South Darley C.E Primary School Science Overview

EYFS:

Communication and Language	Listening, Attention and Understanding	• Make comments about what they have heard and ask questions to clarify their understanding.
Personal, Social and Emotional Development	Managing Self	• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
Understanding the World	The Natural World	• Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

	KS1	LKS2	UKS2
Animals Including Humans	**Pupils should be taught to:** **Y1** • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; • identify and name a variety of common animals that are carnivores, herbivores and omnivores; • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Y2** • notice that animals, including humans, have offspring which grow into adults; • find out about and describe the basic needs of animals, including humans, for survival (water, food and air);	**Pupils should be taught to:** **Y3** • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat; • identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Y4** • 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.	**Pupils should be taught to:** **Y5** • describe the changes as humans develop to old age **Y6** • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function; • describe the ways in which nutrients and water are transported within animals, including humans.

	• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		
Plants	**Pupils should be taught to:** **Y1** • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; • identify and describe the basic structure of a variety of common flowering plants, including trees. **Y2** • observe and describe how seeds and bulbs grow into mature plants; • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**Pupils should be taught to:** **Y3** • 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.	
Living Things and Their Habitats	**Pupils should be taught to:** **Y2** • explore and compare the differences between things that are living, dead, and things that have never been alive; • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other; • identify and name a variety of plants and animals in their habitats, including microhabitats; • 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.	**Pupils should be taught to:** **Y4** • 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.	**Pupils should be taught to:** **Y5** • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; • describe the life process of reproduction in some plants and animals. **Y6** • 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; • give reasons for classifying plants and animals based on specific characteristics.

Seasonal Changes	**Pupils should be taught to:** **Y1** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.		
Materials	**Pupils should be taught to:** **Y1 Everyday Materials** • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of everyday materials on the basis of their simple physical properties. **Y2 Use of Everyday Materials** • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**Pupils should be taught to:** **Y3 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. **Y4 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.	**Pupils should be taught to:** **Y5 Properties and Changes of Materials** • everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic; • demonstrate that dissolving, mixing and changes of state are reversible changes; • 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.
Light		**Pupils should be taught to:** **Y3** • 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.	**Pupils should be taught to:** **Y6** • recognise that light appears to travel in straight lines; • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye; • 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; • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Electricity		**Pupils should be taught to:** **Y4** • 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.	**Pupils should be taught to:** **Y6** • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit; • 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; • use recognised symbols when representing a simple circuit in a diagram.
Sound		**Pupils should be taught to:** **Y4** • 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	
Earth and Space			**Pupils should be taught to:** **Y5** • describe the movement of the Earth and other planets relative to the Sun in the solar system; • describe the movement of the Moon relative to the Earth; • describe the Sun, Earth and Moon as approximately spherical bodies; • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces		**Pupils should be taught to:** **Y3 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.	**Pupils should be taught to:** **Y5 Forces** • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object; • identify the effects of air resistance, water resistance and friction, that act between moving surfaces; • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.
Evolution and Inheritance			**Pupils should be taught to:** **Y6** • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago; • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents; • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Working Scientifically	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content • asking simple questions and recognising that they can be answered in different ways; • observing closely, using simple equipment; • performing simple tests; • identifying and classifying;	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them; • setting up simple practical enquiries, comparative and fair tests; • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers;	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;

	• using their observations and ideas to suggest answers to questions; • gathering and recording data to help in answering questions.	• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions; • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables; • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; • identifying differences, similarities or changes related to simple scientific ideas and processes; • using straightforward scientific evidence to answer questions or to support their findings.	• using test results to make predictions to set up further comparative and fair tests; • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations; • identifying scientific evidence that has been used to support or refute ideas or arguments.

	KS1 Cycle A						KS1 Cycle B						KS2 Cycle A						KS2 Cycle B					
	Lest We Forget: No Place like home / Remembrance	**Staying Alive:** Nurturing Nurses	**No Stone Left Unturned:** Great Explorers / Beside the Seaside	**Best of British? :** Famous Brits / Gunpowder Plot	**World on a Plate:** Beautiful India? / Living off the Land	**All the World's a Stage:** Cinderella and Fairy Tales of the World	**Our DNA:** Incredible Me! / Towers and Turrets: Norman Conquest	**Plague! :** Pirates and the Great Fire of London	**Travel Through Time:** Travel and Transport	**Industrial Age:** Queen Victoria and Elizabeth II	**Treasure Hunters:** Special Toys Through Time / Superheroes Rule	**Hooray for Habitats:** Paws, Claws and Whiskers / Jack and the Beanstalk	**Lest We Forget:** World Wars	**Staying Alive:** Survival	**No Stone Left Unturned:** Stone Age to Iron Age	**Best of British?:** Romans	**World on a Plate:** Enterprise Unit – Foods from around the world	**All the World a Stage:** Greeks / Olympics	**Our DNA:** Vikings and Anglo Saxons	**Plague! :** Eyam and the Plague	**Travel Through Time:** Space	**Industrial Age:** Industrial Revolution – Local History	**Treasure Hunters:** Egyptians	**Hooray for Habitats:** Rainforests
Animals including humans		x	x	x			x	x			x	x		x						x				
Plants			x		x				x			x					x							x
Living things & habitats					x				x								x							x
Seasonal changes		x		x				x		x														
Materials	x				x	x	x			x	x		x					x	x				x	
Light													x		x				x		x			
Electricity													x			x			x			x		
Sound													x						x					
Earth and Space															x						x			
Forces																x						x		
Evolution																		x					x	
Working scientifically	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Key: LKS2 UKS2

	KS1	LKS2	UKS2

Lest We Forget	**Brilliant Builders: Comparing Materials** • Sort objects in the classroom according to these criteria: flexible, rigid, hard, soft, stretchy, stiff**.** Use materials selected for their properties to fix a torn umbrella. • **(Sorting, classifying and identifying, problem solving).** • Year 1 -Recap on how different objects are made from different materials. Year 2 -Discuss their selection of materials for fixing the umbrella: what properties does this material have that makes it a good choice? • Investigate materials for their useful properties, considering questions e.g. how can we know that this material will not let the` rain through? How can we test it? Use pipettes to simulate raindrops and test different materials **(Observing over time, problem solving)**. • Year 1 - Observe and record the results. Year 2 - Make hypotheses about why certain materials do not let water through. • Consider question: Can 'hard' materials (wood, stone) absorb water? **(Pattern seeking, testing)** • Year 1 - Consider what buildings are made of and why. Year 2 - Devise an investigation to test a variety of materials (plastics, metals, different types of wood, bricks) for their absorbent property and make predictions • Are all makes of paper as good as each other? Investigate which papers are the most absorbent **(Pattern seeking, problem solving).** • Year 1 - Make predictions about which paper would be best at mopping up a spillage of water. Year 2 - Understand the different reasons why people may need to use absorbent materials. • Investigate the absorbency of fabrics by using a dropper. • Year 1 - Investigate how to make the fabric waterproof. Year 2 - Observe and measure the number of drops and the time they stay on the cloth before being absorbed. Explore texture and various properties	**Sound:** • Look at videos of instruments. • Conclude that vibrations cause the sound; feel vocal chords. • Put rice on drum and tuning fork in water to observe vibrations. Bang drum harder/softer and discuss what happens to rice. • Complete school sound survey. • Explore how sound travels and then what happens to vibrations as they enter the ear. • Investigate different instruments and how to make high and low pitch of a sound. Explain how they change pitch. • Explore how sounds change over distance and make a string telephone. • Carry out investigation to see which soundproofing material works best around a box with music playing inside. • Make a musical instrument. **Electricity:** • Identify common appliances that run on electricity and then classify, sort and present in books or as a poster/presentation. • Construct a simple series circuit – identify and name its basic parts: cells, wires, bulbs, switches and buzzers. • Experiment with and test different circuits and draw circuit diagrams with correct symbols. Investigate which circuits work and which don't work. Discuss why? Present findings.	**Light:** • Using search lights used during the war as a starter, discuss what the light does. • Create a model of light travelling using torches and card with a hole in. Demonstrate this using yellow wool. • Investigate angles of incidence and reflection, light travelling in straight lines and that light travels from light sources to eyes, by creating a periscope. Discuss the uses for a periscope. • Investigate refraction using cups of water and drawings on paper. • Create colour wheels and explore prisms to demonstrate that light is made up of a spectrum of colours. • Create a shadow theatre based on Topic theme. **Materials:** • Sort everyday objects according to their properties (Viking treasure). • To give reasons, based on evidence from comparative and fair tests of their thermal and electrical conductivity, for the particular uses for everyday materials (metals, plastics, woods). • Compare and group together everyday materials on the basis of their solubility by investigating dissolving. To use knowledge of solids, liquids and gases to decide how mixtures could be separated, including through filtering, sieving and evaporating. • Explore irreversible changes.

	(absorbency, flexibility) by using materials to print with paint onto squares of cloth or card. Year 1 - Discuss the difference between natural and man-made objects. Year 2 -Sort the objects into natural and man-made and observe any similarities and differences between the two groups.		

Staying Alive	**Amazing Me!** • Share baby photos together as a class.Discuss differences between 'baby me' and 'present me', explore memories and why they are important. Make memory chains/lockets. **(Exploring)** • Year 1 -Play Memory Games to encourage understanding of the passing of time • Year 2-Observe changes over time between the baby photos and current ones • Year 1/2 - make a class wall display of Our Body Patterns, with photographs and measurements, to show their understanding and learning **(Pattern seeking)**. • Year 2-Extend the activity by looking at ways to present the data. • Talk to each other about what makes a difference to how well they can hear a whistle when it is blown. • Year 1/2 -Investigate ideas by going outside and asking and extending questions and noticing patterns **(Pattern seeking).** • Year 2-Extend the investigation by considering how to make it fair and looking at what can be changed and what should stay the same. • Discuss and draw up a list of essential items for basic survival **(Problem solving)** • Year 1 Identify differences between fruit and vegetables using our senses. • Year 2 Classify fruit and vegetables into different groups **(Sorting, classifying and identifying)**. • Year 1 Use blindfolds to explore without the sense of sight. • Year 2- Understand how the senses work together. Year 1 /2 Design a balanced lunch box on paper to serve as a reminder of how much each food group is required for a balanced lunch. By drawing on previous knowledge of healthy food, select healthy sandwiches to pack in a picnic. Record the healthy picnic in photographs and talk about learning with invited guests **(Problem solving).**	**Animals Including Humans:** • Sort food packages into food groups and then find out about the different nutrients the different foods provide. • Gather information from food labels to find out the nutritional values of different foods. • Explore what is the right kind and right type of nutrition for humans. • Sort animal skeletons into groups, discussing patterns, similarities and differences. • Identify and name parts of the human digestive system. • Explain the functions of the digestive system. Explore different types of teeth in humans and their function. Compare human and animal teeth and find similarities and differences. • Plan an investigation to see what affect liquids have on chewing gum. • Record results and findings and draw conclusions. Construct and interpret food chains identifying producers, predators and prey.	**Animals Including Humans:** • Draw a timeline to indicate stages of growth as humans develop to old age. • Look at data for babies in their first year of growth and document in line graphs and bar charts. • Explore the changes that happen during puberty and in old age. • Research the different gestation periods for animals and how life expectancy is different through time and in different countries. Analyse data and present in bar and line graphs. • Explore the heart and circulatory system – diagrams to explain the heart, blood vessels and blood. • Children to create presentations to describe the ways in which nutrients and water are transported within animals including humans. • To research the impact of diet, exercise, drugs and lifestyle on the way bodies function – to plan different scientific enquiries to explore the effects of exercise on the heart rate. • Recognise and control variables, record data and results (graphs, tables etc.) and write up conclusions.

	Wild Weather • Go outside and look at the weather, observe the temperature, wind etc Suggest how to dress a teddy or doll appropriately for different weather conditions**. (Exploring, problem solving)** • Year 1 -Look at weather forecasts and the symbols used by forecasters. Year 2 - Write phrases, using typical words used by weather forecasters, to present the weather they have observed.. • Understand how the weather they have observed outside is typical (or not) of the weather for the season. Listen to Vivaldi's Four Seasons and create collage of the current season. **(Pattern seeking)** • Year 1 - Record weather observations in the classroom and discuss the changes. Year 2 Take the temperature outside in the morning and afternoon and discuss how to do this accurately. • Understand day length changes each day and varies from season to season. Look at shadows (or create them in the classroom) and look at how they change. • Year 1 -Photograph them and draw around them on the playground in pairs with chalk. Year 2 Track a shadow by observing and measuring over time and record the results. • Consider what effect rain has on us and our daily lives. Set up rainfall gauges , record rainfall and make predictions. **(Pattern seeking)** • Year 1 - Begin to look at how to record the results of the rain gauge in a clear way and use results to generate questions . Year 2 Look at how to record the results of the rain gauge in a variety of ways. • Make a wind sock to measure wind direction and a wind vane to measure the direction of the wind. Record the observations. **(Observing over time, pattern seeking)**. • Year 1 - Does the direction of the wind change from morning to afternoon? Year 2 - Observe wind direction over time; notice rainfall and		

	wind patterns: is it always windy when it is raining? • Consider warm and cold weather and measure the temperature inside and outside the classroom. Make a thermometer box. Year 1- Understand that air temperature changes with the seasons, and that usually summer is hotter than winter. Year 2 - Begin to understand how a thermometer box works.		

No Stone Left Unturned	**Great Explorers** **Growing Things** • Go outside to the school garden to look at plants. **(Exploring)** • Year 1 – Identify plants, label them and sketch. Year 2 Make a map of the garden plot, identifying the plants and predicting what they will turn into when they are fully grown. • In groups, prepare tubs and plant chitted potatoes. Label the tubs and predict what will happen. • Year 1 Look at the different types of potato and talk about any similarities and differences. Year 2 - Consider what do we need to do, as a team, to encourage our potato to grow and produce lots of potatoes. • Design and set up a garden centre in the classroom. Plant a bean in a jar and seeds in a bag and keep them in the classroom garden centre **(Observing Over Time).** • Year 1 - Share what they know about what beans need to grow. Year 2 - Start a record of the bean's growth and predict the outcome. • Plant cress seeds on cotton in an eggshell or small container. • Year 1 Place one egg shell with cress in a cupboard and talk about what might happen to the cress and its growth **(Exploring over time, pattern seeking). Year 2** Start a record of the cress growth and predict how long it will take for the cress to grow long enough to eat **(Problem solving)**. • Understand that there are differences between the bean grown in the classroom and the one grown in the cupboard. **(Exploring over time, pattern seeking** Make a bean out of craft and junk materials • Year 1 - Begin to talk about the various functions of the parts of the plant and their importance. Year 2 - Begin to explain why those differences have occurred	**Light:** • Sort items into sources of light or not. Understand that dark is the absence of light. • Carry out a feely bag investigation to see if they can work out what is in the bags. • Explore reflection and how light reflects off a surface using a torch. • Understand if reflected light hit our eyes, we see the object. • Discuss how different surfaces reflect better than others and carry out an investigation to see which surface reflects the light best for designing a reflective book bag. • Look at the angles of reflection for a mirror and have a look at some mirrors. Have a go at some mirror games: following a wiggly line in a mirror and reading messages in a mirror. • Understand that light from the sun can be dangerous and design a sun hat or sunglasses. • Explore how shadows are formed and investigate the best material for curtains in a baby's bedroom. Explore how shadows change when you alter the distance between the object and the light source.	**Earth and Space:** • Find out how it was ascertained that the Sun, Earth and Moon were spherical bodies – explore scientific evidence that has been used to support this. • Learn the order of the planets and create model solar systems. • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Examine the geocentric and heliocentric theories. • Create a presentation about a famous astronomer they have learnt about/researched. • Carry out observations of the sun to track movement throughout the day then explain night and day and the apparent movement of the sun across the sky. • Predict day and night in different part of the world. • Make models of the sun and moon to demonstrate and explain the movement of the moon.

	• Understand the differences between the cress grown in the classroom and that left in the cupboard. Boil eggs and butter sandwiches and make egg and cress sandwiches. Year 1 - Observe the cress growth and comment on their observations. Year 2 -Be able to talk about what the seed has produced and how the cress plant grew. **Beside the Seaside** **Wild and Wonderful Creatures** • Using plastic animal toys, pass around and brainstorm all the information the class already know about different animals. Sort different creatures into sets according to criteria such as appearance, structure, birds, fish, amphibians, reptiles, mammals and invertebrates. **(Exploring, seeking patterns)** • Year 1 - Discuss the meaning of those groupings. Year 2 - Sort creatures into carnivores, herbivores or omnivores. • Consider the differences/similarities between what they want and what they need to survive. Discuss and draw up a list of essential items for basic survival. (**Problem solving)** • Year 1 - Understand what they need to survive and what else they might need to be comfortable and happy. Year 2 -Discuss why they need certain things for survival, including food and water. • Create show box dioramas for plastic animal toys or laminated images of wild and wonderful creatures. Year 1 – with support . Year 2 - Annotate the dioramas with researched information **(Researching and analysing secondary sources).** • Understand that animals, including humans, have offspring which grow into adults • Year 1 - Make lift the flap information poster on a wild animal. Year 2 - Make lift the flap information books on a wild animal.		

	• Collate and discuss knowledge and information about a range of African animals **(Researching and analysing secondary sources).** Year 1 /2 Make a micro-safari in a tuff tray for a toy car, with a recorded message for the pretend drivers, announcing facts about the wild animals, including information about their offspring and basic needs.		

Best of British?	**The Best of British People and Their Pets** • Use observation skills to look closely at creatures outside. Understand that there are special places (habitats) where mini-beasts (invertebrates) live. Carefully observe creatures outside, generate questions, notice patterns, make a visual record of their observations, annotate to show understanding (Pattern seeking). • Year 1 - Make a visual record of their observations; annotate to show understanding and learning. Year 2 - Annotate drawings of their observations with scientific questions and develop lines of enquiry. • Observe and consider what type of condition a woodlouse might prefer. Set up different colonies in the classroom based on what they know about their habitats. (Exploring, Observing over time). • Year 1 -Observe the woodlice over time and record the results. Year 2 -Extend to include recording of results in different ways. • Discuss the problem: which paper will be best for the job of mopping up the puppy accident? (Fair test, problem solving). • Year 1 -Carry out an investigation to test the different types of paper. Consider what a pet needs to be healthy and happy. Year 2 - Extend to include recording of data, Make comparison between different pets' needs and requirements for health and happiness. • Understand that animals' features vary and why some animals make good pets. (Researching, analysing secondary sources). • Year 1 - Talk about and design a good pet. Year 2 – Extend by asking them to label the features. • Understand the common features that make good pets. Imagine what sort of care and environment their homemade pet might like the most, by considering its needs and features. • Year 1 -Work in groups to identify a pet's needs and write a group list of requirements to keep the pet happy. Year 2 -Draw up a list: 'Looking after my Pet',	**Forces:** • Explore pushing and pulling forces and have a go at some and create freeze frames of them. • Investigate friction by adding different materials to the surface of a ramp and see which causes most friction when a toy car travels down it. • Discuss what magnets are and explain what a magnetic field is. • Children to sort magnetic objects from non-magnetic objects. • Investigate the strength of magnets by planning an experiment to see how many paper clips can hang from a variety of magnets. • Look at how magnets attract and repel and then create a compass using a magnet. • Use the compass to complete a treasure hunt. • Design and make a magnetic game.	**Electricity** • Explore and research the major discoveries in electricity. • Draw simple circuits using electrical symbols and explain the effects of different volts in a circuit. • Create circuits and explore the brightness of a bulb or volume of a buzzer with the number and voltage of cells used in a circuit. • Plan a series of investigations to answer questions e.g. relationship between wire length and brightness of bulbs or loudness of buzzers. • Record and present findings including conclusions and degree of trust in results. **Forces** • Research Isaac Newton and his theory of gravity and the difference between weight and mass. • Measure the weight of objects using newton meters. Explore and identify the effects of air resistance. • Design parachutes and experiment to see which one is best to slow an object down. • Identify the effects of water resistance by creating and racing streamlined boats. • Explore and research friction then try out different materials as brake pads to see which slows the scooter wheel the quickest. • Design a simple mechanism allowing a smaller force to have a greater effect. Use levers, pulleys or gears.

	talk about their pet, demonstrate their understanding of what makes an animal happy and healthy. Observe different pets in the classroom. Study their similarities, differences and features they have in common that make them good pets (Exploring) Year 1- Record observations in photographs to talk about. Year 2 Record observations in annotated photographs and create a small group presentation to deliver to the class. **The Gunpowder Plot** **Weather Art** • Talk about the four seasons and what weather is associated with each. Make a seasons collage**. (Exploring, pattern seeking)** • Year 1 - Consider what we do to relax during winter and summer. How does it change with the weather? How can we represent these activities? Year 2 - Think about the different moods we feel with different weathers. What colours or shapes would represent those best on our collage? • Talk about what wind is like, where it might come from and how we know it is there. Discuss what we do differently when it is very windy, what we need to wear and what might blow away**. (Problem solving)** • Year 1 -Make a wind sock to measure wind direction and try them out in the playground. Year 2- Make a wind vane to measure the direction of the wind. Which is best and why? How can we test them? • Talk about what wind is like and what happens when the wind is very strong. Explore the idea of measuring the wind using the spinners. • Year 1 - Make a bottle wind spiral and spinner to explore wind strength. Year 2 -Discuss which is better for measuring wind strength and why. • Explain what a light source is and the importance of the sun. Dim the lights and investigate torches, lamps and candles. **(Exploring)** • Year 1 - Design sun catchers for the classroom. Discuss good places to hang them in the school. Year 2 Design sun catchers that will both absorb the sun and reflect it, using dark and shiny materials.		

	• Year 1 -Make a group sundial in the playground and observe what happens. Year 2 -Make smaller sundials outside and explore to see if the right time can be achieved. Talk about why they work and why they sometimes are not effective. • Talk about shadows being formed by something blocking a light source. • Make a shadow theatre. Year 1 -Explore shadows further by playing with, and sharing, theatre characters together. Year 2 -Present a demonstration, using their shadow theatre characters explaining how shadows are formed.		

World on a Plate	**Beautiful India?** **Exploring Changes** • Observe a block of ice and record Understand what happens to particles in ice and water by role-playing the movement of particles in the PE hall/playground. (Exploring, problem solving, observing over time). • Year 1 -Observe a block of ice and record the changes. Year 2 -Understand that water is a material and ice is water in a different state. Explain how the appearance of ice changes as it melts? How long will the block of ice last? What will happen if we put salt on it? • Consider why it is useful to know how to regulate the melting of ice. • Year 1 -Observe a block of ice and consider how to change its state. Year 2 Devise an investigation to melt the ice quickly or slowly and make predictions. • Create puddles in shallow containers or plastic sheets. Drawing chalk lines around the puddles, measure and observe the changes and make predictions. Discuss evaporation. (Exploring, observing over time). • Year 1 – Understand that water is a material. Year 2 Talk and write about the best ways of observing and measuring how puddles change over time • Create dances, portraying the changes in a puddle and a block of ice over time, and perform The Puddle Dance and The Ice Dance to an audience. (Pattern Seeking, problem solving). • Year 1 - Consider what makes a difference to how puddles dry up and Year 2- consider the rate at which they do. • Have a go at wax drawing and washing as a way of giving fabric waterproof properties. Make a wax resist picture using wax crayons, oil pastels and paint. Year 1 -Consider why waterproof material is sometimes used for making clothes. Year 2 -think of other reasons why a material may need to be made waterproof. • Make a batik wax piece of art by applying molten wax to a piece of cotton and dying it. Chop up old	**Plants:** • Look at pictures of flowering plants and spot the features and function. Go outside to look at spring flowers and blossom. Label diagram in their book. Plan an investigation putting seeds in different places and see how well/how they grow. • Record findings and conclude what plants needs to grow well. Carry out an investigation with white flowers left in water with food colouring in. Conclude how water is transported in plants. • Using flowers with easily visible stamens, stigma and style (lillies, tulips) dissect the flowers to see what they can find. Name the parts of the flower and their role in pollination and fertilization. • Sort living things into a range of groups and use a variety of methods. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment by generating questions (for vertebrate and invertebrates). Use lists of similarities and differences to help with this. • Look for invertebrates in the local area and place in a classification key (as above). Then create classification key for a variety of living things in the rainforest/another world location.	**Living Things and their Habitats:** • Look at reproduction in animals and then sexual and asexual reproduction in plants. • Use geranium plants to take cuttings to create another plant by growing roots in water. • Explore life cycles of mammals in different habitats. Children to make life cycle wheels. • Research the work of Jane Goodall with chimpanzees to describe the life process of reproduction in some plants and animals. Create an advert to encourage people to aid in the work to save endangered chimpanzees. • Explore the differences in the life cycles of an amphibian and an insect by exploring complete and incomplete metamorphosis. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Solve the task of classifying a list of zoo animals ready for the opening of a new zoo. • Classify living things using the Linnaean system. Explore the different type of animal and their characteristics then create a new animal which falls into one of the categories. • Complete and create some classification keys. Investigate microorganisms then plan and carry out an experiment to find out the best conditions for the growth of microorganism. • Complete a field guide based on the plantation/local environment. • Sort plants/animals and create classification keys for them.

	wax crayons and heat in moulds in the microwave/oven. Make new wax crayon in a different shape (Exploring) Year 1 - learn about what happens when a material is heated up and why it changes shape. Year 2 -Role play what happens to the particles in a material when it is heated. **Living Off the Land** **Art and Nature** • Investigate and sort materials according to where they came from. Understand that some materials are made from plants. **(Exploring)** • Year 1 - Identify common plants and trees. Year 2 - Categorise items as 'from plants' or 'not from plants'. • Consider why it is important for a plant to spread its seeds. Make a seed helicopter and try it out. Make dandelion seed each and form together to make a dandelion 'clock'**. (Seeking patterns)** • Year 1 -Collect dandelion plants and look carefully at their seeds, using a magnifying glass. Year 2 - Consider how different plants disperse seeds. • Look carefully at plants for signs of them having been eaten and discuss what has eaten them. Create large pollen sculptures out of clay and display, along with facts, in the classroom. **(Observing)** • Year 1 -Identify and sketch flowers. Year 2 -look carefully at pollen and understand more about the role it plays in the growing of plants, vegetables and fruits. • Find flowers outside in the playground and carefully examine them with a magnifying glass. Sketch and photograph them. Make a large model of a flowering plant using junk modelling materials. **Exploring, researching and analysing secondary sources** • Year 1 -Take a flower to pieces and label the parts. Year 2 -Understand the basic structure of a flower and the basic function of the main parts. • In teams, draw a close up section of a plant and piece together. **(Exploring)**		

	• Year 1 - Use magnifying glasses to observe plants and their parts. Year 2 -Talk about what they see, including facts about the stem and leaves. • Do bark and leaf rubbings. Understand the basic structure of a tree and what goes on inside. Represent the inside of a tree through playground art, using cloths, chalk and found materials. **(Exploring)** Year 1 -Explore the outdoor area, looking specifically at the trees. Year 2 - Note the variety of trees and discuss their similarities and differences in appearance. **Food Chains** • Role play the interdependence of a food chain and consider what part each plays in its survival. Explore the school grounds, looking for examples of food chains **(Exploring).** • Year 1 - Observe parts of food chains in the school grounds. Year 2 -discuss what would happen in the rest of the food chain • Explore the school grounds, looking for examples of food chains (living things eating leaves, for example). • Year 1 – Make simple local food chain. Year 2 – challenge them to create food chains found in other places. • Explore the differences between things that are living, dead, and things that have never been alive. Discuss the key features of things that are living, as opposed to dead. **(Exploring, pattern seeking)** • Year 1 Categorise specimens according to their features. Year 2 Categorise and label the specimens according to their features. • Create shoebox dioramas for plastic animal toys or laminated images of living things. Annotate the dioramas with researched information. **(Exploring, researching ,analysing secondary sources).** • Year 1 - Understand that habitats can be small and local but also very extensive. Year 2 - Consider what makes each creature perfectly		

	adapted to their habitat and imagine what would happen if living things wandered into other habitats (lion in the ocean, e.g.) . • Look at water food chains and reconstruct in tanks of water using found materials, toys and laminated images. • Year 1 /2 -Make plastic bag jelly fish and invite others to visit the classroom 'aquarium'. Place information signs around the aquarium. • Year 2 - Consider that creatures found in water are perfectly suited to their environment. • Look more closely at what happens in a food chain. Understand that the sun's energy travels through a food chain and then back into the ground. **(Researching and analysing secondary sources).** Year 1 /2 Interpret the transfer of energy in a food chain through a dance, using masks and torches Year 2 write an explanation or draw a diagram explaining how the sun's energy is transferred in their group's food chain etc. **Habitats and Homes** • Understand that allotments are habitats and that gardeners attract some mini-beasts to adopt their allotments as their habitats. **(Exploring, problem solving, researching and analysing secondary sources).** • Year 1 - Design and plan an allotment together. Year 2 -Understand that growing conditions need to be right for plants to grow and what those conditions are. • Observe the allotment, paying close attention to the living things that can be found there. Consider why they are there. • Year 1 -Consider how to create micro-habitats to encourage these mini-beasts. Year 2 -Understand that different habitats provide for the basic needs of different kinds mini-beasts and plants and that they depend on each other. Make micro-habitats to encourage certain mini-beasts. Create the right conditions to attract those specific living things.		

	• Visit a farm or have a farmer visit the school. Understand the jobs a farmer has to do and why. Understand the role farms play in the food chain and why they are important. (**Exploring, pattern seeking).** • Year 1 -Play farms in small world play and set up a role-play farm in the classroom. Year 2 -Weed and tend to the allotment, understanding why the weeds need to be pulled out. Identify the weeds. Make flap pictures of micro-habitats and the min-beasts. • Year 1/2 in groups, design a layer of a bug hotel, incorporate specific microhabitats agreed for that group by the class. Build a bug hotel according to the group designs **(Problem solving)** •		

All the World's a Stage	**Cinderella… and other fairy tales** **Brilliant Builders: Choosing Materials** • Identify and name the materials found in the classroom, Sort the objects according to their properties. Play Material Snap in pairs. **(Sorting, classifying and identifying).** • **Year 1 -** Understand the difference between an object and the material from which it is made. Year 2 - Sort objects according to their properties, usefulness and other criteria • Think carefully about the different materials and their properties, and play games in pairs with items from the classroom. Write songs based on the properties of materials. **(Pattern seeking, problem solving)**. • Year 1 / Year 2 – Understand that objects are made of different materials and they have simple properties. • Play with magnets and explore their properties. Create games using magnets and classroom metal objects. **(Observing over time, problem solving)**. • Year 1 – Consider questions such as: does everything made of metal stick to a magnet Year 2 –Discuss the properties of metal objects and the usefulness of magnets. • Sort objects in the classroom according to these criteria: hard, soft, stretchy, stiff, bendy/floppy **(Sorting, classifying and identifying).** • **Year 1 / Year 2** Understand the properties of materials using terms such as hard/ soft / stretchy/ stiff/ bendy/ floppy • Listen to the story of three pigs who didn't choose the right materials and recreate using straw, twigs, bricks and a hairdryer **(Exploring, problem solving)**. • Year 1 – Explore and understand the properties of materials used by Little Pigs. Year 2 – Predict which material will be most successful. • Use alternative building materials to recreate the story of the three little pigs **(Exploring, problem solving)**.	**Materials:** • Compare different rocks based on their appearance. Understand the difference between natural and human-made rocks. • Group rocks according to if they are sedimentary, metamorphic or igneous. • Explore the properties of rocks. Test different rocks to see how durable they are (scratch test), how permeable they are or how dense they are (buoyancy test). • Look at a variety of fossils and discuss and record how they are formed. • Study Mary Anning and explain her contribution to paleontology. • Look at the different layers in soil and the different ways it is formed. Experiment with making their own compost. • Complete a matching rocks and soils activity. Plan an investigation to explore the permeability of different soils. • Understand the differences between solids, liquids and gases. • Explore gases in more detail in fizzy drinks and carry out an experiment to investigate and compare the weight of gas. • Look at temperatures of melting and freezing points. Carry out an investigation to see which is the best temperature for melting chocolate. • Discuss states of matter for water and carry out an investigation to see how long it takes ice cubes to melt on cling film over different temperatures of water. • Demonstrate how boiling water from a kettle turns to steam then condensation. • Devise an experiment to investigate how well tea towels dry in different temperatures and conditions. • Explore the water cycle by using a model and making a model of it.	**Evolution:** • Explore and sort acquired and inherited characteristics. Look at and match adaptive traits to different plants and animals. • Discuss the key theories of evolution and different opinions then look closely at the work of Charles Darwin and the Galapagos finches as well as Wallace. Look at Evolutionary ideas and decide if they are true or false. • Look at the evidence of fossils and explain how this could be plants or animals. • Explore human evolution and look at similarities and differences between species of ape and humans. • Look at the advantages and disadvantages of specific adaptations and the role of human intervention in the role of evolution.

	• Year 1 – Explore and use materials to recreate alternative story. Year 2 – Predict which material will be the most successful and why.		

Our DNA	**Incredible Me!** **Amazing Me!** • Share baby photos together as a class.Discuss differences between 'baby me' and 'present me', explore memories and why they are important. Make memory chains/lockets. **(Exploring)** • Year 1 -Play Memory Games to encourage understanding of the passing of time • Year 2-Observe changes over time between the baby photos and current ones • Year 1/2 - make a class wall display of Our Body Patterns, with photographs and measurements, to show their understanding and learning **(Pattern seeking)**. • Year 2-Extend the activity by looking at ways to present the data. • Talk to each other about what makes a difference to how well they can hear a whistle when it is blown. • Year 1/2 -Investigate ideas by going outside and asking and extending questions and noticing patterns **(Pattern seeking).** • Year 2-Extend the investigation by considering how to make it fair and looking at what can be changed and what should stay the same. • Discuss and draw up a list of essential items for basic survival **(Problem solving)** • Year 1 Identify differences between fruit and vegetables using our senses. • Year 2 Classify fruit and vegetables into different groups **(Sorting, classifying and identifying)**. • Year 1 Use blindfolds to explore without the sense of sight. • Year 2- Understand how the senses work together. Year 1 /2 Design a balanced lunch box on paper to serve as a reminder of how much each food group is required for a balanced lunch. By drawing on previous knowledge of healthy food, select healthy sandwiches to pack in a picnic. Record the healthy picnic in photographs and talk about learning with invited guests **(Problem solving).**	**Sound:** • Look at videos of instruments. • Conclude that vibrations cause the sound; feel vocal chords. • Put rice on drum and tuning fork in water to observe vibrations. Bang drum harder/softer and discuss what happens to rice. • Complete school sound survey. • Explore how sound travels and then what happens to vibrations as they enter the ear. • Investigate different instruments and how to make high and low pitch of a sound. Explain how they change pitch. • Explore how sounds change over distance and make a string telephone. • Carry out investigation to see which soundproofing material works best around a box with music playing inside. • Make a musical instrument. **Electricity:** • Identify common appliances that run on electricity and then classify, sort and present in books or as a poster/presentation. • Construct a simple series circuit – identify and name its basic parts: cells, wires, bulbs, switches and buzzers. • Experiment with and test different circuits and draw circuit diagrams with correct symbols. Investigate which circuits work and which don't work. Discuss why? Present findings.	**Light:** • Using search lights used during the war as a starter, discuss what the light does. • Create a model of light travelling using torches and card with a hole in. Demonstrate this using yellow wool. • Investigate angles of incidence and reflection, light travelling in straight lines and that light travels from light sources to eyes, by creating a periscope. Discuss the uses for a periscope. • Investigate refraction using cups of water and drawings on paper. • Create colour wheels and explore prisms to demonstrate that light is made up of a spectrum of colours. • Create a shadow theatre based on Topic theme. **Materials:** • Sort everyday objects according to their properties (Viking treasure). • To give reasons, based on evidence from comparative and fair tests of their thermal and electrical conductivity, for the particular uses for everyday materials (metals, plastics, woods). • Compare and group together everyday materials on the basis of their solubility by investigating dissolving. To use knowledge of solids, liquids and gases to decide how mixtures could be separated, including through filtering, sieving and evaporating. • Explore irreversible changes.

	Towers and Turrets **Brilliant Builders: Comparing Materials** • Sort objects in the classroom according to these criteria: flexible, rigid, hard, soft, stretchy, stiff**.** Use materials selected for their properties to fix a torn umbrella. • **(Sorting, classifying and identifying, problem solving).** • Year 1 -Recap on how different objects are made from different materials. Year 2 -Discuss their selection of materials for fixing the umbrella: what properties does this material have that makes it a good choice? • Investigate materials for their useful properties, considering questions e.g. how can we know that this material will not let the rain through? How can we test it? Use pipettes to simulate raindrops and test different materials **(Observing over time, problem solving)**. • Year 1 - Observe and record the results. Year 2 - Make hypotheses about why certain materials do not let water through. • Consider question: Can 'hard' materials (wood, stone) absorb water? **(Pattern seeking, testing)** • Year 1 - Consider what buildings are made of and why. Year 2 - Devise an investigation to test a variety of materials (plastics, metals, different types of wood, bricks) for their absorbent property and make predictions • Are all makes of paper as good as each other? Investigate which papers are the most absorbent **(Pattern seeking, problem solving).** • Year 1 - Make predictions about which paper would be best at mopping up a spillage of water. Year 2 - Understand the different reasons why people may need to use absorbent materials. • Investigate the absorbency of fabrics by using a dropper. • Year 1 - Investigate how to make the fabric waterproof. Year 2 - Observe and measure the number of drops and the time they stay on the cloth before being absorbed.		

	Explore texture and various properties (absorbency, flexibility) by using materials to print with paint onto squares of cloth or card.		

Plague	**Shiver Me Timbers!** **Wild and Wonderful Creatures** • Using plastic animal toys, pass around and brainstorm all the information the class already know about different animals. Sort different creatures into sets according to criteria such as appearance, structure, birds, fish, amphibians, reptiles, mammals and invertebrates. **(Exploring, seeking patterns)** • Year 1 - Discuss the meaning of those groupings. Year 2 - Sort creatures into carnivores, herbivores or omnivores. • Consider the differences/similarities between what they want and what they need to survive. Discuss and draw up a list of essential items for basic survival. (**Problem solving)** • Year 1 - Understand what they need to survive and what else they might need to be comfortable and happy. Year 2 -Discuss why they need certain things for survival, including food and water. • Create show box dioramas for plastic animal toys or laminated images of wild and wonderful creatures. Year 1 – with support . Year 2 - Annotate the dioramas with researched information **(Researching and analysing secondary sources).** • Understand that animals, including humans, have offspring which grow into adults **London's Burning** **Wild Weather** • Go outside and look at the weather, observe the temperature, wind etc Suggest how to dress a teddy or doll appropriately for different weather conditions**. (Exploring, problem solving)** • Year 1 -Look at weather forecasts and the symbols used by forecasters. Year 2 - Write phrases, using typical words used by weather forecasters, to present the weather they have observed..	**Animals Including Humans:** • Sort food packages into food groups and then find out about the different nutrients the different foods provide. • Gather information from food labels to find out the nutritional values of different foods. • Explore what is the right kind and right type of nutrition for humans. • Sort animal skeletons into groups, discussing patterns, similarities and differences. • Identify and name parts of the human digestive system. • Explain the functions of the digestive system. Explore different types of teeth in humans and their function. Compare human and animal teeth and find similarities and differences. • Plan an investigation to see what affect liquids have on chewing gum. • Record results and findings and draw conclusions. • Construct and interpret food chains identifying producers, predators and prey.	**Animals Including Humans:** • Draw a timeline to indicate stages of growth as humans develop to old age. • Look at data for babies in their first year of growth and document in line graphs and bar charts. • Explore the changes that happen during puberty and in old age. • Research the different gestation periods for animals and how life expectancy is different through time and in different countries. Analyse data and present in bar and line graphs. • Explore the heart and circulatory system – diagrams to explain the heart, blood vessels and blood. • Children to create presentations to describe the ways in which nutrients and water are transported within animals including humans. • To research the impact of diet, exercise, drugs and lifestyle on the way bodies function – to plan different scientific enquiries to explore the effects of exercise on the heart rate. • Recognise and control variables, record data and results (graphs, tables etc.) and write up conclusions.

	• Understand how the weather they have observed outside is typical (or not) of the weather for the season. Listen to Vivaldi's Four Seasons and create collage of the current season. **(Pattern seeking)** • Year 1 - Record weather observations in the classroom and discuss the changes. Year 2 Take the temperature outside in the morning and afternoon and discuss how to do this accurately. • Understand day length changes each day and varies from season to season. Look at shadows (or create them in the classroom) and look at how they change. • Year 1 -Photograph them and draw around them on the playground in pairs with chalk. Year 2 Track a shadow by observing and measuring over time and record the results. • Consider what effect rain has on us and our daily lives. Set up rainfall gauges , record rainfall and make predictions. **(Pattern seeking)** • Year 1 - Begin to look at how to record the results of the rain gauge in a clear way and use results to generate questions . Year 2 Look at how to record the results of the rain gauge in a variety of ways. • Make a wind sock to measure wind direction and a wind vane to measure the direction of the wind. Record the observations. **(Observing over time, pattern seeking)**. • Year 1 - Does the direction of the wind change from morning to afternoon? Year 2 - Observe wind direction over time; notice rainfall and wind patterns: is it always windy when it is raining? • Consider warm and cold weather and measure the temperature inside and outside the classroom. Make a thermometer box. Year 1- Understand that air temperature changes with the seasons, and that usually summer is hotter than winter. Year 2 - Begin to understand how a thermometer box works.		

Travel Through Time	**Travel and Transport** **Growing Things** • Go outside to the school garden to look at plants. **(Exploring)** • Year 1 – Identify plants, label them and sketch. Year 2 Make a map of the garden plot, identifying the plants and predicting what they will turn into when they are fully grown. • In groups, prepare tubs and plant chitted potatoes. Label the tubs and predict what will happen. • Year 1 Look at the different types of potato and talk about any similarities and differences. Year 2 - Consider what do we need to do, as a team, to encourage our potato to grow and produce lots of potatoes. • Design and set up a garden centre in the classroom. Plant a bean in a jar and seeds in a bag and keep them in the classroom garden centre **(Observing Over Time).** • Year 1 - Share what they know about what beans need to grow. Year 2 - Start a record of the bean's growth and predict the outcome. • Plant cress seeds on cotton in an eggshell or small container. • Year 1 Place one egg shell with cress in a cupboard and talk about what might happen to the cress and its growth **(Exploring over time, pattern seeking). Year 2** Start a record of the cress growth and predict how long it will take for the cress to grow long enough to eat **(Problem solving)**. • Understand that there are differences between the bean grown in the classroom and the one grown in the cupboard. **(Exploring over time, pattern seeking** Make a bean out of craft and junk materials • Year 1 - Begin to talk about the various functions of the parts of the plant and their importance. Year 2 - Begin to explain why those differences have occurred	**Light:** • Sort items into sources of light or not. Understand that dark is the absence of light. • Carry out a feely bag investigation to see if they can work out what is in the bags. • Explore reflection and how light reflects off a surface using a torch. • Understand if reflected light hit our eyes, we see the object. • Discuss how different surfaces reflect better than others and carry out an investigation to see which surface reflects the light best for designing a reflective book bag. • Look at the angles of reflection for a mirror and have a look at some mirrors. Have a go at some mirror games: following a wiggly line in a mirror and reading messages in a mirror. • Understand that light from the sun can be dangerous and design a sun hat or sunglasses. • Explore how shadows are formed and investigate the best material for curtains in a baby's bedroom. • Explore how shadows change when you alter the distance between the object and the light source.	**Earth and Space:** • Find out how it was ascertained that the Sun, Earth and Moon were spherical bodies – explore scientific evidence that has been used to support this. • Learn the order of the planets and create model solar systems. • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Examine the geocentric and heliocentric theories. • Create a presentation about a famous astronomer they have learnt about/researched. • Carry out observations of the sun to track movement throughout the day then explain night and day and the apparent movement of the sun across the sky. • Predict day and night in different part of the world. • Make models of the sun and moon to demonstrate and explain the movement of the moon.

	• Understand the differences between the cress grown in the classroom and that left in the cupboard. Boil eggs and butter sandwiches and make egg and cress sandwiches. Year 1 - Observe the cress growth and comment on their observations. Year 2 -Be able to talk about what the seed has produced and how the cress plant grew. **Food Chans** • Role play the interdependence of a food chain and consider what part each plays in its survival. Explore the school grounds, looking for examples of food chains **(Exploring).** • Year 1 - Observe parts of food chains in the school grounds. Year 2 -discuss what would happen in the rest of the food chain • Explore the school grounds, looking for examples of food chains (living things eating leaves, for example). • Year 1 – Make simple local food chain. Year 2 – challenge them to create food chains found in other places. • Explore the differences between things that are living, dead, and things that have never been alive. Discuss the key features of things that are living, as opposed to dead. **(Exploring, pattern seeking)** • Year 1 Categorise specimens according to their features. Year 2 Categorise and label the specimens according to their features. • Create shoebox dioramas for plastic animal toys or laminated images of living things. Annotate the dioramas with researched information. **(Exploring, researching ,analysing secondary sources).** • Year 1 - Understand that habitats can be small and local but also very extensive. Year 2 - Consider what makes each creature perfectly adapted to their habitat and imagine what would happen if living things wandered into other habitats (lion in the ocean, e.g.) .		

	• Look at water food chains and reconstruct in tanks of water using found materials, toys and laminated images. • Year 1 /2 -Make plastic bag jelly fish and invite others to visit the classroom 'aquarium'. Place information signs around the aquarium. • Year 2 - Consider that creatures found in water are perfectly suited to their environment. • Look more closely at what happens in a food chain. Understand that the sun's energy travels through a food chain and then back into the ground. **(Researching and analysing secondary sources).** Year 1 /2 Interpret the transfer of energy in a food chain through a dance, using masks and torches Year 2 write an explanation or draw a diagram explaining how the sun's energy is transferred in their group's food chain etc.		

Industrial Age	**Kings and Queens** **Weather Art** • Talk about the four seasons and what weather is associated with each. Make a seasons collage**. (Exploring, pattern seeking)** • Year 1 - Consider what we do to relax during winter and summer. How does it change with the weather? How can we represent these activities? Year 2 - Think about the different moods we feel with different weathers. What colours or shapes would represent those best on our collage? • Talk about what wind is like, where it might come from and how we know it is there. Discuss what we do differently when it is very windy, what we need to wear and what might blow away**. (Problem solving)** • Year 1 -Make a wind sock to measure wind direction and try them out in the playground. Year 2- Make a wind vane to measure the direction of the wind. Which is best and why? How can we test them? • Talk about what wind is like and what happens when the wind is very strong. Explore the idea of measuring the wind using the spinners. • Year 1 - Make a bottle wind spiral and spinner to explore wind strength. Year 2 -Discuss which is better for measuring wind strength and why. • Explain what a light source is and the importance of the sun. Dim the lights and investigate torches, lamps and candles. **(Exploring)** • Year 1 - Design sun catchers for the classroom. Discuss good places to hang them in the school. Year 2 Design sun catchers that will both absorb the sun and reflect it, using dark and shiny materials. • Year 1 -Make a group sundial in the playground and observe what happens. Year 2 -Make smaller sundials outside and explore to see if the right time can be achieved. Talk about why they work and why they sometimes are not effective. • Talk about shadows being formed by something blocking a light source. • Make a shadow theatre.	**Forces:** • Explore pushing and pulling forces and have a go at some and create freeze frames of them. • Investigate friction by adding different materials to the surface of a ramp and see which causes most friction when a toy car travels down it. • Discuss what magnets are and explain what a magnetic field is. • Children to sort magnetic objects from non-magnetic objects. • Investigate the strength of magnets by planning an experiment to see how many paper clips can hang from a variety of magnets. • Look at how magnets attract and repel and then create a compass using a magnet. • Use the compass to complete a treasure hunt. • Design and make a magnetic game.	**Electricity** • Explore and research the major discoveries in electricity. • Draw simple circuits using electrical symbols and explain the effects of different volts in a circuit. • Create circuits and explore the brightness of a bulb or volume of a buzzer with the number and voltage of cells used in a circuit. • Plan a series of investigations to answer questions e.g. relationship between wire length and brightness of bulbs or loudness of buzzers. • Record and present findings including conclusions and degree of trust in results. **Forces** • Research Isaac Newton and his theory of gravity and the difference between weight and mass. • Measure the weight of objects using newton meters. Explore and identify the effects of air resistance. • Design parachutes and experiment to see which one is best to slow an object down. • Identify the effects of water resistance by creating and racing streamlined boats. • Explore and research friction then try out different materials as brake pads to see which slows the scooter wheel the quickest. • Design a simple mechanism allowing a smaller force to have a greater effect. Use levers, pulleys or gears.

	Year 1 -Explore shadows further by playing with, and sharing, theatre characters together. Year 2 -Present a demonstration, using their shadow theatre characters explaining how shadows are formed. **Brilliant Builders: Choosing Materials** • Identify and name the materials found in the classroom, Sort the objects according to their properties. Play Material Snap in pairs. **(Sorting, classifying and identifying).** • **Year 1 -** Understand the difference between an object and the material from which it is made. Year 2 - Sort objects according to their properties, usefulness and other criteria • Think carefully about the different materials and their properties, and play games in pairs with items from the classroom. Write songs based on the properties of materials. **(Pattern seeking, problem solving)**. • Year 1 / Year 2 – Understand that objects are made of different materials and they have simple properties. • Play with magnets and explore their properties. Create games using magnets and classroom metal objects. **(Observing over time, problem solving)**. • Year 1 – Consider questions such as: does everything made of metal stick to a magnet Year 2 –Discuss the properties of metal objects and the usefulness of magnets. • Sort objects in the classroom according to these criteria: hard, soft, stretchy, stiff, bendy/floppy **(Sorting, classifying and identifying).** • **Year 1 / Year 2** Understand the properties of materials using terms such as hard/ soft / stretchy/ stiff/ bendy/ floppy • Listen to the story of three pigs who didn't choose the right materials and recreate using straw, twigs, bricks and a hairdryer **(Exploring, problem solving)**.		

	• Year 1 – Explore and understand the properties of materials used by Little Pigs. Year 2 – Predict which material will be most successful. • Use alternative building materials to recreate the story of the three little pigs **(Exploring, problem solving)**. • Year 1 – Explore and use materials to recreate alternative story. Year 2 – Predict which material will be the most successful and why.		

Treasure Hunters	**Toys Through Time** Exploring Changes • Observe a block of ice and record Understand what happens to particles in ice and water by role-playing the movement of particles in the PE hall/playground. (Exploring, problem solving, observing over time). • Year 1 -Observe a block of ice and record the changes. Year 2 -Understand that water is a material and ice is water in a different state. Explain how the appearance of ice changes as it melts? How long will the block of ice last? What will happen if we put salt on it? • Consider why it is useful to know how to regulate the melting of ice. • Year 1 -Observe a block of ice and consider how to change its state. Year 2 Devise an investigation to melt the ice quickly or slowly and make predictions. • Create puddles in shallow containers or plastic sheets. Drawing chalk lines around the puddles, measure and observe the changes and make predictions. Discuss evaporation. (Exploring, observing over time). • Year 1 – Understand that water is a material. Year 2 Talk and write about the best ways of observing and measuring how puddles change over time • Create dances, portraying the changes in a puddle and a block of ice over time, and perform The Puddle Dance and The Ice Dance to an audience. (Pattern Seeking, problem solving). • Year 1 - Consider what makes a difference to how puddles dry up and Year 2- consider the rate at which they do. • Have a go at wax drawing and washing as a way of giving fabric waterproof properties. Make a wax resist picture using wax crayons, oil pastels and paint. Year 1 -Consider why waterproof material is sometimes used for making clothes. Year 2 -think of other reasons why a material may need to be made waterproof. • Make a batik wax piece of art by applying molten wax to a piece of cotton and dying it. Chop up old	**Materials:** • Compare different rocks based on their appearance. Understand the difference between natural and human-made rocks. • Group rocks according to if they are sedimentary, metamorphic or igneous. • Explore the properties of rocks. Test different rocks to see how durable they are (scratch test), how permeable they are or how dense they are (buoyancy test). • Look at a variety of fossils and discuss and record how they are formed. • Study Mary Anning and explain her contribution to paleontology. • Look at the different layers in soil and the different ways it is formed. Experiment with making their own compost. • Complete a matching rocks and soils activity. Plan an investigation to explore the permeability of different soils. • Understand the differences between solids, liquids and gases. • Explore gases in more detail in fizzy drinks and carry out an experiment to investigate and compare the weight of gas. • Look at temperatures of melting and freezing points. Carry out an investigation to see which is the best temperature for melting chocolate. • Discuss states of matter for water and carry out an investigation to see how long it takes ice cubes to melt on cling film over different temperatures of water. • Demonstrate how boiling water from a kettle turns to steam then condensation. • Devise an experiment to investigate how well tea towels dry in different temperatures and conditions. • Explore the water cycle by using a model and making a model of it.	**Evolution:** • Explore and sort acquired and inherited characteristics. Look at and match adaptive traits to different plants and animals. • Discuss the key theories of evolution and different opinions then look closely at the work of Charles Darwin and the Galapagos finches as well as Wallace. Look at Evolutionary ideas and decide if they are true or false. • Look at the evidence of fossils and explain how this could be plants or animals. • Explore human evolution and look at similarities and differences between species of ape and humans. • Look at the advantages and disadvantages of specific adaptations and the role of human intervention in the role of evolution.

	wax crayons and heat in moulds in the microwave/oven. Make new wax crayon in a different shape (Exploring) Year 1 - learn about what happens when a material is heated up and why it changes shape. Year 2 -Role play what happens to the particles in a material when it is heated. **Superheroes Rule** **Habitats and Homes** • Understand that allotments are habitats and that gardeners attract some mini-beasts to adopt their allotments as their habitats. **(Exploring, problem solving, researching and analysing secondary sources).** • Year 1 - Design and plan an allotment together. Year 2 -Understand that growing conditions need to be right for plants to grow and what those conditions are. • Observe the allotment, paying close attention to the living things that can be found there. Consider why they are there. • Year 1 -Consider how to create micro-habitats to encourage these mini-beasts. Year 2 -Understand that different habitats provide for the basic needs of different kinds mini-beasts and plants and that they depend on each other. Make micro-habitats to encourage certain mini-beasts. Create the right conditions to attract those specific living things. • Visit a farm or have a farmer visit the school. Understand the jobs a farmer has to do and why. Understand the role farms play in the food chain and why they are important. (**Exploring, pattern seeking).** • Year 1 -Play farms in small world play and set up a role-play farm in the classroom. Year 2 -Weed and tend to the allotment, understanding why the weeds need to be pulled out. Identify the weeds. Make flap pictures of micro-habitats and the min-beasts.		

	• Year 1/2 in groups, design a layer of a bug hotel, incorporate specific microhabitats agreed for that group by the class. Build a bug hotel according to the group designs **(Problem solving)** • Predict what each micro-habitat will attract and annotate the photographs with these predictions**.** **(Seeking patterns)** • Year 1 - Observe over time what happens to the bug hotel. Year 2 -Evaluate their micro-habitat. Year 1 / 2 Harvest the edible foods grown in the allotments and study them carefully, photographing and sketching them. Eat the edible foods in a class snack and review their gardening skills.		

Hooray For Habitats	**Paws, Claws and Whiskers** **People and Their Pets** • Use observation skills to look closely at creatures outside. Understand that there are special places (habitats) where mini-beasts (invertebrates) live. Carefully observe creatures outside, generate questions, notice patterns, make a visual record of their observations, annotate to show understanding (Pattern seeking). • Year 1 - Make a visual record of their observations; annotate to show understanding and learning. Year 2 - Annotate drawings of their observations with scientific questions and develop lines of enquiry. • Observe and consider what type of condition a woodlouse might prefer. Set up different colonies in the classroom based on what they know about their habitats. (Exploring, Observing over time). • Year 1 -Observe the woodlice over time and record the results. Year 2 -Extend to include recording of results in different ways. • Discuss the problem: which paper will be best for the job of mopping up the puppy accident? (Fair test, problem solving). • Year 1 -Carry out an investigation to test the different types of paper. Consider what a pet needs to be healthy and happy. Year 2 - Extend to include recording of data, Make comparison between different pets' needs and requirements for health and happiness. • Understand that animals' features vary and why some animals make good pets. (Researching, analysing secondary sources). • Year 1 - Talk about and design a good pet. Year 2 – Extend by asking them to label the features. • Understand the common features that make good pets. Imagine what sort of care and environment their homemade pet might like the most, by considering its needs and features. • Year 1 -Work in groups to identify a pet's needs and write a group list of requirements to keep the pet happy. Year 2 -Draw up a list: 'Looking after my Pet',	**Plants:** • Look at pictures of flowering plants and spot the features and function. Go outside to look at spring flowers and blossom. Label diagram in their book. Plan an investigation putting seeds in different places and see how well/how they grow. • Record findings and conclude what plants needs to grow well. Carry out an investigation with white flowers left in water with food colouring in. Conclude how water is transported in plants. • Using flowers with easily visible stamens, stigma and style (lillies, tulips) dissect the flowers to see what they can find. Name the parts of the flower and their role in pollination and fertilization. • Sort living things into a range of groups and use a variety of methods. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment by generating questions (for vertebrate and invertebrates). Use lists of similarities and differences to help with this. • Look for invertebrates in the local area and place in a classification key (as above). Then create classification key for a variety of living things in the rainforest/another world location.	**Living Things and their Habitats:** • Look at reproduction in animals and then sexual and asexual reproduction in plants. • Use geranium plants to take cuttings to create another plant by growing roots in water. • Explore life cycles of mammals in different habitats. Children to make life cycle wheels. • Research the work of Jane Goodall with chimpanzees to describe the life process of reproduction in some plants and animals. Create an advert to encourage people to aid in the work to save endangered chimpanzees. • Explore the differences in the life cycles of an amphibian and an insect by exploring complete and incomplete metamorphosis. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Solve the task of classifying a list of zoo animals ready for the opening of a new zoo. • Classify living things using the Linnaean system. Explore the different type of animal and their characteristics then create a new animal which falls into one of the categories. • Complete and create some classification keys. Investigate microorganisms then plan and carry out an experiment to find out the best conditions for the growth of microorganism. • Complete a field guide based on the plantation/local environment. • Sort plants/animals and create classification keys for them.

	talk about their pet, demonstrate their understanding of what makes an animal happy and healthy. Observe different pets in the classroom. Study their similarities, differences and features they have in common that make them good pets (Exploring) Year 1- Record observations in photographs to talk about. Year 2 Record observations in annotated photographs and create a small group presentation to deliver to the class. **Jack and the Beanstalk** **Art and Nature** • Investigate and sort materials according to where they came from. Understand that some materials are made from plants. **(Exploring)** • Year 1 - Identify common plants and trees. Year 2 - Categorise items as 'from plants' or 'not from plants'. • Consider why it is important for a plant to spread its seeds. Make a seed helicopter and try it out. Make dandelion seed each and form together to make a dandelion 'clock'**. (Seeking patterns)** • Year 1 -Collect dandelion plants and look carefully at their seeds, using a magnifying glass. Year 2 - Consider how different plants disperse seeds. • Look carefully at plants for signs of them having been eaten and discuss what has eaten them. Create large pollen sculptures out of clay and display, along with facts, in the classroom. **(Observing)** • Year 1 -Identify and sketch flowers. Year 2 -look carefully at pollen and understand more about the role it plays in the growing of plants, vegetables and fruits. • Find flowers outside in the playground and carefully examine them with a magnifying glass. Sketch and photograph them. Make a large model of a flowering plant using junk modelling materials. **Exploring, researching and analysing secondary sources** • Year 1 -Take a flower to pieces and label the parts. Year 2 -Understand the basic structure of a flower and the basic function of the main parts. • In teams, draw a close up section of a plant and piece together. **(Exploring)**		

	• Year 1 - Use magnifying glasses to observe plants and their parts. Year 2 -Talk about what they see, including facts about the stem and leaves. • Do bark and leaf rubbings. Understand the basic structure of a tree and what goes on inside. Represent the inside of a tree through playground art, using cloths, chalk and found materials. **(Exploring)** Year 1 -Explore the outdoor area, looking specifically at the trees. Year 2 - Note the variety of trees and discuss their similarities and differences in appearance.		