

MOOR PARK HIGH SCHOOL: CURRICULUM

Long Term Planning

Year 9

Curriculum Area: Physics

Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Syllabus	AQA Physics Physics 3.1 Acceleration		AQA Physics Physics 3.2 Heating		AQA Physics Physics 3.3 Sound and Waves	AQA Physics Physics 3.4 Home Electricity
Connections to prior KS3 learning	<p>Forces have size and direction, Forces are represented on free-body force diagram, Balanced, unbalanced forces and resultant forces</p> <p>The difference between Mass and weight</p> <p>Speed = distance / time</p> <p>Describe an object's motion from a graph.</p> <p>Acceleration describes how quickly a speed is changing (speeding up or slowing down).</p> <p>The gradient of the distance-time graph is the object's speed.</p>		<p>Arrangement of particles</p> <p>movement of particles in each state</p> <p>Energy cannot be created or destroyed, only transferred between different energy stores</p> <p>Energy stores and transfers</p> <p>Energy is measured in joules (J)</p> <p>Thermal energy and Temperature</p> <p>conductors and insulators</p>		<p>Energy cannot be created or destroyed, only transferred between different energy stores</p> <p>Energy stores and transfers</p> <p>When light reaches a different medium, some light can be reflected and some is refracted.</p> <p>Light can be represented by ray diagrams.</p> <p>White light contains all the colours of the visible spectrum.</p> <p>Transparent, Translucent and opaque materials</p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Energy can be transferred from one store to another - Waves are one way of doing this.</p> <p>Speed = distance / time</p> <p>KS2 links</p> <p>recognise that vibrations from sounds travel through a medium to the ear</p>	<p>Functions of the following components: cell, battery, bulb/lamp, motor, switch, buzzer, ammeter, voltmeter.</p> <p>Current needs a complete circuit to flow.</p> <p>Potential difference is also known as voltage. It is measured in Volts (V) by a Voltmeter.</p> <p>Voltmeters are placed in parallel.</p> <p>Resistance slows current. Resistance is measured in ohms.</p> <p>Current, potential difference or resistance can be calculated using the equation $V=I \times R$</p> <p>Wave frequency is the number of waves that pass each second. The unit of frequency is hertz (Hz)."</p> <p>Potential difference is a measure of how much energy is transferred to each unit of charge which makes up the current (Coulomb).</p> <p>Current is the rate of flow of charged particles, usually electrons."</p>

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			<p>find patterns between the pitch of a sound and features of the object that produced it</p> <p>find patterns between the volume of a sound and the strength of the vibrations that produced it</p>	<p>Atoms are composed of the sub-atomic particles: proton, neutron and electron</p> <p>Atoms have a neutral charge</p> <p>Atoms turn into positive ions if they lose one or more outer electron(s).</p>
Knowledge	<p>Scalars and Vectors</p> <p>Resultant Vectors</p> <p>Resolving Vectors</p> <p>Newton's Third Law</p> <p>Newton's First Law</p> <p>Acceleration</p> <p>Acceleration Investigation</p> <p>Linear Graphs</p> <p>Velocity-Time Graphs</p> <p>Velocity-Time Graphs 2</p> <p>Acceleration Problems</p>	<p>Rearranging Equations</p> <p>Internal Energy</p> <p>Thermal Transfers</p> <p>Thermal Transfers 2</p> <p>Specific Heat Capacity</p> <p>Specific Heat Capacity Investigation</p> <p>Specific Latent Heat</p>	<p>Types of Wave</p> <p>Properties of Waves</p> <p>Derived Quantities</p> <p>Velocity of Waves</p> <p>Reflection and Refraction</p> <p>Investigating Reflection and Refraction</p> <p>Investigating Waves</p> <p>Using Waves</p>	<p>Mains Electricity</p> <p>Plugs</p> <p>Power</p> <p>Cost of Electricity</p> <p>Power in Circuits</p> <p>Power and Energy in Appliances</p> <p>Energy Resources</p> <p>The National Grid</p> <p>Static Electricity</p>
Skills	<p>Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force.</p> <p>Measure time accurately</p> <p>Measure motion, including determination of speed and rate of change of speed (acceleration/deceleration)</p>	<p>An investigation to determine the specific heat capacity of one or more materials.</p>	<p>Use models to explain transverse and longitudinal waves (e.g. slinky or mexican wave).</p> <p>Waves on a string can be used to model varying amplitude, frequency and wavelength.</p> <p>Know the difference between a scientific question and a non-scientific question</p> <p>Define and understand the term hypothesis.</p> <p>Draw ray diagrams to represent reflection and refraction</p> <p>9: Investigate the reflection of light by</p>	<p>Change the subject of an equation</p> <p>Interconvert units.</p> <p>Safe use of appropriate apparatus to measure energy changes/ transfers and associated values such as work done</p>

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			<p>different types of surface and the refraction of light by different substances.</p> <p>Making observations of waves in fluids and solids to identify the suitability of apparatus to measure speed, frequency and wavelength.</p> <p>8: make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.</p>	
Assessment	End of unit test	End of unit test	End of unit test	End of unit test
Homework	<p>GCSE past paper exam questions</p> <p>Analysis / Evaluation of investigations</p> <p>Extended answer questions</p>			
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	<p>During the course of the academic year, Year 9 students will attend the University of Central Lancashire. This visit will enable students to:</p> <p>Explore Advanced Scientific Concepts: Students will have the opportunity to engage with scientific research and technology, enhancing their understanding of key topics covered in their science curriculum.</p> <p>Hands-On Learning: Through interactive workshops and laboratory sessions, students will apply theoretical knowledge in practical settings, fostering a deeper comprehension of scientific principles.</p> <p>Inspiration and Aspiration: Exposure to a university environment and interaction with university faculty and students will inspire Year 9 pupils to consider future educational and career paths in science and related fields.</p> <p>Curriculum Integration: The visit is designed to complement and enrich the current science curriculum, providing real-world context to classroom learning and helping students see the relevance of their studies.</p> <p>This experience aims to ignite a passion for science, encourage critical thinking, and support the academic growth of our students.</p>			

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Literacy	<p>Keywords that students may find difficult:</p> <p>Force, contact, non-contact, resultant, friction, scalar, vector, speed, velocity, displacement, distance, resultant, component, action, reaction</p> <p>balanced, unbalanced, resultant, stationary, constant velocity, acceleration, deceleration, velocity, initial velocity, final velocity, force, mass, acceleration, initial velocity, final velocity, velocity, acceleration, gradient, slope, area, curve, gradient, tangent, vertical, gravity, weight, resultant, acceleration</p>	<p>Keywords that students may find difficult:</p> <p>Density, pressure, work, Internal, kinetic, potential, energy,</p> <p>temperature, Conduction, convection, radiation, insulation, thermal, Specific, capacity</p> <p>specific, latent, internal, kinetic, potential, state, temperature, boiling, melting</p>	<p>Keywords that students may find difficult:</p> <p>"energy, store, waves, reflection, refraction, longitudinal, transverse, compression, rarefaction, oscillation, wavelength, amplitude, pitch, frequency, period, "SI units, base units, derived units, prefix, velocity, Frequency, wavelength, displacement, time period, "reflection, Refraction, medium, wavelength, frequency, speed, reflection, Refraction, normal, medium, Perspex, velocity, Frequency, wavelength, ripple tank, oscillator, ultrasound, Frequency, vibrate, longitudinal, transverse</p>	<p>Keywords that students may find difficult:</p> <p>Current, Potential difference, Resistance, Component, Frequency, Potential difference, Alternating current, Live wire, Neutral wire, Earth wire, Power, Current, Potential difference, Energy transferred, Charge, Potential, difference, Power, Cable, Pylon, Transformer, National grid, Potential difference, Electron, Transfer, Static, Earthed, Potential difference, Current</p>
Numeracy	<p>Recognise the importance of scientific quantities and understand how they are determined.</p> <p>Change the subject of an equation</p> <p>Measure motion, including determination of speed and rate of change of speed (acceleration/deceleration)</p> <p>Any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored.</p> <p>Understand that $y=mx + c$ represents a linear relationship</p> <p>Determine the slope and intercept of a linear graph</p>	<p>Any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored.</p> <p>Change the subject of an equation</p>	<p>Relate derived quantities with the formulae to calculate those quantities</p> <p>Draw ray diagrams to represent reflection and refraction"</p>	<p>Change the subject of an equation</p> <p>Interconvert units.</p>

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	Plot two variables from experimental or other data.			
CIAG	<p>What workplace skills does physics develop?</p> <p>Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more.</p> <p>Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills.</p> <p>Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers.</p> <p>Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively.</p>			