Mark First C of E Academy
Creating a Love of Learning

Whole School Overview						
Year Group	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
	Ourselves and Humankind	**Culture and Diversity**	**Community and Citizenship**	**Exploration and Discovery**	**Expression and Creativity**	**Ourselves and Humankind**
Preschool	Light & sound	Animals excluding humans	Seasonal changes Humans	Environment	Materials & forces	Living things and their habitats
EYFS	Light & sound	Animals excluding humans	Seasonal changes Humans	Environment	Materials & forces	Living things and their habitats
Year 1	Animals inc. humans	Seasons (autumn to winter)	Materials	Human body and senses	Seasons (spring to summer)	Plants
Year 2	Living things and their habitats		*Evolution & inheritance	Materials	Plants	Animals including humans
Year 3	Rocks	Animals including humans	Forces and magnets	Light	Plants	
Year 4	States of matter	Sound	Sound/Electricity	Electricity	Living things and their habitats	Animals inc. Humans (teeth & digestion)

National Curriculum coverage

Mark First C of E Academy
Creating a Love of Learning

Year 1	Animals inc. Humans	Seasons (autumn to winter)	Materials	Human body and senses	Seasons (spring to summer)	Plants
National Curriculum Objectives and WLT Knowledge	**NC -** • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	**NC -** • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	**NC –** • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties.	**NC -** • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**NC -** • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	**NC –** • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants, including trees.

Year 2	Living things and their habitats	Evolution & inheritance	Materials	Plants	Animals inc. Humans
National Curriculum Objectives and WLT Knowledge	**NC –** • Explore and compare the differences between things that are living, dead, and things that have never been alive • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • Identify and name a variety of plants and animals in their habitats, including micro-habitats • 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 WLT additions/ cross-science links Notice that animals, including humans, have offspring	**WLT –** •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. (Y2 – Living things and their habitats) •Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)	**NC –** • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**NC –** • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. WLT additions/cross-science links •Identify and name a variety of plants and animals in their habitats, including micro-	**NC –** • Notice that animals, including humans, have offspring which grow into adults. • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

	which grow into adults. (Y2 - Animals including humans)				habitats. (Y2 - Living things and their habitats)	
Year 3	**Rocks**	**Animals inc. humans**	**Forces & magnets**	**Light**		**Plants**
National Curriculum Objectives and WLT Knowledge	NC - • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter.	NC- • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food – they get nutrition from what they eat. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	NC - • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.	NC- • Recognise that they need light in order to see things, and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change.		NC- • Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Year 4	States of matter	Sound		Electricity	Living things & their habitats	Animals inc. Humans (teeth & digestion)
National Curriculum Objectives and WLT Knowledge	NC- • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).	NC- • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it.		NC- • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is	NC- • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can	• Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions.

	• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.		part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.	sometimes pose dangers to living things. * • Construct and interpret a variety of food chains, identifying producers, predators and prey (animals inc. Humans.)	

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

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

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial

understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

School curriculum

The programmes of study for science are set out year-by-year for key stages 1 and 2. ***Schools are, however, only required to teach the relevant programme of study by the end of the key stage***. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online.

EYFS

Autumn 1: Light and Sound

	Prior learning; • Explore how things work. (Nursery) • Talk about the differences in materials and changes they notice. (Nursery)
ELG (disciplinary concepts)	The aim of this unit is for pupils to: • Describe what they see, hear and feel whilst outside. (Understanding the world) • Manage their own needs. (PSED)
Key learning (PLAN matrix)	**Light** Opportunities to explore shadows • Looking for shadows created by the Sun on cloudy and non-cloudy days • Drawing around shadows and comparing their shape and size • Making shadows using their bodies, both outside using the Sun and inside using torches • Making shadows using transparent and opaque objects/materials • Putting hands in a beam of light and making shadow shapes • Making shadows using shadow puppets or other objects • Observing a toy outside and noticing how the shadow changes during the day • Observing what areas are sunny and shady at different times in the day • Sharing books about shadows Opportunities to explore rainbows • Making rainbows from sunlight e.g. bubbles, water sprinkler, holographic paper, CDs etc. • Sharing books about rainbows **Sound**

	Opportunities to listen to sounds outside and identify the source • Going on a sound walk • Closing eyes and listening to the sounds around them when outside • Listening to rain, wind, thunder • Recording sounds when outside • Playing sound identification games • Catching rain in metal buckets or saucepans Opportunities to make sounds • Making noise by blowing on a blade of grass • Making wind chimes • Using voices, instruments and other objects to mimic sounds they hear outdoors	
Possible teaching opportunities	**Light** • Encourage children to talk about the shadows that they see inside and outdoors. • Support children to identify the light source and the object that is making the shadow. • Support children to identify that see-through objects make pale shadows and non-see-through objects make dark shadows. • Support children to measure shadows using their feet or other nonstandard units. • Encourage children to draw around shadows throughout the day to record how they change over time. • Encourage children to talk about changes they feel when the clouds cover and uncover the Sun. • Encourage children to talk about the changes to the shadows when the clouds cover and uncover the Sun. • Support children to choose appropriate clothing when they are hot or out in the Sun. • Encourage children to ask questions about the shadows and rainbows that they see. **Sound** • Encourage children to describe the sounds they hear. • Support children to identify what is making each sound. • Encourage children to ask questions about the sounds they hear and what is making them.	

Scientific enquiry	**Light** Comparative testing • Compare the shape of shadows made by different objects. Classification • Which objects/materials make dark shadows? Observing over time • How do the Sun and shade change during the day? • How does a toy's shadow change during the day? Researching using secondary sources • Find out about shadows. • Find out about rainbows. **Sound** Observing over time • Listen to the siren of an emergency vehicle as it approaches and moves away.	
Core Texts:	**Light** • Suddenly by Colin McNaughton • Where is the Dragon? By Leo Timmers • Little Glow by Katie Sahota & Harry Woodgate **Sound** Traditional stories and nursery rhymes • One Coconut, Two Coconuts	

	• Pass the Secret Round Other texts • Splish, Splash, Splosh by Mick Manning • Alfie's Weather by Shirley Hughes • Polar Bear, Polar Bear, What Do You Hear? by Eric Carle • The Very Quiet Cricket by Eric Carle • The Very Clumsy Click Beetle by Eric Carle
Common Misconceptions	**Some children may think:** **Light** • shadows are only caused by the Sun • all shadows are black. **Sound** • sounds do not travel through solids and liquids.
Key Vocabulary	**Light** Model and encourage children to use vocabulary such as: • Sun, sunny, light, shadow, shady, clouds, torch, see-through, not see-through, source, light source Expose children to supplementary vocabulary such as: • casting a shadow, pale, dark, transparent, opaque **Sound** Model and encourage children to use vocabulary such as: • sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar

	Expose children to supplementary vocabulary such as: • source, crescendo, vibration, pitch
Autumn 2: Animals excluding humans	
	Prior learning; • Understand the key features of the life cycle of a plant and an animal. (Nursery) • Begin to understand the need to respect and care for the natural environment and all living things. (Nursery)
ELG (disciplinary concepts)	The aim of this unit is for pupils to: - Recognise some environments that are different to the one in which they live. (Understanding the world) - Revise and refine the fundamental movement skills they have already acquired: rolling; crawling; walking; jumping; running; hopping; skipping; climbing.
Key learning (PLAN matrix)	**Opportunities to learn about animals from a different habitat** • Sharing books about animals in the local area and animals in other countries e.g. jungle, polar regions, desert, ocean • Looking at pictures of animals in different habitats • Watching videos of animals in different habitats • Playing games involving matching animals to their habitats • Playing with small world animals in different habitats • Visiting the zoo, focusing on animals that live in different habitats • Caring for pets from a different habitat e.g. tropical fish • Creating pictures of animals in their habitats • Pretending to be animals • Naming and describing animals they see in books, pictures, videos or while on a trip • Describing different habitats

Possible teaching opportunities	• Encourage children to name and describe animals that live in different habitats while reading books, watching videos, looking at pictures or playing matching games. • Encourage children to ask questions about different animals and the habitats they live in. • Encourage children to describe habitats. • Encourage children to talk about how animals are cared for when they live outside their natural habitat. • Encourage children to move like different animals.	
Scientific enquiry	**Classification** - Sort animals according to where they live - Researching using secondary sources - Learn how animals from a different habitat are cared for - Learn about animals in a different habitat.	
Core texts	• Lost and Found by Oliver Jeffers • Shark in the Park by Nick Sharratt • One Day on our Blue Planet: In the Antarctic by Ella Bailey • Poles Apart by Jeanne Willis • Monkey with a Bright Blue Bottom by Steve Smallman • Walking through the Jungle by Julie Lacome • How many legs? by Kes Gray • What do you do with a tail like this? by Steve Jenkins • The Rainbow Bear by Michael Morpurgo • We're Going on a Bear Hunt by Michael Rosen and Helen Oxenbury • Bears by Sally Morgan • Usborne Beginners Bears by Helen Helbrough	

Key Vocabulary	Model and encourage children to use vocabulary such as: • names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice Expose children to supplementary vocabulary such as: • environment, polar regions, ocean, camouflage
Common Misconceptions	• animals are furry and have four legs • a bee is not an animal because it is an insect • animals adapt to their surroundings, e.g. a brown bear turns white and becomes a polar bear • animals living in the soil breathe by coming to the surface • dragons and other mythical creatures are real animals.
Career links (possibilities for role-play area)	• Zookeeper • Safari centre • Aquarium • Explorer/Naturalist • Vet
Skills (assessment evidence)	**Children ask questions, make observations and talk about what they have found out about:** • animals from a different habitat. **Children sort:** • animals.
Understanding (assessment evidence)	• Can name and describe animals that live in different habitats. • Can describe different habitats.
Spring 1: Seasonal changes / Humans	

Prior learning	**Seasonal changes** • Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans) **Humans** • Use all their senses in hands-on exploration of natural materials. (Nursery) • Begin to make sense of their own life-story and family's history. (Nursery) • Understand the key features of the life cycle of a plant and an animal. (Nursery) • Begin to understand the need to respect and care for the natural environment and all living things. (Nursery)
ELG (disciplinary concepts)	**The aim of this unit is for pupils to:** **Seasonal changes** • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them. **Humans** • Talk about members of their immediate family and community. • Name and describe people who are familiar to them.
Key learning (PLAN matrix)	**Seasonal changes** • Encourage children to talk about how they feel in different types of weather/seasons. • Encourage children to talk about the clothes they wear in different seasons and why. • Encourage children to talk about the weather throughout the year. • Encourage children to find shelter or make shelters to keep themselves dry in the rain or shade themselves when it is sunny. • Encourage children to talk about how the ground changes when it rains. • Encourage children to measure the size of puddles using their feet after it rains. • Encourage children to talk about how puddles change over time after it rains.

	• Encourage children to talk about the animals and plants that they find in different seasons. • Encourage children to ask questions about the weather and seasonal changes. **Humans** • Encourage children to look at photographs of different people and to describe them. • Encourage children to describe their friends and family using photographs to help them. • Encourage children to talk about how their friends and family are the same and different. • Encourage children to compare themselves to characters in books. • Encourage children to compare their hand, foot and fingerprints with their friends. • Encourage children to talk about the people who look after them, both within their family and the wider community e.g. teachers, doctors, dentists etc. • Encourage children to ask a dentist, nurse, meal supervisor/school cook, road crossing supervisor etc. questions.	
Possible teaching opportunities	**Seasonal changes** **Opportunities to play and explore outside in all seasons and in different weather** • Playing in the rain and snow • Drawing around puddles • Catching rain and hail in buckets • Catching snowflakes on frozen black paper and looking at them with magnifying glasses or an app on a tablet • Making icicles • Using scarves or pinwheels to explore the strength and direction of the wind • Looking at photographs of different seasons and types of weather • Sharing books about different seasons and types of weather **Opportunities to observe living things throughout the year** • Sharing books about the seasons • Going on seasonal walks to observe key features of the seasons	

	• Making artwork with seasonal found objects • Visiting a canal or pond to look for birds and their young in spring • Visiting a farm to see the young animals in the spring • Finding minibeasts in the school grounds at different times in the year • Taking photographs of the minibeasts they find in the school grounds at different times in the year • Looking for birds and other animals throughout the year using binoculars • Sharing books and videos about animals that migrate or hibernate over winter, gather food in autumn, build nests and lay eggs in spring etc. • Taking photographs of the plants they find in the school grounds at different times in the year • Observing closely and drawing the plants in the school grounds at different times in the year • Matching animals and plants they find to pictures that identify them **Humans** **Opportunities to describe people who are familiar to them** • Talking about themselves, friends, family and community using photographs • Using mirrors to look at their faces • Creating pictures or collages of themselves, friends, family and community • Making hand and footprints using paint • Making fingerprints using ink pads • Using a 'magic' mirror which shows everything about them and getting children to describe themselves and how they are special • Sharing books about different types of families **Opportunities to learn about how to take care of themselves** • Demonstrating and talking about how they look after themselves • Talking about other people that look after them • Talking to a dentist, nurse, meal supervisor/school cook, road crossing supervisor etc. • Sharing videos of people who care for us and how we look after ourselves	

Scientific inquiry	**Seasonal changes** Classification • Which clothes are suitable for each season? Observing over time • How does a puddle change over time? • How does a snowman change as it melts? • How does the natural world change with the seasons? Researching using secondary sources • Find out about how animals behave in different seasons. • Find out about the weather and seasons. **Humans** **Classification** • Sort images of people according to their characteristics. **Researching using secondary sources** • Find out information from visitors (dentist, nurse etc.). **Pattern seeking** • Are taller children faster? • Are taller children stronger?	
Texts that teach	• I Love My Hair by Natasha Anastasia Tarpley	

	• What I Like About Me by Alia Zobel-Nolan
Key Vocabulary	**Seasonal changes** Model and encourage children to use vocabulary such as: • spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers Expose children to supplementary vocabulary such as: • hibernate, migrate, snowflake **Humans** Model and encourage children to use vocabulary such as: • hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman Expose children to supplementary vocabulary such as: • bald, elderly, wrinkles, male, female, freckles
Common Misconceptions	**Seasonal Changes** • it always snows in winter • it is always sunny in the summer • there are only flowers in spring and summer • it rains most in the winter. **Humans** • sons look like their fathers and daughters look like their mothers.
Career links (possibilities for role-play area)	• Meteorologist • Weather presenter • Doctor • Nurse • Dentist • Optician

Skills (assessment evidence)	**Seasonal changes** **Children ask questions, make observations using simple equipment and talk about what they have done and found out while carrying out a range of activities, such as:** • playing and exploring outside in all seasons and in different weather • observing living things throughout the year. **Children make direct comparisons when:** • exploring the size of puddles. **Children sort:** • clothes for different seasons. **Children record their observations when:** • observing plants, animals and puddles.
	Humans **Children ask questions, make observations using simple equipment and talk about what they have done and found out while carrying out a range of activities, such as:** • describing people who are familiar to them • learning about how to take care of themselves. **Children sort:** • humans by their characteristics.

	Children record their observations when: • drawing themselves, their family, friends and community.
Understanding (assessment evidence)	Seasonal changes • Can talk about different types of weather. • Can talk about the four seasons. • Can talk about the living things they see in the playground and on visits during each season. Humans • Can describe themselves, family, friends and community. • Can create pictures of themselves, family, friends and community and identify their distinguishing features. • Can talk about what they see when using a mirror. • Can compare hand, foot and fingerprints and talk about how they are different. • Can talk about how they look after themselves and how other people look after them.
Spring 2: Environment (Living things and their Habitats) ** linked with Summer 2	
Prior learning	• Use all their senses in hands-on exploration of natural materials. (0-3) • Explore collections of materials with similar and/or different properties. (3-4) • Begin to understand the need to respect and care for the natural environment and all living things. (3-4)
ELG (disciplinary concepts)	The aim of this unit is for pupils to: • Draw information from a simple map. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live.

Key learning (PLAN matrix)	**Opportunities to explore the plants in the surrounding natural environment** • Taking photographs of the plants they find in the school grounds • Observing closely and drawing the plants in the school grounds • Finding plants in the school grounds to match with photographs of them • Looking at aerial views to count the number of trees in the school grounds • Using a map of the school grounds, with pictures of where specific plants can be found, to find those plants • Creating a map to show how to find their favourite plants in the school grounds **Opportunities to explore the animals in the surrounding natural environment** • Finding minibeasts in the school grounds • Taking photographs of the minibeasts they find in the school grounds • Matching the minibeasts they find to pictures that identify them • Observing the minibeasts closely, using a magnifying glass or app on a tablet • Drawing pictures of the minibeasts • Creating a map to show where they found each type of minibeast • Sharing books about minibeasts • Playing with small world minibeasts • Building minibeast homes **Opportunities to explore plants and animals in a contrasting natural environment** • Visiting a contrasting natural environment e.g. forest, beach, etc. • Finding and taking photographs of plants and animals in the contrasting natural environment • Sharing non-fiction and fiction books about the contrasting natural environment visited • Support children to identify different plants e.g. trees, bushes, flowers, vegetables, herbs. • Ensure children are careful when exploring the plants and do not damage them in any way. • Encourage children to touch and smell the plants, when appropriate. • Encourage children to talk about the plants they find. • Support children to name the plants they find. • Encourage children to find the same plant in a different place. • Ensure children are careful when observing minibeasts and return them to where they found them.

	• Encourage children to talk about the minibeasts they find. • Support children to name the minibeasts they find.
Possible teaching opportunities	• Support children to identify different plants e.g. trees, bushes, flowers, vegetables, herbs. • Ensure children are careful when exploring the plants and do not damage them in any way. • Encourage children to touch and smell the plants, when appropriate. • Encourage children to talk about the plants they find. • Support children to name the plants they find. • Encourage children to find the same plant in a different place. • Ensure children are careful when observing minibeasts and return them to where they found them. • Encourage children to talk about the minibeasts they find. • Support children to name the minibeasts they find.
Core texts	Traditional stories and nursery rhymes • Incey, Wincey Spider • Ladybird, Ladybird Fly Away Home Other texts • Bad-Tempered Ladybird by Eric Carle • Mad About Minibeasts by David Wojtowycz & Giles Andreae • Ben Plants a Butterfly Garden by Kate Petty • Norman the Slug with the Silly Shell by Sue Hendra • Aargh a Spider by Lydia Monks • Insects: A Close-up Look by Peter Seymour
Summer 1: Materials and forces	
Prior learning	Materials

	• Use all their senses in hands-on exploration of natural materials. (Nursery) • Explore collections of materials with similar and/or different properties. (Nursery) • Talk about the differences between materials and changes they notice. (Nursery) Forces
ELG (disciplinary concepts)	The aim of this unit is for pupils to know that: Materials • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. Forces
Key learning (PLAN matrix)	**Materials** **Opportunities to explore a range of materials in a sensory way, including natural materials** • Looking for dew, ice, icicles and frost in the playground • Using their senses to explore natural materials in the environment, such as stones, twigs, leaves, feathers, seeds, flowers etc. • Gathering natural materials to make collections **Opportunities to make objects from different materials, including natural materials** • Making pictures using natural materials they have gathered from the environment • Making dens, nests, bug hotels etc. using natural materials • Making ice pictures by putting water in a shallow tray and adding natural objects gathered from the environment and then leaving them outside to freeze or putting them in the freezer

	• Making junk models with a range of materials, including natural materials they have gathered from the environment **Opportunities to compare how materials change** • Making popcorn in a microwave and on a fire • Making pizza dough with different flours • Baking bread in different tins or for different times to compare the outcome • Baking cupcakes and removing one after every five minutes • Choosing where to put ice cubes in the playground and observing how quickly they melt • Observing how a large block of ice changes over time, using string to measure around it • Putting wax crayons in different areas of the playground and observing how they change • Making a snowman and observing how it changes over time • Making snowballs and putting them in different parts of the playground and observing how they change over time
Possible teaching opportunities	• Encourage children to talk about the natural materials they explore, using their senses. • Encourage children to talk about the materials they are using when making pictures. • Encourage children to choose from a range of materials, including natural materials, when making models and identify a key property that was required. • Encourage children to reuse materials and talk about what can be recycled to care for the natural world. • Support children to list the properties the material has. • Encourage children to test that their model is fit for purpose and that the materials are suitable. • Encourage children to compare and describe how materials change over time and in different conditions.
Scientific inquiry	Comparative testing • How does popcorn made in a microwave compare to popcorn made on a fire? • How quickly do ice cubes melt in different areas of the playground? • How are pizza bases different when made with different flours? • How does a loaf cook differently in different tins?

	• How do cupcakes cook if they have different amounts of mixture? Observing over time • How does the block of ice change over time? • How does a snowman change over time? • How does cake mixture/bread dough change as it is cooked?
Key vocabulary	**Model and encourage children to use vocabulary such as:** • ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back **Expose children to supplementary vocabulary such as:** • solid, liquid, gas, most suited
Common Misconception	• material only means fabric • all plastic/wood etc. is the same.
Career links (possibilities for role-play area)	• Recycling centre worker • Product designer • Builder • Chef
Skills (assessment evidence)	**Children ask questions, make observations using simple equipment and talk about what they have done and found out while carrying out a range of activities, such as:** • exploring a range of materials in a sensory way, including natural materials • making objects from different materials, including natural materials • comparing how materials change. **Children make direct comparisons when:** • observing how objects melt. **Children sort:** • materials, including natural materials.

	Children record their observations when: • materials are changing over time or in different conditions.
Understanding (assessment evidence)	• Can name the material they are using and why. • Can talk about multiple properties of the material and why it is suited for its purpose. • Can observe changes in their natural world and say why it is different now or will change in the future. • Can compare and describe how materials change over time and in different conditions.
Summer 2: Animals and their habitats	
Prior learning	• Use all their senses in hands-on exploration of natural materials. (0-3) • Explore collections of materials with similar and/or different properties. (3-4) • Begin to understand the need to respect and care for the natural environment and all living things. (3-4)
ELG (disciplinary concepts)	The aim of this unit is for pupils to: • Draw information from a simple map. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live.
Key learning (PLAN matrix)	**Opportunities to explore the plants in the surrounding natural environment** • Taking photographs of the plants they find in the school grounds • Observing closely and drawing the plants in the school grounds • Finding plants in the school grounds to match with photographs of them • Looking at aerial views to count the number of trees in the school grounds • Using a map of the school grounds, with pictures of where specific plants can be found, to find those plants

	• Creating a map to show how to find their favourite plants in the school grounds **Opportunities to explore the animals in the surrounding natural environment** • Finding minibeasts in the school grounds • Taking photographs of the minibeasts they find in the school grounds • Matching the minibeasts they find to pictures that identify them • Observing the minibeasts closely, using a magnifying glass or app on a tablet • Drawing pictures of the minibeasts • Creating a map to show where they found each type of minibeast • Sharing books about minibeasts • Playing with small world minibeasts • Building minibeast homes **Opportunities to explore plants and animals in a contrasting natural environment** • Visiting a contrasting natural environment e.g. forest, beach, etc. • Finding and taking photographs of plants and animals in the contrasting natural environment • Sharing non-fiction and fiction books about the contrasting natural environment visited • Support children to identify different plants e.g. trees, bushes, flowers, vegetables, herbs. • Ensure children are careful when exploring the plants and do not damage them in any way. • Encourage children to touch and smell the plants, when appropriate. • Encourage children to talk about the plants they find. • Support children to name the plants they find. • Encourage children to find the same plant in a different place. • Ensure children are careful when observing minibeasts and return them to where they found them. • Encourage children to talk about the minibeasts they find. • Support children to name the minibeasts they find.	
Possible teaching opportunities	• Support children to identify different plants e.g. trees, bushes, flowers, vegetables, herbs. • Ensure children are careful when exploring the plants and do not damage them in any way.	

	• Encourage children to touch and smell the plants, when appropriate. • Encourage children to talk about the plants they find. • Support children to name the plants they find. • Encourage children to find the same plant in a different place. • Ensure children are careful when observing minibeasts and return them to where they found them. • Encourage children to talk about the minibeasts they find. • Support children to name the minibeasts they find.
Core texts	Traditional stories and nursery rhymes • Incey, Wincey Spider • Ladybird, Ladybird Fly Away Home Other texts • Bad-Tempered Ladybird by Eric Carle • Mad About Minibeasts by David Wojtowycz & Giles Andreae • Ben Plants a Butterfly Garden by Kate Petty • Norman the Slug with the Silly Shell by Sue Hendra • Aargh a Spider by Lydia Monks • Insects: A Close-up Look by Peter Seymour
Key Vocabulary	**Model and encourage children to use vocabulary such as:** • plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest **Expose children to supplementary vocabulary such as:** • environment
Common misconceptions	• trees are not plants • trees are not living as they do not seem to change or grow • weeds are bad plants.

Career links (possibilities for role-play area)	• Botanist • Naturalist • Entomologist • Ecologist • Environmentalist • Environmental scientist • Beekeeper
Skills (assessment evidence)	Children ask questions, make observations using simple equipment and talk about what they have done and found out while carrying out a range of activities, such as: • exploring the plants in the surrounding natural environment • exploring the animals in the surrounding natural environment • exploring plants and animals in a contrasting natural environment. Children record their observations when: • drawing plants and animals they find.
Understanding (assessment evidence)	• Can name and describe plants and animals in the school grounds and their environment. • Can talk about how another environment is different to their surrounding natural environment. • Children do not damage the living things they encounter in the natural environment.

Year 1

Mark First C of E Academy
Creating a Love of Learning

Term: Autumn 1	
	Unit title: Animals Prior learning; • NA
National Curriculum Objectives (disciplinary concepts)	The aim of this unit is for pupils to: • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	*Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets.*
Understanding of vocabulary – *evidence*	• Can name a range of animals which includes animals from each of the vertebrate groups • Can describe the key features of these named animals • Can label key features on a picture/diagram • Can write descriptively about an animal • Can write a What am I? riddle about an animal

	• Can describe what a range of animals eat **Core Texts:**
Key Vocabulary	Different wild animals, pets, tail, wing, claw, fin, scales, feathers, fur, beak, hooves
Common misconceptions	
Application of knowledge – *activities*	• Make first-hand, close observations of animals from each of the groups. • Compare two animals from the same or different groups. • Classify animals using a range of features. • Identify animals by matching them to named images. • Classify animals according to what they eat.
Application of knowledge – *assessment (possible evidence)*	• Can sort and group animals using similarities and differences • Can use simple charts etc. to identify unknown animals • Can create a drawing of an imaginary animal labelling its key features • Can use secondary resources to find out what animals eat, including talking to experts e.g. pet owners, zookeepers etc. • Can use first-hand close observations to make detailed drawings
Term: Autumn 2	
National Curriculum Objectives (disciplinary concepts)	**Unit title: Seasonal changes (autumn to winter)** Prior learning; The aim of this unit is for pupils to: • observe changes across the four seasons

Key learning (PLAN matrix)	• observe and describe weather associated with the seasons and how day length varies. 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.
Notes & Guidance (non-stat.)	*Pupils should observe and talk about changes in the weather and the seasons.* *Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.* *Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.*
Understanding of vocabulary – *evidence*	*• Can name the four seasons and identify when in the year they occur* *• Can describe weather in different seasons over a year* *• Can describe days as being longer (in time) in the summer and shorter in the winter* *• Can describe other features that change through the year* **Core Texts:**
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
Common misconceptions	

Application of knowledge – *activities*	• Collect information about the weather regularly throughout the year. • Present this information in tables and charts to compare the weather across the seasons. • Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans. • Present this information in different ways to compare the seasons. • Gather data about day length regularly throughout the year and present this to compare the seasons.
Application of knowledge – *assessment (possible evidence)*	• Use the evidence gathered to describe the general types of weather and changes in day length over the seasons. • Use their evidence to describe some other features of their surroundings, e.g. themselves, animals, plants that change over the seasons• Demonstrate their knowledge in different ways e.g. making a weather forecast video, writing seasonal poetry, creating seasonal artwork
Term: Spring 1	
National Curriculum Objectives (disciplinary concepts)	**Unit title: Materials** Prior learning; • Use all their senses in hands-on exploration of natural materials. (Nursery - Materials, including changing materials) • Explore collections of materials with similar and/or different properties. (Nursery - Materials, including changing materials) • Talk about the differences between materials and changes they notice. (Nursery - Materials, including changing materials) The aim of this unit is for pupils to: • distinguish between an object and the material from which it is made. • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • describe the simple physical properties of a variety of everyday materials. • compare and group together a variety of everyday materials on the basis of their simple physical properties.

Mark First C of E Academy
Creating a Love of Learning

Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	*Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil.*
Understanding of vocabulary – *evidence*	• Can label a picture or diagram of an object made from different materials • Can describe the properties of different materials **Core Texts:**
Key Vocabulary	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through
Common misconceptions	
Application of knowledge – *activities*	• Classify objects made of one material in different ways e.g. a group of object made of metal. • Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials. • Classify materials based on their properties.

	• Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters.
Application of knowledge – *assessment (possible evidence)*	• Can sort objects and materials using a range of properties • Can choose an appropriate method for testing an object for a particular property • Can use their test evidence to answer the questions about properties e.g. "Which cloth is the most absorbent?"
Term: Spring 2	
	Unit title: Human body & senses (part of Animals inc. Humans) Prior learning; • Use all their senses in hands-on exploration of natural materials. (Nursery - Humans) • Name and describe people who are familiar to them. (Reception - Humans)
National Curriculum Objectives (disciplinary concepts)	The aim of this unit is for pupils to: • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	*Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes.*

Understanding of vocabulary – *evidence*	*Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells.* • Can play and lead 'Simon says' • During PE lessons, can follow instructions involving parts of the body **Core Texts:**
Key Vocabulary	body, head, neck, arms, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, tongue, feet
Common misconceptions	
Application of knowledge – *activities*	• Make first-hand close observations of parts of the body e.g. hands, eyes. • Compare two people. • Take measurements of parts of their body. • Compare parts of their own body. • Look for patterns between people e.g. Do people with big hands have big feet? • Classify people according to their features. • Investigate human senses e.g. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match?
Application of knowledge – *assessment (possible evidence)*	• Can use first-hand close observations to make detailed drawings • Can name body parts correctly when talking about measurements and comparisons e.g. "My arm is x straws long." "My arm is x straws long and my leg is y straws long. My leg is longer than my arm." "We both have hands, but his are bigger than mine." "These people have brown eyes and these have blue."

	• Can talk about their findings from investigations using appropriate vocabulary e.g. "My fingers are much better at feeling than my toes" "We found that the crisps all taste the same"	
Term: Summer 1		
National Curriculum Objectives (disciplinary concepts) **Key learning (PLAN matrix)** **Notes & Guidance (non-stat.)** **Understanding of vocabulary – *evidence***	**Unit title: Seasonal changes (spring to summer)** The aim of this unit is for pupils to know that: **Core Texts:**	
Key Vocabulary	Tier 2:	
	Tier 3:	
Common misconceptions		

Key Knowledge		
Term: Summer 2		
National Curriculum Objectives (disciplinary concepts)	**Unit title: Plants** The aim of this unit is for pupils to: - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - identify and describe the basic structure of a variety of common flowering plants, including trees.	
Key learning (PLAN matrix)	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.	
Notes & Guidance (non-stat.)	*Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).*	
Understanding of vocabulary (evidence)	Can name trees and other plants that they see regularly. • Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom • Can point out trees which lost their leaves and those that kept them the whole year. • Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green.	

	Core Texts:
Key Vocabulary	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area
Common misconceptions	
Application of knowledge – *activities*	• Make close observations of leaves, seeds, flowers etc. • Compare two leaves, seeds, flowers etc. • Classify leaves, seeds, flowers etc. using a range of characteristics. • Identify plants by matching them to named images. • Make observations of how plants change over a period of time. • When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.
Application of knowledge – *assessment (possible evidence)*	• Can sort and group parts of plants using similarities and differences • Can use simple charts etc. to identify plants • Can collect information on features that change during the year • Can use photographs to talk about how plants change over time

Year 2

Term: Autumn 1 & 2	
National Curriculum Objectives (disciplinary concepts)	**Unit title: Living things & their habitats** *Prior learning;* *• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)* *• Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)* *• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)* *• Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans)* *• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)* *• Observe changes across the four seasons. (Y1 - Seasonal changes)* The aim of this unit is for pupils to: • Explore and compare the differences between things that are living, dead, and things that have never been alive • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other

Key learning (PLAN matrix)	• Identify and name a variety of plants and animals in their habitats, including micro-habitats • 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
Notes & Guidance (non-stat.)	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). 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.
Understanding of vocabulary (evidence)	*Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.* • Can find a range of items outside that are living, dead and never lived • Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied • Can talk about how the features of these animals and plants make them suitable to the habitat • Can talk about what the animals eat in a habitat and how the plants provide shelter for them

	• Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction **Core Texts:**
Key Vocabulary	living, dead, never been, alive, move, grow, Feed, have offspring/young/babies, name, local habitats, name, micro habitats, damp/wet/dry, dark/light, hot/warm/cool/cold, suited/suitable, basic needs, food, food chain, shelter
Common misconceptions	
Application of knowledge – *activities*	• Explore the outside environment regularly to find objects that are living, dead and have never lived. • Classify objects found in the local environment. • Observe animals and plants carefully, drawing and labelling diagrams. • Create simple food chains for a familiar local habitat from first-hand observation and research. • Create simple food chains from information given e.g. in picture books (Gruffalo etc.).
Application of knowledge – *assessment (possible evidence)*	• Can sort into living, dead and never lived • Can give key features that mean the animal or plant is suited to its micro-habitat • Using a food chain can explain what animals eat • Can explain in simple terms why an animal or plant is suited to a habitat e.g. the caterpillar cannot live under the soil like a worm as it needs fresh leaves to eat; the seaweed we found on the beach cannot live in our pond because it is not salty
Term: Spring 3 & 4	
	Unit title: Materials Prior learning; *• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)* *• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)*

National Curriculum Objectives (disciplinary concepts)	*• Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)* *• Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)*
Key learning (PLAN matrix)	The aim of this unit is for pupils to know that: • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 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.
Notes & Guidance (non-stat.)	*Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.*

Understanding of vocabulary (evidence)	*• Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use* *• Can label a picture or diagram of an object made from different materials* *• For a given object can identify what properties a suitable material needs to have* **Core Texts:**
Key Vocabulary	Recap Y1 *soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull* wood, metal, plastic, glass, brick, rock, paper, cardboard, opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching
Common misconceptions	
Application of knowledge – *activities*	• Classify materials. • Make suggestions about alternative materials for a purpose that are both suitable and unsuitable • Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat
Application of knowledge – *assessment (possible evidence)*	• Can sort materials using a range of properties • Can explain using the key properties why a material is suitable or not suitable for a purpose • Can begin to choose an appropriate method for testing a material for a particular property • Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?
Term: Summer 1	
	Unit title: Plants

National Curriculum Objectives (disciplinary concepts)	Prior learning; • *Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)* • *Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)* The aim of this unit is for pupils to: • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	*Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants.* **Note:** *Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.*
Understanding of vocabulary (evidence)	• Can describe how plants that they have grown from seeds and bulbs have developed over time • Can identify plants that grew well in different conditions **Core Texts:**

Key Vocabulary	seeds, bulbs fully grown, water, light, damp, wet/dry/dark/light, hot/warm/cool/cold, grow/growth, healthy, shoot, seedling, wither/limp, die, dry/crips, soil, earth
Common misconceptions	
Application of knowledge – *activities*	• Make close observations of seeds and bulbs. • Classify seeds and bulbs. • Research and plan when and how to plant a range of seeds and bulbs. • Look after the plants as they grow – weeding, thinning, watering etc. • Make close observations and measurements of their plants growing from seeds and bulbs. • Make comparisons between plants as they grow
Application of knowledge – *assessment (possible evidence)*	• Can spot similarities and difference between bulbs and seeds • Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants
Term: Summer 2	
National Curriculum Objectives (disciplinary concepts) **Key learning (PLAN matrix)**	**Unit title: Animals including humans** Prior learning; • *Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)* • *Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)* The aim of this unit is for pupils to: • Notice that animals, including humans, have offspring which grow into adults. • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Notes & Guidance (non-stat.) **Understanding of vocabulary (evidence)**	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 should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. • Can describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages • Can state the basic needs of animals, including humans, for survival • Can state the importance for humans of exercise, eating the right amounts of different types of food, and hygiene • Can name foods in each section of the Eatwell Guide **Core Texts:**
Key Vocabulary	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/hen, kitten/cat, caterpillar/butterfly), survive, survival, water food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)

Common misconceptions	
Application of knowledge – *activities*	• Ask people questions and use secondary sources to find out about the life cycles of some animals. • Observe animals growing over a period of time e.g. chicks, caterpillars, a baby. • Ask questions of a parent about how they look after their baby. • Ask pet owners questions about how they look after their pet. • Explore the effect of exercise on their bodies. • Classify food in a range of ways, including using the Eatwell Guide. • Investigate washing hands, using glitter gel.
Application of knowledge – *assessment (possible evidence)*	• Can describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book for a younger child • Can measure/observe how animals, including humans, grow. • Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide • Explain how development and health might be affected by differing conditions and needs being met/not met

Year 3

Term: Autumn 1	
	Prior learning; • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)

	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
National Curriculum Objectives (disciplinary concepts)	**Unit title: Rocks** The aim of this unit is for pupils to: • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.
Understanding of vocabulary (evidence)	• Can name some types of rock and give physical features of each • Can explain how a fossil is formed # • Can explain that soils are made from rocks and also contain living/dead matter
	Core Texts:

Key Vocabulary	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil (e.g. peaty, sandy, chalk, clay)
Common misconceptions	
Application of knowledge – *activities*	• Observe rocks closely. • Classify rocks in a range of ways, based on their appearance. • Devise a test to investigate the hardness of a range of rocks. • Devise a test to investigate how much water different rocks absorb. • Observe how rocks change over time e.g. gravestones or old building. • Research using secondary sources how fossils are formed. • Observe soils closely. • Classify soils in a range of ways based on their appearance. • Devise a test to investigate the water retention of soils. • Observe how soil can be separated through sedimentation. • Research the work of Mary Anning.
Application of knowledge – *assessment (possible evidence)*	• Can classify rocks in a range of different ways, using appropriate vocabulary • Can devise tests to explore the properties of rocks and use data to rank the rocks • Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily • Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc. • Can identify plant/animal matter and rocks in samples of soil • Can devise a test to explore the water retention of soils
Term: Autumn 2	
	Unit title: Animals including humans **Prior learning;** • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)

	• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)
National Curriculum Objectives (disciplinary concepts)	The aim of this unit is for pupils to: - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - identify that humans and some other animals have skeletons and muscles for support, protection and movement.
Key learning (PLAN matrix)	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. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.
Notes & Guidance (non-stat.)	Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.
Understanding of vocabulary (evidence)	• Can name the nutrients found in food • Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients
	Core Texts:

Key Vocabulary	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine
Common misconceptions	
Application of knowledge – *activities*	• Classify food in a range of ways. • Use food labels to explore the nutritional content of a range of food items. • Use secondary sources to find out the types of food that contain the different nutrients. • Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? • Plan a daily diet to contain a good balance of nutrients. • Explore the nutrients contained in fast food. • Use secondary sources to research the parts and functions of the skeleton. • Investigate patterns asking questions such as: ▪ Can people with longer legs run faster? ▪ Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals.
Application of knowledge – *assessment (possible evidence)*	• Can classify food into those that are high or low in particular nutrients • Can answer their questions about nutrients in food, based on their gathered evidence • Can talk about the nutrient content of their daily plan • Use their data to look for patterns (or lack of them) when answering their enquiry question • Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons
Term: Spring 1	
	Unit title: Forces & magnets **Prior learning;** • Explore how things work. (Nursery – Forces)

	• Explore and talk about different forces they can feel. (Nursery – Forces) • Talk about the differences between materials and changes they notice. (Nursery – Forces) • Explore the natural world around them. (Reception – Forces) • Describe what they see, hear and feel whilst outside. (Reception – Forces) • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
National Curriculum Objectives (disciplinary concepts)	The aim of this unit is for pupils to: • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).

Understanding of vocabulary (evidence)	• Can give examples of forces in everyday life • Can give examples of objects moving differently on different surfaces • Can name a range of types of magnets and show how the poles attract and repel • Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets **Core Texts:**
Key Vocabulary	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole
Common misconceptions	
Application of knowledge – *activities*	• Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. • Explore what materials are attracted to a magnet. • Classify materials according to whether they are magnetic. • Explore the way that magnets behave in relation to each other. • Use a marked magnet to find the unmarked poles on other types of magnets. • Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. • Devise an investigation to test the strength of magnets.
Application of knowledge – *assessment (possible evidence)*	• Can use their results to describe how objects move on different surfaces • Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface • Can use classification evidence to identify that some metals, but not all, are magnetic

	• Through their exploration, they can show how like poles repel and unlike poles attract, and name unmarked poles • Can use test data to rank magnets
Term: Spring 2	
National Curriculum Objectives (disciplinary concepts) **Key learning (PLAN matrix)**	**Unit title: Light** **Prior learning;** • Explore how things work. (Nursery – Light) • Talk about the differences in materials and changes they notice. (Nursery – Light) • Describe what they see, hear and feel whilst outside. (Reception – Light) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) The aim of this unit is for pupils to: • Recognise that they need light in order to see things, and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change. 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.

Notes & Guidance (non-stat.) **Understanding of vocabulary (evidence)**	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 should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. • Can describe how we see objects in light and can describe dark as the absence of light • Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses • Can define transparent, translucent and opaque • Can describe how shadows are formed **Core Texts:**
Key Vocabulary	light, light source, Sun, sunlight, dangerous
Common misconceptions	
Application of knowledge – *activities*	• Explore how different objects are more or less visible in different levels of lighting. • Explore how objects with different surfaces, e.g. shiny vs matt, are more or less visible. • Explore how shadows vary as the distance between a light source and an object or surface is changed.

	• Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground. • Choose suitable materials to make shadow puppets. • Create artwork using shadows.
Application of knowledge – *assessment (possible evidence)*	• Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change • Can clearly explain, giving examples, that objects are not visible in complete darkness • Can describe and demonstrate how shadows are formed by blocking light • Can describe, demonstrate and make predictions about patterns in how shadows vary
Term: Summer 1 & 2	
National Curriculum Objectives (disciplinary concepts) **Key learning (PLAN matrix)**	**Unit title: Plants** **Prior learning** • Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) The aim of this unit is for pupils to: • Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 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.

Notes & Guidance (non-stat.) **Understanding of vocabulary (evidence)**	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 should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. • Can explain the function of the parts of a flowering plant • Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination • Can give different methods of pollination and seed dispersal, including examples **Core Texts:**
Key Vocabulary	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport
Common misconceptions	
Application of knowledge – *activities*	• Observe what happens to plants over time when the leaves or roots are removed. • Observe the effect of putting cut white carnations or celery in coloured water. • Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. • Spot flowers, seeds, berries and fruits outside throughout the year.

	• Observe flowers carefully to identify the pollen. • Observe flowers being visited by pollinators e.g. bees and butterflies in the summer. • Observe seeds being blown from the trees e.g. sycamore seeds. • Research different types of seed dispersal. • Classify seeds in a range of ways, including by how they are dispersed. • Create a new species of flowering plant.
Application of knowledge – *assessment (possible evidence)*	• Can explain observations made during investigations • Can look at the features of seeds to decide on their method of dispersal • Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

Year 4

Term: Autumn 1	
	Unit title: States of matter **Prior learning;** • Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

National Curriculum Objectives (disciplinary concepts)	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) The aim of this unit is for pupils to: • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	

Understanding of vocabulary (evidence)	Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. • Can create a concept map, including arrows linking the key vocabulary • Can name properties of solids, liquids and gases • Can give everyday examples of melting and freezing • Can give everyday examples of evaporation and condensation • Can describe the water cycle **Core Texts:**
Key Vocabulary	solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle
Common misconceptions	
Application of knowledge – *activities*	• Observe closely and classify a range of solids. Observe closely and classify a range of liquids. • Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind. • Classify materials according to whether they are solids, liquids and gases. • Observe a range of materials melting e.g. ice, chocolate, butter. • Investigate how to melt ice more quickly. • Observe the changes when making rocky road cakes or ice-cream. • Investigate the melting point of different materials e.g. ice, margarine, butter and chocolate. • Explore freezing different liquids e.g. tomato ketchup, oil, shampoo.

	• Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration). • Observe water evaporating and condensing e.g. on cups of icy water and hot water. • Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers. • Use secondary sources to find out about the water cycle.
Application of knowledge – *assessment (possible evidence)*	• Can give reasons to justify why something is a solid liquid or gas • Can give examples of things that melt/freeze and how their melting points vary • From their observations, can give the melting points of some materials • Using their data, can explain what affects how quickly a solid melts • Can measure temperatures using a thermometer • Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup • From their data, can explain how to speed up or slow down evaporation • Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet
Term: Autumn 2	
National Curriculum Objectives (disciplinary concepts)	**Unit title: Sound** **Prior learning;** • Explore how things work. (Nursery – Sound) • Describe what they see, hear and feel whilst outside. (Reception – Sound) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) The aim of this unit is for pupils to: • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it.

Key learning (PLAN matrix)	• Recognise that sounds get fainter as the distance from the sound source increases. 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.
Notes & Guidance (non-stat.)	Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.
Understanding of vocabulary (evidence)	• Can name sound sources and state that sounds are produced by the vibration of the object • Can state that sounds travel through different mediums such as air, water, metal • Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it • Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder • Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases **Core Texts:**
Key Vocabulary	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation
Common misconceptions	

Application of knowledge – *activities*	• Classify sound sources. • Explore making sounds with a range of objects, such as musical instruments and other household objects. • Explore how string telephones or ear gongs work. • Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks. • Measure sounds over different distances. • Measure sounds through different insulation materials.
Application of knowledge – *assessment (possible evidence)*	• Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear • Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects • Can use data to identify patterns in pitch and volume
Term: Spring 1 & 2	
National Curriculum Objectives (disciplinary concepts)	**Unit title: - Electricity** **Prior learning;** • Explore how things work. (Nursery - Electricity) The aim of this unit is for pupils to: • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.

Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.
Understanding of vocabulary (evidence)	• Can name the components in a circuit • Can make electric circuits • Can control a circuit using a switch • Can name some metals that are conductors • Can name materials that are insulators
	Core Texts:
Key Vocabulary	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

	N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.
Common misconceptions	
Application of knowledge – *activities*	• Construct a range of circuits. • Explore which materials can be used instead of wires to make a circuit. • Classify the materials that were suitable/not suitable for wires. • Explore how to connect a range of different switches and investigate how they function in different ways. • Choose switches to add to circuits to solve particular problems, such as a pressure switch for a burglar alarm. • Apply their knowledge of conductors and insulators to design and make different types of switch. • Make circuits that can be controlled as part of a DT project. N.B. Children should be given one component at a time to add to circuits.
Application of knowledge – *assessment (possible evidence)*	• Can communicate structures of circuits using drawings which show how the components are connected • Use classification evidence to identify that metals are good conductors and non-metals are insulators • Can incorporate a switch into a circuit to turn it on and off • Can connect a range of different switches identifying the parts that are insulators and conductors • Can add a circuit with a switch to a DT project and can demonstrate how it works • Can give reasons for choice of materials for making different parts of a switch • Can describe how their switch works
Term: Summer 1	
	Unit title: Living things and their habitats Prior learning; • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)

National Curriculum Objectives (disciplinary concepts)	• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) • Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) The aim of this unit is for pupils to: • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things.
Key learning (PLAN matrix)	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.
Notes & Guidance (non-stat.)	Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.

Understanding of vocabulary (evidence)	Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. • Can name living things living in a range of habitats, giving the key features that helped them to identify them • Can give examples of how an environment may change both naturally and due to human impact **Core Texts:**
Key Vocabulary	classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate
Common misconceptions	
Application of knowledge – *activities*	• Observe plants and animals in different habitats throughout the year. • Compare and contrast the living things observed. • Use classification keys to name unknown living things. • Classify living things found in different habitats based on their features. • Create a simple identification key based on observable features. • Use fieldwork to explore human impact on the local environment e.g. litter, tree planting. • Use secondary sources to find out about how environments may naturally change. • Use secondary sources to find out about human impact, both positive and negative, on environments.
Application of knowledge – *assessment (possible evidence)*	• Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.) • Can use classification keys to identify unknown plants and animals • Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter

Term: Summer 2	
National Curriculum Objectives (disciplinary concepts)	**Unit title: Animals inc. Humans (teeth & digestion)** Prior learning; • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans) The aim of this unit is for pupils to: • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions. **check coverage for; Construct and interpret a variety of food chains, identifying producers, predators and prey.
Key learning (PLAN matrix)	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.

Notes & Guidance (non-stat.)	Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions.
Understanding of vocabulary (evidence)	• Can sequence the main parts of the digestive system • Can draw the main parts of the digestive system onto a human outline • Can describe what happens in each part of the digestive system • Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for ** • *Can construct food chains* • *Can name producers, predators and prey within a habitat* **Core Texts:**
Key Vocabulary	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar
Common misconceptions	
Application of knowledge – *activities*	• Research the function of the parts of the digestive system. • Create a model of the digestive system using household objects. • Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing).

	• Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls.
Application of knowledge – *assessment (possible evidence)*	• Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part • Can record the teeth in their mouth (make a dental record) • Can explain the role of the different types of teeth