Curriculum Plans: Year 13 Physics teacher B

Topic	Knowledge: By the end of the unit students will know:	Skills: What skills will students have developed by the end of this unit?	Key terms: What new key terms and vocabulary will be learnt in this unit?	Summative Assessment: How will pupils be assessed in this unit?
Further mechanics and thermal physics	**By the end of the unit, students will know: - The principles of simple harmonic motion (SHM), including defining characteristics like displacement, amplitude, period, frequency, and phase difference. - How to derive and use the equations for velocity and acceleration in SHM. - The concepts of resonance, natural frequency, and forced oscillations. - An understanding of damped oscillations and how energy dissipation affects SHM systems. - The gravitational field and potential, including calculations involving gravitational field strength and potential.**	Students will have developed the following skills by the end of the unit: - Ability to analyze SHM using experimental data, including constructing and interpreting graphs of displacement, velocity, and acceleration against time. - Proficiency in determining gravitational field strength and potential experimentally. - Ability to apply equations of SHM to solve practical problems involving pendulums and mass-spring systems. - Competence in interpreting damping effects and resonance in real-world systems, like bridges and buildings. - Skills in using data loggers and ICT tools for capturing oscillatory motion.	The new key terms and vocabulary to be learned in this unit include: - Simple Harmonic Motion (SHM), Displacement, Amplitude, Period, Frequency, Phase Difference. - Resonance, Damping, Forced Oscillations, Natural Frequency. - Gravitational Field Strength, Gravitational Potential. - Velocity and Acceleration in SHM, Damped Oscillations, Resonant Frequency.	
Nuclear physics	By the end of the unit, students will know: - The principles of alternating currents (AC), including root mean square (RMS) values and the use of oscilloscopes to measure AC	Students will have developed the following skills by the end of the unit: - Use of an oscilloscope to measure	The new key terms and vocabulary to be learned in this unit include: - Alternating Current	

Curriculum Plans: Year 13 Physics teacher B

	characteristics. - The transformer equation and the concept of transformer efficiency. - The principles behind the transmission of electrical power at high voltage and its implications for power loss in transmission lines. - Rutherford scattering and its implications for understanding the structure of the atom. - The properties and uses of alpha, beta, and gamma radiation, including their experimental identification and applications in measuring thickness or assessing safety risks.	and analyze AC waveforms, including determining RMS values and peak voltage. - Practical understanding of transformer operations, including calculations related to efficiency and power loss. - Conducting qualitative experiments to explore Rutherford scattering and radioactive decay, including verification of the inverse-square law for gamma radiation. - Investigative skills in analyzing electrical systems, including AC generation and power transmission, using practical tools like signal generators and multimeters.	(AC), Root Mean Square (RMS), Peak Voltage, Oscilloscope. - Transformer Equation, Eddy Currents, Transformer Efficiency. - Rutherford Scattering, Alpha Radiation, Beta Radiation, Gamma Radiation, Inverse-Square Law. - Power Transmission, High Voltage, Power Loss, AC Waveforms.	
Astrophysics	By the end of the unit, students will know: - The principles of nuclear decay, including the types of radiation (alpha, beta, and gamma) and their characteristics. - Half-life and its use in calculating the decay of radioactive substances. - How nuclear decay processes relate to the concept	Students will have developed the following skills by the end of the unit: - Ability to calculate half-life from experimental data and use it to make predictions about radioactive decay. - Skill in using a Geiger-Müller counter	The new key terms and vocabulary to be learned in this unit include: - Alpha Decay, Beta Decay, Gamma Radiation, Half-life. - Activity,	

Curriculum Plans: Year 13 Physics teacher B

	of activity and the units used to measure radiation (becquerels). - Nuclear fission and fusion, including energy release and its application in both power generation and natural processes such as in stars. - The concept of binding energy and how it relates to nuclear stability and mass defect.	to measure radiation levels and assess the effectiveness of shielding materials. - Applying equations for nuclear processes, such as using the equation for activity and understanding exponential decay. - Proficiency in analyzing the relationship between binding energy per nucleon and nuclear stability, including the use of graphs to interpret stability. - Understanding nuclear processes through practical experiments and simulations, enhancing comprehension of fission and fusion concepts.	Becquerel, Geiger-Müller Counter. - Nuclear Fission, Nuclear Fusion, Mass Defect, Binding Energy. - Stability Curve, Radioactive Decay, Shielding Materials, Exponential Decay.	