

Year 5 Science LTP	Topic	Milestones	Key learning	Key vocabulary	Common misconceptions
<b>Autumn 1</b>	Earth and space	<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>	<p>The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.</p>	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>the Earth is flat</li> <li>the Sun is a planet</li> <li>the Sun rotates around the Earth</li> <li>the Sun moves across the sky during the day</li> <li>the Sun rises in the morning and sets in the evening</li> <li>the Moon appears only at night</li> <li>night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.</li> </ul>
<b>Autumn 2</b>	Forces	<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 that 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>	<p>A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.</p> <p>Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.</p> <p>A mechanism is a device that allows a small force to be increased to a larger force.</p> <p>The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and</p>	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>the heavier the object the faster it falls, because it has more gravity acting on it</li> <li>forces always act in pairs which are equal and opposite</li> <li>smooth surfaces have no friction</li> <li>objects always travel better on smooth surfaces</li> <li>a moving object has a force which is pushing it forwards and it stops when the pushing force wears out</li> <li>a non-moving object has no forces acting on it</li> <li>heavy objects sink and light objects float.</li> </ul>

			gears are all mechanisms, also known as simple machines.		
<b>Spring 1</b>	Properties and changes of materials	<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>	<p>Materials have different uses depending on their properties and state (liquid, solid, gas).</p> <p>Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.</p> <p>Mixtures can be separated by filtering, sieving and evaporation.</p> <p>Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.</p>	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	<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 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.</p> <p>Some children may think:</p> <ul style="list-style-type: none"> <li>• thermal insulators keep cold in or out</li> <li>• thermal insulators warm things up</li> <li>• solids dissolved in liquids have vanished and so you cannot get them back</li> <li>• lit candles only melt, which is a reversible change.</li> </ul>
<b>Spring 2</b>	Properties and changes of materials continued				

<p><b>Summer 1</b></p>	<p>Living things and their habitats</p>	<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>	<p>As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</p> <p>Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.</p>	<p>life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, bulbs, cuttings</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• all plants start out as seeds</li> <li>• all plants have flowers</li> <li>• plants that grow from bulbs do not have seeds</li> <li>• only birds lay eggs.</li> </ul>
<p><b>Summer 2</b></p>	<p>Animals, including humans</p>	<ul style="list-style-type: none"> <li>• Describe the changes as humans develop to old age.</li> </ul>	<p>When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics.</p> <p>This enables the adult to reproduce. This needs to be taught alongside PSHE. The new statutory requirements for relationships and health education can be found below:</p>	<p>Puberty – the vocabulary to describe sexual characteristics</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• a baby grows in a mother's tummy</li> <li>• a baby is "made".</li> </ul>

			<ul style="list-style-type: none"><li>• statutory guidance on Physical health and mental wellbeing (primary and secondary).</li></ul> <p>Other useful guidance includes:</p> <ul style="list-style-type: none"><li>• Joint briefing on teaching about puberty in KS2 from PHSE Association and Association for Science Education</li><li>• Briefing on humans development and reproduction in the Primary Curriculum from PHSE Association and Association for Science Education.</li></ul>		
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