

Links to the Early Years Foundation Stage Curriculum

Science begins with critical thinking. Through a combination of teacher directed curriculum, the use of practical resources and purposeful problem-solving children explore, use and begin to refine their investigative skills. Understanding the World and seasonal changes are taught regularly as part of St. Joseph's EY curriculum.

Pupils investigate collaboratively and share ideas, resources and skills. Teachers elicit language development and prompt children to make predictions through refined and expert questioning. EYFS staff provide children with step-by-step guidance when appropriate.

In planning and guiding children's activities, practitioners must reflect on the different ways that children learn and reflect these in their practice.

The three characteristics of effective teaching and learning are;

- playing and exploring – children investigate and experience things, and 'have a go'
- active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things.

Working scientifically key: Identify and classify Investigations, comparative and fair testing Observations over time Predictions, conclusions and evaluations Pattern Seeking Secondary data					
Subject: Science Year 1					
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview		Overview	
<p>Pupils will use skills learned in maths such as measuring heights and presenting as a bar chart. Learning will provide a basis for further study of plants in KS2.</p> <p>Pupils will have used their local environment and at the end of the unit, pupils will be able to name a variety of different flowering plants and be able to compare and contrast them by observing closely. They will know what the words deciduous and evergreen mean and will be able to name some trees. Pupils will have grown plants from seeds and recorded their growth over time.</p>	<p>The main context for learning is linked to art and maths. Pupils will closely observe and draw themselves and each other using skills developed in art. In making pictograms and charts, they practise counting skills.</p> <p>Pupils will build on knowledge gained in Reception when they used their senses to explore foods and learned about changing form a baby to an infant. At the end of the unit the pupils will be able to name the five senses, talk about them and name different parts of their bodies.</p>	<p>Pupils will be exposed to scientific terminology which continues from their Understanding of the World units of study in Early Years.</p> <p>At the end of the unit, pupils will be able to name a range of materials and the properties associated with them. Pupils will know new vocabulary such as translucent, transparent, rigid and flexible. They will be able to sort and group them in different ways, explaining their reasons and record their ideas as charts and Venn diagrams.</p>	<p>This builds on learning from Reception when pupils learned about farm animals and animals that hibernate. At the end of the unit pupils will be able to identify a range of animals and contrast and compare them, then sort and classify them.</p>	<p>This builds on learning from Reception when pupils learned about farm animals and animals.</p> <p>At the end of the unit pupils will be able to identify a range of animals, name the different diet types of animals can be classified by, and contrast and compare them, then sort and classify them.</p>	<p>During 'Seasonal Changes (Autumn and Winter)' pupils will learn about the four seasons, with a particular focus on autumn and winter. Children will learn what the word weather means and find out how different types of weather can be measured. Children will use a class weather station to observe measure and record the weather across the seasons. They will also observe changes across the seasons by exploring the signs of autumn and winter through nature and wildlife. A range of learning activities are used in this unit including observation, discussion and learning outside. Children also work scientifically by collecting, recording and interpreting simple data. At the end of the unit, children will be able to talk about the weather in Autumn/winter and use a weather station to record different weather.</p>
<p>Key Vocab: Plant, wild, garden, look, feel, smell, root, stem, leaf, flower,</p>	<p>Key Vocab: Head, body, skeleton, limb, joint</p>	<p>Key Vocab: Fabric, glass, material, metal, object, plastic, rock, wood, bendy, firm, hard,</p>	<p>Key Vocab: Mammal, fur, milk, babies, birth, lungs, breathe, bird, feathers, wings, beak,</p>	<p>Key Vocab: Food, meat, plants, products, supermarket, grow, herbivore, plants,</p>	<p>Key Vocab: Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring,</p>

<p>tree, trunk, branch, evergreen, leaves, petals, blossom, seed, sprout, bud, grow, light, soil, air, fruit.</p>	<p>Brain, eyelash, eye, sight, pupil, Close, Far Magnify, See Sound, ear, sign, language, vibration, deafness, Tongue, mouth, taste, flavour, sweet, touch, fingertips, skin, Rough, Skin, Smooth, Soft, Touch, organ, brain, Smell, odour, nose, nostril, nose, hair</p>	<p>press, shape, soft, squash, stiff, bumpy, feel, grip, rough, scratch, slippery, smooth, touch, absorbent, drip, dry, soak, waterproof, wet, bright, dull, light, shine, shiny, sparkle, choice, see-through, transparent.</p>	<p>eggs, fly, walk, swim, reptile, scales, land, cold-blooded, sun, warm, eggs, amphibian, moist, eggs, jelly, gills, lungs, tadpole, frog, change, fish, scales, fins, gills, swim, nests, habitat.</p>	<p>grind, crush, teeth, leaves, carnivore, meat, hunt, sharp, catch, prey, omnivore, both, choice, snout, seeds, peck, ocean, seaweed, coral, gills, fins, underwater, unusual, special, different, surprising, strange, shrimp.</p>	<p>Autumn), sun, sunrise, sunset, temperature, sunshine, daylight, shadow, thermometer, spring, blossom, buds, warmer, rainy, babies, frost, hibernate, ice, bare, den, months, daylight, pattern, change.</p>
<p>Key Knowledge:</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Working scientifically-Use observations, Identify and classify) Identify and describe the basic structure of a variety of common flowering plants, including trees (Working scientifically-Use observations) Know how plants change over time (Know that fruit trees and vegetables are varieties of plants) (Working scientifically- Observations over time.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Name basic parts of the human body. (Working scientifically- Identify) Know which body part is associated with each sense. - (Working scientifically- classify. Perform simple investigations. Use observations.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Describe the simple physical properties of everyday materials using scientific terminology and vocabulary. (Working scientifically- Identify and classify) Understand the basic concept of objects that float and sink using scientific terminology. (Working scientifically- Perform simple investigations and use observations to answer questions.) Distinguish between an object and the material from which it is made (Working scientifically- Identify and classify) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock(Working scientifically- Identify and classify) Describe the simple physical properties of a variety of everyday materials (Working scientifically- Identify and classify, Perform simple tests, Use observations) Compare and group together a variety of everyday materials on the basis of their simple physical properties. Working scientifically- Identify and classify) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.- (working scientifically- Group and sort) Explain the characteristics of an animal.(Working scientifically- Use observations to suggest answers.) Describe and compare the structure of a variety of common animals .(Working scientifically- Use observations to suggest answers.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Define a herbivore, carnivore and omnivore.(working scientifically- Group and sort.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Understand that there are four seasons and recognise and understand the changes associated with the seasons and day length- (Working scientifically- Observations. Identifying and classifying)
<p>Learning Breakdown</p>	<p>Learning Breakdown</p>	<p>Learning Breakdown</p>		<p>Learning Breakdown</p>	
<p>Plants:</p> <ul style="list-style-type: none"> Label the basic parts of a plant. Observe a bean growing and record their observations. Identify different types of plants. Become familiar with common names of flowers and plant structures including seeds. Identify and describe the basic structure of a variety of common flowering plants, including trees. Become familiar 	<p>Animals, including humans – All about me - I:</p> <p>Identify, name, draw and label the basic parts of the human body. To know the five senses and say which part of the body is associated with each sense Learn about:</p> <ul style="list-style-type: none"> eyes and sight ears and hearing tongue and taste sense and touch nose and smell 	<p>Everyday materials:</p> <ul style="list-style-type: none"> Describe the simple physical properties of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties Describe the simple physical properties of everyday materials Understand that materials are used to create a variety of furniture. Explore a variety of fabrics and understand their different properties. 	<p>Animals, including humans – All about animals:</p> <ul style="list-style-type: none"> Name and label the basic parts of an animal. Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). 	<p>Animals, including humans – All about animal's diets:</p> <ul style="list-style-type: none"> Know some similarities and differences between different animals. Discover the types of food living things eat. Define what a herbivore, carnivore and omnivore is. Explain the characteristics of an animal. <p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making</i></p>	<p>Seasonal Changes:</p> <ul style="list-style-type: none"> Understand that there are four seasons. Observe, describe and understand the weather associated with the seasons and how day length (one lesson per season) Observe and describe weather associated with the seasons and how day length varies. Observe and describe weather associated with the seasons and how day length varies.

<p>with common names of flowers and plant structures.</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants. (Understand that different plants can grow in the same environment) Identify and name a variety of deciduous and evergreen trees (Know the difference between deciduous and evergreen trees) Understand how plants change over time (Know that fruit trees and vegetables are varieties of plants) Keep records of how plants change over time. <p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making diagrams, representing results and gather and record data to help in answering questions.</i></p>	<p>(One lesson for each sense)</p> <p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making diagrams, representing results and gather and record data to help in answering questions.</i></p>	<ul style="list-style-type: none"> Compare and group together a variety of everyday materials on the basis of their simple physical properties Investigate the suitability of materials for a specific purpose e.g. plastic works better for an umbrella because it is waterproof. Explain the uses of materials and why they are suitable. <p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making diagrams, representing results and gather and record data to help in answering questions.</i></p>	<ul style="list-style-type: none"> Learn about the differences between amphibians, reptiles and fish. Learn about the differences between mammals and birds. Know some similarities and differences between different animals. Explore the difference between wild animals and pets. <p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making diagrams, representing results and gather and record data to help in answering questions..</i></p>	<p><i>diagrams, representing results and gather and record data to help in answering questions..</i></p>	<p><i>Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making diagrams, representing results and gather and record data to help in answering questions..</i></p>
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Seasonal Change:

Observe and talk about changes in the weather and the seasons.

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

Work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them. Answer questions about the weather.

Subject: Science						Year group: 2	
Autumn		Spring		Summer			
1	2	1	2	1	2		
Overview	Overview	Overview	Overview	Overview	Overview	Overview	
<p>Growing plants</p> <p>This builds on prior knowledge from Year 1 scientific study, identifying and naming a variety of common wild and garden plants. It also links to knowledge of the basic structure of a flowering plants.</p> <p>At the end of this unit pupils will be able to describe how seeds and bulbs grow into plants. They will also be able to say what plants need to grow (water, light, temperature)</p>	<p>Everyday Materials</p> <p>This builds on prior knowledge identifying different everyday materials from Year 1 scientific study. Pupils will draw on their knowledge of materials names and properties in order to use technical vocabulary. They will also draw on their learning from D.T when they explored various materials for model making.</p> <p>At the end of this unit, pupils will be able to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. They</p>	<p>Animal needs</p> <p>This builds on prior knowledge of 'Living things including animals' from Year 1 scientific study. Pupils will draw on their knowledge of animals and their needs then use this knowledge to inform their work. They will also draw on their geographical knowledge to research a suitable habitat.</p> <p>At the end of this unit, pupils will have greater understanding of the differences between living and not living and what animals need to live. They will be able to identify that most living things live in habitats to which they are suited and describe how</p>	<p>Local Habitats</p> <p>This builds on prior knowledge of animals and habitats. Pupils can draw on their experience of identifying animals to be carnivores, herbivores and omnivores. They will be able to identify the suitability of the habitat based on an understanding of animal needs.</p> <p>At the end of this unit, pupils will be able to identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. They will also be able to identify and name a</p>	<p>Habitats and Microhabitats</p> <p>This builds on prior knowledge of 'Living things including animals' from Year 1 scientific study. Pupils will draw on their knowledge of living things and their habitats, then use this knowledge to inform their work.</p> <p>At the end of this unit, pupils will have greater understanding of animals and their offspring. They will develop scientific skills such as identifying and classifying .</p>	<p>Food chains and health</p> <p>Building on from their prior learning in Year 1 and their 'Animals including humans' unit of study in the autumn term of Year 2, pupils will be able to describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>		

	will also extend their scientific skills in using their observations and ideas to suggest answers to questions. Pupils will know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Pupils will be able to describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	variety of plants and animals in their microhabitats.		
<p>Key Vocab: Seed, Bulb, Growth, Soil, Light, Water, Temperature</p> <p>Seeds, bulbs, growth, plant, compare Predict, investigate, control experiment, method Photosynthesis, carbon dioxide, oxygen, glucose, energy Pollination, life cycle, germination, reproduction, seedling Manure, crop, insulate, thrive, healthy Forest, desert, adapt, condition, survive</p>	<p>Key Vocab: Material, property, suitable, object, brick Bridge, triangle, obstacle, structure, construction Stretchy, elastic, floppy, hinder, limit, Bend, twist, squash, stretch, force Mackintosh, protective, fluorescent, safety, waterproof John McAdam, merchant, bound, highway, road</p>	<p>Key Vocab: Baby, Adult, Life cycle, Food, Water, Air, Exercise, Hygiene</p>	<p>Key Vocab: Habitat, Environment, Food chain, Animal, Plant, Predator, Prey</p>	<p>Key Vocab: Microhabitat, Adaptation, Environment, Conditions, Biodiversity</p>	<p>Key Vocab: Food chain, Producer, Consumer, Predator, Health, Diet</p>
<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know and explain how seeds and bulbs grow into plants. (Working scientifically. Using observations to suggest answers and Observing Closely & Using Equipment: Use magnifying glasses to observe seed changes daily. Recording Data: Measure plant height weekly, record observations in a plant diary Know what plants need to grow and stay healthy (water, light & suitable temperature) (Working scientifically. Using observations to suggest answers.) Flowers make seeds to make more plants (reproduce). (Working scientifically- Asking simple questions and recognising that they can be answered in different ways) We can eat different parts of the plants (leaves, stems, roots, seeds, fruit) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know that some objects shape can be changed when we bend or twist them. (Working scientifically- Performing simple tests.) Identify which objects' shapes can be changed and know that some materials shape cannot be changed by bending or twisting. (Working scientifically- Performing simple tests. data to help answer questions) Know that materials are used for specific objects due to their properties certain materials have the best properties for that object. (Working scientifically- Using their observations and ideas to suggest answers to questions.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know the basic stages in a life cycle for animals, (including humans). (Working scientifically- Identifying and classifying. Using observations to suggest answers. Gathering and recording data) Name some different sources of food for animals. (working scientifically- Gathering and recording data to help in answering question) There is variation between living things. Different animals and plants live in different places and living things are adapted to survive in different habitats. (working scientifically- Identifying and classifying. Using their observations and ideas to suggest answers to questions.) <p>Environmental change can affect plants and animals that live there.(working scientifically- Using their observations and ideas to suggest answers to questions.)</p>	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Classify things by living, dead or never lived. (Working scientifically- Identifying and classifying) Identify most living things live in habitats to which they are suited. (working scientifically- identify and classify. Using observations and ideas to suggest answers.) Know how different habitats provide for the basic needs of different kinds of animals and plants. (working scientifically- Using observations and ideas to suggest answers.) Name plants and animals in their habitats. Appreciate that environments are constantly changing. (Working scientifically- Observations over time) Know how a specific habitat provides for the basic needs of things living there (plants and animals) (Working scientifically- Observing closely, using simple equipment) To be able to match living things to their habitat. (working scientifically- Using their observations and ideas to suggest answers to questions) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Identify most living things live in habitats to which they are suited. (working scientifically- identify and classify. Using observations and ideas to suggest answers.) Know how different habitats provide for the basic needs of different kinds of animals and plants. (working scientifically- Using observations and ideas to suggest answers.) Name plants and animals in their habitats. Appreciate that environments are constantly changing. (Working scientifically- Observations over time) Know how a specific habitat provides for the basic needs of things living there (plants and animals) (Working scientifically- Observing closely, using simple equipment) To be able to match living things to their habitat. (working scientifically- Using their observations and ideas to suggest answers to questions) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know why exercise, a balanced diet and good hygiene are important for humans. Know about and explain a simple food chain.

Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown
1. Introduction to Plant Growth 2. Germination: Plant seeds and observe early growth 3. Observing Growth 4. What Plants Need 5. Comparing Growth 6. Summarising and Recording	<ul style="list-style-type: none"> Explore the environment identifying different materials and discuss their use. Identify and classify where materials come from and if they are man-made or natural. Research properties of materials. Discuss what makes a material suitable or unsuitable for a particular purpose. Know that the same material can be used for different purposes. Understand the differences between chemical and physical changes. Carry out experiments to investigate physical and chemical changes. Research people who have developed new useful materials e.g. John McAdam 	<ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify different habitats and classify depending on type. Identify and name a variety of plants and animals in their habitats, including microhabitats - research a habitat (rainforest and its problems) Describe how animals obtain their food from plants and other animals. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain. Understand how food makes the journey from farm to fork. 	<ul style="list-style-type: none"> 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 different habitats and classify depending on type. Identify and name a variety of plants and animals in their habitats, including microhabitats - research a habitat (rainforest and its problems) Describe the habitat and explain why it is a suitable environment for that animal. Describe Oceanic, Antarctic and Arctic habitats – identifying and classifying features of importance. 	<ul style="list-style-type: none"> Know the difference between seeds and bulbs by observing how a plant grows from seeds or bulbs, over time. Investigate the requirements for plants to grow and survive by designing an experiment. Understand the requirements of plants for germination, growth and survival, as well as, the processes of reproduction and growth in plants by describing the life cycle of a plant. Look after a plant keep a diary of its growth. Research germination and the process of reproduction and understand that plants adapt to suit their environment. 	Animals including humans. <ul style="list-style-type: none"> Know that animals, including humans, have offspring which grow into adults by ordering the stages of the human life cycle. To understand that animals, including humans, have offspring which grow into adults by describing the stages of a human life cycle. To recognise that animals, including humans, have offspring which grow into adults by identifying the offspring and parent of an animal. Explore the life cycle of a chicken. Describe the life cycle of a butterfly Explore the life cycle of a frog.
Enrichment activities to reinforce learning	Enrichment activities to reinforce learning	Enrichment activities to reinforce learning	Enrichment activities to reinforce learning	Enrichment activities to reinforce learning	Enrichment activities to reinforce learning

Subject: Science						Year group: 3 - NEW					
Autumn			Spring			Summer					
1	2		1	2		1	2				
Overview	Overview		Overview	Overview		Overview	Overview				
Plants The main context for learning is plant growth and the seasons.	Rocks Children will build on prior learning from Year 2 of materials, living things and plants. Their knowledge of animals and plants learned in		Light and Shadow Children will build on prior learning of electricity from Year 2 science. By the end of this unit, children will be able to recognise that we need light in	Animals (including humans) Children will build on their learning in Year 2. They will further investigate the body of humans and animals, building on their understanding by learning how the body works and grows.		Forces and Magnets Children will build on prior learning of materials from Year 2. They will use their knowledge of sorting, by a given criterion, to compare and group objects that are magnetic.		The Bee Project Pupils will explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			

<p>In this unit, children will build on previous knowledge gained in Year 2. They will understand the functions of different parts of flowering plants they learnt to identify in Year 2 and further develop their understanding of how each part supports its growth.</p> <p>By the end of this unit, children will be able to carry out investigations in order to understand and explain different processes associated with plants. It will consolidate and extend their knowledge of the functions of the different parts of flowering plants and the part that flowers play in the life cycle of a flowering plant.</p>	<p>Year 2, will help them to understand the concept of fossils and organic matter within soil.</p> <p>By the end of this unit, children will be able to compare and sort different kinds of rocks based on their appearance and physical properties. They will be able to describe how fossils are formed and that soils are made from rocks and organic matter.</p>	<p>order to see things and that dark is the absence of light. They will know that light is reflected from surfaces and how shadows are formed.</p>	<p>By the end of this unit, they will be able to identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food. Additionally, that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>By the end of this unit, children will understand that forces need contact between two objects, but magnetic forces can act at a distance. They will have investigated how magnets attract and repel different materials. They will know that magnets have two poles and be able make predictions about whether two magnets will attract or repel each other.</p>	<p>They identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>They will further identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>
<p>Key Vocab: Roots, stem, trunk, leaves, flowers, nutrients, evaporation, fertilisation, petal, stamen, carpel (pistil), sepal, pollination, pollinator, germinator, seed dispersal</p>	<p>Key Vocab: Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, topsoil, sub soil, base rock</p>	<p>Key Vocab: Light, dark, reflection, ray, pupil, retina, shadow, opaque, translucent, transparent</p>	<p>Key Vocab: Nutrition, nutrients, carbohydrates, proteins, vitamins, minerals, fibre, skeleton, bones, muscles, joints</p>	<p>Key Vocab: Force, magnetic force, magnet, attract, repel, poles, contact force, non-contact force</p>	<p>Key Vocab: Abdomen, antennae, mandible, proboscis, stinger thorax, venom, bee, bread, cells, colonies, drone hexagonal larva, pupa royal, jelly, social bees Honey, stomach, propolis swarm, waggle dance, honeydew, solitary, sugarbag beekeepers, insecticide</p>
<p>Key Knowledge:</p> <ul style="list-style-type: none"> Understand what plants need to grow. (Working scientifically- making a predication, making scaffolded conclusions based on evidence, use of secondary data) Understand the functions of different parts of plants. (working scientifically- follow and set up a simple investigation, identifying and classifying) Describe the different ways in which plants can disperse their seeds. (working scientifically- follow and set up a simple investigation Comparative or fair test) Investigate the way in which water is transported in a plant. (working scientifically- observation over time, follow a simple investigation.) Know the part that flowers play in the life 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Compare and group together different kinds of rocks (sedimentary, igneous, metamorphic) based on their appearance and simple physical properties – durable, permeable, impermeable, density. (working scientifically- compare and classify, make predictions, set up a simple procedure, comparative test.) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (working scientifically- follow a simple practical procedure) Know that Mary Anning made significant discoveries impacting palaeontology. Recognise that soils are made from rocks and organic matter and describe the four processes of soil formation 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. (working scientifically- questioning and observations) Notice that light is reflected from surfaces. (working scientifically- comparative testing) Recognise that light from the sun can be dangerous and that there are ways to protect their eyes and skin. (working scientifically- observation) Know how shadows are formed and which objects are more likely to form a shadow: transparent, translucent or opaque. (working scientifically- Fair testing, identifying, classifying and grouping) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Name the five food groups. (working scientifically- identifying and grouping) Identify that animals, including humans, need the right types and amount of nutrition (predict, observe, comparative testing and evaluation) Identify that humans and some other animals have skeletons and muscles for support, protection and movement. (Working scientifically- Observe, modelling) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know that some forces need contact between two objects (pushes and pulls), but magnetic forces can act at a distance. (working scientifically- follow a simple practical procedure, observe, make conclusions based on evidence, evaluation) Investigate how different surfaces can cause more or less friction. (working scientifically- Fair test, predictions, variables, pattern seeking, repeats, averages, conclusion based on evidence.) Know magnets attract or repel each other and attract some materials and not others. (working scientifically- fair test, prediction, variables, repeats, pattern seeking, conclusion, evaluation.) Describe magnets as having two poles. (working scientifically- observation) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know that bees live in hives. (working scientifically- observations using a range of equipment) To recognise that bees communicate the position of nectar by doing a waggle dance. (working scientifically- systematic observations, follow a practical procedure) To recognise that not all bees make honey. (working scientifically- comparative and fair test, observing, asking questions.)

<p>cycle of flowering plants, including pollination and seed formation. (working scientifically- Follow a simple investigation, comparative or fair test. Identify and change variables.)</p> <ul style="list-style-type: none"> Know the different ways in which plants can disperse their seeds: air, wind, water, animal. 	<p>(addition, losses, translocations and transformation). (working scientifically- follow a simple practical procedure, observe over time, make a conclusion based on evidence.)</p>				
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown
<p>Plants What are the parts or the plant? Why do plants need flowers? Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>What do plants need to grow? 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</p> <p>How does water travel though a plant? Investigate the way in which water is transported within plants</p> <p>What are the stages of a plant life cycle? How do plants make new plants? Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <p>NS- 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</p>	<p>Rocks What are some properties of rocks? Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Where can we find fossils? How do volcanoes make igneous rock? Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Why is soil important? Recognise that soils are made from rocks and organic matter.</p> <p>Can rocks be changed? Can rocks be recycled? Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time</p> <p>Why is soil important? Explore the different layers of the Earth.</p>	<p>Light and Shadow Light source or Light reflector? Translucent, transparent or opaque? 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</p> <p>How can we protect our eyes from the sun? Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>What is a shadow? Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p> <p>What makes a good reflector? 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.</p> <p>What is a shadow? They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change</p> <p>How to telescopes work?.</p>	<p>Animals (including humans) What do we need to eat? How much is enough food? Understand what makes a healthy diet.</p> <p>How do living things get energy? Understand how nutrient, water and oxygen get transported around the body.</p> <p>What bones are in the human body? Are human and animal bones the same? Compare human skeletons to a variety of different animals.</p> <p>How to animals move? Understand that muscles and joints are responsible for movement. Investigate the effect of exercise on the body.</p>	<p>Forces and Magnets How do we make things move? Compare how things move on different surfaces</p> <p>What are some contact forces? What are some non-contact forces? Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Are all metals magnetic? 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 2 poles</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p> <p>NS- 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).</p> <p>Can you make a magnet stronger? Can magnets help us when we are lost?</p>	<p>Animals (including humans) What is a bee? Recall the parts of a bee and the products made by bees.</p> <p>What do bees make? Know how bees collect substances from flowers. Explain how bees use the products they make.</p> <p>How do bees communicate? Recall the ways bees use scent to communicate and describe how bees use dance to communicate.</p> <p>Who makes honey? Recall that not all bees make honey. Describe how other animals make honey and evaluate the life of a solitary bee.</p> <p>What is happening to bees? Describe why bees are important to humans. Explain how humans are harming bees and the ways in which we can protect bees.</p>

<ul style="list-style-type: none"> Know the main properties of solids, liquids and gases. (working scientifically- identify and classify, observations) Solids - holds its shape, closely packed particles. Liquids - takes shape of container, can be poured, particles less tightly packed. Gases - fill space they are in, particles very loosely packed. Compare and group materials according to whether they are solids, liquids or gases. (working scientifically- identify and classify) Know that some materials change state when they are heated or cooled (ice, water, water vapour). (working scientifically- set up and follow a simple investigation, predictions, conclusion, evaluation, research) Know what the water cycle is and the four main stages: evaporation, condensation, precipitation, collection. (working scientifically- set up and follow a simple investigation, observation, conclusion based on evidence, modelling, secondary data) 	<ul style="list-style-type: none"> Name and describe the simple functions of the basic parts of the human digestive system (mouth, oesophagus, stomach, liver, pancreas, duodenum, small intestine, large intestine, rectum, anus) (working scientifically- setup and follow a simple investigation, observation, conclusion based on evidence.) Identify different types of human teeth and their functions (molar, premolar, canine, incisor, wisdom). Identify differences in teeth of carnivores, omnivores and herbivores and why this is. Understand what causes tooth decay (plaque, bacteria, acids) and that some foods can damage teeth (sugars and starches, acids). (working scientifically- follow and set up a simple investigation, predict, comparative test, conclusion, evaluation, variables.) Construct and interpret a variety of food chains and know meaning of predator, prey, source, producer, consumer. 	<ul style="list-style-type: none"> Know that sound is made when objects vibrate the air molecules nearby, causing a sound wave. (working scientifically- observation over time) Know main parts of the ear (outer ear, middle ear, inner ear, auditory canal, ear drum, ossicles, cochlea, auditory nerve) (working scientifically- observation over time) Know that vibrations from sounds travel through a medium (solid, liquid, gas) to the ear. Know pitch is how high or low a sound is and that the faster the vibrations, the higher the pitch. (working scientifically- pattern seeking testing, measuring.) Know that the louder the sound (volume), the bigger the vibration (amplitude). (working scientifically- follow an investigation, fair testing, measuring sound, use of simple equipment.) Know that sounds get fainter as the distance from the sound source increases. 	<ul style="list-style-type: none"> Know that living things can be grouped in a variety of ways (e.g. plants and animals, flowering and non-flowering plants, vertebrates and invertebrates). Know the 5 main vertebrate groups: mammals, reptiles, amphibians, fish and birds. (working scientifically- identify and classify, secondary data, observing, grouping, pattern seeking, making conclusions based on evidence.) Use classification keys to help group, identify, and name living things in the environment. (working scientifically- secondary data, classifying, identifying, pattern seeking, conclusions.) Know that environments can change through the effects of human population and development, litter, deforestation and natural events such as fire and floods and this can damage habitats. (working scientifically- secondary data, evaluate data) 	<ul style="list-style-type: none"> Identify common appliances that run on electricity. (working scientifically- follow and set up a simple practical procedure to gather and record data, observe over time, conclusion.) Describe common conductors (metals such as copper, iron and steel) and insulators (plastic, wood, rubber). (working scientifically- follow and set up a simple investigation, gather and record data, pattern seeking, comparative test, conclusion, evaluation, variables, suggestions for further enquiry) Identify and name basic parts of a simple series electrical circuit (cells, wires, bulbs, switches and buzzers) (working scientifically- follow and set up a simple investigation, working with basic equipment, suggestions for further enquiry.) Know that a switch opens and closes a circuit. 	<ul style="list-style-type: none"> Know a lever is a type of simple machine. Levers are one of the earliest types of technology used by humans. (working scientifically- follow and set up a simple investigation, gathering and recording data, pattern seeking.) Know that Ancient Egyptians removed moisture from bodies in order to make mummies! (working scientifically- follow and set up a simple practical enquiry, gather and record data, conclusion, evaluation) Recognise that scientific knowledge can develop overtime for example - many of Aristotle's ideas were accepted for over 2000 years! Some ideas were incorrect and could have been proven wrong if experiments had been carried out. (working scientifically- careful observations, use secondary data) Ibn-al-Haytham was a Muslim scientist who proved that the eye is not a light source. Appreciate that scientists often have different beliefs until their ideas are 'proven'. <i>Copernicus suggested the earth and other planets travel around the sun unlike Aristotle, who believed the sun travelled around other planets and that earth was in the centre.</i>
Learning Breakdown	Learning Breakdown	Learning Breakdown		Learning Breakdown	Learning Breakdown
<p>States of Matter</p> <p>What are the states of matter? Recall some solids, liquids and gases Group solids, liquids and gases Describe the properties of solids, liquids and gases</p> <p>Can we turn a solid into a liquid? Recall the change of state that happens in melting Give some examples of melting Investigate melting</p>	<p>Animals (including humans)</p> <p>Can we group animals by what they eat? Recall why plants are important Recall which feeding group animals belong to Explain the importance of herbivores</p> <p>Who eats what? Understand what is meant by a food chain Construct food chains Describe how food chains can be disrupted</p>	<p>Sound</p> <p>How are sounds made? Know how sounds are produced Understand how different instruments work Make an instrument</p> <p>How does sound travel? Give examples of different mediums Describe how an echo is made Investigate how sound travels through different mediums</p> <p>How do our ears work? Recall the structure of the ear Describe the function of the parts of the ear</p>	<p>Living Things and their Habitats</p> <p>How can we sort living things? Know what is meant by characteristics Know some characteristics of non flowering plants Sort plants into groups</p> <p>Name the different types of vertebrates Name the different types of vertebrates Give some characteristics of different types of vertebrates</p>	<p>Electricity</p> <p>What is electricity? Recall different types of electricity Know what is meant by electricity Know how static electricity is made</p> <p>How do we produce electricity for our homes? Know what is meant by electric current Describe some ways electricity is made Explain what a circuit is</p> <p>What are the parts of a circuit? Recall the different components of a circuit Describe how different components have different uses in devices Explain how a switch helps us control a circuit</p> <p>Conductors or insulators? Define the volume of a sound</p>	<p>The History of Science</p> <p>Did science exist in prehistoric times? State how early humans lived Describe how simple machines are useful Explain how science can help humans survive</p> <p>How did ancient Egyptians use science? Recall an ancient civilisation Describe some challenges they faced Explain how ancient Egyptians responded to these challenges using science</p> <p>What was ancient Greek science? Recall an ancient civilisation Describe some challenges they faced Explain how ancient Egyptians responded to these challenges using science</p>

<p>What is the opposite of melting? Recall the change of state that happens in freezing Give some examples of freezing Investigate freezing</p> <p>Why do puddles disappear?</p> <p>Recall the change of state that happens in evaporation Give some examples of evaporation Investigate evaporation</p> <p>Can we make rain? Recall the change of state that happens in condensation Give some examples of condensation Investigate condensation</p> <p>Do we drink the same water as the dinosaurs?</p> <p>Correctly sequence the stages of the water cycle Know how to create a model of the water cycle Describe each stage of the water cycle</p> <p><i>Compare and group materials together, according to whether they are solids, liquids or gases</i></p> <p><i>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)</i></p> <p><i>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</i></p>	<p>Why are we born without teeth? Understand what is meant by digestion Identify the parts of the human digestive system Explain how digestion begins in the human body</p> <p>Why doesn't the stomach digest itself? Recall the role of the oesophagus Describe the conditions in the stomach</p> <p>How big is the small intestine? Recall the structure of the small intestine Describe the role of the small intestine Explain what happens to nutrients that are absorbed across the small intestine</p> <p>Are all bacteria bad for us? Recall the structure of the large intestine Describe the role of the large intestine Explain the role of bacteria in the large intestine</p> <p><i>Explain how the stomach breaks down food in animals</i></p> <p><i>Describe the simple functions of the basic parts of the digestive system in humans</i></p> <p><i>Identify the different types of teeth in humans and their simple functions</i></p> <p><i>Construct and interpret a variety of food chains, identifying producers, predators and prey</i></p>	<p>Explain how sound is detected by the human ear</p> <p>Big or small? Define the volume of a sound Describe how volume can be increased Explain some negative effects of loud sounds</p> <p>High or low? Define the pitch of a sound Describe how pitch can be changed Explain how ultrasound is used by animals, including humans</p> <p><i>Identify how sounds are made, associating some of them with something vibrating</i></p> <p><i>Recognise that vibrations from sounds travel through a medium to the ear</i></p> <p><i>Find patterns between the pitch of a sound and features of the object that produced it</i></p> <p><i>Find patterns between the volume of a sound and the strength of the vibrations that produced it</i></p> <p><i>Recognise that sounds get fainter as the distance from the sound source increases.</i></p>	<p>Summarise the similarities and differences between different types of vertebrates</p> <p>What are invertebrates? Recognise different types of invertebrates Give some characteristics of different types of invertebrates Compare the characteristics of different invertebrates</p> <p>What is a classification key? Develop questions that can be used to sort living things in to groups Use a classification key Construct a classification key</p> <p>How can we see living things in their habitat? Understand ways habitats can change naturally Consider ways humans have changed habitats Suggest ways humans can positively affect habitats</p> <p>How do humans affect plant and animal habitats?</p> <p>Understand ways habitats change naturally Consider ways humans have changed habitats Suggest ways humans can positively affect habitats</p> <p><i>Recognise that living things can be grouped in a variety of ways</i></p> <p><i>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</i></p> <p><i>Recognise that environments can change and that this can sometimes pose dangers to living things.</i></p>	<p>Describe how volume can be increased Explain some negative effects of loud sounds</p> <p>Is electricity safe? Define a hazard Identify some electrical hazards Explain how insulators can be used for protection Identify common appliances that run on electricity</p> <p><i>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</i></p> <p><i>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</i></p> <p><i>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</i></p> <p><i>Recognise some common conductors and insulators, and associate metals with being good conductors.</i></p>	<p>How did Ancient Rome use science? Recall an ancient civilisation Describe some challenges they faced Explain how ancient Romans responded to these challenges using science</p> <p>What was science in the Middle Ages? Recall some civilisations outside of Europe Describe some challenges they faced Explain how they overcame challenges using science</p> <p>What is modern science? Recall some important modern scientists Explain some issues they faced trying to introduce new knowledge Suggest why they changed the way people think about the world</p>
<p>Enrichment activities to reinforce learning</p>	<p>Enrichment activities to reinforce learning</p>	<p>Enrichment activities to reinforce learning</p>	<p>Enrichment activities to reinforce learning</p>	<p>Enrichment activities to reinforce learning</p>	<p>Enrichment activities to reinforce learning</p>
<p>Life Centre – Science Zone Great north museum – Animals, skeletons</p>			<p>Beach visit – rock pools</p>	<p>Life Centre</p>	<p>beach visit – rock pools</p>

Science Year group: 5 -NEW					
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview		Overview	Overview
<p>Chemistry: Properties and Changes of Materials Pupils will learn about materials and the components in which they are made. Pupils will use this knowledge to investigate which materials would be best suited to a set specification.</p> <p>Pupils will explore the processes of dissolving and separating, providing justified reasons to explain reversible and irreversible changes.</p> <p>Previous learning from the unit 'States of Matter' (Y4), 'Forces and Magnets' (Y3) and 'Uses of Everyday Materials' (Y2) will be transferrable in helping pupils when observing materials and their changing state.</p>	<p>Biology: Animals Including Humans Pupils will learn about the interconnections between animals and humans, exploring the similarities and differences between food chains and reproduction.</p> <p>Pupils will explore how the human body changes over time (including during puberty) and how this may be similar for some animals. They will further their knowledge by making links to the size of a mammal and the gestation period that they experience.</p> <p>Previous learning from Year 4, where pupils explored the effects of the environment can have on animals, will support children during this unit.</p>	<p>Physics: Forces Pupils will learn about an array of scientists who have discovered different forces. They will explore the work of Isaac Newton who discovered gravity, as well as scientists such as Galileo Galilei and Albert Einstein.</p> <p>Pupils will use their learning from the Year 3 unit, Forces and Magnets, to deepen their understanding of resistance and buoyancy.</p> <p>Pupils will work scientifically to answer a range of questions, using experiments and other sources to support learning.</p>	<p>Biology: Living Things and their Habitats In this unit of study, pupils will investigate plants and how they can be affected or have their expectancy altered based on the habitat in which they live.</p> <p>Pupils will be able to use their knowledge and understanding of the different animal groups to justify any differences in the reproduction of some plants and animals.</p> <p>By the end of this unit, pupils should be able to describe how human interactions and behaviour implicate reproduction and growth. Pupils will also be exposed to famous naturalists such as David Attenborough and Mary Agnes Chase.</p> <p>Pupils will be able to use transferrable skills taught in Year 4 to use classification keys as a means of understanding different living things and the environments that they thrive most in.</p>	<p>Physics/Earth Science: Earth and Space Pupils will learn about the planets and how they orbit around the Earth. Pupils will use their understanding of the planets, rotation and day and night to answer scientific questions about astronomy.</p> <p>Pupils will explore links between the size of planets and the time that it takes to travel around the sun. Linked to this, pupils will calculate what their age would be on different planets. They will also develop scientific thinking to explain why the moon usually cannot be seen during the day.</p>	<p>The Scientific Method Pupil' knowledge will be affirmed through the reinforcement of disciplinary knowledge investigations which seek to ensure that pupils know the different types of variables which form key parts of scientific investigations</p> <p>They will develop knowledge of categorical, independent, dependent variables through the use of the 'Variables Song' and recognise how these can be applied to graphs.</p>
<p>Key Vocab: Solids, liquids, gas, particles, state, materials, properties</p>	<p>Key Vocab: Puberty, sexual reproduction, sperm cell, menstruation, period, sperm, egg, foetus, gestation, life expectancy</p>	<p>Key Vocab: Forces, gravity, weight, mass, friction, air resistance, water resistance</p>	<p>Key Vocab: Lifecycle, reproduction, sexual reproduction, asexual reproduction, fertilise, metamorphosis, runner, bulb, cutting, tuber</p>	<p>Key Vocab: Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric</p>	<p>Key Vocab: hypothesis, control variable, dependent variable independent variable, the job? Bunsen burner, data, data logger, measuring cylinder pipette, volume accurate, average, conclusion, precise repeatable, centrifuge</p>
<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know the properties of different materials using words such as impermeable, conductive, thermal, soluble, transparent. (Working scientifically- Carry out an investigation, pattern seeking, comparative testing, drawing conclusions based on evidence.) Know that some materials will dissolve in liquid to 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Order the stages of human development. (Working scientifically- Identifying, classifying and grouping) Demonstrate understanding of how babies grow in height and weight. (Working scientifically- observations, pattern seeking.) Know the main changes that occur during puberty. (Working scientifically- 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know that forces change the motion of an object – make it start, move, speed up, slow down or change shape. Know that unsupported objects fall towards the Earth due to the pulling force of gravity. (Working scientifically- Comparative testing, observation, investigation.) Know and identify effects of friction, air resistance and water resistance. (Working scientifically- comparative 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Compare the life cycle of certain mammals, reptiles, amphibians and birds. (Working scientifically- pattern seeking, secondary research) Identify the parts of a plant and its function. (Working scientifically- identifying and classification.) Explain asexual reproduction and sexual reproduction in plant. (Working scientifically- observations, investigation, pattern seeking) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know the movements of the Earth, Sun and Moon including length of time to orbit. (Working scientifically- secondary research.) Know what causes night and day and why night and day varies in different parts of the world. (Working scientifically- secondary research) List the names and order of the planets in the Solar System. 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Know the different types of variables which form part of scientific investigations (Working scientifically- design a comparative test, fair test, observation, secondary research.) Recognise the 'Variables Song' as a way in which to remember the different types of experimental variables and how these can be applied to graphs. (Working scientifically- variables)

<p>form a solution and that some substances can be recovered from a solution. (working scientifically- Observe and compare)</p> <ul style="list-style-type: none"> Explain with examples reversible and irreversible changes to a material including burning. (Working scientifically- observe, make conclusions, evaluate, suggest improvements) Explain the terms: properties, dissolve, solution, filtering, sieving and evaporating. (Working scientifically- Observations) 	<p>comparative testing, pattern seeking, trends.)</p> <ul style="list-style-type: none"> Know the main changes that take place in old age. (Working scientifically- Pattern seeking, data handling, secondary sources.) 	<p>testing, fair test, observation, data handling.)</p> <ul style="list-style-type: none"> Understand how these can be affected by different variables, e.g. mass, surface, shape, streamlining. (Working scientifically- Variables, comparative testing) Know that levers, gears and pulleys allow a smaller force have a greater effect (Working scientifically- observation over time, pattern seeking.) 			
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	
<p>Properties and Changes of Materials:</p> <p>How can we group/compare different materials? Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Enquiry: grouping and classifying</p> <p>To understand what happens when materials are mixed together. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Enquiry: problem solving</p> <p>To recognise the that some changes are reversible/irreversible. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Demonstrate that dissolving, mixing and changes of state are</p>	<p>Animals including Humans:</p> <p>What happens in the life cycle of a human? Describe the changes as humans develop to old age. Enquiry: observation over time</p> <p>How do human gestation periods compare to other animals? Research gestation periods of other animals and compare them to humans. Enquiry: pattern seeking</p> <p>Puberty and the menstrual cycle. Links to RSE – puberty (physical and emotional changes)</p> <p>What is it like to ‘get old’? Draw a timeline to indicate stages of growth and development of humans</p> <p>To recognise that other animals have different life cycle/survival rates.</p>	<p>Forces:</p> <p>What happens when friction is low? Know some everyday examples of forces in action Describe events when forces are low Explain how friction can be increased</p> <p>What happens when friction is high? Know some materials that produce a lot of friction Describe events where friction is high Explain how friction can be reduced</p> <p>What is air resistance? Know what is meant by air resistance Know how air resistance can be increased Know how air resistance can be reduced</p> <p>What is water resistance? Know what is meant by water resistance Know how water resistance can be increased Know how water resistance can be reduced</p> <p>What is gravity?</p>	<p>Living Things and their Habitats:</p> <p>Do mammals develop the same way? Recall the life cycle of mammals Outline the similarities in the life cycles of mammals Describe some differences in the life cycle of mammals</p> <p>What is metamorphosis? Recall the life cycle of amphibians Describe how water supports an amphibian life cycle Explain some of the challenges amphibians face on land.</p> <p>What is inside a cocoon? Recall the life cycle of insects Outline the similarities in the life cycles of different insects Describe some differences in the life cycle of different insects.</p> <p>Which came first, the chicken or the egg? Recall the life cycle of birds Outline the ways birds care for unhatched young Give examples of ways young birds are cared for.</p> <p>Why is there variation amongst living things?</p>	<p>Earth and Space:</p> <p>Do objects move in space? What makes up our solar system? Describe the movement of the Earth, and other planets, relative to the sun in the solar system</p> <p>What have scientists discovered about the Solar System over time? Explore how scientific theories have changes over time. Identify scientific evidence that has been used to support or refute ideas or argument. Enquiry: research</p> <p>Why does the sun move across the sky? Where does the sun go at night? Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky. Know that the Sun casts shadows on Earth Know what a sundial is Make a model sundial</p> <p>Why do we have day and night? Know that Earth rotates on its axis Know what is meant by a day Explain why the Sun appears to move across the sky</p> <p>Why do we have time differences across the world? Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky. Enquiry: research</p>	<p>The Scientific Method</p> <p>To become fluent in the application of variables, scientific investigation planning through conducting a series of experiments. See knowledge organisers for a more detailed overview of each week-by-week experimental breakdown of investigations.</p> <p>What is the scientific method? Know how we ask questions in science Give examples of questions asked in science Investigate questions in science</p> <p>What are variables? Identify the different types of variables Plan an investigation using variables Carry out an investigation using variables</p> <p>What is the best equipment for the job? Recognise a range of equipment Describe the function of a range of equipment Correctly use science equipment</p> <p>Is the data reliable? Know how to collect accurate data Know how to collect precise data Generate repeatable data How did the scientific method transform blood transfusions? Know an important discovery using the scientific method Describe the discovery using the scientific method Use knowledge to make a hypothesis</p> <p>How did the scientific method help us learn about chimpanzees? Know an important discovery using the scientific method Describe the discovery using the scientific method Use knowledge to make a hypothesis</p>

Animals including Humans	Light	Electricity	Evolution and Inheritance	Living Things and their Habitats	Preparing for Secondary Science
<p>This unit builds on pupils' prior understanding of the human body and how it changes and grows over time. Pupils will have a good understanding of human growth from birth through to old age which will help them better understand the specific processes in the body.</p> <p>As a result of the unit, pupils will be able to explain how the human circulatory system works, as well as how lifestyle factors can both positively and negatively affect the functioning of the body.</p>	<p>This unit develops pupils' understanding of light from previous learning in Year 3. They consolidate their knowledge of how light moves and the processes involved in allowing us to see.</p> <p>This unit allows pupils to develop their understanding from being able to notice changes to being able to explain them using appropriate vocabulary. Pupils will work scientifically in order to observe changes and provide an account for why these have occurred</p>	<p>This unit of work builds on pupils' prior learning from their electricity topic in Year 4. Pupils will have already learnt about how to construct circuits and how to identify whether a circuit will work. They will now extend their understanding to be able to give reasons for different effects on the components of a circuit. As a result of this unit, pupils will be able to account for changes in the functioning of various components in a circuit and will be able to explain how changes can be made.</p>	<p>This unit builds on pupils' prior understanding of animals and living things from their key stage 2 programmes of study. Pupils will be familiar with various groups of animals and the associated habitats. They will develop their understanding of the specific features which are beneficial for each habitat by exploring how changes happen over long periods of time.</p> <p>Pupils will also extend their understanding of reproduction to be able to explain how features are inherited and passed down from parents.</p>	<p>This unit of work builds on prior learning from Year 5, where pupils studied 'Living things and their habitats' in the context of the life cycles and reproduction of animals and birds. In Year 6, the children will describe how living things are classified into groups including micro-organisms, animals and plants. They will be able to give reasons for classifying animals and plants.</p>	<p>This unit of work revises core concepts from the Key Stage 2 curriculum in preparation for Key Stage 3.</p>
<p>Key Vocab: Oxygenated, deoxygenated, valve, exercise, respiration, circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco</p>	<p>Key Vocab: Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent, reflect, absorb, emitted, scattered, refraction</p>	<p>Key Vocab: Circuit, cell, batter, current, amps, voltage, resistance, electrons</p>	<p>Key Vocab: Evolution, offspring, inherited, characteristics, variation, adapted, environment, species, fossil</p>	<p>Key Vocab: Characteristics, classify, taxonomist, bacteria, microorganism, species.</p>	<p>Key Vocab: Acid, alkali, characteristics, chromatography, classify, bacteria, microorganism, species, photosynthesis, transformation.</p>
<p>Key Knowledge:</p> <ul style="list-style-type: none"> The circulatory system is made of the heart, lungs and blood vessels. (working scientifically- comparative testing, observations over time.) Arteries carry oxygenated blood from the heart to the rest of the body (except the pulmonary artery). (Working scientifically- Pattern seeking, identifying, classifying and grouping, observing over time.) Veins carry deoxygenated blood from the body to the heart (except the pulmonary vein). (Working scientifically- Pattern seeking, identifying, classifying and grouping, observing over time.) Nutrients, oxygen and carbon dioxide are exchanged via the capillaries. (Working scientifically- identifying, classifying and grouping, observing over time.) Some choices, such as smoking and drinking alcohol can be harmful to our health. (Working scientifically- comparative testing, research using secondary sources.) Tobacco can cause short-term effects such as shortness of 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Light travels in straight lines. (Working scientifically- comparative testing) When there is an opaque object blocking the light, a shadow is formed. Shadows have the same shape as the opaque objects that cast them. (Working scientifically- Research using secondary data) Light can travel through transparent objects. (working scientifically- comparative testing.) Some light can travel through translucent objects. (Working scientifically- comparative testing.) Light consists of a spectrum of colour: red, orange, yellow, green, blue, indigo and violet. (Working scientifically- observation.) Light travels at a different speed through water which can cause refraction – making objects look larger than they are. 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Explain the difference between non-renewable and renewable mains power. Use symbols when drawing a simple circuit diagram. (Working scientifically- Identifying, classifying and grouping, research using secondary sources) Associate the brightness of a lamp with the number and voltage of cells in a circuit. (Working scientifically- Comparative testing.) Explain how electricity is made. (working scientifically- identify, secondary research.) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Offspring inherit genes from their parent or parents. (Working scientifically- Identify, classify and grouping) Inherited and learnt characteristics are often referred to nature vs nurture. (Working scientifically- Identify, classify and grouping) Adaptations occur due to random mutations and can lead to evolution. (Working scientifically- Research using secondary data) Charles Darwin established his theory of evolution from observing finches. (Working scientifically- Identify, classify and grouping) We can use fossils to study and document the evolution of different animals and plants. (Working scientifically- Identify, classify and grouping) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> Give reasons for classifying plants and animals based on specific characteristics. (Working scientifically- Identify, classify and grouping, observations over time, plan an investigation) Know living things are classified into broad groups according to common observable characteristics. (Working scientifically- Identify, classify and grouping, observations) 	<p>Key Knowledge:</p> <ul style="list-style-type: none"> To revise principles of variables and classification. Begin to recognise the techniques used to further scientific study and knowledge including chromatography, the principles of acid/alkali and energy transformation. (Working scientifically- revisit all areas of working scientifically covered)

<p>breath, difficulty sleeping and loss of taste and long-term effects such as organ damage, cancer and death. (Working scientifically-comparative testing, research using secondary sources.)</p> <ul style="list-style-type: none"> Exercise can tone our muscles and reduce fat, increase fitness, make you feel physically and mentally healthier, strengthens the heart and improves lung function (Working scientifically-comparative testing.) 				
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown

<p>What is the circulatory system? now what the circulatory system does. Identify the main parts of the heart. Know the importance of cardiac muscle.</p> <p>How does blood get around the body? Know the role of blood vessels. Describe the structure of blood vessels. Explain how blood pressure is generated.</p> <p>What is in the blood? Identify the components of blood. Know the function of blood components. Create a model representing blood components.</p> <p>How do we get water and nutrients? Recall the role of the digestive system. Know how the blood transports nutrients. Explain the effects of lack of nutrients.</p> <p>How can we keep our heart healthy? State some circulatory system illnesses. Describe some causes of illness. Explain how we can keep our circulatory system healthy</p> <p>What are some blood disorders? Recall blood components. Describe disorders of the blood. Explain how different components are affected by blood disorders.</p> <p><i>To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</i></p>	<p>How does light travel? Know how light travels. Explain why light is important. Design and conduct an investigation</p> <p>How does reflection help us see? Know light is reflected when it bounces off an object. Describe how light is reflected off different surfaces. Design and conduct an investigation.</p> <p>Can we increase reflection? Know that light travels in a straight line. Explain that reflection helps us see objects. Design and conduct an investigation</p> <p>What shapes our shadows? Recall that light travels in straight lines. Explain why shadows form. Interpret a secondary data source.</p> <p>What causes rainbows? Recall the states of matter. Describe how the speed of light can be changed. Design and conduct an investigation.</p> <p>Can we make a red apple blue? Understand that white light is a mixture of colours. Observe that some colours are reflected and some are absorbed. Design and conduct an investigation.</p> <p><i>To recognise that light appears to travel in straight lines and use this knowledge to explain how objects are seen because they give out or reflect light into the eye.</i></p> <p><i>To explain that we see things because light travels from light sources to our eyes or</i></p>	<p>How do electrical appliances work? Recall what an electric circuit is. Identify the main parts of a circuit. Describe the role of the components</p> <p>Why do batteries have voltage? Define voltage. Compare batteries of different sizes and their typical voltage. Explain how adding batteries together increases total voltage</p> <p>What are the parts of a circuit? Identify common electrical components. Explain how each component uses electricity to serve its function. Draw a circuit diagram with various components.</p> <p>What are circuit diagrams? Identify common circuit symbols. Construct simple circuit diagrams. Explain the advantages of using circuit diagrams</p> <p>How can we use electricity safely? Identify electrical hazards. Describe risks. Suggest ways to reduce electrical risks</p> <p>What is the history of electricity? Read about early experiments. Recall important scientists and inventors. Describe some major developments</p> <p><i>To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</i></p> <p><i>To compare and give reasons for variations in how components function,</i></p>	<p>What is variation? Understand that variation refers to differences within a species Identify that genes and environment contribute to variation Recognise variation in simple observable traits</p> <p>Why do adaptations matter? Explain how adaptations aid survival. Describe physical and behavioural adaptations Explain natural selection.</p> <p>What are some animal adaptations? Identify physical and behavioural animal adaptations. Explain how animal adaptations aid survival Explore examples of real-world animal adaptations</p> <p>How do plants adapt? Recognise physical adaptations in plants. Explain how adaptations aid plant survival. Explore real-world examples of plant adaptations</p> <p>What can fossils reveal? Recall what fossils are and how they form Describe how fossils form. Explore a range of fossil adaptations</p> <p>Who are key figures in evolution? Recall key scientific thinkers in evolution history. Describe discoveries that shaped evolutionary thinking. Explore evidence that led to theories of adaptation over time.</p>	<p>How do we classify animals? Recall characteristics of animals. Distinguish between vertebrates and invertebrates. Compare characteristics of different vertebrate groups.</p> <p>How do we classify plants? Distinguish between flowering and non-flowering plants. Understand how different plants reproduce. Explore the uses of various plants</p> <p>What are microorganisms? Name some microorganisms. Consider the role of various microorganisms. Plan an investigation</p> <p>Are there some tricky classifications? Revisit characteristics of a variety of plants and animals. Study some organisms that are difficult to classify. Create an organism</p> <p>Can we study local habitats? Identify some organisms in their natural habitat. Study some organisms in their natural habitat. Classify organisms found in a local habitat.</p> <p>Who was Carl Linnaeus? Recall who Carl Linnaeus was. Describe the binomial naming system. Explain the importance of a universal naming system.</p> <p><i>To describe how living things are classified into broad groups according</i></p>	<p>How can we improve observations? Identify the basic parts of a microscope. Describe the basic functions of a microscope. Identify when to use a microscope in scientific observations.</p> <p>Acid or alkali? Give some examples of acids and alkalis. Describe uses of indicators. Investigate some natural indicators.</p> <p>How can we separate colours? Recall some mixtures. Explain some uses of chromatography. Carry out an investigation.</p> <p>What can affect photosynthesis? Recall that plants make their own food. Describe the factors affecting photosynthesis. Carry out an investigation.</p> <p>How can we change sound? Recall how sounds can be changed. Describe the factors affecting sounds. Carry out an investigation.</p> <p>How is energy transformed? Recall some examples of energy. Describe some energy changes. Explain one energy change in detail.</p>
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<p>To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function</p> <p>NS To understand how to keep our bodies healthy and how our bodies might be damaged – including how some drugs and other substances can be harmful to the human body.</p> <p>To describe the ways in which nutrients and water are transported within animals, including humans</p> <p>NS To work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.</p>	<p>from light sources to objects and then to our eyes. Enquiry: comparative/fair test</p> <p>To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>NS Pupils may extend their experience of light by looking at phenomena such as how objects look bent in water (refraction).</p> <p>NS Pupils might find out about the work of scientists such as Isaac Newton, who studied the light spectrum and the effects of light refraction.</p>	<p>including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Enquiry: comparative/fair test</p> <p>To use recognised symbols when representing a simple circuit in a diagram.</p> <p>NS To answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.</p>	<p>To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>To use recognised symbols when representing a simple circuit in a diagram.</p> <p>NS Pupils should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments; for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Enquiry: problem solving, pattern seeking</p> <p>To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>NS Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Enquiry: research, classifying and grouping</p> <p>To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p>	<p>to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>NS Pupils will learn about the significance of the work of scientist, Carl Linnaeus, a pioneer of classification.</p> <p>To give reasons for classifying plants and animals based on specific characteristics.</p> <p>To learn that micro-organisms are living things – mouldy bread experiment. Enquiry: observation over time</p> <p>Pupils should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). Enquiry: research, classifying and grouping</p>	
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