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.

Subject: Science Year 1					
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview		Overview	
The main context for learning this term links to design and technology. Pupils will be using different appropriate materials to make capsule for an egg to travel in through the air and to land safely. It also links to art, when pupils have explored natural materials in their environment to create sculptures. It builds on learning in Reception when pupils explored different reclaimed materials to build vehicles. Pupils will be using scientific skills such as sorting and grouping which will be developed further in Year 2 and KS2. 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.	The main context for learning this half term links to English and Art. Children will be writing autumn poetry and using autumnal themes in their art work. During this '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.	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. 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.	The main context for learning this half term is aligned to English and art. In English, pupils are writing instructions for how to look after a pet. In art, pupils will continue to develop drawing skills as they make representations of a wide range of different animals. This builds on work done in 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.	The main context for learning in this unit is English and art. In English, the text has a theme of plants or trees and in art pupils are learning about the artist William Morris and his prints depicting plants. It builds on the learning about plants in Reception when pupils learned how to look after plants. 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. 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.	
Key Vocab: Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque	**Key Vocab:** Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length, monsoon, thunder storm	**Key Vocab:** Sight, hearing, touch, taste, smell Amphibians, birds, fish, mammals, reptiles, carnivores, herbivores, omnivores		**Key Vocab:** Leaf, flower, petal, fruit, root, seed, trunk, branch, stem, bark	
Key Knowledge:	**Key Knowledge:**	**Key Knowledge:**		**Key Knowledge:**	

Identify and compare the materials everyday objects are made from: wood, plastic, glass, metal, water, rock. Distinguish between an object and the material which it is made from e.g. a table made from wood. Investigate the suitability of materials for a specific purpose e.g. plastic works better for an umbrella because it is waterproof.	• Describe weather changes throughout the year. • Observe the seasons and what happens in them.	• Name basic parts of the human body. • Know which body part is associated with each sense. • Identify and group animals. • Name and label the basic parts of an animal. • Know some similarities and differences between different animals. • Sort animals according to their diet. • Define what a herbivore, carnivore and omnivore is.		• Label the basic parts of a plant. • Observe a bean growing and record their observations. • Identify different types of plants.
Learning Breakdown	Learning Breakdown	Learning Breakdown		Learning Breakdown
Everyday materials: Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Exploring different materials found in everyday life. Distinguish between an object and the material from which it is made. Look at different objects around school and identify the materials they are made from. Learn that some objects are made from more than one material. Describe the simple physical properties of a variety of everyday materials. Learn new vocabulary associated with properties of materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. Find different ways of sorting objects according to their materials and properties. Work scientifically by asking questions about objects and materials, observing closely, describing, classifying and sorting, comparing and contrasting, making Venn diagrams and charts.	**Seasonal Changes:** To name the four seasons To name different types of weather To make observations about the weather To describe the weather associated which each season To collect and record simple data To make simple observations about changes across the seasons	**Animals, including humans**: Identify, name, draw and label the basic parts of the human body. Draw pictures of each other. Sing songs and play games. Learn about and investigate each of the five senses and say which part of the body is associated with each sense. One lesson for each sense. Work scientifically by: answering questions by investigating; collecting and presenting data; observing closely	**Animals, including humans**: Pupils should become familiar with the common names of some 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). Work scientifically by: answering questions by investigating; comparing and contrasting; sorting and grouping; making Venn diagrams.	**Plants:** Where do plants come from? Find the answer to the question 'What will happen if we plant an apple seed?' Plant seeds sunflower, beans. Make a diary to record growth. Measure sunflower plants and make a bar chart. (Gather and record data.) Identify and name a variety of common garden plants. How many flowers can we name? Go out to look at plants in the school grounds and in gardens around school. Photograph. Make a pictogram of favourite flowers. Identify the basic structure of a variety if flowering plants. Label parts of a plant- stem, leaves, roots, flowers explaining what each part does. Deciduous and evergreen trees- sorting Identify the basic structure of a variety if flowering plants including trees. Label the parts of a tree. Identify trees by leaves, sorting leaves. Comparing and contrasting familiar plants describing how they sorted plants.
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

Animals including humans	Living things and their habitats	Everyday Materials	Microhabitats	Plants	Animals including humans
The main context for learning is linked to English and the suggested English texts, African Animal Folktales. Links can be made to the various animals and how they survive. 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. They will also draw on their prior knowledge of identifying animals to be carnivores, herbivores and omnivores. Pupils will be encouraged to use learned vocabulary such as amphibians, reptiles, birds, mammals. 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 .	The main context for learning is linked to English and the suggested English fiction text Meerkat Mail. Links can be made to meerkats, where they live and what they need to survive. 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. 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 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.	The main context for learning is linked to English and the suggested English fiction and non-fiction texts about the Great Fire of London. Links can be made to D.T and investigating the most suitable materials to build a Tudor house. 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. 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 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	The main context for learning is to build on the prior unit of work on habitats but explore one microhabitat in greater depth. By focussing on the seashore habitat, links can also be made to future learning in history, geography and D.T on lighthouses. 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. 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 variety of plants and animals in their microhabitats.	The main context for learning is linked to English and the suggested English fiction text Jack and the Beanstalk. Additionally, the summer term is a prime time for planting and observing growth. Pupils will use their observations and knowledge of plants to inform their work on flowers. 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. 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.	Building on from their prior learning in Year 1 and their 'Animals including humans' unit of lstudy 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. **Electricity** (an introduction to) linking to D.T, geography and history for this half-term looking at Grace Darling and the seaside. In D.T children will discover the use of LED electricity in the lighthouse model making unit. Children will use their knowledge of electricity and circuits to make a working light in the model. From the electricity study, they will be able to use their observations and ideas to suggest answers to questions and perform simple tests.
Key Vocab: Offspring, reproduction, growth	**Key Vocab:** Habitat, microhabitat, minibeasts, living, dead, never alive, food chain, predator, prey	**Key Vocab:** Material, rubber, inflatable, fabric, flexible, absorbent, waterproof, reflective, magnetic, properties	**Key Vocab:** Habitats, microhabitats	**Key Vocab:** Seed, bulb, germinate, seedling, bud, flower, fruit, berry, root	**Key Vocab:** Exercise, breathing, hygiene, germs, disease
Key Knowledge: • Animals move in order to survive. Different animals move in different ways to help them survive. • Exercise keeps animal's bodies in good condition and increases survival chances. • All animals eventually die. • Animals reproduce new animals when they reach maturity. • Animals grow until maturity and then do not grow any larger.	**Key Knowledge:** • Classify things by living, dead or never lived. • Know how a specific habitat provides for the basic needs of things living there (plants and animals) • Match living things to their habitat. • Name some different sources of food for animals. • Know about and explain a simple food chain. • Some things are living, some were once living but now dead and some things never lived. • There is variation between living things. Different animals and plants live in different places.	**Key Knowledge:** • Know that some objects shape can be changed when we bend or twist them Identify which objects' shape can be changed know that some materials shape cannot be changed by bending or twisting. • Know that materials are used for specific objects due to their properties certain materials have the best properties for that object. • Know some materials can be stretched different types of elastic can be stretched for different amounts.	**Key Knowledge:** • Identify most living things live in habitats to which they are suited. • Know how different habitats provide for the basic needs of different kinds of animals and plants. • Name plants and animals in their habitats.	**Key Knowledge:** • Know and explain how seeds and bulbs grow into plants. • Know what plants need in order to grow and stay healthy (water, light & suitable temperature) • Flowers make seeds to make more plants (reproduce) • We need plants to survive (to clean air, to eat) • We can eat different parts of the plants (leaves, stems, roots, seeds, fruit)	**Key Knowledge:** • Know the basic stages in a life cycle for animals, (including humans). • Know why exercise, a balanced diet and good hygiene are important for humans.

	• Living things are adapted to survive in different habitats. • Environmental change can affect plants and animals that live there.				
Learning Breakdown	**Learning Breakdown**	**Learning Breakdown**	**Learning Breakdown**	**Learning Breakdown**	**Learning Breakdown**
• Know that animals including humans have off spring which grow into adults. • Understand the life cycle of an animal (e.g. butterfly) • Compare the life cycle of an animal to that of a human. • Research the basic needs of an animal for survival. • Identify different food groups needed to maintain a healthy diet • Explore how to stay healthy – focusing on exercise and hygiene.	• Explore and compare the differences between living, not living and never lived. • Understand that living things live in habitats that are best suited to their needs. (look at the habitat where Sunny lives – Meerkat Mail) • Identify different habitats and classify depending on type. • Research a habitat and make a model of that habitat. • Describe the habitat made and explain why it is a suitable environment for that animal. • Investigate food chains and why they are vital to each living thing.	• 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	• Recap what a habitat is and where we find different habitats. • Investigate microhabitats and compare them to larger habitats. • Explore a microhabitat in a rock pool or by the sea. • Write a description of a seaside microhabitat explaining why it is a suitable environment for that animal/plant. • Compare seaside habitats with woodland or garden habitats.	• Identify different plants found in our local environment. • Investigate the requirements for plants to grow and survive • Observe how a plant grows form seeds or bulbs. • Look after a plant keep a diary of its growth. • Research germination and the process of reproduction ***May = SATS***	**Animals including humans.** • Identify different food groups needed to maintain a healthy diet • Explore how to stay healthy – focusing on exercise *(linking to P.E)* and hygiene. **Electricity** • Make a simple circuit. *(linking to D.T when making a lighthouse)*
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**
	Chopwell Woods • Finding animals hidden in the area and discussing the habitats appropriate for them. • Building their own habitats for animals they have found using natural materials around them. • Discuss what the animals they have found eat. • Play a game which teaches them about food chains called the 'Energy Transfer Game'.		A visit to the Sea Life Centre and the beach, or Washington Wetland Centre to explore a variety of microhabitats.	Visit to Dobbie's Garden Centre.	

Subject: Science		**Year group: 3**			
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview		Overview	Overview

Rocks	Light and Shadow	Plants	Forces and Magnets	Animals (including humans)
The main context for learning is linked to our topic of the Stone Age. Children will gain a greater understanding of the stone age by studying rocks, which will then inform their knowledge of the period in English and History. Children will build on prior learning from Year 2 of materials, living things and plants. Their knowledge of animals and plants learned in Year 2, will help them to understand the concept of fossils and organic matter within soil. 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.	The main context for learning is linked to our topic of rainforests. Children will gain a greater understanding of the structure of a rainforest through investigations into light and shade. 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 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.	The main context for learning is plant growth and the seasons. It links to English, through the writing of poetry, which will use summer and plants as a theme. The children's knowledge of plants will add further detail to their poetry. 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. 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.	The main context for learning is linked to our topic of the Romans. Children will explore forces through investigations into Roman clothing and equipment. They will also investigate magnets and how they can be used. Children will build on prior learning of materials from Year 2. They will use their knowledge of sorting, by a given criteria, to compare and group objects that are magnetic. 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.	The main context for learning is linked to English and Geography. Children will extend their knowledge of rainforest animals by learning how they move, feed and hunt. 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. 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.
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	**Key Vocab:** Light, dark, reflection, ray, pupil, retina, shadow, opaque, translucent, transparent	**Key Vocab:** Roots, stem, trunk, leaves, flowers, nutrients, evaporation, fertisation, petal, stamen, carpel (pistil), sepal, pollination, pollinator, germinator, seed dispersal	**Key Vocab:** Force, magnetic force, magnet, attract, repel, poles, contact force, non-contact force	**Key Vocab:** Nutrition, nutrients, carbohydrates, proteins, vitamins, minerals, fibre, skeleton, bones, muscles, joints
Key Knowledge: • Compare and group together different kinds of rocks (sedimentary, igneous, metamorphic) based on their appearance and simple physical properties – durable, permeable, impermeable, density. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Know that Mary Anning made significant discoveries impacting palaeontology. • Recognise that soils are	**Key Knowledge:** • 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 and skin. • Know how shadows are formed and which objects are more likely to form a shadow: transparent, translucent or opaque.	**Key Knowledge:** • Understand what plants need to grow. • Understand the functions of different parts of plants. • Describe the different ways in which plants can disperse their seeds. • Investigate the way in which water is transported in a plant. • Know the part that flowers play in the life cycle of flowering plants, including pollination and seed formation. • Know the different ways in which plants can disperse their seeds: air, wind, water, animal.	**Key Knowledge:** • Know that some forces need contact between two objects (pushes and pulls), but magnetic forces can act at a distance. • Investigate how different surfaces can cause more or less friction. • Know magnets attract or repel each other and attract some materials and not others. • Describe magnets as having two poles.	**Key Knowledge:** • Name the five food groups. • Identify that animals, including humans, need the right types and amount of nutrition • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

made from rocks and organic matter and describe the four processes of soil formation (addition, losses, translocations and transformation).				
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown
Rocks Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter. Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time Explore the different layers of the Earth.	**Light and Shadow** 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 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 look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.	**Plants** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant 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 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 support, leaves for nutrition and flowers for reproduction.	**Forces and Magnets** Compare how things move on different surfaces Notice that some forces need contact between 2 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 2 poles Predict whether 2 magnets will attract or repel each other, depending on which poles are facing 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).	**Animals (including humans)** Understand what makes a healthy diet. Understand how nutrients, water and oxygen get transported around the body. Understand how nutrient, water and oxygen get transported around the body. Compare human skeletons to a variety of different animals. Understand that muscles and joints are responsible for movement. Investigate the effect of exercise on the body.
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
Great North museum – Rocks and fossils workshop	Christmas crafts that use light sources (candles, lanterns etc) and transparent/translucent/ opaque materials (stained glass windows)	Belgian Cemetery eco-project as part of the Live Simply Award application. Children will help to plant and tend new flowers, support projects to encourage bees and butterflies etc.		Life Centre – Science Zone Great North Museum – Animals, skeletons

Subject: Science		**Year group: 4**			
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview		Overview	Overview

Animals (including humans) This builds on knowledge from prior learning from Year 3 where pupils: identified 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 and identify that humans and some other animals have skeletons and muscles for support, protection and movement. This unit will result in pupils being able to: describe the process of food through the digestive system; be able to identify the different teeth and their functions and have a deepened understanding of the transfer of energy through a food chain.	**States of Matter** This unit builds on prior knowledge from Year 2 where pupils developed their understanding and knowledge of everyday materials, properties and suitability. This topic links to the geography topic of weather as it will contextualise their knowledge of the water cycle and how rivers are formed. Following this unit, pupils will be able to: identify some of the key characteristics of liquids, solids, and gases; understand how some materials can change state e.g. freezing water changes it from a liquid to a solid, boiling it changes into a gas	**Sound** This unit builds on knowledge from music lessons and discussions about pitch and tempo. Pupils' knowledge will also be strengthened through computing sessions on manipulating sound. At the end of this unit, pupils will have an understanding that sound is caused by objects vibrating; understand the difference between pitch and volume and recognise that sound travels through various mediums	**Electricity** Pupils will have gained some supporting knowledge from the Year 3 Light unit of study. They will also identify it as a cleaner source of energy. As a result of this unit, pupils should be able to identify common appliances which run on electricity. They should also be able to create a simple circuit and be aware of different materials which can act as an insulator or a conductor.	**Living Things and their Habitats** This unit builds on from prior knowledge where pupils were to taught to: explore and compare the differences between things that are living, dead and have never been alive. In addition to this, pupil will identify that most living things live in habitats to which they are suited and describe how different habitats meet their basic needs. The unit will also support Climate taught in geography, giving contextual knowledge to pupils about how change to environment can pose dangers to living things. As a result of this unit, pupils should be able to: use classification keys; recognise the differences between vertebrate and invertebrates; and identify that vertebrates can be grouped into mammals, reptiles, fish, birds, and amphibians.
Key Vocab: Herbivore, Carnivore, Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer	**Key Vocab:** Condensation, evaporation, precipitation, boiling point, melting point, liquid, solid, gas	**Key Vocab:** Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave	**Key Vocab:** Appliance, circuit, conductor, insulator, battery, cell, switch	**Key Vocab:** Classification, classification key, environment, habitat, migrate, hibernate, vertebrates, invertebrates
Key Knowledge: • 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) • 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).	**Key Knowledge:** • Know the main properties of solids, liquids and gases. • 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. • Know that some materials change state when they are heated or cooled (ice, water, water vapour). • Know what the water cycle is and the four main stages: evaporation, condensation,	**Key Knowledge:** • Know that sound is made when objects vibrate the air molecules nearby, causing a sound wave. • Know main parts of the ear (outer ear, middle ear, inner ear, auditory canal, ear drum, ossicles, cochlea, auditory nerve) • Know that vibrations from sounds travel though 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. • Know that the louder the sound (volume), the bigger the vibration (amplitude). • Know that sounds get fainter as the distance from the sound source increases.	**Key Knowledge:** • Identify common appliances that run on electricity. • Describe common conductors (metals such as copper, iron and steel) and insulators (plastic, wood, rubber). • Identify and name basic parts of a simple series electrical circuit (cells, wires, bulbs, switches and buzzers) • Know that a switch opens and closes a circuit.	**Key Knowledge:** • 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. • Use classification keys to help group, identify, and name living things in the environment. • 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.

• Construct and interpret a variety of food chains and know meaning of predator, prey, source, producer, consumer.	precipitation, collection.			
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown
Animals (including humans) Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey	**States of Matter** 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	**Sound** Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases.	**Electricity** 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.	**Living Things and their Habitats** 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.
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
Life Centre – Science Zone Great north museum – Animals, skeletons			life Centre	beach visit – rock pools

Subject: Science		**Year group: 5**		
Autumn		Spring	Summer	
Overview	Overview	Overview	Overview	Overview

Physics/Earth Science: Earth and Space	Physics: Forces	Chemistry: Properties and Changes of Materials	Biology: Living Things and their Habitats	Biology: Animals Including Humans
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. 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.	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. Pupils will use their learning from the Year 3 unit, Forces and Magnets, to deepen their understanding of resistance and buoyancy. Pupils will work scientifically to answer a range of questions, using experiments and other sources to support learning.	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. Pupils will explore the processes of dissolving and separating, providing justified reasons to explain reversible and irreversible changes. 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.	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. 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. 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 naturists such as David Attenborough and Mary Agnes Chase. 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.	Pupils will learn about the interconnections between animals and humans, exploring the similarities and differences between food chains and reproduction. 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. Previous learning from Year 4, where pupils explored the effects of the environment can have on animals, will support children during this unit.
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	**Key Vocab:** Forces, gravity, weight, mass, friction, air resistance, water resistance	**Key Vocab:** Solids, liquids, gas, particles, state, materials, properties	**Key Vocab:** Lifecycle, reproduction, sexual reproduction, asexual reproduction, fertilise, metamorphosis, runner, bulb, cutting, tuber	**Key Vocab:** Puberty, sexual reproduction, sperm cell, menstruation, period, sperm, egg, foetus, gestation, life expectancy
Key Knowledge: • Know the movements of the Earth, Sun and Moon including length of time to orbit. • Know what causes night and day and why night and day varies in different parts of the world. • List the names and order of the planets in the Solar System.	**Key Knowledge:** • 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. • Know and identify effects of friction, air resistance and water resistance. • Understand how these can be affected by different variables, e.g. mass, surface, shape, streamlining. • Know that levers, gears and pulleys allow a smaller force have a greater effect	**Key Knowledge:** • Know the properties of different materials using words such as impermeable, conductive, thermal, soluble, transparent. • Know that some materials will dissolve in liquid to form a solution and that some substances can be recovered from a solution. • Explain with examples reversible and irreversible changes to a material including burning. • Explain the terms: properties, dissolve, solution, filtering, sieving and evaporating.	**Key Knowledge:** • Compare the life cycle of certain mammals, reptiles, amphibians and birds. • Identify the parts of a plant and its function. • Explain asexual reproduction and sexual reproduction in plant.	**Key Knowledge:** • Order the stages of human development. • Demonstrate understanding of how babies grow in height and weight. • Know the main changes that occur during puberty. • Know the main changes that take place in old age.
Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown	Learning Breakdown
Earth and Space: **How can we prove Earth is round?** Describe the sun, Earth and moon as approximately spherical bodies Identify scientific evidence that has been used to support or refute ideas or arguments Enquiry: research, identify, grouping and classifying **What makes up our solar system?** Describe the movement of the Earth, and other planets, relative to the sun in the solar	**Forces:** **Why don't objects fly off into space?** **How did Isaac Newton discover gravity?** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Enquiry: pattern seeking , research **How do sycamore seeds fall?** Identify the effects of air resistance. Pupils should explore falling objects and raise questions about the effects of air resistance.	**Properties and Changes of Materials:** **How can we group 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 **Is dissolving just a magic trick?** Know that some materials will dissolve in liquid to form a solution, and describe how to	**Living Things and their Habitats:** **How can we classify plants and animals?** Recap – recognise that living things can be grouped in a variety of ways Enquiry: grouping and classifying **What is the difference between the life cycles of mammals, insects, amphibians and birds?** Describe the differences in the life cycles of a mammal, an amphibian and insect and a bird. Enquiry: Observation over time, research	**Animals including Humans:** **What happens in the life cycle of a human?** Describe the changes as humans develop to old age. Enquiry: observation over time **How do human gestation periods compare to other animals?** Research gestation periods of other animals and compare them to humans. Enquiry: pattern seeking

system **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 **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. **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 **Why does the earth's moon appear to change shape?** Describe the movement of the moon relative to the Earth Enquiry: observation over time Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones). Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus	Enquiry: comparative/fair test **What is the best shape for a paper boat to float?** Identify the effects of water resistance. Pupils might explore resistance in water by making and testing boats of different shapes. Enquiry: comparative/fair test **How do cars slow down?** Identify the effects of friction that act between moving surfaces. Enquiry: comparative/fair test **What is the point of mechanisms?** Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect Enquiry: problem solving, pattern seeking Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	recover a substance from a solution Enquiry: comparative/fair test, observing over time **How can I separate mixtures?** Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Enquiry: problem solving **Can I prove which materials are best for the job?** Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Enquiry: problem solving **How can I make changes, then 'undo' them?** Demonstrate that dissolving, mixing and changes of state are reversible changes Enquiry: observation over time **When might it be useful to make a new material?** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda Enquiry: classifying and grouping **Which inventions have changed our world?** Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Enquiry: research, classifying and grouping	**How do plants reproduce**? Describe the life process of reproduction in some plants and animals. **How do animals reproduce?** Describe the life process of reproduction in some plants and animals. Observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment or alternatively hatching and rearing of chicks. Investigate different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals	**Why do I have to go through puberty?** Links to RSE – puberty (physical and emotional changes) **What is it like to 'get old'?** Draw a timeline to indicate stages of growth and development of humans

Subject Science Year 6					
Autumn		Spring		Summer	
1	2	1	2	1	2
Overview	Overview	Overview	Overview	Overview	Overview
Light	**Electricity**	**Living Things and their Habitats**		**Animals including Humans**	**Evolution and Inheritance**

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. 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	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. This unit will also be useful in relation to pupils' history and English topics as they will be able to associate the differences between the past and modern day with advancements in technology.	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.	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. 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.	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. Pupils will also extend their understanding of reproduction to be able to explain how features are inherited and passed down from parents.
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	**Key Vocab:** Circuit, cell, batter, current, amps, voltage, resistance, electrons	**Key Vocab:** Characteristics, classify, taxonomist, bacteria, microorganism, species.	**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	**Key Vocab:** Evolution, offspring, inherited, characteristics, variation, adapted, environment, species, fossil
Key Knowledge: • Light travels in straight lines. • 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. • Light can travel through transparent objects. • Some light can travel through translucent objects. • Light consists of a spectrum of colour: red, orange, yellow, green, blue, indigo and violet. • Light travels at a different speed through water which can cause refraction – making objects look larger than they are.	**Key Knowledge:** • Explain the difference between non-renewable and renewable mains power. • Use symbols when drawing a simple circuit diagram. • Associate the brightness of a lamp with the number and voltage of cells in a circuit. • Explain how electricity is made.	**Key Knowledge:** • Give reasons for classifying plants and animals based on specific characteristics. • Know living things are classified into broad groups according to common observable characteristics.	**Key Knowledge:** • The circulatory system is made of the heart, lungs and blood vessels. • Arteries carry oxygenated blood from the heart to the rest of the body (except the pulmonary artery). • Veins carry deoxygenated blood from the body to the heart (except the pulmonary vein). • Nutrients, oxygen and carbon dioxide are exchanged via the capillaries. • Some choices, such as smoking and drinking alcohol can be harmful to our health. • Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and loss of taste and long-term effects such as organ damage, cancer and death. • Exercise can tone our muscles and reduce fat, increase fitness, make you feel physically and	**Key Knowledge:** • Offspring inherit genes from their parent or parents. • Inherited and learnt characteristics are often referred to nature vs nurture. • Adaptations occur due to random mutations and can lead to evolution. • Charles Darwin established his theory of evolution from observing finches. • We can use fossils to study and document the evolution of different animals and plants.

				mentally healthier, strengthens the heart and improves lung function	
Learning Breakdown	Learning Breakdown	Learning Breakdown		Learning Breakdown	Learning Breakdown
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. To explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Enquiry: comparative/fair test To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. NS Pupils may extend their experience of light by looking at phenomena such as how objects look bent in water (refraction). 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.	To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit To compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Enquiry: comparative/fair test To use recognised symbols when representing a simple circuit in a diagram. NS To answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.	To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. NS Pupils will learn about the significance of the work of scientist, Carl Linnaeus, a pioneer of classification. To give reasons for classifying plants and animals based on specific characteristics. To learn that micro-organisms are living things – mouldy bread experiment. Enquiry: observation over time 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		To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 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. To describe the ways in which nutrients and water are transported within animals, including humans NS To work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 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 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. 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 To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.