



Topic name	Term	Skills developed	Link to NC subject content and beyond	Prior learning	Next link in curriculum
8.1 Light and sound	<i>Autumn</i>	Explain observations where sound is reflected, transmitted or absorbed by different media. Explain observations of how sound travels using the idea of a longitudinal wave. Describe the amplitude and frequency of a wave from a diagram or oscilloscope picture. Use drawings of waves to describe how sound waves change with volume or pitch. Construct ray diagrams to show how light reflects off mirrors, forms images and refracts.	Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels. The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch. When a light ray meets a different medium, some of it is absorbed and some reflected. For a mirror, the angle of incidence equals the angle of reflection. The ray model can describe the formation of an image in a mirror and how objects appear different colours. Includes lessons on - • Sound vibrations • Travelling sound and vibrations • Reflecting and absorbing sound • Shadows • Reflecting light from mirrors • How we see things	Links from prior topics: This unit builds on pupils' prior learning from Light and how it travels, where they explored the basic properties of light, including how it moves in straight lines and forms shadows. It extends this knowledge by examining the nature of sound and light waves, their interactions, and how they are perceived by the human senses.	Links to future topics: This prepares pupils for the next unit, Making images, where they will apply their understanding of wave properties to explore how light is used to create images, further enhancing their grasp of the role of waves in communication and perception.
8.2 Heating and cooling	<i>Autumn / Spring</i>	Explain observations about changing temperature in terms of energy transfer. Describe how an object's temperature changes over time when heated or cooled. Explain how a method of thermal insulation works in terms of conduction, convection and radiation. Sketch diagrams to show convection currents in unfamiliar situations.	This unit explains energy transfer between objects due to temperature differences, through conduction or radiation, the role of insulators, and thermal equilibrium. It covers particle arrangements and motions in solids, liquids, and gases and Brownian motion. Includes lessons on - • Measuring and changing temperature • Mixing substances of different temperatures • Colling • Thermal conductors • Thermal insulators • Energy, substance and temperature.	This unit builds on pupils' prior learning from Solid, liquid, and gas states and changes of state, where they explored how particles behave in different states and respond to heating and cooling. It deepens their understanding by examining energy transfer, thermal equilibrium, and the role of insulators.	This prepares pupils for the GCSE unit where we look at particle explanations of density and pressure, where they will apply their knowledge of particle behaviour to explore how density and pressure are influenced by particle arrangement and movement.



8.3 Moving by force	Spring	Illustrate a journey with changing speed on a distance-time graph, and label changes in motion. Describe how the speed of an object varies when measured by observers who are not moving, or moving relative to the object.	This unit explores speed, forces, and motion, including effects on objects. It covers deriving equations, calculations, and distance-time graphs. Learn to use force arrows, identify balanced and unbalanced forces, and understand their impact on movement. Includes lessons on - • Calculating and measuring speed • Reading distance time graphs • Interpreting distance time graphs • Changing speed • Newtons first law • Streamlining • Investigation g parachutes	This unit builds on pupils' prior learning from Forces, where they explored different types of forces and how they affect motion. It deepens their understanding by examining how forces cause objects to move, stop, and change direction, using force diagrams and calculations.	This prepares pupils for the GCSE unit on forces, where they will apply their knowledge of forces to quantify motion through speed, velocity, and acceleration, enhancing their grasp of the principles governing movement.
8.4 Electric Circuits	Spring / Summer	Describe how current changes in series circuits when components are changed. Turn circuit diagrams into real series circuits, and vice versa. Describe what happens when charged objects are placed near to each other or touching. Use a sketch to describe how an object charged positively or negatively became charged up.	This unit covers electric current, potential difference, and resistance in series and circuits. It also explores charge separation, electron transfer, and electric fields. The unit focuses on interpreting data, identifying patterns, and drawing conclusions using scientific knowledge. Current is a movement of electrons and is the same everywhere in a series circuit. Current divides between loops in a parallel circuit, combines when loops meet, lights up bulbs and makes components work. Includes lessons on - • Making series circuits • Fixing faulty circuits • Measuring electric current • Measuring and changing voltage • Static electricity and charge	This unit builds on pupils' prior learning from KS2, where they explored the components and variations of electrical circuits and how changes affect circuit behaviour. It deepens their understanding by focusing on series circuits, exploring current, voltage, and resistance in a simple loop.	This prepares pupils for the next unit, Magnets and electromagnets, where they will apply their knowledge of electric circuits to understand how electricity and magnetism interact, further enhancing their understanding of electromagnetic systems.



8.5 Making images	Summer	Explain observations where coloured lights are mixed or objects are viewed in different lights. Use ray diagrams to describe how light passes through lenses and transparent materials. Describe how lenses may be used to correct vision.	This unit explores the transmission of light, including absorption, scattering, and reflection, and the use of the ray model in imaging, refraction, and lenses. It also covers energy transfer in various processes, using safe techniques, making accurate observations, and improving reliability. Includes lessons on - • Seeing in colour • The visible spectrum • Reflecting colour • Pinhole cameras • Reflected images • Refracting light • Focusing light	This unit builds on pupils' prior learning from Sound, light and vision, where they explored the properties of sound and light waves and how they interact with different materials. It deepens their understanding by examining how light is used to form images through reflection, refraction, and lenses.	This prepares pupils for the next unit, Waves, where they will apply their knowledge of wave properties to explore the broader concepts of wave behaviour, including superposition and wave interactions, reinforcing their understanding of how waves function in various contexts.
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