *Rosie's Walk* and *Where's Spot?* to explore sequencing and time language (e.g. first, next, then) Retell and recount summer trips — use past-tense vocabulary and personal experiences Explore pirate stories — compare past and present ideas of treasure and travel (*My Granny Is a Pirate*, *Ten Little Pirates*) Talk about seasonal change — summer weather,

Reception

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Timelines of personal growth – "How I have grown up and changed" Favourite toys now vs. in the past – comparing across generations Family history and changes over time – exploring different types of families Books like Dogger and Starting School – support emotional reflection and change over time	Explore opposites: light vs dark, day vs night — link to time and change Compare daily routines: morning vs bedtime — role-play and social phrases Seasonal change: *Goodbye Autumn, Hello Winter*, *Winter Sleep* Shadow changes throughout the day — link to sun movement and time Historical art: explore and recreate *Monet's Starry*	Explore traditional tales (Little Red Riding Hood, Three Billy Goats Gruff) and how stories have changed over time. Compare versions of stories and discuss how characters are portrayed (e.g. the wolf). Use memory games (Grandma's basket) to reflect on recall and change. Begin to explore timelines through baking (dough before/after baking).	Compare images of nurses, firefighters, and police from the past and present. Discuss how community roles have changed over time. Explore the evolution of superhero characters and their traits. Use stories like The True Story of the Three Little Pigs to challenge historical perspectives.	**Summer 1: Growing** Explore traditional tale *The Little Red Hen* — sequencing and retelling Compare farming practices past and present (linked to trips to Kenyon Hall Farm and Farmer Ted) Discuss how seeds grow over time — introduce timelines and diaries	Use the *Seaside Holidays Past and Present* PowerPoint to compare experiences Explore Punch and Judy puppets — traditional entertainment Compare materials and tools used at the beach now vs. in the past Books like *Grandad's Island* and *Lucy and Tom at the Seaside* support intergeneration al reflection

End of EYFS

Children will:

Talk about the lives of the people around them and their roles in society.

"now", "then", "when I was little" Explore journeys and time through *Whatever Next!* and *The Way Back Home*	"before", "now", "then", "last year" Compare how we celebrate now with how others may have celebrated in the past	— winter to early spring Talk about how travel and transport has changed over time	*Bucketful of Dinosaurs* Explore how animals and plants change over time — link to life cycles Compare dinosaurs and zoo animals — past vs present creatures	change over time Compare traditional nursery rhymes — *Mary Had a Little Lamb*, *Three Blind Mice*, *Humpty Dumpty*	seaside experiences Use simple time concepts in storytelling and routines — "yesterday", "last week", "before lunch"		*Night*, fireworks art Discuss how celebrations have changed over time (e.g. Christmas traditions) Explore how people used light in the past (candles, firelight, etc.					

Understanding the World: People, Culture and Communities

Nursery (Cycle 1 and Cycle 2)						Reception						End of EYFS
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**	
Share ideas about themselves — favourite toys, animals, places Explore feelings and preferences — link to rules and responsibilities Read diverse stories — *Daisy and the Trouble with Peas*, *Brown Bear*, *Children's Favourite Stories* Sing songs from different cultures: *I'm a Little Teapot*, *Down in the Jungle*, *Hey Diddle Diddle*	Explore celebrations: Bonfire Night, Christmas — link to family and community traditions Read diverse books and stories — *Hug*, *Lost and Found*, *The Bear*, *Little Polar Bear* Develop friendships and collaborative play — build sense of belonging Discuss rules, routines, and responsibilities — link to hygiene (e.g.	Explore different countries and environments — Africa, jungles, savannahs (*Tinga Tinga Tales*) Share experiences of travel — photos, stories, role-play Read diverse stories — *Emma-Jane's Aeroplane*, *You Can't Take an Elephant on the Bus* Use props and materials to recreate well-	Celebrate Easter — explore traditions, stories, and shared experiences Read diverse stories — *Bella Loves Bugs*, *A Good Place*, *Dear Zoo* Explore feelings and friendships — through stories like *Hug* and *Come on Daisy* Use props and materials to recreate well-known stories in role-play Invent and adapt stories through small	Learn about people who help us — farmers, growers, food producers Read diverse stories — *Sam Plants a Sunflower*, *Ten Seeds*, *Flip Flap Farm* Explore feelings and friendships — through stories like *The Hungry Caterpillar*, *Come on Daisy* Share experiences of growing, cooking, and eating — link to	Read diverse stories — *Clean Up*, *The Rainbow Fish*, *Miss Polly Had a Dolly* — explore kindness, care, and community Discuss relationships and resolving conflicts — link to *The Rainbow Fish* and collaborative play Explore seaside and pirate cultures — link to traditions, clothing, and celebrations Talk about different countries and places — use	Walk in Stockbridge Village – exploring local landmarks and safety Map making and messy maps – geography and community awareness RE link: religious buildings and cultural landmarks Books like The Great Big Book of Families and Tango Makes Three – exploring diversity in family structures	Festival of Light celebration — exploring Diwali, Christmas, Hanukkah, etc. Stories like Rama and Sita, Laura's Star, and The Fox and the Star introduce cultural narratives Visits to "Imagine That" and the Panto — engaging with community experiences Role-play routines and social phrases — building cultural awareness	Explore maps and atlases — land, sea, roads. Create maps for Little Red Riding Hood's journey. Forest School: build dens and shelters, explore natural spaces. Bring in family photos and discuss family structures. Explore senses and describe forest objects.	Celebrate key workers and community heroes. Invite real-life superheroes (nurse, firefighter, police) into school. Explore Chinese New Year — food, traditions, and cultural celebration. Discuss what makes someone a superhero in real life (e.g. bin collectors, postmen). Link to PSED: "I am me" — what	Explore food origins — planting, harvesting, and baking (*The Little Red Hen*) Discuss farming communities and their roles Use food tasting to explore preferences and cultural links	Hold a "Beach Day" — explore seaside traditions and community roles (lifeguards, fishmongers) Explore environmental care — plastic in the ocean, recycling Use circle time to share beach memories and favourite activities Explore emotional wellbeing through activities like "You Are My Sunshine" and	Children will: Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Talk about hygiene routines — handwashing, toileting Explore healthy lifestyles — teeth brushing, food choices, exercise Begin to understand community roles through stories and play Pose and answer questions (what, who, where, when) — build social talk Join in with rhymes and songs — build shared cultural experiences Explore transport and travel — link to community and movement	handwashing instructions) Share experiences of baking and celebrations — *The Gingerbread Man*, baking gingerbread men Celebrate differences — continue developing positive attitudes about people and cultures Sing and perform songs: *Pat-a-Cake*, *Polly Put the Kettle On*, *It's Raining, It's Pouring* Use positional language to describe familiar routes — link to community and movement Build confidence in new social situations — e.g. festive events, group play	known stories in role-play Perform songs and rhymes — *The Wheels on the Bus*, *London Bridge*, *Five Little Monkeys* Develop friendships and confidence in new social situations Begin to understand the need to respect and care for the natural environment and living things Explore how people move around in different places — link to community and culture Celebrate differences through books and shared storytelling Use positional language to describe journeys and locations	world and imaginative play Sing and perform rhymes — *Five Little Speckled Frogs*, *Baa Baa Black Sheep*, *Hickory Dickory Dock* Continue developing positive attitudes about differences between people Share experiences of visiting zoos, farms, or parks — link to community and environment Pose and answer questions — build social talk and curiosity Explore hygiene routines — handwashing, toileting, caring for ourselves	fruit kebabs and planting seeds Perform and create poems, songs, and stories — *Old MacDonald*, *Itsy Bitsy Spider* Use props and materials to recreate farm and garden stories in role-play Invent and adapt stories through small world play — link to farm animals and growing plants Continue developing positive attitudes about differences between people Understand and follow rules — link to turn-taking, group play, and routines Use language to explain, retell, and describe — build social talk and expressive vocabulary	photos and stories to compare environments Share personal experiences — seaside visits, summer holidays, family traditions Sing and perform rhymes — *Row, Row Your Boat*, *Five Little Ducks*, *I Can Sing a Rainbow* Continue developing positive attitudes about differences between people Use expressive language to explain preferences and creative choices Develop independence and school readiness — lining up, turn-taking, following routines	Library visits and Forest School – community engagement Food tasting and cooking (apple crumble, pumpkin pie) – cultural experiences	Exploring how different communities use light in worship and celebration		makes me special?		perseverance stories	
Understanding the World: The Natural World												
Nursery (Cycle 1 and Cycle 2)						Reception						**End of EYFS**

St Albert's Science Overview 2025-26

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Talk about favourite animals — describe features and habitats Use non-fiction to verbally share information about animals and what's above the clouds Explore space and sky — *Roaring Rockets*, *Look Up!*, *Twinkle Twinkle Little Star* Observe seasonal change — weather, clothing, nature Explore colour identification and mixing — link to design and creativity Use tools and materials — explore their purpose and safety Talk about what they see — use wide vocabulary to describe places and objects	Observe seasonal change — weather, clothing, nature Explore frozen environments — *Frozen*, *Frozen Planet*, *Owl's Winter Rescue* Use scientific vocabulary linked to stories — e.g. cold, melting, freezing Ask and answer 'why' questions — e.g. "Why do we wear coats?", "Why does ice melt?" Use shapes for building — explore properties like flat sides for stacking Explore colour mixing with intent — link to winter palettes and festive art Use tools effectively — pencils, scissors, baking tools Count and link numerals to amounts up to 3 — e.g. three snowballs, three	Explore how things work — link to transport, movement, and design Investigate forces — pushes and pulls through play and story contexts Observe seasonal change — weather, nature, clothing Use scientific vocabulary linked to stories — e.g. "fast", "slow", "heavy", "light" Explore movement styles — crawling, climbing, balancing, riding bikes/scooters Use tools effectively — pencils, scissors, construction materials Develop own designs and select materials — link to transport and jungle environments	Observe seasonal change — weather, plants, clothing, nature Plant seeds and care for growing plants — understand the life cycle of a plant Explore the life cycle of animals — frogs, ducks, dinosaurs (conceptually) Use senses in hands-on exploration — soil, seeds, water, natural materials Use scientific vocabulary linked to stories — e.g. "growing", "melting", "hatching" Explore patterns — ABAB sequences, visual patterns in nature and stories Combine shapes to make new ones — bridges, arches, squares Use tools effectively — pencils, scissors,	Observe seasonal change — weather, plants, animals, nature Plant seeds and care for growing plants — understand the life cycle of a plant Explore the life cycle of animals — caterpillars, lambs, farm animals Use senses in hands-on exploration — soil, seeds, fruit, textures Use scientific vocabulary linked to stories — e.g. "growing", "roots", "sunlight", "fruit" Explore textures — natural materials, food, soil, leaves Use tools effectively — pencils, scissors, gardening tools Develop own designs and select materials — link to planting and	Explore under the sea environments — link to *Tiddler*, *Commotion in the Ocean*, *Stanley the Fish with Fingers* Use scientific vocabulary — "float", "sink", "wave", "shell", "scale", "tentacle" Talk about caring for the natural world — link to *Clean Up* and beach environments Use senses to explore natural materials — sand, water, shells, stones Solve real-world problems — e.g. more/fewer, patterns, shapes in nature Create and extend patterns — link to pirate maps, sea creatures, treasure designs Use tools effectively — pencils, scissors, drawing tools	Autumn texts: Leaf Man, Goodbye Summer, Hello Autumn, Pattan's Pumpkin – seasonal changes Science link: body parts and senses – naming and labelling Colour mixing and self-portraits – observation and scientific thinking Exploring movement and obstacle courses – physical development and body awareness	Light and dark exploration — torches, lamps, shadows, and brightness Shadow puppets and seasonal change — linking to science and observation Art inspired by light (e.g. stained glass, fireworks, Starry Night) Winter texts (Stickman, Winter Sleep, The Snowflake) — seasonal understanding Space and opposites — scientific vocabulary and conceptual thinking	Explore seasonal change: *Goodbye Winter, Hello Spring*, *Tadpole's Promise*. Use natural materials to build 3D maps and small world forests. Investigate dough changes — baking, texture, smell, taste. Explore woodland animals (e.g. wolves) and their habitats.	Explore senses and superhero powers (sight, hearing, strength). Investigate healthy eating and dental hygiene (Dr Dog, brushing teeth). Explore materials and forces through superhero obstacle courses. Continue seasonal change texts and observations (*One Springy Day*, *Crunching Munching Caterpillar*).	Investigate seeds and plant growth — observation, prediction, and scientific vocabulary Explore plant needs and environments (e.g. cacti vs. beans) Use sensory stations and transient art to explore textures and patterns Link to seasonal change: *Hello Summer, Goodbye Spring*	Explore floating and sinking — lifeguard float design Investigate water movement — watering cans, parachute waves Explore marine life (*One Tiny Turtle*, *The Snail and the Whale*) Use sensory trays and materials to explore textures and sounds of the sea Link to seasonal change and weather patterns	Children will: Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps; - Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class; - Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.

Make comparisons — size, length, weight, capacity Use shapes for building — explore properties like flat sides for stacking Spot and talk about patterns — e.g. stripes on scarves Develop gross motor skills — bikes, scooters, movement play Explore mark making — link to outdoor play and natural materials	gingerbread buttons Describe routes and locations — e.g. "The Gingerbread Man ran past the river" Experiment with movement styles — crawling through tunnels, navigating festive obstacle courses Explore materials and textures — e.g. ice, snow, glitter, dough	Explore colour mixing with intent — primary colours, jungle palettes Make comparisons — size, height, length, capacity, quantity Recognise and represent 3 in different ways — manipulatives, visual patterns Begin to understand natural habitats — forest, jungle, savannah Talk about animals and their environments — link to *The Bear*, *Cuddly Dudley*, *Little Polar Bear*	joining materials Develop own designs and select materials — link to habitats and environments Use movement styles to match situations — crawling, climbing, balancing Recognise and represent numbers to 5 — finger numbers, manipulatives Explore zoo animals — describe features, habitats, and needs Talk about footprints — link to animals, dinosaurs, and tracking	farm environments Use movement styles to match situations — balancing, crawling, climbing Recognise and represent numbers to 5 — finger numbers, manipulatives Subitise up to 3 objects — e.g. seeds, fruit pieces, animals Compare 2D and 3D shapes — informal vocabulary like "round", "flat", "straight" Create and extend ABAB patterns — link to planting rows, fruit kebabs, animal markings	for detailed pictures Express ideas through materials — collage, drawing, model-making Explore movement styles — crawling, balancing, swimming motions in play Sequence events and retell stories — link to journeys, treasure hunts, sea adventures							
Begins to make sense of their own life-story and family history	Develop positive attitudes about the difference between people. Know that there are different countries in the world and talk about the difference they have	Shows interest in different occupations Talk about the difference between materials and changes they notice.	Understands key features of the life cycle of a plant and an animal.	Explores how things work Explore and talk about different forces they can feel	Plant seeds and care for growing plants. Begin to understand the need to respect and care for the natural environment and living things.	Talks about members of their immediate family and community. Name and describe people who are familiar to them. Comment on images of familiar	Draw information from a simple map. Recognise that people have different beliefs and celebrate special times in different ways. Recognise some similarities and	Observe and interact with natural processes.	Explore the natural world around them and make observations – oral and drawings of what they see.	Compare and contrast characters from stories, including figures form the past. Observe and interact with natural processes.	Explore the natural world around them. Recognise some environments are different to the one in which they live.	

	experiences or seen in photos.					situation in the past.	difference between life in this country and life in other countries.					

Key Stage 1	
Y1	
Autumn 1	**Materials** **<u>Key Learning</u>** **Material Properties – Everyday Materials** All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. **Pupils Might Work Scientifically** • By **performing simple tests** to **explore questions**, for example, what is the best material for: - an umbrella? - lining a dog basket? **Key questions** • Can you describe it? • What does it feel like? What does it look like? What can it do? • What is it made from? • What is the best material for…? **Lesson sequence to deliver the objectives:** 1. Identify different materials 2. Explore properties of materials 3. Compare materials based on their properties 4. Perform simple tests to explore: 'What is the best material for a dog's bed?'

	5. Recognise the suitability of materials for specific purposes 6. Review learning about materials **Key vocabulary** • Common material names: metal, plastic, wood, paper, glass, clay, rock, brick, fabric, sand, papers, cork, shell, water, elastic, foil, etc. • Words used to describe materials and their properties: hard/soft, rough/smooth, shiny/dull, bendy/not bendy, stretchy/stiff, waterproof/not waterproof, absorbent/not absorbent, magnetic, transparent, opaque, float, wet, squashy, strong, etc. • Words and phrases for making comparisons: the same as, different from, harder, smoother, stretchiest, roughest, etc. • Working scientifically vocabulary: group, sort, sorting rings, describe, compare, because, etc. • Some children may also need some support in naming some objects and knowing the difference between an object and the material it is made from. Words/nouns such as cup, table, desk, door, etc. might also be displayed as children mention them.
Autumn 2	**Seasonal Change – Autumn - Winter** **Key Learning** In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people **Pupils Might Work Scientifically** • By making tables and charts about the weather. • By making displays of what happens in the world around them, including day length, as the seasons change. **Lesson sequence to deliver the objectives:** 1. To describe how things change between summer and autumn 2. Autumn Walk -Observe seasonal change in local area 3. To describe how things change between autumn and winter 4. Observe and describe weather associated with the seasons – wind 5. Observe and describe weather associated with the seasons – rain 6. To identify differences between the four seasons. Key Vocabulary weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length

Spring 1	**Plants: Common Names and Basic Structure** **Key Learning** Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. **Pupils Might Work Scientifically** • By observing closely, perhaps using magnifying glasses. • By comparing and contrasting familiar plants. • By describing how they were able to identify and group them. • By drawing diagrams showing the parts of different plants including trees. • By keeping records of how plants have changed over time, for example the leaves falling off trees and buds opening. • By comparing and contrasting what they have found out about different plants. **Key questions** • How do plants change? • Is it a plant? How do we know? • Can we name the different parts of a plant? • Are all plants the same? • Is a tree a plant? • How many different plants can we find/name? • Are all leaves the same? • Can you draw a leaf? • Are leaves always green? • Which parts of a plant can we eat? • Is it a fruit or a vegetable? • Are all roots the same? • How many colours can you find in nature?

	Plants: Common Names and Basic Structure **1. To plant a bean and make observations (Discuss basic needs of plants)** **2. To know some names of wild plants and begin to recognise them.** **3. To know some names of common garden flowering plants and be able to recognise them.** **4. To identify deciduous and evergreen trees.** **5. To identify and describe the basic structure of a plant** **6. To identify and describe the basic structure of a tree** **Key vocabulary** • Labelling features: plant, seedling, tree, leaf, flower, blossom, petals, fruit, root, bulb, seed, stem, branch, twig, trunk. • Common names for plants: daisy, dandelion, oak tree, etc. • Categories of plants: deciduous, evergreen, wild plant, indoor plant, herb, weed, vegetable/fruit/salad crop, etc. • Words related to working scientifically: compare (same, different), observe, describe, record, group, name/identify, change.
Spring 2	**Seasonal Change – Ongoing -** **Key Learning** In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people **Pupils Might Work Scientifically** • By making tables and charts about the weather. • By making displays of what happens in the world around them, including day length, as the seasons change. **Lesson sequence to deliver the objectives:** 7. To describe how things change between Winter and Spring 8. Summer Walk -Observe seasonal change in local area 9. To describe how things change between Spring and Summer 10. Observe and describe weather associated with the seasons – wind 11. Observe and describe weather associated with the seasons – rain 12. To identify differences between the four seasons.

	Key Vocabulary weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length
Summer 1	**Animals including Humans -** Classification; animal families **<u>Key Learning</u>** **Animals - Other Animals** Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. **Pupils might work scientifically by using their observations** • To compare and contrast animals at first hand or through videos and photographs. • To describe how they identify and group them. • To group animals according to what they eat. • To use their senses. **Key questions** • How do we know they are animals? • What makes an animal an animal? What features do animals have? (head, body/body parts, body covering, way of moving, senses, number of legs, wings, etc.) • What things are similar between two different animals? • All animals are the same? True or false? • How do animals move? • What if animals couldn't move around? • Can you invent an animal? • What is its head and body like? How does it move? What is it covered with? Does it have a tail? Which 'super sense' does it have? **Lesson sequence to deliver the objectives:** 1. Identify and name common animals 2. Identify and describe animal structures and their functions 3. Classify animals into groups (mammals, birds, reptiles, etc.) 4. Explain what herbivores, carnivores, and omnivores are 5. Group animals by their diets and where they live 6. Review and consolidate learning on animals

	Key vocabulary • Parts of the body for animals: head, leg, body, beak, wing, senses (eyes, ears, nose, mouth/mouth parts, hands/paws/claws/talons), etc. • Features linked to movement: fly, swim, crawl, run, climb, etc. • Features linked to body covering: feathers, fur, scales, colour, camouflage, etc. • Common animal types: mammal, bird, fish, amphibians, reptiles, etc. • Comparative language: tall/taller/tallest, long/longer/longest, similar to, different from, etc. • Describe, observe, compare, because. • Expressions making generalisations, e.g. 'most have…'
Summer 2	**Humans and the Senses** **Key Learning** **Animals - Humans** Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body **Pupils Might Work Scientifically** • By using their observations to **compare and contrast** animals (humans) at first hand or through videos and photographs. • By **using their senses** to **compare** different textures, sounds and smells. **Key questions** • What is my body like? What is my body made up of? • Are all humans the same? • Are humans animals? • Are we the same as other animals? • How does my body find out about its surroundings? • How good is our sense of taste? • How good is our sense of smell? **Lesson sequence to deliver the objectives:** 1. To identify and name the basic parts of the human body. 2. To draw and label the basic parts of the human body. 3. To understand the five senses and which part of the body is associated with each sense. 4. To explore how the senses help us interact with the world. 5. To describe the function of each part of the body related to senses.

6. Review learning

Key vocabulary

- Words linking to the senses, e.g. sense, eye, sight, see/seeing, ear, hear/hearing, nose, smell/smelling, skin, feel, touch/touching, taste/tasting and words associated with describing sounds (e.g. loud/quiet, high/low) and light (e.g. sunlight, bright/dim).
- Parts of the body for humans, e.g. body, head, neck, arms, legs, face, ears, eyes, nose, hair, mouth, (could also include; hands, wrists, elbows, fingers, nails, feet, toes, knees, thigh, ankles, calf, eyebrows, eyelashes, teeth, tongue, lips, hips, waist, chest, shoulders, back, etc.)
- Comparative language, e.g. tall/taller/tallest, long/longer/longest, similar to, different from, etc.
- Describe, observe, notice, compare.

Expressions making generalisations e.g. 'we all...'

Y2

Living Things and Habitats

<u>Key Learning</u>

Living Things and Their Habitats

All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.)

An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).

Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.

Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.

Pupils Might Work Scientifically

- By **sorting and classifying** things as to whether they are living, dead or were never alive.
- By **recording** their findings using charts.
- By **describing** how they decided where to place things.

- By **exploring questions** such as: 'Is a flame alive? Is a deciduous tree dead in winter?' By **talking about ways of answering their questions**.
- By **constructing a simple food chain** that includes humans (e.g. grass, cow, human).
- By **describing** the conditions in different habitats and micro-habitats (under log, on stony path, under bushes).
- By **finding out how** the conditions **affect** the number and type(s) of plants and animals that live there.
- By **observing, through video or first-hand observation** and **measurement**, how different animals grow.
- By **asking questions** about what things animals need for survival **suggesting ways to find answers to their questions**.
- By **describing** the main changes as young animal offspring grow into adults (at least: between egg and adult bird; between egg and adult insect; between baby and adult mammal).

Key questions

- Is it an animal? How do you know?
- Are all animals the same?
- Which animals live in our school grounds/locality? Where is the best place to find them? Why do you think they live there? How many different types can we find? How does this change through the year?
- Which plants live in our school grounds/locality? How many different types can we find? How does this change through the year?
- Is it alive? What do animals need to stay alive?
- What if tigers lived in our locality?
- What if x were as big as y?
- What eats what?
- What if x ate y?

Lesson sequence to deliver the objectives:

1. To explore and compare the differences between things that are living, dead, and things that have never been alive.
2. To identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
3. To identify and name a variety of plants and animals in their habitats, including micro-habitats.
4. To 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.
5. To understand that different kinds of plants and animals live in different places.

	Pupils to investigate the different kinds of habitat near school that need to be cared for 6. To understand that habitats provide the preferred conditions for the animals/plants that live there. Pupils to compare local habitats and less familiar examples. Over time: Pupils to observe living things in their habitats during different seasonal changes (on-going over time). **Key vocabulary** • Animals, plants, habitat / micro-habitat, living / dead / never been alive, suited to, survive, basic needs, food chain, seashore, ocean, woodland, rainforest. • Expressions to describe location e.g. within, under, next. • Comparative phrases: smaller than, larger than, longer than, shorter than, more…, long, longer, longest, small, smaller, smallest, similar to, different from. • Expressions making generalisations e.g. 'most have...'
Autumn 2	**Animals including Humans -** **Key Learning** Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses **Pupils Might Work Scientifically** • By observing, through video or first-hand observation and measurement, how humans grow. • By recording their findings using charts. • By asking questions about what things animals [humans] need for survival and what humans need to stay healthy. • By suggesting ways to find answers to their questions. **Key Vocabulary:** • Survival, basic need (food, water, air), oxygen, carbon dioxide

	• Nutrition, balanced diet (carbohydrates, proteins, fats and oils, minerals, vitamins, fibre and water) • Growth, hygiene, medicine • Investigate, describe, differences, observe **Lesson sequence to deliver the objectives:** 1. What do humans need to do to stay healthy? 2. What do humans and animals need to survive? 3. What is a balanced diet? How do humans get a balanced diet? 4. Investigating the amount of sugar in our food. 5. Why is exercise important? Investigating the effect of exercise on our bodies. 6. Life cycles of humans and animals.
Spring 1	**Plants** **<u>Key Learning</u>** Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. **Pupils Might Work Scientifically** • By **observing** and **recording**, with some accuracy, the growth of a variety of plants as they **change over time** from a seed or bulb. • By **observing** similar plants at **different stages** of growth. • By **setting up a comparative test** to show that plants need light and water to stay healthy. • By **observing, through video or first-hand observation** and **measurement**, how humans grow. • By **recording** their findings using charts. • By **asking questions** about what humans need to stay healthy. • By **suggesting ways to find answers to their questions**. **Key questions** • How do plants grow?

	• Where do seeds come from (i.e. inside a fruit)? • Which part of the plant grows from the seed first? • How do we keep plants healthy? • What do plants need to grow healthily? • What can we ask a garden expert? **Key vocabulary** • Words and phrases for making comparisons: e.g. tall/taller/tallest, long/longer/longest, like, similar to, different from, etc. • Labelling features: root, stem, leaf, flower, seeds, seedlings, plants, branch, twig, trunk, and weed. • Names for plants e.g. daisy, dandelion, oak tree. • Words and phrases relating to living and non-living things and life processes e.g. living, non-living, alive, not alive, dead, healthy, produce new plants, grow. Compare, describe, because. **Lesson sequence to deliver the objectives:** 1. To observe and describe how seeds and bulbs grow into mature plants. (Plants grow from seeds or bulbs, then germinate and grow into seedlings which continue to grow into mature plants. These mature plants may have flowers which develop into seeds, berries, fruits etc) 2. To identify what plants need to stay alive (water, light and a suitable temperature to grow and stay healthy) 3. Investigation- What happens if we change the water, light and temperature? *How will this affect the plant?* 4. Pupils plant seeds, which they will look after as they grow. Pupils to make regular observations and measurements of their plants growing from seeds and bulbs over the half term. Pupils to make comparisons between plants as they grow 5. To understand that some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. 6. To understand that plants are living and eventually die.
Summer 1	**Materials - Uses of Every day Materials** **<u>Key Learning</u>** All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials.

Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.

Pupils Might Work Scientifically

- By **comparing** the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs).
- By **observing closely**.
- By **identifying and classifying** the uses of different material.
- By **recording their observations**.
- By **thinking about** unusual and creative uses for everyday materials.

Key questions

- What is it made of?
- Is it useful?
- What properties does it have?
- What can it be used for?
- Where do different materials come from?

Lesson sequence to deliver the objectives:

1. To recognise that a material may come in different forms which have different properties
2. To sort, group and classify a variety of everyday materials (wood, metal, plastic, glass, brick, water, rock, paper and cardboard), sorting them into a range of properties.
3. To compare the suitability of a variety of everyday materials for particular uses.
4. Investigation: To test the properties of a certain materials for a particular uses e.g. test materials for waterproofness to select the most appropriate material for a coat (children to decide).
5. To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (applying a force).
6. To understand that some materials can be found naturally; others have to be made.

	Key vocabulary • Common materials: **metal, plastic, wood, paper, glass**, **rock**, clay, brick, fabric, sand, paper, card/cardboard, **water**, elastic, foil, cork, shell, rubber, etc. • Words used to describe materials and their properties recapped from Year One e.g. **hard/soft**, **rough/smooth**, **shiny/dull**, **stretchy**/not stretchy, **flexible**/bendy/not bendy/stiff/rigid, **waterproof**/not waterproof, **absorbent**/not absorbent, magnetic, transparent, opaque, translucent, float, wet, squashy, strong/breaks easily, wobbly, sticky, uncomfortable etc. • Words associated with changing shape: push/pushing, pull/pulling, **stretch**/stretching, **squash**/squashing, squeeze/squeezing, **twist**/twisting, **bend**/bending, pinch/pinching, poke/poking, roll/rolling. • Words and phrases such as: **use/useful**, **object**, **property**, properties of materials, **suitable/unsuitable**. • Words and phrases for making comparisons e.g. the same as, different from, harder, smoother, stretchiest, roughest, etc. • Group, sort, sorting rings/Venn diagrams, describe, compare, because.
Key Stage 2	
Year 3	
Autumn 1	**Light and Shadow** **Key Learning** We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. **Pupils Might Work Scientifically** • By looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. **Key questions** • What are shadows?

	• How are shadows formed? • Can shadows change? • Where will the shadow be? • What will the shadow be like? • How does light travel? • How do mirrors work? / What can mirrors do? **Key vocabulary** • See, seen, light, light source, eyes, travel, torch, shadow, opaque, transparent, translucent, block, reflect, reflection, reflective, mirror, direction, light travels, straight lines. • Comparisons e.g. shortest, highest, furthest, closest. • Words which have different meanings in other contexts e.g. test, fair, conclude. Lesson sequence to deliver the objectives: 1. Recognise that they need light in order to see things and that dark is the absence of light. Explore natural and artificial light sources. 2. Notice that light is reflected from surfaces. 3. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Ways to stay safe in the sun. 4. Recognise that shadows are formed when the light from a light source is locked by a solid object. 5. Explore materials which make a darker and clearer shadow (opaque, translucent and transparent materials). 6. Find patterns in the way that size of a shadow can chance.
Autumn 2	**Animals including Humans- Nutrition** **Key Learning** Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. **Pupils Might Work Scientifically** • By comparing and contrasting the diets of different animals (including their pets). • By deciding ways of grouping them according to what they eat. • By researching different food groups and how they keep us healthy. • By designing meals based on what they find out. **Key questions** • How do we keep healthy? • Why is it important to keep healthy? • What choices can we make for a healthy lifestyle?

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How can we group the type of foods we eat?
How do the different food groups help to keep us healthy?
What are the diets of different animal like?
Can you design a healthy meal/menu?

Key vocabulary
Food/feed/feeding, growth, activity, healthy, unhealthy, nutrition, exercise, choice, balanced diet, lifestyle, adequate and varied diet, the right types and amount of nutrients. Food groups: vegetables, meat, fish, sugars and starches, fruit, fats etc. Words which have different meanings in other contexts: diet, activity, evidence, conclusion etc.
Lesson sequence to deliver the objectives:

Identify that animals, including humans, need the right types and amount of nutrition and that they cannot make their own food. Know the food groups.
An adequate and varied diet is beneficial to health. Understand a meal using the Eat Well Plate and proportions in which we eat.
Design a healthy meal.
Compare the diets of animals including pets.
Compare the amount of sugar in a variety of drinks and the effects of sugar on our teeth (oral hygiene)
Regular and varied exercise from a variety of activities is beneficial to health (focus on energy in versus energy out – looking at calories).

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<tr><td>Spring 1</td><td>
<h2>Rocks</h2>
<u>Key Learning</u>

Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.

Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.

Pupils Might Work Scientifically

By observing rocks and exploring how and why they might have changed over time.
By using a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.
By researching and discussing the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.
By exploring different soils and identifying similarities and differences between them and investigating what happens when rocks are rubbed together [hardness test] or what changes occur when they are in water [permeability test].
By raising and answering questions about the way soils are formed.

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	Key questions • What is rock? • How can rocks be different? • What are rocks used for? • How can we test rocks/compare rocks? • How hard is your rock? • Does it float? • Does it allow water in? Is it permeable? • What happens if you put an acid on your rock? • How do rocks change over time? • What are fossils? • How are fossils formed? • What can fossils tell us about the past? • What is soil made up of? • How is soil formed? **Key vocabulary** • Words describing rocks e.g. rock, stone, pebble, slate, marble, chalk, granite, sand, sandstone, hard, texture, grains, crystals, contains fossils, bits pressed together, sedimentary. • Words describing soils e.g. darker, lighter, organic matter, leaf litter, grains, clay, sandy, grains. • Rub together, break apart/break up, permeable, non-permeable, acid rain, weathering, and erosion. • Comparison/compare, description/describe. • Words which have different meanings in other contexts e.g. test, fair, conclude. **Lesson sequence to deliver the objectives:** 1. Know and understand the 3 types of rock – sedimentary, igneous and metamorphic. 2. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. 3. Describe in simple terms how fossils are formed when things have lived are trapped within rock. 4. Recognise that soils are made from rocks and organic matter. 5. Rocks and soils can feel and look different. 6. Rocks and soils can be different in different place/environments.
Spring 2	**Plants** **<u>Key Knowledge</u>**

Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.

Pupils Might Work Scientifically

- By **comparing** the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser.
- By **observing** the different stages of plant cycles over a period of time.
- By **looking for patterns** in the structure of fruits that relate to how the seeds are dispersed.
- By **observing** how water is transported in plants, for example, by putting cut, white carnations into coloured water.
- By **observing** how water travels up the stem to the flowers.

Key questions

- What makes a plant a plant? (Considering the features of plants).
- What does each feature do to help the plant survive, grow and reproduce?
- What do plants need to grow healthily?
- Do seeds need soil to grow?
- Do plants need soil to grow healthily?
- How much water should we give plants? How long can they last without water?
- Where is the best location to keep our plants? Does a greenhouse help?
- Why do plants need leaves? What happens if we remove all the leaves from a plant?
- Why are plants important?
- What if all plants died out?
- How do plants produce new plants?
- How do plants help their seeds to spread?
- What are pollinators and how do they help plants?
- How do plants change as they grow?

Key vocabulary

- Role, part/structure, flowering plant, root / roots, leaf / leaves, stem / stalk / trunk / branch, flowers, blossom, petal, pollen, transfer, pollination, seed formation, seed, bulb, fruit, berry, seed dispersal (explosion, wind, water, animal), transported, insects / birds / animals.
- Life cycle, grow / growth, reproduce, air, light (dark / light), water (damp / wet / dry), nutrients, soil, room to grow, fertiliser, volume (liquids), temperature (hot / warm / cool / cold).

	• Words to describe physical characteristics of plants e.g. yellow, pale, thin, spindly, healthy, features representing good growth. **Lesson sequence to deliver the objectives:** 1. What makes a plant a plant? Identify, locate and describe the functions of different parts of flowering plants; roots, stem/trunk, leaves and flowers. 2. Explore the different factors on plant growth and observing the stages of plant cycles over a period of time. 3. How do plants live? 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. 4. Investigate the way in which water is transported within plants. 5. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 6. Seed dispersal, by a variety of methods, helps ensure that new plants survive.
Summer 1	**Forces and Magnets** **<u>Key Learning</u>** A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract **Pupils Might Work Scientifically** • By comparing how different things move and grouping them. • By raising questions and carrying out tests to find out how far things move on different surfaces. • By gathering and recording data to find answers to their questions. • By exploring the strengths of different magnets and finding a fair way to compare them. • By sorting materials into those that are magnetic and those that are not. • By looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another. • By identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. **Key questions** • What materials are attracted to magnets? • When and where are magnets useful? • How strong are magnets? • Are all magnets the same strength? • Will a magnet attract plastic covered paperclips?

	• What if everything was magnetic? • How can we make objects move? • How can we stop things moving? • How can we change the movement? • How can we slow down a moving object? • Do different surfaces make a difference? • What if we could only push but not pull? **Key vocabulary** • Move, movement: fly, bounce, slide, spin, roll, swirl, swing, forward, backward, upwards, downwards, faster, slower, accelerate, decelerate, ramp, incline. • Push, pull, squeeze, springy, attract, repel, magnetic, non-magnetic, attraction, repulsion, names of common metals (e.g. iron, copper, aluminium), poles, horseshoe magnet, bar magnet, ring magnet, button magnet. • Stronger / weaker, best / worse. **Lesson sequence to deliver the objectives:** 1. Compare how some things move on different surfaces. 2. Notice that some forces need contact between two objects but magnetic forces can act at a distance. 3. Observe how magnets attract or repel each other and attract some materials but not others. 4. Compare and group together a variety of everyday materials on the bases of whether they are attracted to a magnet and identify some magnetic materials. 5. Describe magnets as having two poles (north and South Pole) – like and unlike poles. 6. Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Summer 2	**Animals including Humans – Skeletons and Movement** **Key Learning** Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. **Pupils Might Work Scientifically** • By **identifying** and **grouping** animals with and without skeletons. • By **observing** and **comparing** their movement; **exploring** ideas about what would happen if humans did not have skeletons. • The learning within this unit links to aspects of PE and health, e.g. • **Researching** how our bodies move and what our bodies can do and researching different exercises/sports/pastimes and how they can work different parts of our bodies and different muscle groups. **Key questions** • What if our skeleton stayed the same size for our entire life but the rest of our body grew?

	• PMI (plus, minus, interesting) – Skeletons were made of jelly. • What if humans didn't have a skeleton? • What if humans didn't have a skeleton? • Do all animals have a skeleton? • Which are the most important bones in our body and why? • Does our skeleton grow the older we get? How do we know? • How does our skeleton help with movement? • Why do we have muscles and how do they work? • Do we all grow at the same rate? • Is our body in proportion? **Key vocabulary** • Words relating to skeletons and muscles e.g. bones, skeleton, muscle(s), ribs, backbone/spine, vertebra, skull, joints, sockets. • Features of skeletons: movement, support, protection (organs). • Animal groups: vertebrates and invertebrates, insects, mini-beasts, mammals, reptiles, fish, birds, amphibians **Lesson sequence to deliver the objectives:** 1. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 2. Identify animals (vertebrates) which have a skeleton which supports their body, aids movement and protects vital organs (be able to name some vital organs). Recognise that animals are alive, they move, feed, grow, use their sense and reproduce. 3. Identify animals without internal skeletons/backbones (invertebrates) and describe how they have adapted other ways to support themselves, move and protect their vital organs. 4. Know how the skeletons of birds, mammals, fish, amphibians or reptiles are similar and difference. 5. Know that muscles, which are attached to the skeleton, help animals move parts of their body. 6. Explore how humans grow bigger as they reach maturity by making comparisons linked to body proportions and skeleton growth.
Year 4	
Autumn 1	**Electricity** **Key Learning** Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.

	Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity. **Pupils Might Work Scientifically** • Observing patterns (e.g. More cells = brighter bulbs, metal = conductors) **Key vocabulary** Components, cell (battery), wire, bulb, bulb holder, buzzer, motor, switch (open/closed), circuit, electrical conductor, electrical insulator, connection, component, break, devices, appliances, mains electricity, safety **Key questions** • What do we use electricity for? • What if we had no electricity? / Could we survive without electricity? • Why can electricity be dangerous? • How can we make a light bulb work? • Can you make a simple switch to turn a light on and off? • Are all switches the same? • Can we design different switches for different purposes? • What materials allow electricity to flow through them? • Why should we try not to waste electricity? • Can you design a circuit for a particular purpose? • Why does this circuit not work? **Lessons** **1.** Electrical Safety - Mains v Battery powered classification & Dangers of Electricity **2.** Light the Bulb – First hands on experience of circuits (Children to attempt to create circuits with appropriate components) **3.** Little Electricians – Children given the challenge of fixing circuits that do not work and explaining what the problem was. **4.** Conductors and Insulators – Explore search given objects and others they can find around the room. Can they be used as a *switch*. Create own definition for the terms conductor and insulator, decide what makes a good conductor, predict whether or not an object could conduct electricity **5.** Switches – Use knowledge of conductors to create working switches DT – Create a board game using knowledge of circuits.
Autumn 2	**Living things and their habitats**

	Key Learning Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year **Key vocabulary** • life processes - nutrition, habitats, feeding. • Relationships: environment, habitat, condition, organism, carnivore, herbivore, omnivore, predator, prey, producer, consumer, food chain, key, classify, classification key, positive human impact, negative human impact. • Words which have a different meaning in other contexts: producer, consumer, key, condition. • Vertebrates and invertebrates: insects, minibeasts, mammals, reptiles, fish, birds, amphibians. **<u>Lessons</u>** 1. Bug Hunt – How many different things live in our school environment? (inc scientific photography) Forrest school 2. Classify: What is a minibeast?, Introducing classification keys 3. Introduction to food chains **4.** Science investigation Pattern seeking - provide an opportunity for children to practice their planning and testing skills using mini beasts and the observations made in the previous weeks.
Spring 1	**Animals including Humans - Teeth and Digestion** **Key Learning** Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.

	Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). **Pupils Might Work Scientifically** • **Comparing** teeth of carnivores and herbivores • **Suggesting** reasons for differences. • **Finding** out what damages teeth and how to look after them. • **Drawing and discussing** their ideas about the digestive system and comparing them with models or images **Key questions** • Why do we have teeth? • What do the teeth do? • How many teeth do we have? Is it the same for everyone? • Why do we lose teeth? • How can we care for our teeth and gums? • What are the teeth like of other animals? • How does this give us information about what they eat? • How are the teeth of carnivores and herbivores similar or different? Why? • What happens to our food once it enters our mouths? • What happens in our bodies between eating our food and going to the toilet? **Vocabulary** Molar, Incisor, Canine, Enamel, Decay, Digestion, Mouth, Oesophagus, Stomach, Small Intestine, Large Intestine, Faeces, Producer, prey, Predator **Lessons** 1. Human Teeth – Explore the different types of teeth we have and explore their differing uses. 2. Caring for teeth – Explore the effect of acid on our teeth (Test enamel using an Egg) 3. Caring for teeth- Create our own toothpaste 4. Digestion and the digestive system – Create a model of the Human digestive system 5. Teeth of animals – Compare the teeth of animals to that of humans. - Why do animals have different types of teeth? Food Chains – Interpret different food chains and identify producers, predators and prey.
Spring 2	**States of Matter** **Key Learning** A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because

they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.

Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.

Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.

Pupils Might Work Scientifically

- By grouping and classifying a variety of different materials.
- By exploring the effect of temperature on water and ice.
- By observing and recording evaporation over a period of time, such as a puddle in the playground or washing on a line..

Key vocabulary

Solid, liquid, gas, property, change, temperature, change state, heated, cooled, temperature, degrees Celsius, water cycle, Condensation/condense, evaporation/evaporate, melting/melt, freezing/freeze, solidification/solidity, boiling temperature, Particle, air, carbon dioxide, oxygen, helium, natural gas, viscosity, States of matter.

Key questions

- Is it solid, liquid or gas?
- How do we know?
- What features do they each have?
- What would it be like if you could shrink and go inside a solid, liquid or gas?
- Are all solids the same?
- Are all liquids the same?
- Are all liquids colourless?
- What happens if a liquid is placed into a different container?
- What happens if you tilt a container that a liquid is in?

	• Can you spill a solid? • Are all gases the same? • How do we smell things? • How can we change water into a solid, liquid and a gas? Can you change it back again? • How hot or cold is it? How do you know? How can you measure it? • What happens if you change the temperature? • Where does all the rain come from? Where does all the rain go? • What happens when you heat water? • How are clouds formed? • How do humans affect the water cycle? • What is global warming and how is it affecting water around the world? • How can we reduce our carbon footprint? / How can we save energy? **lessons** 1. What is a solid – Cornflour slime (Non Newtonian fluids) Defining different states of matter 2. Freezing and melting – Observe how what happens to a block of ice over time. Can we make changes which affects the change? 3. Evaporation and condensation – What happens when we heat water (recording change – scientific predictions) Create a puddle outside in the morning (Sunny day) Take pictures describe what happens over the day. Use of thermometer 4. Practical Investigation - Do all liquids act the same? Child led investigation based on the work we have done 5. Modelling – Understand the water cycle and create mini water cycles 6. Global warming and the water cycle. Research the effects of global warming.
Summer 1	**Sound** **Key Learning** A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds

Pupils Might Work Scientifically

- By finding **patterns** in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.
- By making ear muffs from a variety of different materials to investigate which provides the best insulation against sound.

Key questions

- How can we describe sounds?
- What is the difference between sound and noise?
- How do we hear sounds?
- What happens to a sound the further we get from the source?
- How are sounds created?
- How do sounds travel?
- How can sounds be changed?
- How can we block or muffle sounds?
- What if there were no sounds?
- What if we didn't have ears?
- What if all sounds were noisy or all sounds were quiet?

Key Vocabulary

Sound, source, quiet, soft, noise, vibrate, vibration, travel, loudness, volume, loud/quiet, faint / fainter, pitch, high/low, muffle, tuning, tension, tight, air, air column, instrument (strings, brass, woodwind, percussion).

Lessons

1. What is sound – Children to discuss, compare and classify ways in which we can make sound. First-hand experience of different instruments to discuss which part is vibrating and what changes can be made to the sound.
2. Ears and Hearing – Can we identify where a sound is coming from? What happens when we move further away from a sound? Test ear cones – do bigger cones help us hear more easily?
3. Vibrations – Associate sound with vibration – observe rice on a drum, using balloons to create visual vibrations.
4. Loudness – Associate loudness with the strength of the vibrations. Pluck a string instrument, bang drums harder and more gently; observe differences.
5. Pitch – Investigate how pitch can be changed using glass bottle xylophone, Straw oboe
6. Muffling sounds - What is the best material for sound proof ear muffs? Children to investigate different materials to decide which would be best.

Year 5

Autumn 1	**Earth and Space** **Key Learning** **Light and Astronomy** The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical. **Pupils Might Work Scientifically** • By comparing the time of day at different places on the Earth through internet links and direct communication. • By creating simple models of the solar system. • By constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day. • Evaluating the validity of scientific hypothesis and evidence regarding the shape of the Earth. • Explaining and demonstrating the apparent movement of the sun across the sky. • Explaining and demonstrate how night and day are created. • Explaining and demonstrating how the seasons are created. **Key questions** • What do we know about the Earth, Sun and Moon? • How do the Earth, Sun and Moon fit within our solar system? • How do we get day and night? • What do we know about the shape and movement of the Earth? • Why does the Moon appear to change shape? • How do shadows, created by the Sun, change during a day? • How were shadows used in the past to help people tell the time? **Lesson sequence** 1. Naming the 8 planets in the solar system. Describing the Earth and Moon's movement through space. 2. Evaluating the validity of scientific evidence regarding the shape of the Earth. 3. Demonstrating how the Earth's rotation causes the apparent movement of the Sun across the Sky and how night and day are formed. 4. Demonstrating how the Earth being tilted on its axis causes the seasons to form.

	5. Describing the moon and its phases using the terms waxing and waning. 6. Conducting an experiment into the Earth's rotation resulting in the creation of sundials. **Key Vocabulary** Solar System, Orbit, Rotate, Axis, Sphere, Waxing, Waning, Satellite, Sundial, Celestial body, Geocentric model, Heliocentric model Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit
Autumn 2 & Spring 1	**Properties and change of Materials** **Key Learning** Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible. **Pupils Might Work Scientifically** • Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, transparency, thermal conductivity, electrical conductivity). • Carry out tests to answer questions regarding thermal conductivity such as 'Which materials would be the most effective for using as a handle on a saucepan etc. • Carry out tests to answer questions regarding electrical conductivity such as 'Which materials would be the most effective for using as switch in a circuit etc. • Carry out tests to answer questions regarding hardness such as 'Which material would be the most effective for building a squash court? etc. • Carry out tests to answer questions regarding transparency such as 'Which material would be most effective for making blackout curtains?' etc. • Observing changes of materials as a result of subjecting them to heat. Categorising these changes as reversible or irreversible.

- Carry out tests to answer questions regarding solubility such as 'How much of a solute can dissolve in different solvents' etc.
- Conducting investigations to assess how different factors affect the rate of change to materials
- Categorising material changes into reversible or irreversible.
- Reversible changes: freezing, melting, boiling, evaporating, condensing and dissolving.
- Irreversible changes: cooking, reactions caused when some materials are mixed and new materials are created plus burning, rusting.

Key questions

- What materials do we use / need for…? Why?
- How can we categorize materials?
- What are the properties of different materials? Why is this useful to know?
- Is this the best material for the job?
- How can we conduct a fair test?
- Does light pass through all objects equally?
- Does heat pass through all objects equally?
- Does electricity pass through all objects equally?
- How can we keep things warm/cold?
- What is the best insulation material? How are these used in everyday objects?
- Why does a ball bounce higher off of some materials than others?
- What happens if we mix different solids together? Can you get it back?
- What happens if we mix solids and liquids together? Does it dissolve?
- How can I separate a solution? (undissolved / insoluble solids from liquids?) Can you change it back again?
- Can I make it dissolve more quickly?
- Can we always get back what we started with?
- What happens when we burn things?
- What happens when we cook things?
- Why do some things rust?

Lesson sequence

1. Categorizing materials based on their properties.

	2. Carousel of investigations into the hardness, transparency or magnetism of a variety of materials. 3. Conduct an investigation into the conductivity (thermal and electrical) of a variety of materials. 4. Solids, liquids and gasses and their molecular make up. Separating solids from solids via sieving and solids from liquids via filtering. 5. Dissolving solids into liquids creating solutions. Investigating whether all solutes dissolve in all solvents. 6. Retrieving the solute from the solvent by separating the solid and liquid via evaporating. 7. Factors affecting change – how can we make a solute dissolve more quickly? 8. Irreversible change – cooking, burning or rusting. 9. Categorising change, reversible/irreversible **Key Vocabulary** Properties, Hardness ,Absorb, Resistant, Transparency, Translucent, Opaque, Thermal Conductor, Electrical Conductor, Insulator , Magnetic, Repellent, Reversible, Irreversible, Sieve, Filter, Evaporate, Solution, Solute, Solvent, Saturated, Dissolve, Rusting, Melting
Spring 2	**Forces - Motion and Resistance** **Key Learning** A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines. **Pupils Might Work Scientifically** • By exploring how the size and shape of moving objects create different amount of air resistance.

- By designing and making [exploring] a variety of parachutes.
- By carrying out fair tests to determine which designs are the most effective.
- By exploring resistance in water by making and testing boats of different shapes.
- By designing and making [creating/inventing/designing] artefacts that use simple levers, pulleys, gears and/or springs and explore their effects.

Key questions

- What is friction?
- When is friction useful?
- When is friction a disadvantage?
- What if there was no friction?
- How can objects be moved more easily? i.e. reduce the friction (rollers, lubricants, shiny surfaces, wet surfaces)
- How can we slow down a moving object?
- How can you slow down the movement of an object through the air?
- Why does everything fall to the ground when thrown in the air?
- How can you measure a force?
- How can we make a small force have a big effect?
- How do forces affect the movement?
- What are levers and why are they useful?
- What are pulleys and why are they useful?
- How are gears useful?

Lesson sequence

Forces – Ogden Trust unit Gravity, resistance, mechanisms

1. Gravity – Understand unsupported objects will fall towards earth due to gravity
2. Friction Forces – To identify the effects of air resistance, water resistance and gravity
3. Simple Machines – To recognise that mechanisms can allow smaller forces to have a greater effect
4. Slippery shoes enquiry – identify effects of friction
5. Sinking under the sea enquiry – identify the effects of water resistance
6. Moving Machines - To recognise that mechanisms can allow smaller forces to have a greater effect

Key Vocabulary

Force, Weight, Mass, Friction, Air Resistance, Newton, Gravity, Water Resistance, Lever, Pulley, Surface Area, Balanced

Animals including Humans - Human Life Cycles

Key Learning

When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce.

This needs to be taught alongside PSHE & RSE

Pupils Might Work Scientifically

- Researching the gestation periods other animals and comparing them with humans.
- Observing and recording the length and mass of a baby as it grows.
- Observing the growth and development of humans and plotting this on a graph or timeline.

Key questions

- What characteristics do all animals exhibit?
- How long is the human gestation period?
- How does this compare to other mammals?
- What changes occur in the human body during its life cycle?
- How do babies develop into children?
- What changes occur during puberty?

Key Vocabulary

Life Cycle, Gestation, Puberty, Mammal, Movement, Nutrition, Growth, Senses, Reproduce, Respire, Excrete

Lesson sequence

1. Animals – what characteristics do all animals exhibit? Movement, nutrition, growth, use their senses, reproduce, breathe/respire and excrete.
2. Gestation – stages of human gestation, basic development of a foetus, how does this compare to other mammals?
3. Baby Development – how do babies grow during their childhood – weight, height?

	4. Puberty – what changes occur as children grow into adults? 5. Plotting Data – using information gather to plot the development of humans over time
Summer 1	**Living Things and their Habitats** **<u>Key Learning</u>** As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects **Pupils Might Work Scientifically** • Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times). • Suggesting reasons for similarities and differences. • Examining different parts of a plant for example, seeds, stem and root cuttings, tubers, bulbs. • Observing changes in an animal over a period of time. • Comparing how different animals reproduce and grow • Categorizing animals. • Studying the work of famous naturalists e.g. David Attenborough, Jane Goodall **<u>Key questions</u>** • How do plants and animals change over time?

	• What are baby animals like? How are they different in different species? • How can animals be categorised? • What is a life cycle? • How do animal life cycles differ? • Why is the work of naturalists important? • How do plants reproduce? • What changes does a plant go through during its life cycle? • What features does a plant have to aid reproduction? • What is the job of the different reproductive parts of a plant? **Key Vocabulary** Mammal, Amphibian, Reptile, Fertilisation, Asexual, Reproduction, Stigma, Stamen, Style, Sepal, Ovary, Pollinate **Lesson sequence** 1. Plant Reproduction – identify the different reproductive parts of a plant and describe their role. 2. Plant dissection – examine a plant and discover its reproductive parts. 3. Categorise animals – understand that animals can be grouped and how they are grouped i.e. mammals, reptiles, amphibians, insects etc. 4. Understanding how plants and animals can be sited to their environments. 5. Reproduction in animals – understand that reproduction occurs in animals when male sperm fertilises a female egg. 6. Life Cycles – compare life cycles of animals from different categories, e.g. butterfly, frog, heron, kangaroo.
Year 6	
Autumn 1	**Living things and their Habitats – Classification** Key Learning Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot.

	Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. **Pupils Might Work Scientifically** • By **using classification systems and keys**. • By **identifying [grouping and classifying]** some animals and plants in the immediate environment. • By **researching** unfamiliar animals & plants from a broad range of other habitats & decide where they belong in the classification system **[grouping and classifying]**. **Key questions** • How many different animals/plants are there? • How do scientists group these effectively? • Are all plants and animals the same? • How can we use the differences between animals to help us identify them? • What if all the insects/mammals/microbes/birds died out? • Who is Carl Linnaeus and what did he discover/create? **Key vocabulary** Sort, group, identify, classify, environment, suited, classification system, key, habitat, characteristics, features, compare and contrast. **Lesson sequence to deliver the objectives:** 1. Living things can be grouped into micro-organisms, plants and animals. 2. Classify according to similarities and differences, including micro-organisms, plants and animals. 3. Describe how living things are classified into broad groups according to common observable characteristics 4. Give reasons for classifying plants and animals based on specific characteristics. 5. Vertebrates can be grouped as fish, amphibians, reptiles, birds and mammals. Invertebrates can be grouped as snails and slugs, worms, spiders and insects. Plants can be grouped as flowering plants (incl. trees and grasses) and non-flowering plants (such as ferns and mosses).
Autumn 2	**Animals including Humans - The Circulatory System, Drugs and Alcohol** <u>Key Learning</u> The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other

parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system.

Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.

Pupils Might Work Scientifically

- By exploring the work of scientists.
- Through scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
- By observing / measuring changes to breathing, heart beat and or pulse rates after exercise.

Key questions

- What is 'pulse rate'? What is it we can feel?
- Why do we have lungs? Why do we have a heart? How do our hearts and lungs work together to keep us alive?
- Why does our heart beat faster and our breathing increase when we exercise?
- Do different types of exercise affect our heart in different ways? Which types of exercise are better for our heart?
- What if our blood always circulated at the same speed?

Key vocabulary

Heart, heartbeat, pulse, pulse rate, muscle, blood vessel, blood, lungs, oxygen, oxygenated blood, deoxygenated blood, carbon dioxide, circulate, circulatory system, organ, transported.
Diet, exercise, drugs, lifestyle, body function, harmful, healthy, damaged, nutrients, water, transported, substances.

Lesson sequence to deliver the objectives:

1. Identify and name the main parts of the human circulatory system.
2. Describe the functions of the heart, blood vessels and blood.
3. During exercise muscles need more oxygen so the heart beats faster and our breathing and pulse rates increase.
4. An adequate, varied and balanced diet is needed to help us grow and repair our bodies (proteins), provide us with energy (fats and carbohydrates) and maintain good health (vitamins and minerals).
5. Tobacco, alcohol and other 'drugs' can be harmful. All medicines are drugs, not all drugs are medicines
6. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
7. Animals are alive; they move, feed, grow, use their senses, reproduce, breathe/respire and excrete.

Spring 1

Light and Astronomy –Light

Key Learning

Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen.

Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.

Pupils Might Work Scientifically

- By deciding [observe/explore] where to place rearview mirrors on cars.
- By designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.
- By investigating the relationship between light sources, objects and shadows.
- By extending their experience [explore and observe] of light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Key questions

- How does light travel?
- How do we see?
- How does light get into our eyes?
- How can we use mirrors to see behind us?
- How do shadows created by the sun change during a day?
- How can we represent light travelling in drawings?
- Can you make simple drawings to help to explain how light travels?
- How does light behave?

Key vocabulary

See, seen, light source, eyes, travel, shadow, opaque, block, reflect, reflection, mirror, direction, light travelling, light beam, straight lines, cast, periscope, rear view mirror, object, rainbow, colours, bend, split, light rays.

Lesson sequence to deliver the objectives:

1. Explore and recognise that light appears to travel in straight lines. Explain that we see things because the light that travels from light sources to our eyes or from light sources to objects and then to our eyes. Model through using practical resources e.g. string, objects, torch etc.
2. Identify and describe parts of the eye and their function in helping us see.
3. 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
4. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

	5. Investigate what happens to shadows the closer and further way you are from a light source. 6. Draw up line graphs to show their results and analyse their findings.
Summer 1	**Electricity** Key Learning Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well You can use recognised circuit symbols to draw simple circuit diagrams **Pupils Might Work Scientifically** • By systematically identifying **[testing]** the effect of changing one [thing] component at a time in a circuit. • By designing and making **[Create / Invent / Design]** a set of traffic lights, a burglar alarm or some other useful circuit. **Key questions** • Which circuits work? • How can we draw different circuits more accurately? • Why do circuits need a battery/cell and wires? • How can we identify faults in a circuit? • How can we change circuits to create different effects? • Can we solve circuit challenges? • Where does electricity come from? • How does electricity get to our homes? **Key vocabulary** Cell (battery), wire, bulb, bulb holder, buzzer, motor, switch (open/closed), complete circuit, electrical conductor, electrical insulator, component, circuit symbol, circuit diagram, standard symbols, voltage. Connection, component, break, fault, mains, wire. Devices, appliances, mains electricity, safety. Common materials e.g. metal, wood, plastic. Comparative expressions e.g. brighter, less bright (bulbs); faster, slower (motors). Words which have a different meaning in other contexts e.g. circuit, break, bulb, fault). Expressions for making suggestions using 'if', 'might', 'could'. **Lesson sequence to deliver the objectives:** **Electricity - Ogden**

	1. Drawing Circuits – Use recognised symbols in a circuit diagram 2. Analyse Circuits – Compare and give reasons for variation in how components function 3. Varying Voltages – Associate effectiveness of component with number and voltage of cells 4. Circuit analyst Enquiry - Compare and give reasons for variation in how components function 5. Bright Lights Enquiry - Compare and give reasons for variation in how components function 6. Blaring Buzzers Enquiry – Associate the volume of a buzzer with the number and voltage of cells used in the circuit 7. Optional – Spin yourself Silly Enquiry – Associate speed of a motor with the number and voltage of cells used in the circuit
	Evolution and Inheritance **<u>Key Learning</u>** **Environment – Evolution and Inheritance** All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. **Pupils Might Work Scientifically** • By observing and raising questions about how animals are adapted to the environment. • By comparing how some living things are adapted to survive in extreme conditions, for example cactuses, penguins and camels. • By analysing the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. • Investigating and comparing changes in beak sizes. **Key questions** • Are all plants and animals the same? Are humans all the same? • How do animals survive? • Why do animals need to reproduce? • How have species changed over time? • Who is Charles Darwin? • Why are some species under threat while others aren't?

	Key vocabulary Evolution, change over time, species, population, features, trait, inherited, reproduce, offspring, variation, mutation, survive/survival/survival of the fittest, adaptation, key, suited, characteristics **Lesson sequence to deliver the objectives:** 1. Research and identify how animals and plants are adapted to suit their environment in different ways. 2. Research the work of Charles Darwin and how he developed his ideas on evolution. 3. Use models to demonstrate evolution-Darwin's Finches Beak Experiment. 4. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Describe the process of fossilisation. 5. Cross Breeding activity to recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. 6. How do species evolve over time? Use secondary sources to find out how the population of peppered moths changed during the industrial revolution.