



Topic name	Term	Skills developed	Link to NC subject content	Prior learning	Next link in curriculum
<b>Heating &amp; Cooling</b>	Autumn	<ul style="list-style-type: none"> <li>Collect data</li> <li>Present data</li> <li>Analyse patterns</li> <li>Draw conclusions</li> <li>Construct explanations</li> </ul>	<ul style="list-style-type: none"> <li>heating and thermal equilibrium: temperature difference between 2 objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference; use of insulators</li> <li>energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change</li> <li>comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, <b>temperatures</b>, changes in positions in a field, in elastic distortions and in chemical compositions</li> <li>using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes</li> </ul>	<p><b>Links from KS2:</b></p> <p><b>Properties and changes of materials</b></p> <p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, <b>conductivity</b> (electrical and thermal), and response to magnets</p> <p><b>Links from Year 7:</b></p> <p><b>Topic 1 Energy</b></p> <ol style="list-style-type: none"> <li>thermal energy is stored in hot objects.</li> <li>The hotter the object, the more thermal energy it stores.</li> <li>Burning fuels releases energy in the form of heat.</li> <li>Energy resources needed to heat our homes and water or for cooking.</li> </ol>	<p>Y9 – Autumn: <i>Energy</i></p> <p>Links to GCSE</p> <p>Topic 1 <b>Energy</b> Year 10:</p> <p>Energy Internal Energy Energy resources</p> <p>Heating and Infrared</p>
<b>The Universe</b>	Autumn/ Spring	<ul style="list-style-type: none"> <li>understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together</li> </ul>	<ul style="list-style-type: none"> <li>gravity force, weight = mass x gravitational field strength (g), on Earth <math>g=10</math> N/kg, 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>	<p><b>Links from KS2:</b></p> <p><b>P5.1 EARTH and SPACE</b></p> <ol style="list-style-type: none"> <li>describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> </ol>	<p>Links to GCSE</p> <p>Y10 Forces and motion</p> <p>Y11 Spring - <b>Space physics</b></p>



		<p>with the importance of publishing results and peer review</p> <ul style="list-style-type: none"> <li>understand and use SI units</li> <li>use simple equations and carry out appropriate calculations</li> </ul>		<p>2. describe the movement of the Moon relative to the Earth</p> <p>3. describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>4. 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><b>Forces and Their Effects</b></p>	<p>Spring/ Summer</p>	<ul style="list-style-type: none"> <li>Collect data</li> <li>Present data</li> <li>Analyse patterns</li> <li>Draw conclusions</li> <li>Construct explanations</li> </ul>	<ul style="list-style-type: none"> <li>rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water</li> <li>force-extension linear relation; Hooke's Law as a special case</li> <li>work done and energy changes on deformation</li> <li>atmospheric pressure, decreases with increase of height as weight of air above decreases with height</li> <li>Forces</li> <li>moment as the turning effect of a force</li> <li>forces: associated with deforming objects; stretching and squashing – springs;</li> <li>pressure in liquids, increasing with depth; upthrust effects, floating and sinking</li> <li>pressure measured by ratio of force over area – acting normal to any surface</li> </ul>	<p><b>Links from KS2:</b></p> <p><b>P3.2 FORCES and MAGNETS</b></p> <ol 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> </ol> <p><b>P5.2 FORCES</b></p> <ol 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> </ol>	<p>Y9 <b>Forces and Motion</b></p> <ol style="list-style-type: none"> <li>Relative motion (trains passing each other).</li> <li>Forces associated with deforming objects.</li> <li>Moments and levers and gears in simple machines.</li> <li>Work done</li> </ol> <p><b>Links to KS4:</b></p> <p>Year 11:</p> <p>Pressure in the atmosphere</p>



				<p><b>Links from Year 7:</b></p> <p><b>Topic 2 Forces</b></p> <ol style="list-style-type: none"><li>1. forces as pushes or pulls, arising from the interaction between two objects</li><li>2. speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)</li><li>3. the representation of a journey on a distance-time graph</li><li>4. opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.</li><li>5. 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></ol>	
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<b>Waves</b>	Summer	<ul style="list-style-type: none"><li>• understand and use SI units</li><li>• use simple equations and carry out appropriate calculations</li><li>• Draw conclusions</li><li>• Construct explanations</li></ul>	<ul style="list-style-type: none"><li>• How we describe sound in Physics and how sound travels as a longitudinal wave.</li><li>• How to measure the speed of sound.</li><li>• How we can compare sounds.</li><li>• How our ears work and how to look after them.</li><li>• What is ultrasound and what is it used for?</li><li>• Sound insulation.</li><li>• Light and how fast it travels.</li><li>• Reflection and refraction of light.</li><li>• Colour, colour filters and how we see things in different colours.</li><li>• How our eyes work and what we can do to correct defects of vision such as long- and short sightedness.</li></ul>	<b>Links from KS2:</b> <b>LIGHT P3.1</b> <ol style="list-style-type: none"><li>1. recognise that they need light in order to see things and that dark is the absence of light</li><li>3. recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li></ol> <b>P4.1 SOUND</b> <ol style="list-style-type: none"><li>1. identify how sounds are made, associating some of them with something vibrating</li><li>4. find patterns between the volume of a sound and the strength of the vibrations that produced it</li><li>5. recognise that sounds get fainter as the distance from the sound source increases.</li></ol>	<b>Y9 Waves</b> <ol style="list-style-type: none"><li>1. Transverse and longitudinal waves</li><li>2. Mechanical waves</li><li>3. Seismic waves</li><li>4. Superposition of waves and interference.</li></ol> <b>Links to KS4:</b> Year 10: Electromagnetic Spectrum Year 11: Refraction of light and lenses
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