

Science Overview - Physics

Year 8

	Term 1	Term 2	Term 3
Topic	<ul style="list-style-type: none"> <li>· Solids, liquids, and gases</li> </ul>	<ul style="list-style-type: none"> <li>· Static Electricity</li> <li>· The Earth and Space</li> <li>· Magnets</li> <li>· Electromagnets</li> </ul>	<ul style="list-style-type: none"> <li>· How light travels</li> <li>· Light reflection and refraction</li> <li>· Sound (production and transmission of sound)</li> <li>· Applications of sound and the ear</li> </ul>
Key concept	<b>Matter and materials</b>	<b>Forces and fields</b>	<b>Energy</b>
Learning Objectives	<ul style="list-style-type: none"> <li>· State that solids, liquids, and gases are states of matter with different properties such as shape, volume, density, and compressibility.</li> <li>· Recognise matter is made up of tiny particles called atoms.</li> <li>· Describe the particle arrangement in solids, liquids, and gases.</li> <li>· Describe that particles have kinetic energy and are continually moving.</li> <li>· Explain that heating a system will change the energy stored within the system and raise its temperature or produce changes of state.</li> </ul>	<ul style="list-style-type: none"> <li>· Describe that static electricity causes a non-contact force affecting the space around it.</li> <li>· State how static electricity is created and the possible dangers.</li> <li>· Describe the seasons in terms of day length and the height of the sun.</li> <li>· Calculate weight using the equation <math>W=m \times g</math>.</li> <li>· State that how the moon is held in orbit.</li> <li>· Describe weight as non-contact force due to gravity.</li> <li>· Describe the solar system and the orbits of the planets and moons.</li> <li>· State our position within the galaxy and the Milky Way.</li> <li>· State that a magnetic force is a non-contact force.</li> <li>· State that the poles of a magnet are called north and south.</li> <li>· State that the Earth has a magnetic field and how this affects a compass.</li> </ul>	<ul style="list-style-type: none"> <li>· State that light can be reflected, transmitted, or absorbed.</li> <li>· Describe light as a transverse wave. State the law of reflection.</li> <li>· Draw a ray diagram to show how an image is formed.</li> <li>· State the effect of light travels at different speeds in different materials.</li> <li>· Describe how an inverted image is formed.</li> <li>· State that eyes and cameras use convex lens.</li> <li>· Define frequency and amplitude.</li> <li>· Describe how sound moves through solids, liquids, and gases.</li> <li>· Use quantitative data to compare the speed of sound in solids, liquids, gases.</li> <li>· Recall the frequency range of the human ear (average 20,000 Hz to 20 Hz).</li> <li>· State some applications of ultrasound.</li> <li>· Describe how the ear detects sound.</li> <li>· Describe how a microphone converts energy transferred by sound into electrical signals.</li> <li>· State that different animals have different hearing ranges.</li> </ul>

		<ul style="list-style-type: none"> <li>· Describe the shape and direction of a magnetic field.</li> <li>· Explain how an electromagnet works.</li> </ul>	
Scaffolding SEND	glossaries, targeted questions, knowledge organisers, recall quizzes	glossaries, targeted questions, knowledge organisers, recall quizzes	glossaries, targeted questions, knowledge organisers, recall quizzes
Key Vocabulary	particle, atom, molecule, solid, liquid, gas, melt, freeze, boil, temperature, volume, evaporate, condense, density, compressible, incompressible, kinetic.	atom, nucleus, electron, electric field, conductor, attraction, repulsion, insulator, electrostatic force, charge, Earth, moon, model, orbit, planet, solar system, star, galaxy, gravity, sun, weight, milky way, Mercury, Venus, Mars, artificial satellite, natural satellite, gravitational field, gravitational field strength, andromeda, light year, magnet, pole, north compass, south compass, magnetic material, attract, force field, magnetic field	transparent, opaque, translucent, beam, diffuse, specular, filter, absorption, transmission, reflection, incident ray, reflected ray, real magnification, lens, beam, inverted, virtual, converge, diverge, angle of incidence, angle of reflection, normal, refraction, focal point, ultrasound, vibration, pitch, frequency, velocity, amplitude, hertz, infrasound
Formative Assessment	Rewind grids	Rewind grids	Rewind grids
Summative Assessment	End of topic test	End of topic test	End of topic test
Careers	aeronautical engineer, forensic scientist, geoscientist, lab technician, volcanologist	aeronautical engineer, lab technician, robotist, telecoms technician, weather forecaster, geoscientist	optician, telecoms technician, lab technician, neuroscientist
Links	<p>To build on observations of changes in state.</p> <p>To prepare for quantitative approach to gases.</p>	<p>To build on basic electric circuits and the idea of magnetic forces. In addition, the solar system.</p> <p>To prepare for electromagnetism, magnetism and electrostatic phenomena. In addition to prepare for astronomy.</p>	<p>To build on light travelling in straight lines and sound being vibrations.</p> <p>To prepare for the electromagnetic spectrum.</p>