Year 12

Timing	Unit Title	Key Question	Knowledge		Assessing understanding
			Teacher 1	Teacher 2	
Autumn	**Measurements and Errors and Materials** **Mechanics and Waves**	**What are the definitions?** **What is the key theory?** **Can I apply the theory in order to solve problems?**	●Hooke's Law series & parallel ●Energy in a spring ●Young's modulus: stress & strain Properties, F-x graphs ●Linear equations and vectors ●Resolving vectors, slopes ●PE, KE & Conservation ●Work-Energy ●Power, efficiency ●Displacement, velocity, acceleration, scalars ●Motion graphs ●SUVAT: 1D problems ●R P 3: Determination of g ●Projectiles ●Newton's Laws: Statics and acceleration ●Terminal Velocity ●Momentum & Impulse ●Momentum & Collisions ●Moments	●Measuring instruments ●Measuring circus ●Measurements & units ●SI units and prefixes ●Uncertainty 1 ●Uncertainty 2 ● Graphs & uncertainty ●RP4: Determination of Young's Modulus ●Wave Basics: Longitudinal + Transverse waves on a string/spring ●Interference & Superposition ●Stationary Waves: On a string and in pipes ●Higher harmonics ●RP 1: Stationary waves on a string ●EM waves ●Polarisation ●Refraction ●Fibre optics ●Diffraction Single slit	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Physical processes covered. ● Interpret graphical and experimental data ● Plan and describe valid experiments ● Evaluate experimental procedures and results **Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Manipulating Mathematical Formulae **Assessment point information** Based on: ● Summer homework ● Home works during the term ● Test on Mechanics. ● Test on Waves & Measurements.

	Electricity		●Charge & Current ●Energy & Potential	●Double Slit ●Diffraction Grating ●White Light Diffraction Patterns ●RP 2: Interference Effects	
Spring	**Electricity and the structure of atoms** **Unstable Nuclei** **Particle Theory**	**What are the definitions?** **What is the key theory?** **Can I apply the theory in order to solve problems?**	●Resistance ●Ohm's Law ●Ohm's Law Practical Skills ●Combinations of Resistors (ideal meters) ●EMF & Kirchhoff's Laws ●Solving circuits ●Resistivity ●Microscopic resistance: Effect of temperature in metals ●Characteristic Curve of a filament bulb ●RP 5: Resistivity of a Wire ●Semiconductor devices Thermistor, LDR, LED, Diode ●Characteristic Curve of a Diode (LED) ●Internal Resistance ●RP 6: EMF and Internal Resistance	●The atom, specific charge and isotopes ●Strong nuclear force ●Unstable nuclei and α and β decay ●α + β decay, importance of the neutrino ●Antiparticles ●pair production and annihilation ●The four fundamental interactions ●Exchange particles + Feynman Diagrams ●Introduction to exotic particles ●Baryons, mesons and leptons ●Conservation ideas ●Strange particles, production and decay ●Properties of quarks	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Physical processes covered. ● Interpret graphical and experimental data ● Plan and describe valid experiments ● Evaluate experimental procedures and results **Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Manipulating Mathematical Formulae **Assessment point information** Based on: ● Home works during the term ● Test on Materials and Electricity to date ● Test on Particles to date.

			●Thermistor: how does Resistance change as Temperature is varied ●Cells in Series & Parallel ●Power in Circuits ●Potential Divider	●Quark combination of hadrons ●β+β- decay ●Photoelectric effect ●Threshold Frequency and photon model ●Conclusion/ explanation of the photoelectric experiment ●Einstein's equation ●Spectra ●Excitation and de-excitation of electrons	
Summer	**Electricity and Quantum Physics** **Year 2 Start of Course: Thermal Physics and**	**What are the definitions?** **What is the key theory?** **Can I apply the theory in order to solve problems?**	●Sensor circuits: potential divider + component ●Superconductivity ●Uniform Circular Motion ●Centripetal Acceleration ●Applications to Hills and Bends ●Applications to Swings ●Simple Harmonic Motion	● Further evidence of discrete energy levels ● De Broglie wavelength ● Electron diffraction ● Internal Energy and Temperature ● Specific Heat Capacity ● SHC Practical	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Physical processes covered. ● Interpret graphical and experimental data ● Plan and describe valid experiments ● Evaluate experimental procedures and results **Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Manipulating Mathematical Formulae

	Further Mechanics		●RP7: Pendulum and Mass spring system ●SHM and Circular Motion	• Specific Latent Heat • Gas laws • RP7: Pendulum and Mass spring system	**Assessment point information** Based on: • Home works during the term • Internal End of Course Exams