
















## Science MTP - Living things and their habitats - Year 5

National Curriculum Objectives		Sticky Knowledge		Key Scientists	
<ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>Describe the life process of reproduction in some plants and animals.</li> </ul>		<ul style="list-style-type: none"> <li>Different animals mature at different rates and live to different ages.</li> <li>Some organisms reproduce sexually where offspring inherit information from both parents.</li> <li>Some organisms reproduce asexually by making a copy of a single parent.</li> <li>Environmental change can affect how well an organism is suited to its environment.</li> <li>Different types of organisms have different life cycles.</li> </ul>		Mary Agnes Chase <i>(Botanist)</i>  David Attenborough <i>(Broadcaster &amp; Natural Historian)</i>	
		Vocabulary			
		amphibians, animals, asexual, birds, bulb, changes, cuttings, differences, dispersal, fertilisation, gestation, habitats, insects, life cycle, life process, mammals, parent plant, plants, pollination, reproduction, root, seed, sexual, similarities, stem, tuber			
Prior Learning		Future Learning		Key Questions	
<b>In Year 4 children should:</b> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways.</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>		<b>In Year 6 children will:</b> <ul style="list-style-type: none"> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>		<ul style="list-style-type: none"> <li>Do all animal embryos look the same?</li> <li>Are all life cycles the same?</li> <li>Are there any patterns between vertebrate animals and their gestation periods?</li> <li>Do plants reproduce in the same ways as humans?</li> <li>How do plants spread their seeds?</li> </ul>	
 Which seed shape takes the longest time to fall?	 Can you create a classification key for a group of plants?	 How does a flower bud change as it opens?  How does an animal change over time (e.g. hatching chicks)?	 Is there a relationship between a mammal's size and its gestation period?	 What are the differences in the life cycles of an insect and a mammal?	<b>BIG Question</b> (assessment opportunity)  Do all plants and animals reproduce in the same way?  <span style="color: green;">@MrsF_primary</span>






## Science MTP - Animals, Including Humans - Year 5

National Curriculum Objectives		Sticky Knowledge		Key Scientists	
<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> </ul>		<ul style="list-style-type: none"> <li>Puberty is something we all go through, a process which prepares our bodies for being adults, and reproduction.</li> <li>Hormones control these changes; which can be physical and/or emotional.</li> <li>Humans reproduce sexually where offspring inherit information from both parents.</li> <li>The average length of gestation in humans is 280 days, or 40 weeks.</li> </ul>		Elizabeth Blackwell <i>(Doctor)</i>  Patrick Steptoe, Robert Edwards & Jean Purdy <i>(Obstetrician, Physiologist &amp; Embryologist)</i>	
		Vocabulary			
		adolescent, adult, animals, baby, changes, develop, embryo, foetus, gestation, growth, hormones, humans, old age, puberty, teenager, timeline, toddler			
Prior Learning		Future Learning		Key Questions	
<b>In LKS2 children should:</b> <ul style="list-style-type: none"> <li>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.</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> </ul>		<b>In Year 6 children will:</b> <ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>		<ul style="list-style-type: none"> <li>What do humans look like at each stage?</li> <li>How and why do humans change?</li> <li>What causes puberty?</li> <li>What changes do we go through during puberty?</li> <li>How do the gestation periods of other animals compare to humans?</li> </ul>	
					<b>BIG Question</b> (assessment opportunity)
How does age affect a human's reaction time?  Who grows the fastest, girls or boys?	Can you identify all the stages in the human life cycle and put it on a timeline?	How does the mass of a baby change over time?	Is there a relationship between a mammal's size and its gestation period?	What are the longest and shortest gestation periods in mammals?  Why do people get grey/white hair when they get older?	How do humans change across their lifetime?  <span style="color: green;">@MrsF_primary</span>






## Science MTP - Properties and changes of materials - Year 5

National Curriculum Objectives		Sticky Knowledge		Key Scientists	
<ul style="list-style-type: none"> <li>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.</li> <li>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li> <li>Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <li>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.</li> </ul>		<ul style="list-style-type: none"> <li>All matter (including gas) has mass.</li> <li>Sometimes mixed substances react to make a new substance. These changes are usually irreversible.</li> <li>Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible.</li> <li>Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature).</li> <li>Reversible changes can be reversed by: sieving, filtering, evaporating.</li> </ul>		Spencer Silver & Arthur Fry <i>(Chemist &amp; Inventor)</i>  Stephanie Kwolek <i>(Chemist)</i>	
		<b>Vocabulary</b>			
		acid, bicarbonate of soda, burning, chemical changes, chemists, dissolve, electrical conductivity, evaporate, everyday materials, filter, formation, gas, hardness, irreversible, liquid, magnets, melt, metal, mixtures, new materials, plastic, properties, reactions, reversible changes, rusting, separate, sieve, solid, solubility, solution, suspension, thermal conductivity, transparency, wood			
Prior Learning		Future Learning		Key Questions	
<b>In Year 4 children should:</b> <ul style="list-style-type: none"> <li>Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>		<b>In KS3 children will:</b> <ul style="list-style-type: none"> <li>The concept of a pure substance.</li> <li>Mixtures, including dissolving.</li> <li>Diffusion in terms of the particle model.</li> <li>Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography.</li> <li>The identification of pure substances.</li> </ul>		<ul style="list-style-type: none"> <li>How would we know if we have made a new material or the same material just mixed differently?</li> <li>Add baking powder to vinegar, it fizzes up. Has a new substance been made? (Yes the gas was not in the vinegar as it wasn't fizzy, so it must have been made).</li> <li>Use lemon juice as an invisible ink, heating gently makes the ink visible. Is this a new substance?</li> <li>When water is added to jelly and it is set, is it a new substance?</li> </ul>	
					<b>BIG Question</b> (assessment opportunity)
Which material rusts fastest/slowest?  How can we change how wobbly jelly is?	Can you identify and classify these reactions and changes into reversible and irreversible? Can you describe their group's similarities and differences?	How does a nail in salt water change over time?	What patterns can you notice in different reactions? How does the amount of bicarbonate of soda, washing up liquid and vinegar affect the reaction?	What are smart materials and how can they help us?	How can we change materials?  <span style="color: green;">@MrsF_primary</span>

## Science MTP - Earth and Space - Year 5

National Curriculum Objectives		Sticky Knowledge		Key Scientists	
<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</li> <li>Describe the movement of the Moon relative to the Earth.</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies.</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>		<ul style="list-style-type: none"> <li>Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance.</li> <li>Objects with larger masses exert bigger gravitational forces.</li> <li>Objects like planets, moons and stars spin.</li> <li>Smaller mass objects like planets orbit large mass objects like stars.</li> <li>Stars produce vast amounts of heat and light.</li> <li>All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.</li> </ul>		Galileo Galilei <i>(Astronomer, Physicist &amp; Engineer)</i>  Mae Jemison <i>(Astronaut)</i>	
		<b>Vocabulary</b>			
		astronomical clock, axis, celestial body, day, Earth, geocentric, heliocentric, Jupiter, Mars, Mercury, Moon, movement, Neptune, night, orbit, phases, planets, rotation, Saturn, shadow clock, solar system, spherical, star, Sun, sundial, Uranus, Venus			
Prior Learning		Future Learning		Key Questions	
In KS1 and Year 3 children should: <ul style="list-style-type: none"> <li>Understand changes in weather patterns and seasons.</li> <li>Compare how things move on different surfaces.</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>Describe magnets as having two poles.</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>		In KS3 children will: <ul style="list-style-type: none"> <li>Gravity force, weight = mass x gravitational field strength (g), on Earth <math>g=10 \text{ N/kg}</math>, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only).</li> <li>Our Sun as a star, other stars in our galaxy, other galaxies.</li> <li>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.</li> <li>The light year as a unit of astronomical distance.</li> </ul>		<ul style="list-style-type: none"> <li>How does temperature/size/day length/year length change as you get closer/further to the Sun?</li> <li>How does speed/size of a meteorite affect the size of the Moon crater formed?</li> <li>If the Moon became heavier as a result of meteorite collisions what would happen to its position relative to Earth?</li> <li>Why do we have day/night/months/years/seasons?</li> <li>Why does day length change?</li> <li>Why does shadow size change over the course of a day?</li> </ul>	
 <p>How does the number of daylight hours change in each season?</p>	 <p>How could you organise all the objects in the solar system into groups?</p>	 <p>Can you observe and identify all the phases in the cycle of the Moon?</p>	 <p>Is there a pattern between the size of a planet and the time it takes to travel around the Sun?</p>	 <p>How have our ideas about the solar system changed over time?</p>	<p><b>BIG Question</b> (assessment opportunity)</p> <p>Sun, Earth &amp; Moon: What is moving and how do we know?</p> <p>@MrsF_primary</p>

## Science MTP - Forces - Year 5

National Curriculum Objectives		Sticky Knowledge		Key Scientists	
<ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</li> <li>Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>		<ul style="list-style-type: none"> <li>Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way.</li> <li>Friction is a force against motion caused by two surfaces rubbing against each other.</li> <li>Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.</li> <li>Some objects/animals are streamlined to minimise the effects of air/water resistance.</li> </ul>		Albert Einstein <i>(Theoretical Physicist)</i>  Archimedes <i>(Mathematician, Engineer &amp; Inventor)</i>	
		Vocabulary			
		air resistance, Earth, fall, faster, force, friction, gear, gravity, greater, level, machines, mechanism, movement, object, opposing, parachute, pulley, slow down, smaller, stop, surface, theory of gravitation, unsupported, water resistance			
Prior Learning		Future Learning		Key Questions	
<b>In Year 3 children should:</b> <ul style="list-style-type: none"> <li>Compare how things move on different surfaces.</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>Observe how magnets attract and repel each other and attract some materials and not others.</li> <li>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.</li> <li>Describe magnets as having two poles.</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>		<b>In KS3 children will:</b> <ul style="list-style-type: none"> <li>Know about opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.</li> <li>Recognise that forces are needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) .</li> <li>Know that forces change depending on the direction of force and its size.</li> <li>Understand pressure in liquids including upthrust effects, floating and sinking.</li> </ul>		<ul style="list-style-type: none"> <li>What actually is a force?</li> <li>How can a force act on an object?</li> <li>How can we see/measure forces?</li> <li>How does the saltiness (salinity) of water affect the water resistance?</li> <li>How does changing the shape of a piece of plasticine affect water resistance?</li> <li>How does adding holes to a parachute affect the time it takes to fall?</li> <li>How does the amount/depth of tread affect the friction between a shoe and a surface?</li> <li>How can we use levers to lift more?</li> <li>What is the most effective way to move an object?</li> <li>How do see-saws work?</li> <li>Can you create a pulley system to lift a given load?</li> </ul>	
					<b>BIG Question</b> (assessment opportunity)
How does the angle of launch affect how far a paper rocket will go?  How does the surface area of an object affect the time it takes to sink?	Can you label and name all the forces acting on the objects in each of these situations?	How long does a pendulum swing for before it stops?	Do all objects fall through water in the same way? How does the surface area of a parachute affect the time it takes to fall?	How do submarines sink if they are full of air?	How and why do objects move?  <div style="text-align: right; color: green;">@MrsF_primary</div>