Science Planning and Progression of Skills

Year 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	What's going on?	***Dinosaurs***	***Can you Dig it?***	***Animals around the World***	***Art Attack***	***On Holiday with Barnaby Bear***
	Seasonal Changes/ Animals including humans/comparing materials	***Animals Including humans/ Plants/Comparing materials/Seasonal changes***	***Plants/ Seasonal Changes***	***Animals including humans***	***Comparing materials***	***Animals including humans***
Science	Previous Learning • Summer, Autumn, Winter are the seasons and we know the song about it. • We know the weather changes from our daily information board in Early Years. • The pupils identified the main parts of the body (arms, legs, head) What we will learn **Knowledge:** • Pupils will identify and label the parts of the body • Pupils will identify and understand what	Previous Learning • Animals that live in the Arctic • Discussions about pets What we will learn **Knowledge:** • Pupils will learn what omnivores, herbivores and carnivores are, through the topic of dinosaurs. This knowledge will be extended into common animals. • Pupils will explore the school grounds and identify the deciduous and evergreen trees and explain their answers. • Pupils will identify and sort different materials according to their physical properties and discuss the differences and similarities with their peers. **Enquiry:** • What is a herbivore, carnivore or omnivore?	Previous Learning • Daily calendar (including season and weather) • Songs about seasons. • Discussions about seasons and weather to date this academic year. What we will learn **Knowledge:** • Pupils will be able to identify and label some common wild and garden plants, through learning walks and presentations. • They will be able to describe the basic structure of plants and trees and label the parts of the plant. • Pupils will learn what a plant needs to grow and use this	Previous Learning • Animals that live in the Arctic • Discussions about pets • Dinosaurs- learning about herbivores, carnivores and omnivores What we will learn **Knowledge:** • Pupils will learn the different types of common animals and describe and compare them, including fish, amphibians, reptiles' birds and mammals. They will find out about their habitats, where they originate	Previous Learning • Three little pig's houses • Material sorting according to their properties – metal, plastic, wood • Material sorting by their textures. What we will learn **Knowledge:** • Pupils will learn to identify and name a variety of everyday materials such as wood, plastic and metal, in the indoor and outdoor environments. • Pupils will extend their understanding by exploring and describing the physical	Previous Learning • Animals that live in the Arctic • Discussions about pets • Dinosaurs and animals- learning about herbivores, carnivores and omnivores • The different types of animals around the world • Animals and their habitats What we will learn **Knowledge:** • Pupils will further develop their understanding of the different types of common animals and describe and compare them, including fish, amphibians, reptiles' birds and mammals. They will find out about their habitats, where they originate and what they eat. • Pupils will identify and name a variety of common animals incl. fish, amphibians, reptiles, birds and mammals from around the world. • Pupils will transfer and develop their previous learning of herbivores, carnivores and omnivores and identify and name a variety of common animals for each diet type for creatures from the Sea life centre. • Pupils will continue to develop their understanding of animals and their habitats and identify similarities and differences between them, including those living in the Arctic and those in Africa. **Enquiry:** • Can I identify the different type of animal?

	their five sense are and which parts of their body they use for each sense. They will use all their senses to create a new sweet for Willy Wonka. • Identify and name different materials and select the most suitable for their model to recreate the features of their local walk. **Enquiry:** • Can you identify the human body parts? • What are the five senses? • How do we use each of our sense? • Can you use each of your five senses to create a unique sweet for Willy Wonka? • Which is the best material to use? • What are the properties of the materials? **Working Scientifically**: • Pupils will use their observations to answer questions about how and when we use each sense • Pupils will identify the different materials and	• Can you identify which animal/dinosaur is a herbivore/carnivore/omnivore? • What is an Evergreen/Deciduous tree? • Which trees in the garden are deciduous and which are evergreen? • Which material is bumpy/soft/rough? **Working Scientifically:** • Pupils will identify and classify the animals according to their diet. • Pupils will identify and classify the trees according to their properties. Labelling diagrams, writing descriptions and discussing the differences with their peers. • Pupils will identify and then sort materials by using their senses. • Pupils will be able to discuss the types of trees they found on their walk in the outdoor area and will be encouraged to ask questions to further their understanding and curiosity about the types in the different seasons	knowledge to grow their own plant. • Pupils will continue to develop their understanding of Deciduous and Evergreen trees and note changes across the seasons. **Enquiry:** • What flowers can you see growing? • Can you identify the different common flowers/plants? • What are the parts of a plant called? • What do plants need to grow? • What is a deciduous/Evergreen tree? **Working Scientifically:** • Pupils will identify and classify the different plants within the school ground. • Pupils will make observations of the trees and flowers within their surroundings and be encouraged to ask questions. • Pupils will attempt to grow their own plants • Pupils will take part in taking care of, and observing the growth of plants in the classroom • Pupils will use magnifying glasses to observe them closely • Pupils will compare and contrast different plants/flowers and trees.	and what they eat. • Pupils will be able to identify and name a variety of common animals inc fish, amphibians, reptiles birds and mammals from around the world. • Pupils will transfer and develop their previous learning of herbivores, carnivores and omnivores and identify and name a variety of common animals for each diet type. • Pupils will learn about animals (including their structures) and their habitats and identify similarities and differences between them. • Pupils will learn what animals (including pets) need to survive and be healthy. **Enquiry:** • What are the different types of animal? • What does the animal eat? Is it a herbivore, omnivore, carnivore? • What is similar or different to where the animals live? • What is similar/different	properties of a variety of everyday materials - such as how they feel, what they are used to make and whether they can be recycled. • Pupils will then move on to grouping and comparing a variety of materials based on their physical properties. **Enquiry:** • What materials are the objects made from? • Is the material transparent or opaque? Is the material soft or hard? Is the material flexible or hard? Is it waterproof or absorbent? • How are the materials different or the same? • Which is the best material for the Billy Goats bridge? **Working Scientifically:** • Pupils will, through teaching and asking questions, learn the different material types. • Through experiments to determine the strength of different materials in	• What does the animal eat? Is it a herbivore, omnivore, carnivore? • What is similar or different to where the animals live? **Working Scientifically:** • Pupils will continue to gather information from a range of sources including media, teaching, discussions and a school trip (Hunstanton SeaLife centre) to identify and classify animals through their type, diet and habitats. • They will be encouraged to ask simple questions about different animals throughout to support their learning and understanding. • Through experiences in the classroom and on field trips they will observe and use ideas to answer questions.

	use the most suitable for their model. • Pupils will gather data through learning walks to build on their knowledge and understanding of their five senses. The pupils will sing 'Head, Shoulders, Knees and Toes' frequently, to help them identify those body parts.			with the structure of a cat and an elephant? • What do animals need to survive and be healthy? **<u>Working Scientifically:</u>** • Pupils will gather information from a range of sources including media, teaching, discussions and a school trip (Hammerton zoo) to identify and classify animals through their type, diet and habitats. • They will be encouraged to ask simple questions about animals throughout to support their learning and understanding. • Through experiences in the classroom and on field trips they will observe ad use ideas to answer questions. • They will gather and record data over the weeks and observe during their school trip to answer questions.	Design and Technology, and simple tests, children will identify and classify the materials properties and what is similar and different between them. • Throughout pupils will be encouraged to ask questions about materials, gather and record data about their strength and properties to further their knowledge and understanding	
	<u>Previous Learning</u> The pupils daily discussed the season and weather as part of completing the daily calendar. They also sang along to songs including the four seasons highlighting the months, weather, characteristics and name of the four seasons. <u>What we will learn</u>					

	Knowledge • Pupils will observe the weather associated with each season through continuous provision of completing the class calendar daily • Pupils will go on learning walks to observe the changes of the season has on the trees around the school, linking with deciduous and evergreen trees. • Pupils will draw/paint pictures of the trees across the seasons to show the changes across the seasons. • Pupils will learn the four seasons and the weather associated with each season through • Pupils will monitor the length of days throughout the year and how this varies making comparisons across the seasons and months**.** **Enquiries** • What are the differences between the four seasons? • What changes can I see across the seasons? • What season are we in? • What is the difference in the weather across the seasons? • How long is the day in each month and how does this differ? **Working scientifically** • Pupils will use their observations and ideas to suggest answers to question about the weather and seasons. • Record the number of hours of daylight across the seasons to help answer questions and identify the characteristics of the seasons. • Pupils are encouraged to ask questions to further their understanding and to understand that the answers will be different depending on the season/weather.

Year 2

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Science	***Discovering London***		***All Creatures great and Small***		***Exciting Explorers***	
	Uses of everyday materials		***Living things and their habitats*** ***Animals including humans***		***Plants***	
	Previous Learning • Pupils can identify and sort different materials according to their physical properties and discuss the differences and similarities. • Pupils can name materials and their properties. • Pupils can sort different materials based on their physical properties. • Pupils can compare and group the variety of materials What we will learn **Knowledge:** • Pupils will identify and compare the suitability of variety everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Pupils will describe which materials are waterproof, absorbent non-absorbent, bendy not bendy, opaque, transparent, rough, smooth, shiny, dull stretchy, stiff, hard and soft. • Pupils will find out how the shapes of solid objects made from some materials that can be changed by squashing, bending, twisting and stretching. • Pupils will visit Nene Valley Railway as part of their trip to explore the variety of materials used for different aspects of the railway station beyond a train. **Enquiry:** • What are the different uses for the different materials? • Which materials are absorbent? • Which materials are bendy, opaque, rough, transparent etc? • Which materials are most suitable for different objects? • How can a material change its shape through bending, squashing, twisting and stretching? **Working Scientifically:** • Ask simple questions about different materials and recognise that they can be answered in different ways • Observing closely using simple equipment to carry out experiments about suitability of different materials. • Performing simple tests to test out ideas, such as creating a boat to allow Paddington to travel across the River Nene		Previous Learning • Pupils can name variety of common animals • Pupils can identify and name a variety of common animals that are carnivores, herbivores and omnivores • Pupils can describe and compare a variety of animals • Pupils can label the parts of human body What we will learn **Knowledge** • Pupils will explore and compare the differences between things that are living, dead, and things that have never been alive. • Pupils will 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 identify and name a variety of plants and animals in their habitats, including micro-habitats • Pupils will describe how animals obtain their food from plants and other animals, using the idea of a simple food chain • Pupils will identify and name different sources of food, linking to the life cycles of the animals from the story 'The Last Wolf' by Mini Grey. • Pupils notice that animals, including humans, have offspring which grow into adults. • Pupils find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • Pupils describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Enquiry:** • How do we know if an animal is living or dead? • How can we group the different living things? • How does a food chain work? • Why is it important for humans to exercise and eat the right amounts of different foods? **Working Scientifically**		Previous Learning • Pupils will be able to identify and label some common wild and garden plants, through learning walks and presentations. • Pupils will be able to describe the basic structure of plants and trees and label the parts of the plant. • Pupils will learn what a plant needs to grow and use this knowledge to grow their own plant. • Pupils will continue to develop their understanding of Deciduous and Evergreen trees and note changes across the seasons. What we will learn **Knowledge** • Pupils will observe and describe how seeds and bulbs grow into mature plant • Pupils will find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **Enquiry:** • What are the different parts of a plant? • What do all plants need? • What is the best condition for a plant to grow successfully? **Working scientifically** • Asking simple questions about plant life cycle and recognising that they can be answered in different ways • Observing closely how a plant grows in different conditions and using simple equipment to test their questions. • Performing simple tests to find out the best conditions for plant growth. • Identifying and classifying different types of plants. • Explore and carry out experiments of the requirements of plants for life and growth and how they vary from plant to plant • Investigate the way in which water is transported within a plant. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation

	and to think about the most suitable material to use to mend a broken bucket to help put out The Great Fire of London. • Describe the suitability different materials linked to their properties. • Using their observations and ideas to suggest answers to questions • Record findings using simple scientific language and drawings.	• Asking simple questions about human/animal life cycles and diets. Children recognising that they can be answered in different ways • Observing closely using simple equipment about the conditions of plants for life and growth. • Explore different animals/ human life cycle and what they eat. • Preform simple tests to explore the best conditions to grow plants effectively. • Identifying and classifying different species into carnivore, herbivore and • Make systematic and careful observations (such as finding and recording which microhabitats house different minibeasts) and take accurate measurements using standard units, using a range of equipment. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. For example: they will be recording information in and tally and then using pictogram to record their findings. • Report on findings from enquiries, including oral and written explanations • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	and seed dispersal. using their observations and ideas to suggest answers to questions to investigation questions. • Gathering and recording data to help in answering questions about suitable conditions for plant growth.

Year 3

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Discovering Dinosaurs		***Opposites Attract***		***Bella Italia***	
	Rocks	***Animals including humans***	***Forces and magnets***	***Light***	***Plants***	
Science	Previous Learning Pupils will have explored natural and man-made materials. What we will learn **Knowledge** • Through exploring a variety of rocks, the pupils will learn of which rocks are natural and which are man-made. • Through using their observational skills, the pupils will learn about igneous, sedimentary and metamorphic rocks and their permeable and durable properties. • By sequencing pictures, the pupil will learn of the fossilisation process • Through exploring the work of Mary Anning, the pupils will learn about palaeontologists and the study of fossils being known as palaeontology. • Through creating their own compost bin, the pupils will learn of the layers of soil and about the soil formation process from rocks and organic matter. • Through investigating soil permeability, the pupils will learn of how water filters through different types of soil. **Enquiry:** • What are rocks? • Are all rocks from volcanoes?	Previous Learning Pupils will have identified basic parts of the human body. They will have explored the importance of exercise, eating the right types of food and basic hygiene. What we will learn **Knowledge** • By exploring a nutrient pyramid, the pupils will earn about the types of nutrients plants and animals need, how they obtain it differently through eating and photosynthesis and how humans are unable to make their own food. • By comparing the nutrients needed by humans and animals, the pupils will learn that each have different nutritional needs. • Through sorting animals, the pupils will learn of vertebrates and invertebrates and of the endoskeleton, exoskeleton and hydro-skeleton. • By creating their own model skeletons, the pupils will learn the common and scientific names of bones. • Through exploring images of the skeleton, the pupils will learn of how the skeleton functions are to protect, support and allow movement. They will identify ball and socket, hinge and gliding joints.	Previous Learning Pupils will have learned about how different materials can be changed by squashing, bending, twisting and stretching them. What we will learn **Knowledge** • Through creating acting out using freeze frames, the pupils will recreate pushes and pulls and then identify the forces acting in each. • Through an investigation using cars, the pupils will test different surfaces to identify the effects of friction. • Through testing a variety of materials with magnets, the pupils learn which materials are attracted/repel and therefore which are magnetic and non-magnetic. • By testing different magnets, the pupils will observe how different strength magnets attract materials. They will also explore how magnetic forces can act at a distance. • Through creating their own compass, the pupils will learn how magnets have a North and South pole and how they attract and repel each other. • By designing and creating their own magnetic game, the pupils will apply their	Previous Learning Pupils will have named a variety of light sources and associate shadows with light sources being blocked. What we will learn **Knowledge** • Through exploring a variety of light sources, the pupils will learn light is needed to be able to see and that darkness is caused by an absence of light. • Through designing their own book bags, the pupil will learn about materials that reflect light. • Through creating reversal messages, the pupils will explore how mirrors reflect images using light. • Through a simple investigation looking at the effect of UV light, the pupils will learn how sun can damage our bodies. They will create their own posters to suggest ways to stay protected from the sun. • Through investigating how shadows are formed, the pupils will learn about how light travel in straight lines and that shadows are formed when the light source is blocked by a solid object. • By creating a cartoon strip to show their findings, the pupils will investigate how shadows change when the distance between the object and the light source is changed. **Enquiry:** • Why can't we see in the dark?	Previous Learning Pupils will have named and identified a variety of plants and trees. They will have learnt the basic structure of flowering plants. They will know what a plant needs to be able to grow and survive (water, light and a suitable temperature) What we will learn **Knowledge** • Through making close observations of the different part of plants, the pupils will identify the main part of the plant and know about the function each has. • Through investigating what plants need to grow, the pupils will learn about their needs for light, nutrients, water and soil, as well as ensuring they have room to grow. • Through creating a 'Good Plant Growing Guide', the pupils will share what they have found the best conditions for a plant to grow in. • Through experimenting with food colouring, explore how water travels through plants. • By watching a video clip, the pupils will learn about the parts of the plant involved in its life cycle and how pollination occurs. • Through drama, the pupils will learn about seed dispersal. **Enquiry:** • Is a plant a living thing? How can you prove this? • Could a plant survive without a stem? • Which root shape do you think is the most effective?	

	• The boxes of rock in the science resources cupboard have fallen on the floor. How can we sort them out? • Do all fossils contain dinosaurs? • How do fossils show that rock at the tops of mountains was once under water? • Can rocks be recycled? **Working Scientifically** • Ask questions about the properties of rocks and fossils. • Look at the similarities and differences in appearance between natural and man-made rocks. • Make systematic and careful observations about the properties of rocks in order to group them. • Match animals to their fossils and explain how they have made their conclusions. • Draw labelled diagrams of their own compost bins and the layers of soil in them. • Carry out an enquiry into the permeability of soil. They will make systematic and careful observations at the layers of soil. They will gather their findings in a table and then present orally to the class as groups what they noticed and conclusions they have made.	• Through experimenting with muscles, the pupils will learn what muscles are and how they move voluntarily and involuntarily. **Enquiry:** • Is it possible to make food without using plants or animals? • Elysia chlorotica is an animal that makes its own food. So is photosynthesis possible in humans? • Why don't we digest ourselves? • Bones are so hard! Maybe it would be easier for people to move around without them. Do you agree or disagree? Why? • What if our backbone only had one bone? • Tim Peake is an astronaut. What are his needs? How are they different from those on the Earth? **Working Scientifically** • Research scientific evidence to understand how animals and plants obtain their nutrients. • Compare and group animals by their diet. • Classify and group animals by their skeleton type. • Use scientific language to label bones on diagrams. • Identify different hinges on a skeleton. • Make predictions and record results when testing which muscles will contract and relax during a variety of movements.	knowledge of how magnets attract and repel. **Enquiry:** • How do things move? • How can we test if a material is magnetic? • What would happen if we put lots of magnets together? • Which part of the magnet has the strongest force? How do you know? • What would happen if we put the magnets side by side? • Why do some materials attract and not others? **Working Scientifically** • Identify similarities and differences in forces acting on an object during a push or a pull. • Make predictions about how a toy car will travel over different surfaces based on the friction present. They will set up a simple comparative test. Following their texting, they will use a graph to present their results. • Classify and group materials by their magnetic and non-magnetic properties. • Investigate using a comparative test, which magnets are strongest/weakest. Record their findings as a bar chart and then make a conclusion. • Use scientific language to describe orally how magnets attract and repel each other.	• What would a world without light look like? • Why are some shadows darker than others? • Why are some stars we can see at night extinct? • Why is ultraviolet light important to bees and other animals? • How is a rainbow formed? **Working Scientifically** • Make predictions about which materials will reflect light best. Set up a comparative test and make systematic and careful observations when reflecting light and then record results by drawing and label the materials and use these results to make a conclusion about which material is the best choice. • Use scientific evidence and research, the pupils can find out more about the harmful effects of UV light and how to protect themselves from it. • Write an explanation text to share their findings when testing light through transparent, translucent and opaque materials. • Conduct an experiment to look at how shadows change with the distance of objects from a light source. Identify patterns in my findings, make a conclusion and then evaluate how my experiment can be improved	• What would happen to plant populations if there wasn't any wind? • Can you design a plant/flower pollinated by the wind/cars/dogs/children? • What impact has polluted water had on habitats? **Working Scientifically** • Make close observations of plants and then draw detailed, labelled diagrams of the parts. • Create their own investigations to see what plants need to go. Make predictions and decide upon their own variables. Make conclusions from their observations of how the plants have grown over time and then evaluate their experiment. • Create a guide to give explanations of the best conditions to grow a plant based on their experiment. • Make predictions as to what the food colouring will show when it is used in water with a plant. • Using scientific language, the pupils will create labelled diagram to share their knowledge of pollination. • Create a short group dramatisation of how seed dispersal occurs to orally explain their understanding.

Year 4

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	The Americas		***Invaders and Settlers***		***George's Marvellous Medicine***	***The Awesome Egyptians***
	Electricity	***Animals including humans***	***Living things and their habitats***	***Sound***	***States of matter***	
Science	Previous Learning Pupils will have explored a variety of materials and their properties. What we will learn **Knowledge** • Through exploring a range of different electrical appliances around school, pupils will learn about how electricity is generated. Following this, they will be able to identify which appliances are mains or battery powered. • By creating their own simple series circuits, the pupils will name the different components needed (cells, wire, bulbs, switches and buzzers). • Pupils will represent their circuits pictorially to show their understand of the different components and they will note how the position of the switch will affect the rest of the circuit. • Pupils will investigate whether a variety of materials, including metals will conduct or insulate.	Previous Learning Pupils will have labelled different parts of the body. They will have identified herbivores, omnivores and carnivores. What we will learn **Knowledge** • Initially the children will match the names to the functions in the digestive system. When they are familiar with the names and functions, they will then create their own model of the human digestive system. • Through labelling diagrams of the mouth, the children will learn about the different teeth we have and their purpose. They will then make comparisons between humans and animals; herbivores, carnivores and omnivores. • By creating a simple investigation, the pupils will learn about the effects of different liquid and how they can cause tooth decay. • Through constructing their own food chains, the children will learn about predators/ prey, consumers/ producers and learn of the impact each has on a food chain. • Make links to the invention of toothpaste by Washington Sheffield. **Enquiry** • What happens to my food when I swallow it? • Do all animals need teeth? • Where does our food come from?	Previous Learning Pupils will have identified the seven life processes. They will know how to distinguish animal groups- amphibians, reptiles, mammals, bird and fish. They will have identified a range of animals and plants and which habitat they are usually found living in. What we will learn **Knowledge** • By sorting animals by different criteria, the pupils will learn that living things can be grouped by similarities and differences in their characteristics. • Through classifying a range of amphibians, mammals, fish, birds and reptiles, the pupils will learn how to identify vertebrates and invertebrates. • By exploring their own local habitat, the pupils will gather a range of invertebrates to classify. • Through exploring a habitat of their choice, the pupils will create their own classification table for the living things that live there. • Through exploring their local area, the pupils will explore the risk and dangers to living things in their environment. • Pupils will use the internet to research natural and man-made changes that can occur in the environment and how they can	Previous Learning Pupils will have observed and named a range of sound sources. They will have listened to and played a variety of musical instruments through their music curriculum. What we will learn **Knowledge** • By using a range of instruments, the pupils will learn about how sound causes vibrations and how sound travels through a medium to the ear. • Through creating their own factual programme, the pupils share how they have noticed the patterns when experimenting with how the loudness of the sound changes the size of the wave depending of the features of the instrument. • Through creating their own set of straw pan pipes, the pupils will explore pitch can be altered. • Through creating their own string telephones, the pupils will learn how the loudness of a sound alters with the distance from the sound source. • By testing a variety of different materials, the pupils will learn about how sounds are	Previous Learning Pupils will have explored a variety of materials and their properties. What we will learn **Knowledge** • Through continuous provision, the children measure the temperature of the classroom, use met-office weather forecast reports. • By using drama to recreate particles, the pupils will identify solids, liquids and gases and the properties of each state. • Through experimenting with different fizzy drinks (George's mixtures), the pupils will investigate whether gas has a mass. • By experimenting with chocolate, the pupils will learn that some materials change state when temperatures are changed. They will also learn freezing and melting points in °C. • Through a variety of short experiments with water, the pupils will learn about how temperature effects the three states of water. They will learn of the processes of melting, freezing, evaporating and condensing. • Through investigating how washing dries, the pupils will	

	• Make links to the work of Garrett Morgan and Thomas Eddison. **Enquiry** • What is electricity? • Why is electricity dangerous? • What would happen if we did not have electricity? • What is the effect of changing the wire in a circuit from a straight thick wire to a straight thin wire? • Why are switches needed in a circuit? • Imagine a simple series circuit with one 1.5V battery and one bulb. When the 1.5V battery is replaced with a 3V battery, what will happen? **Working Scientifically** • Conduct research using the internet to find out how electricity can be generated. • Sort electrical appliances into Venn diagrams to show if they are mains or battery powered. • Make predictions as to whether a bulb will light or not and then test their electrical circuits. • Use scientific vocabulary to explain how their circuit works in an explanation text. • Make systematic and careful observations to identify which materials insulate and conduct electricity. • Record findings in a table to show how a variety of materials conduct and insulate.	• What would happen in a food chain if one of the links became scarce? Could this affect other animals? • Can some animals be both predators and prey? • Which foods are best for us? **Working Scientifically** • Use simple scientific evidence from an explanation text to understand how the digestive system works. • By identifying similarities and differences of the teeth of a variety of carnivores, herbivores and omnivores note comparisons and contrasts about how their diets determines which teeth they have. • Create relevant questions for their scientific enquiry into the effects of tooth decay. • Set up a fair, comparative investigation to explore how different liquids affect teeth (using boiled eggs to act as enamel) • Make predictions about how each of the liquids will affect the 'enamel' • Make systematic and careful of the 'enamel' over time to notes the changes. • Record their findings using diagrams and annotations. • Create a conclusion based on their observations of the variety of liquids on the 'enamel'. • Suggest improvements that could be made to their experiment, should they complete it again.	cause endangerment and extinction to species. • Make links to Gerald Durell's conservation work in Madagascar. **Enquiry** • How can we group different living things? • What lives in my local habitat? • What is the same/different with living things? • What impact are we having on the environment? **Working Scientifically** • Use Carroll and Venn diagrams to classify and group living things by similarities and differences in their characteristics. • Ask relevant questions in their classification keys to sort living things. • Draw labelled diagrams of the invertebrates they find in their local habitat. • Use a classification key to sort the specimens they find. • Gather and record information using the internet about their chosen habitat as a classification table. • Create a sketch map of the environment and label the dangers and risks to its inhabitants. • Present, as a group, possible ways of making positive changes to impact the environment to save local wildlife.	absorbed by materials to be used as soundproofing. • Through making their own junk musical instrument, the pupils will consolidate their knowledge of sound, vibrations, pitch and volume. • Make links to the work of Alexander Graham Bell- his work with sound, deaf people and his inventions. **Enquiry** • Can you travel faster than sound? • How is sound similar to light? • How do we communicate with astronauts in space? • Why are two ears better than one? • How are vibrations from a loud sound different to a soft sound? • What is an echo? **Working Scientifically** • Use data loggers to measure sound levels around school and decide how they can record their findings. • Create a simple experiment to explore how the difference in volume changes the size of the sound wave. • Write a simple explanation text, using scientific vocabulary, to explain how changing the lengths of their straw panpipes affects the pitch. • Set up a simple experiment to test how to make a sound louder to make it travel further using string telephones. • Take measurements using a data logger of how much sound is absorbed by different materials and then conclude which materials will be best used for soundproofing. • Ask questions about sound, vibrations, pitch and volume when testing their junk musical instruments.	learn about how temperature effects the rate of evaporation. • Apply knowledge of evaporation and condensation to The Water Cycle. Learn of precipitation and the collection of water. • Make links to 'absolute zero' by Lord Kelvin. • Make links to the discovery of oxygen by Lavoisier and Priestley. **Enquiry** • What is the most common state of matter? • Is shaving foam a liquid? • Does gas have weight? • What is the most important state of matter and why? • Do particles melt? • "If we're not careful, one day the Earth will run out of water." What evidence is there to support or refute this statement? **Working Scientifically** • Classifying and sort a variety of materials by their state of matter. • Make predictions about how much gas will weigh in fizzy drinks to explore its mass. • Create a simple enquiry to test the effect of temperature on chocolate. • Make systematic and careful observations about the change of state of chocolate at different temperatures. • Use a thermometer to measure temperatures of the chocolate in its different states. • Present my findings from the chocolate enquiry in a bar chart. • Gather data through observations of how water changes state, thinking carefully about the similarities and differences in the particles for each. • Make predictions and conclusions on how temperature effects the rate at

				• Suggest improvements they could make to their instruments to change the sound.	which washing dries. Record data in a table. • Write a short explanation text, with labelled diagrams, about how The Water Cycle works.

Year 5

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	To infinity and beyond…		***The Maya Civilisation***	***The Terrible Tudors***	***Mother Nature: Out of Control?***	***On the move!***
	Earth and Space		***Properties and Changes of materials***	***Animals including humans Living Things and Their Habitats***	***Forces***	
Science	Previous Learning Children have previously developed their ability to ask relevant questions and using scientific enquiries to answer them in years 3 and 4. They have also developed their knowledge of how to use straightforward scientific evidence to answer questions or support their findings. In year 3 children learnt how shadows were formed. They have also recorded their findings using labelled drawings as well as oral and written explanations. What we will learn **Knowledge** • By discussing and identifying ancient theories/beliefs of Flat Earth versus Spherical Earth and identifying evolution of scientific evidence used to support or refute ideas or arguments in the context of how ideas changed from a flat earth view. Pupils to use scientific vocabulary to support/refute the theories themselves. • To understand and describe the movement of the Earth, and other planets, relative to the sun in the solar system pupils will be introduced to Ancient Greek observations of Solar system and debate about Aristotle and Copernicus Geocentric and Heliocentric models of the solar system respectively to describe the sun, Earth and moon as spherical bodies and understand how Galileo reached a conclusion of the Helio-centric model based on evidences of Copernicus' theories. Pupils to then animate the movements of the solar system. • By identifying the names of eight planets in order and researching features of each planet and create fact cards. Draw diagrams of planets in proportion of one another there by comparing size and distance from the Sun. • Pupils learn that day and night are caused by the rotation of the Earth, and that the Sun only appears to move across the sky. Using a split pin, pupils create a moving model showing how the rotation of the Earth causes day and night. They move their model through a		Previous Learning Children have previously been taught to distinguish between an object and material from which it is made and to identify their names and physical properties in Year 1. They have also learnt how to compare, and group everyday material based on their physical properties. What we will learn **Knowledge** • By comparing and grouping together everyday materials based on their properties, including their hardness, transparency, flexibility and response to magnets. Pupil to record results in a table. • Pupil to predict and sort a range of materials whilst giving reasons, based on evidence from comparative and fair tests, for the particular use of everyday materials as thermal insulators - Investigate which material is best for insulation by conducting an experiment using ice cubes and measuring the temperature to conclude which material is best as insulator to design a lunch box. • Pupil to predict and sort a range of materials whilst giving reasons, based on evidence from comparative	Previous Learning In Year 2 children have compared the differences between living and dead. They have also identified, named and explored a variety of plants and animals and their suitable habitats. They have used the idea of simple food chain to identify different sources of food. Further in Year 4 the children would have grouped living things and used classification keys to help group, identify and name a variety of living things in their local and wider environment What we will learn **Knowledge** • Identify 6 key stages of human life and create a human timeline. Can they identify this for a family member? Children also create a timeline of themselves showing the ages at which they could perform different activities. They draw	Previous Learning In Year 3 children have compared how things move and noticed forces need contact but explored magnetic forces (attract and repel) that act at a distance. Children would have looked at the magnetic force in depth by identifying their two poles, predicting materials that are magnetic or not and compared and sorted based on that property. What we will learn **Knowledge** • To identify the effects of air resistance - Children learn that air resistance can be used in devices such as parachutes. They investigate how canopy size affect's a parachute's rate of descent. They construct 4 parachutes with different canopy areas and predict and then measure how long they take to descend from a given height. They take each measurement 3 times and calculate the mean. Pupils show their results in a bar chart and attempt to answer the scientific question. • To identify the effects of water resistance - Pupils learn that water resistance is a force which prevents an object from moving easily through water. They learn that both high and low water resistance can be desirable in different situations. Discuss this further applying to their swimming experience. Pupil to design and make a streamline boat and have a race to check speed and movement on water. They then analyse and record using causal relationships. As critical scientist they then support or refute ideas based on self-evaluation to improve design. • To identify effect of friction – Based on prior knowledge of friction as a force that prevents objects from sliding. Pupil investigate the best surface to place on a floor to prevent people from slipping. They predict and then measure the force required to make a shoe containing a weight slide across a range of surfaces. They present their results in a bar chart and attempt to answer the scientific question.	

	day and night cycle, using speech bubbles to explain what they would experience at each stage of the cycle. • Pupils learn how the Moon moves around the Earth based on previous learning about Earth rotation around the sun. They will be shown a video for visual representation which will then be followed by pupils to demonstrate the movement of Earth and Moon around the Sun in groups using variety of media. Create a visual aid model of phases of the moon based on its movement. **Enquiry** • What shape Is Earth and how do we know? Describe the sun, moon and Earth as spherical bodies. • What are planets? Describe what a planet is using research and fact files. They will name and learn the order of the planets which orbit around the sun. • Do planets move? Children will learn and be able to describe the movement of the Earth and other planets relative to the sun. • How does day and night happen? Children will draw and label diagrams based on their knowledge of the Earth's rotation around the sun. • Why is Moon visible in the sky in different forms? • Expand on their knowledge of shadows (collecting data). They will design and partake in an experiment to measure them. **Working Scientifically** • Identifying scientific evidence that has been used to support and refute ideas or arguments – Sorting evidence based on flat earth versus spherical Earth theories • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. - Look at scientific theories about the Earth's shape and to make their own conclusions – Pupils to research and come up with sources to suggest how they know Earth is spherical (eg: Satellite images, astronaut's view etc) Pupils to show and demonstrate their understanding of spherical Earth using the flat playground. • Reporting and presenting findings based on causal relationships – A diagram and explanation(written) and active demonstration by pupils(oral) of Earth & Sun movement to show Day and night**;** Pupil to watch the moon over 28 days and draw their observations of the lunar phase • Recording data using graphs (measuring shadows)	and fair tests, for the particular use of everyday materials as thermal conductors – investigate conductivity using bulb circuits. • Pupils learn that when a solute dissolve in a solvent to create a solution, its particles spread out so that they can no longer be seen or retrieved by filtering. They investigate whether sand, sugar, salt, flour will dissolve in water. They record their results in a table They consider how they could separate the mixtures and solutions. Pupil to plan how to and what resources might be needed to separate. • Pupils learn about 6 different methods for separating solutions - picking out by hand, decanting, sieving, filtering, using a magnet, and evaporation. They consider 6 different mixtures / solutions and discuss the best way to separate each. They attempt to separate them using their chosen method. They discuss whether their method worked and why. • Predict and demonstrate that dissolving, mixing and changes of state are reversible changes and 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 by melting chocolate and the action of acid on bicarbonate of soda. • Pupil to choose 4 different objects from school or home and identify the materials that they are made from and explain why those materials have been chosen with reference to their physical properties. Next, they describe the physical	illustrations for each activity. • Explore differences in lifecycle of a mammal- Children complete a table showing the gestation periods of 10 different mammals. They round each gestation period to the nearest 10 days and use this to create a bar chart. They look for patterns and identify which mammal has the longest gestation period. They then compare the lifecycle to an amphibian, an insect and a bird. They create 3 life cycle diagrams, adding their own explanations and diagrams. • To describe the life process of reproduction of a plant- they learn about the purpose of a flower and its basic structures, including petal, anther, sepal, carpel, stigma, style, ovary, pollen grain, pollen tube and ovule. They label a diagram of a flower and carpel and complete an explanation text showing how flowering plants reproduce. Children learn that, unlike animals, pieces broken off from plants can grow into another individual organism – they	• To investigate how levers work - Pupil learn that a lever is a simple machine that can give a mechanical advantage. They will set up their own lever, with fulcrum, beam and load, and investigate how far from the fulcrum different forces (weights) need to be in order to balance the load. They transfer their results to a line graph and attempt to find a relationship between the force required and the distance from the fulcrum. ○ Discuss where have they seen this type of mechanism working in their everyday life. • Investigate how pulleys work and how the number of pulleys change the effort of work required **Enquiry** • What is air resistance and how can we understand it? • What is water resistance and how can we investigate this? • How do levers work? • How do pulleys work? • How does ground friction affect movement? **Working Scientifically** • Plan scientific enquiry, including recognising and controlling variables – fair testing air resistance with parachutes • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeated readings – testing air resistance with parachutes • Using test results to make predictions to set up further comparative and fair test – testing air resistance, water resistance, friction • Reporting and present findings including conclusions, causal relationships with degree of trust in results – Friction • Recording data and results using scientific diagrams, graphs and labels – investigating levers and identifying effects of friction

		properties and uses of 6 different materials of their choice - metals, plastics, wood, fabrics, glass and leather by recording their knowledge in writing using Sway. **Enquiry** • Why are certain materials used to make items we use? • Which material is the best thermal insulator? • Which material is the best electric conductor? • Is it possible to separate dissolved or mixed items? • How do we explore if changes of properties are reversible or irreversible? **Working Scientifically** • Planning scientific enquiry to answer questions, including recognising and controlling variables – experiment to investigate materials for thermal insulation • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings – recording temperature and measuring level for thermal insulation experiment at regular intervals of time. • Using test results to make predictions • Recording data and results of increasing complexity using classification keys and tables -sort and compare materials • Using test results to make predictions to set up further comparative and fair tests – to plan after solute testing if they can be separated • Reporting and presenting findings from enquiries, including conclusions in oral and written form using tables	investigate using cut potato or tomato. • To describe life process of reproduction of an animal - they learn that animals reproduce sexually, and each individual has a male and a female parent from which they inherit various traits. Pupils to then explain the process of animal reproduction, including the stages of sperm and egg production, mating, fertilisation, and the growth of a zygote into an embryo. **Enquiry** • What are the human development stages up to old age? • Are there differences in lifecycle of living things? • What is the difference in reproduction of a plant and an animal? **Working Scientifically** • Recording data using scientific diagrams and labels - human development stages, lifecycle of mammals and reproduction of plants • Recording data using graphs – comparing gestation period using graph • Report and present findings from enquiries with	

			● degree of trust in results – comparing gestation periods. ● Report findings including causal relationships in oral/written forms – explanation of parts of flower	

Year 6

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	The World at War		***Ancient Greece*** ***We are Scientists***		***Brilliant Business***	***Showtime***
	Animals including humans	***Electricity***	***Living things and their habitat*** ***Evolution and Inheritance***		***No Science in Summer 1***	***Light***
Science	<u>Previous Learning</u> Describe the changes as humans develop to old age <u>What we will learn</u> **Knowledge** • By exploring the human circulatory system, pupils will be able to identify and label the main parts and explain how they contribute to a healthy human. • Look at a blood smoothie to identify the components and their function within the circulatory system. Create a leaflet for Dr surgery to explain the function and how blood is transported. • Compare diets and the nutrition value of each food group to recognise the impact of diet and exercise on a healthy lifestyle. Through WW2 topic, pupils will make comparisons about diet and look at how it has evolved over time. • Using recommended websites, children research the effects of drugs on the body and create a drugs advert to • Set up experiment to look at how nutrients and	<u>Previous Learning</u> Identifying common appliances that run on electricity Simple circuits have been created and parts have been named. Pupils have identified whether a bulb will light up or not. Pupils have identified common conductors and insulators. <u>What we will learn</u> **Knowledge** • Through carrying out different types of scientific enquiries, pupils will explore the effects of voltage on electrical circuit components. • Research and conduct a series of simple electrical circuit investigations and make comparisons about how the number of elements affect the circuit. Create a success criteria for an electrical Dragon's Den challenge, using circuit diagrams and symbols to represent our ideas with explanation to the role of resistance in	<u>Previous Learning</u> Described the differences in the life cycles of mammals Described the life process of reproduction in plants and animals <u>What we will learn</u> **<u>Knowledge</u>** **<u>Evolution and Inheritance</u>** • Play a class "Guess Who?" game and discuss characteristics that are inherited and through discussions identify variations between yourself and others. • Create Top Trump for a species of their choice – investigate characteristics, simple dominant and recessive genes and how these genes are used to breed. • Play "Extreme Survivor" to identify which plants and animals survive in given environments – design and animal and a plant that should thrive and survive in a given environment. • Research into the work of Darwin, Wallace and Anning – share and present as a Sway (focus on evidence to back theories on evolution and present logical findings). • Explore online the evolution of flight in birds using the fossil record – present findings using their medium of choice. • Write a "Just So" story about a creature and a distinguishing characteristic. **<u>Enquiry</u>** • What is a fossil? • How old is a fossil? How do you know? • Why do you think fossils have changed over time? • Is adaptation immediate or does it take time? **<u>Living Things and Their Habitats</u>** • Investigate Lineas and the classification of living things. • Create classification routes for a range of living things and give reasons why they have decided on these classifications. • Identify similarities and differences between animals, micro-organisms and plants. • Organise animals, micro-organisms and plants into groups and sub-groups and explain why they are organised in this way.		<u>Previous Learning</u> Recognise that we need light in order to see things. Recognise that darkness is the absence of light. That light is reflected from surfaces. Light from the sun can be dangerous and how we need to protect our eyes. How shadows are formed when the light from a light source is blocked. Find patterns in the way the size of shadows change. <u>What we will learn</u> **<u>Knowledge</u>** • Investigate how light travels • Understand that a light. source is needed in order to see. • Describe the movement of light off mirrors – make a periscope to carry out investigation. • Write an explanation to explain if a human shadow has the same shape as the person casting it. • Look at magnifying lenses suggesting which cannot magnify enough under given circumstances. • Explain and demonstrate that light can be bent when it is slowed down. • Explore how white light is split into different colours and how rainbows are created. **Working Scientifically**

	water are transported through the body. • Label the digestive system and explain how nutrients and water are transported. Children make comparisons between animals and humans **Enquiry** • How does blood travel through your body? • What would the body look like without any water? • What do you think would happen if you didn't have a heart? • Is blood blue? **Working Scientifically** • Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Record data and results of increased complexity. • Discuss the requirements of a fair test to establish accurate and meaningful results. • Investigate the impact exercise has on our heart rate, record results using a table and line graph – make comparisons across the class. • Research into the work of William Harvey and present to peers an accurate description of the unified system of circulation	making components work. • Investigate the properties of a dimmer switch, compare different materials to find the most effective and design their own dimmer switch, identifying materials and tools for their design. • Create and design a Christmas light (decoration circuit) explaining how the components work and evaluate the effectiveness of the circuit • Create a sway to present electrical knowledge. **Enquiry** • What is electricity? • How can you describe its movement in a circuit? • What are the benefits of a parallel rather than a series circuit? • What are the differences in symbol for a cell rather than a battery? **Working Scientifically** • Investigate a dimmer switch identifying materials and tools for their design, leading to the creation of a dimmer switch. • Plan different types of scientific enquiries to explore the effects of voltage on electrical circuit components - record and present results	• Create a feature-lead sweet classification system. • Design and test out a classification key for birds, bees and butterflies. • Explore learning in nature and use the environmental area to observe nature and leaves found in our local environment – design and test a classification key. • Research animals/plants with unusual characteristics from around the world, creating and delivering a group presentation to the rest of the class. • Design, describe, name and sketch a new creature that sits within one of the known classification groups. As a class, sort these animals using animalia system. **Enquiry** • How are animals similar/different? • How do microorganisms help the environment? • How does bacteria spread? • Can we have 'good' bacteria? **Working Scientifically** • Investigate variation across specific plant and animal groups – looking at adaptations and the advantages and disadvantages of certain characteristics. • Investigate features that support surviving in a certain environment and make comparisons. • Research into the work of Darwin, Wallace and Anning – share and present as a Sway (focus on evidence to back theories on evolution and present logical finding) • Explain scientifically how a given creature has evolved in terms of a specific characteristic.		• Give enquiry questions – children to plan and carry out investigations to solve those questions. They need to identify variables to be controlled and how to achieve a fair test and make comparisons. Record data and present findings through identifying patterns and drawing conclusions. • Plan and carry out an investigation into the reflectiveness of given materials. Record results in a graphic form and identify patterns – evaluate and suggest further investigations from their findings – create a periscope. • Carry out an investigation into shadow size and the position of a light source – draw a line graph and identify patterns in results. • Plan and carry out a light colour mixing investigation and present findings in a chart. • Research the work of Isaac Newton's theory of light and make comparisons with Christiann Huygen's theory that light was made of waves.

		graphically. Evaluate the fairness of the test.			