



Beeston Primary School Science Progression Grid



Science at Beeston is about children developing a sense of enquiry and extending their knowledge and understanding of the world around them. It includes knowledge about animals and living things, materials, sound, light, magnets and forces, electricity, the solar system and so much more. We strive for our children to be curious and want to learn more about all aspects of the world and life. Science at Beeston is concerned with investigation and children using their investigations and knowledge to understand how the world is constructed. Throughout the school, the children will be developing scientific skills that will lead to their work as scientists, planning and undertaking scientific investigations.

Scientific Enquiry

At EYFS:	At Key Stage One:	At Lower Key Stage Two:	At Upper Key Stage Two:
<p>Children know about similarities and differences in relation to places, objects, materials and living things</p> <p>Children talk about the features of their own immediate environment and how environments might vary from one another</p> <p>Children describe shapes, spaces, and measures</p>	<p>E1: ask simple questions and recognise that they can be answered in different ways</p> <p>E2: observe closely, using simple equipment</p> <p>E3: perform simple tests</p> <p>E4: identify and classify</p> <p>E5: use their observations and ideas to suggest answers to questions</p> <p>E6: gather and record data to help in answering questions</p>	<p>E1: ask relevant questions and use different types of scientific enquiries to answer them</p> <p>E2: set up simple practical enquiries, comparative and fair tests</p> <p>E3: make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>E4: gather, record, classify and present data in a variety of ways to help in answering questions</p> <p>E5: record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>E6: report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>E7: use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>E8: identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>E9: use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>E1: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>E2: take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>E3: record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>E4: using test results to make predictions to set up further comparative and fair tests</p> <p>E5: report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>E6: identify scientific evidence that has been used to support or refute ideas or arguments</p>

Being a Scientist

At EYFS:	At Key Stage One:	At Lower Key Stage Two:	At Upper Key Stage Two:
<p>Children make observations of animals and plants and explain why some things occur, and talk about changes</p> <p>Children use what they have learnt about media and materials in original ways, thinking about uses and purposes</p>	<p>B1: Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.</p> <p>B2: They should be encouraged to be curious and ask questions about what they notice.</p>	<p>B1: Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them.</p> <p>B2: They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to</p>	<p>B1: Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain</p>

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	<p>B3: They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.</p> <p>B4: They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.</p>	<p>answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys.</p> <p>B3: They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them</p> <p>B4: They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.</p> <p>B5: They should learn how to use new equipment, such as data loggers, appropriately.</p> <p>B6: They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.</p> <p>B7: With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.</p> <p>B8: With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.</p> <p>B9: They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p>B10: Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.</p>	<p>which variables need to be controlled and why.</p> <p>B2: They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.</p> <p>B3: They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.</p> <p>B4: They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.</p> <p>B5: They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p> <p>B6: They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.</p>
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EYFS	Characteristics of effective learning	Early Learning Goals
Enquiry Skills	<p>Show curiosity about objects, events and people</p> <p>Questions why things happen</p> <p>Engage in open-ended activity</p> <p>Take a risk, engage in new experiences and learn by trial and error</p> <p>Find ways to solve problems / find new ways to do things / test their ideas</p> <p>Develop ideas of grouping, sequences, cause and effect</p> <p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world</p> <p>Use senses to explore the world around them</p> <p>Make links and notice patterns in their experiences</p> <p>Create simple representations of events, people and objects</p> <p>Build up vocabulary that reflects the breadth of their experience</p>	<p>Choose the resources they need for their chosen activities</p> <p>Handle equipment and tools effectively</p> <p>Answer how and why questions about their experiences</p> <p>Make observations</p> <p>Develop their own narratives and explanations by connecting ideas or events</p> <p>Explain why some things occur and talk about changes</p>
Knowledge and understanding of the world	<p>Know about the similarities and differences in relation to places, objects, materials and living things.</p> <p>They talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	

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Strand/ Topic area	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically						
Questioning and Predicting	Ask simple questions	Use observations and ideas to suggest answers to questions	Ask relevant questions Start to make predictions	Make sensible predictions Suggest possible further questions Use straightforward scientific evidence to answer questions and support their findings	Use test results to make appropriate, linked predictions and ask further questions Recognise when other sources of information (secondary sources) will help answer questions that cannot be answered through practical investigations	Make predictions for new values Use a range of sources to support own evidence and talk about how scientific ideas have developed over time Evaluate the reliability of their methods and suggest improvements Identify scientific evidence that has been used to support or refute ideas or arguments
Planning and carrying out investigations	Recognise that questions can be answered in different ways Perform simple tests	Carry out pre-planned investigations – with support	Use different types of scientific enquiries to answer questions Set up simple practical enquiries Set up simple comparative tests	Set up fair tests Identify differences, similarities or changes related to simple scientific ideas and processes	Plan different types of scientific enquiries to answer questions – including recognising and controlling variables where necessary Suggest sensible improvements to experiments	Set up further comparative and fair tests in response to results

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Taking and recording observations, measurements and results	<p>Observe closely</p> <p>Use simple equipment</p>	<p>Gather and record data to help answer questions – with support</p>	<p>Start to make systematic and careful observations</p> <p>Take accurate measurements using standard units</p> <p>Gather and record data to help answer questions</p> <p>Start to record findings using simple scientific language</p>	<p>Make systematic and careful observations</p> <p>Take accurate measurements using standard units using a range of equipment including thermometers and data loggers</p> <p>Record findings using simple scientific language – demonstrate through drawings, labelled diagrams, keys, bar charts and tables</p>	<p>Take accurate, precise measurements using appropriate equipment</p> <p>Know and explain when it is appropriate to take repeat measurements</p> <p>Gather, record, classify and present data in a variety of ways including scientific diagrams and labels, keys, graphs and tables</p>	<p>Choose the most appropriate method for recording data and results of increasing complexity</p> <p>Make a series of observations, comparisons and measurements with precision</p>
Explaining results and drawing conclusions	<p>Talk about what they have found out</p>	<p>Start to use simple scientific language in context</p> <p>Identify and classify objects as part of an investigation</p>	<p>Report back on findings verbally</p> <p>Form conclusions from findings</p> <p>Suggest improvements to investigations</p> <p>Use straightforward scientific evidence to answer questions</p>	<p>Classify and present data in a variety of ways to help in answering questions</p> <p>Report back on findings verbally and through written explanations, displays, presentations etc....</p> <p>Form sensible conclusions from findings</p>	<p>Use scientific evidence to answer questions</p> <p>Use scientific evidence to support findings</p> <p>Use results to draw conclusions</p>	<p>Present observations and data using appropriate methods</p> <p>Report and present results including conclusions, causal relationships and explanations</p> <p>Make conclusions consistent with evidence and related to scientific understanding</p>

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Strand/ Topic area	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology						
Animals	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</p>	<p>Notice that animals, including humans have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food, air)</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition and that they cannot make their own food – they get nutrition from what they eat</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>		<p>Describe the ways in which nutrients and water are transported within animals (including humans)</p>
Humans	<p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>Notice that humans have offspring which grow into adults</p> <p>Find out about and describe the basic needs for survival (food, water, air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>	<p>Identify that humans need the right types and amount of nutrition and that they cannot make their own food – they get nutrition from what they eat</p> <p>Identify that humans have skeletons and muscles for support, protection and movement</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p>	<p>Describe the changes as humans develop to old age</p>	<p>Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within humans (and other animals)</p>

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Animals and Humans Vocabulary	Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak.	Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene.	Movement, Muscles, Bones, Skull, Nutrition, nutrients, Skeletons, contract, relax, joints, carbohydrates, protein, fats, fibre, vitamins, minerals, invertebrates, vertebrates.	Digestive system, saliva, Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar.	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, life cycle, fertilisation, Reproduce, Life Expectancy.	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration, Lifestyle, Substances.
Plants	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			

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Plants Vocabulary	Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem.	Seeds, Bulbs, Water, Light, Temperature, Growth.	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower.			
Living Things and their Habitats		<p>Explore and compare the differences between things that are living, dead and things that have never been alive</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats – including microhabitats</p> <p>Describe how animals obtain their food from plants and other animals using the idea of a simple food chain – identify and name different sources of food</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life processes of reproduction in some plants and animals</p>	<p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>

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Living Things and their habitats vocabulary		Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert.		Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats.	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring.	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects.
Evolution and Inheritance						<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment and that adaptations lead to evolution</p>
Evolution vocabulary						Evolution, adaption, inherited traits, adaptive traits, natural selection, inheritance, Charles Darwin, Alfred Wallace, DNA, variation, offspring, fossil.

Strand/ Topic area	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chemistry						
Materials Including: Everyday uses of materials (Year 1& 2) and properties and changes (year 5)	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>			<p>Compare and group everyday materials based on their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism</p> <p>Know some materials dissolve in liquid to form a solution and describe how to recover a substance from solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from</p>	

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					<p>comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials and that these changes are not usually reversible eg: changes from burning or the action of acid on bicarbonate of soda.</p>	
Materials Vocabulary	Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth.	Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil.			<p>Properties, solubility, Transparency, electrical –conductor, thermal, conductor, magnets,, dissolve, solution, separate, separating reversible changes, dissolving, evaporation filtering, sieving, melting, irreversible, new material, quantitative, measurements, conductivity. Insulation, chemical.</p>	

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Rocks			<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p>			
Rocks Vocabulary			<p>Fossils, Sandstone, Granite, Marble, Rock Pumice, Crystals, Absorbent, Sedimentary, Organic matter, Grains.</p>			
States of Matter			<p>Compare and group materials together according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled: measure or research the temperature at which</p>			

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				<p>this happens in degrees C (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>		
States of Matter Vocabulary				<p>Solid, Liquid, Gas, Evaporation, Condensation, Particles, Freezing, solidify, changing state, degrees Celsius, water cycle, water vapour.</p>		

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Strand/ Topic area	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics						
Seasonal Changes	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>					
Seasonal Changes vocabulary	<p>Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark, Seasons, Weather.</p>					
Light			<p>Recognise that light is needed in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source</p>			<p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to</p>

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			<p>is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change</p>			<p>objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p>
Light Vocabulary			<p>Reflective, Reflection, Natural, Artificial.</p>			<p>Refraction, Reflection, Spectrum, Rainbow, travels, straight, reflect, light source, object, shadows, mirrors, periscope, filters.</p>
Forces and Magnets			<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p>	

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			depending on which poles are facing			
Forces and Magnets Vocabulary			Magnetic, Force, Attract, Repel, Friction, Poles, Magnetic Poles.		Gravity, air resistance, water resistance, friction, surface, force, effect, accelerate, decelerate, mechanism, pulley, gear, spring, theory of gravitation, Galileo Galilei, Isaac Newton.	
Sound				<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>		

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Sound Vocabulary				Vibration, Wave, Pitch, Tone, Percussion, Wood wind, Brass, Insulate.		
Electricity				<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit identifying and naming its basic parts including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
Electricity Vocabulary				Cells, Switches, Buzzers, Motor, Circuit, Series, Conductors, Insulators, complete circuit.		Amps, Volts, Voltage, Cell, Circuit Diagram, Symbols.

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Earth and Space					<p>Describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>Describe the movement of the moon relative to the Earth</p> <p>Describe the sun, Earth and moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>	
Earth and Space Vocabulary					<p>Earth, Sun, Moon, Orbit, Axis, Rotation, Spherical, Day, Night, Hemisphere, Season, Tilt, Phases of the Moon, star, constellation, Solar system</p> <p>Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune.</p>	