

Excellence and Enjoyment, Everyone and Everything. "God created you to be amazing" Ephesians 2:10

Year 5	Science Long Term Overview					
	Autumn 1 Forces	Autumn 2 Earth and Space	Spring 1 Forces	Spring 2 Properties and changes of materials	Summer 1 Properties and changes of materials	Summer 2 Living things and their habitats
					Animals including humans covered through RSE	
Unit of work Driving Question	Why are forces important?	What do we know about earth and space?	How do mechanisms allow a smaller force to have a greater effect?	What are the properties of different materials?		How do life cycles differ between animals?
Values	Friendship and Love		Respect and responsibility		Perseverance and Hope	
Link to NC programme of study	<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>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.</p> <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>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a 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 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 this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>		<p>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>describe the life process of reproduction in some plants and animals</p>

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<p>What we need to know Red Hill Riches</p>	<p>Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. A force is measured in a unit called Newtons. The amount of matter in an object is its mass. Gravity acts stronger when objects have more mass and are close together. Air resistance, water resistance and friction act differently between moving surfaces.</p>	<p>The Earth orbits around the sun in our solar system The Sun is a star at the centre of our solar system and that it has eight planets. All planets in our solar system orbit the sun. The Earth takes 365.25 days to orbit the sun The moon orbits the Earth and takes approximately 27 days. The sun, Earth and moon are spherical bodies. The Earth rotates on its axis every 24 hours.</p>	<p>Gears, levers and pulleys are simple machines that are used to allow a smaller force to have a greater effect. Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Everyday materials can be grouped on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Some materials will dissolve in liquid to form a solution Some substances can be recovered from a solution eg. salt. Mixtures might be separated through filtering, sieving and evaporating. Some changes result in the formation of new materials, and this kind of change is not usually reversible. Changes associated with burning and the action of acid on bicarbonate of soda are usually irreversible.</p> <p>Humans change as they develop to old age. Human bodies change as they go through puberty. Animals have different gestational periods compared to humans.</p>	<p>There are differences in the life cycles of a mammal, an amphibian, an insect and a bird. Life cycles of plants and animals differ There is a life cycle of reproduction in some plants and animals. Asexual reproduction takes place in some plants, Sexual reproduction requires male and female parts</p>	
<p>Links to prior knowledge (footprints)</p>	<p>Friction impacts the surface of a vehicle(Y3) Objects can be pushed and pulled (Y3)</p>	<ul style="list-style-type: none"> Observe changes across the four seasons. (Y1 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes) <p>Explore the natural world around them. (Reception – Earth and space)</p> <ul style="list-style-type: none"> Describe what they see, hear and feel whilst outside. (Reception – Earth and space) 	<p>Compare how things move on different surfaces. (Y3 - Forces and magnets)</p> <ul style="list-style-type: none"> Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets) Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic 	<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. (Y2 - Uses of everyday materials)</p> <ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and 	<p>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</p>	<p>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</p> <ul style="list-style-type: none"> Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)

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			<p>materials. (Y3 - Forces and magnets)</p> <ul style="list-style-type: none"> Describe magnets as having two poles. (Y3 - Forces and magnets) Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets) 	<p>identify some magnetic materials. (Y3 - Forces and magnets)</p> <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter) 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). (Y4 - States of matter) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 - States of matter) 		
Vocabulary	Force, gravity, Earth, air resistance, water resistance, friction,	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	mechanisms, simple machines, levers, pulleys, gears	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	Puberty – the vocabulary to describe sexual characteristics	life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, bulbs, cuttings
Common Misconceptions	<p>Some children may think:</p> <ul style="list-style-type: none"> the heavier the object the faster it falls, because it has more gravity acting on it <ul style="list-style-type: none"> forces always act in pairs which are equal and opposite smooth surfaces have no friction objects always travel better on smooth surfaces 	<p>Some children may think:</p> <ul style="list-style-type: none"> the Earth is flat the Sun is a planet the Sun rotates around the Earth the Sun moves across the sky during the day the Sun rises in the morning and sets in the evening the Moon appears only at night <ul style="list-style-type: none"> night is caused by the Moon getting in the way of the Sun or 	<p>Some children may think:</p> <ul style="list-style-type: none"> a moving object has a force which is pushing it forwards and it stops when the pushing force wears out a non-moving object has no forces acting on it heavy objects sink and light objects float. 	<p>Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> a baby grows in a mother's tummy a baby is "made". 	<p>Some children may think:</p> <ul style="list-style-type: none"> all plants start out as seeds all plants have flowers plants that grow from bulbs do not have seeds only birds lay eggs

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		<p>the Sun moving further away from the Earth.</p>		<p>material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed. Some children may think:</p> <ul style="list-style-type: none"> • thermal insulators keep cold in or out • thermal insulators warm things up • solids dissolved in liquids have vanished and so you cannot get them back • lit candles only melt, which is a reversible change 		
<p>Excellence Enjoyment Everyone Everything</p>	<p>Excellence-Recognise the excellence of scientists around the world who have discovered other planets within our solar system. Especially women who have contributed to science (Hidden Figures)</p> <p>Enjoyment- Enjoy exploring the night sky through an astronomy session</p> <p>Everyone-We are not the only planet in the solar system or in our universe. God created us to be amazing within our own planet and created the skies and the stars</p> <p>Everything-Know how the sun orbits our earth</p>	<p>Excellence-Recognise the significance of Sir Isaac Newton in discovering gravity</p> <p>Enjoyment-Enjoy a variety of experiments where forces are explored first hand</p> <p>Everyone-Everyone is impacted by forces and we should understand them</p> <p>Everything-Know how forces affect our earth</p>	<p>Excellence-Recognise the significance of the human body and how it changes through puberty</p> <p>Enjoyment-Enjoy opportunities to filter and separate different mixtures</p> <p>Everyone-Everyone should have access to clean water across the world</p> <p>Everything-Know how different mixtures can be separated</p>		<p>Excellence- Recognise the different reproductive systems of God's creatures</p> <p>Enjoyment-Enjoy exploring a variety of animal lifecycles</p> <p>Everyone-Each of God's creatures has a different life cycle</p> <p>Everything-Know the difference between different life cycles</p>	

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