Year 12 Physics	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Knowledge	**Mechanics** • Equations of motion • Newton's laws **Electricity** • Current, resistance and potential difference relationships in series and parallel circuits • Resistivity **Working as a Physicist** • Base and derived units • Estimation	**Mechanics** • Conservation of linear momentum • Energy and efficiency **Electricity** • Potential divider circuits • Internal resistance • Applications of solid-state physics to electrical phenomena **Working as a Physicist** • Base and derived units • Estimation • Limitations of physical measurement	**Materials** • Density • Stokes' law • Hooke's law • Force-extension and stress-strain graphs • Elastic strain energy **Waves** • Wave basics from GCSE • Interference and stationary modes • Refraction **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation	**Particle Nature of Light** • Diffraction gratings • de Broglie relationship • Wave particle duality • Photoelectric effect • Atomic line spectra **Waves** • Lenses • Polarisation • Pulse-echo techniques and information **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation • Development of scientific ideas over time	**Further Mechanics** • Impulse • Conservation of momentum in 2D • Circular motion **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation Exam analysis and consolidation on areas of weakness	**Further Mechanics** • Circular motion **Oscillations** • Simple harmonic motion • Resonance • Damping in oscillating systems • Plastic deformation of materials **Working as a Physicist** • Synoptic treatment of knowledge in HT1-HT6 through novel situations
Numeracy in Physics	• Plotting two variables from experimental data • Calculating rates of change from linear graphs • Determining rates of change from curved graphs • Distinguishing between instantaneous and average rates of change • Use simple techniques to determine uncertainty • Using angles in regular 2D and 3D structures with force diagrams • Use sine, cosine and tangent ratios in physical problems. • Algebraic manipulation • Applying y = mx + c to experimental data	• Plotting two variables from experimental data • Calculating rates of change from linear graphs • Determining rates of change from curved graphs • Distinguishing between instantaneous and average rates of change • Use simple techniques to determine uncertainty • Using angles in regular 2D and 3D structures with force diagrams • Use sine, cosine and tangent ratios in physical problems. • Algebraic manipulation • Applying y = mx + c to experimental data	• Determining slope of linear graph • Calculating and estimating the area under a curve • Appreciating physical significance of area under graph • Use of sine • Use simple techniques to determine uncertainty	• Determining slope of linear graph • Calculating and estimating the area under a curve • Appreciating physical significance of area under graph • Use of sine • Use simple techniques to determine uncertainty • Applying y = mx + c to experimental data	• Translating between degrees and radians • Use of sine, cosine, tangent ratios • Applying y = mx + c to experimental data	• Translating between degrees and radians • Use of sine, cosine, tangent ratios • Applying y = mx + c to experimental data

Practical Skills	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings • Use methods to increase accuracy of measurements • Use stopwatch or light gates for timing. • Use calipers and micrometers for small distances, using digital or vernier scales • Use ICT such as computer modelling, or data logger with a variety of sensors to collect data, or use of software to process data.	• Use appropriate digital instruments, including electrical multimeters, to obtain a range of measurements • Correctly construct circuits from circuit diagrams using DC power supplies, cells, and a range of circuit components	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings • Use appropriate digital instruments, to obtain a range of measurements • Use calipers and micrometers for small distances, using digital or vernier scales.	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings • Use appropriate digital instruments to obtain a range of measurements • Use signal generator and oscilloscope, including volts/div and time-base • Generate and measure waves, using microphone and loudspeaker, or ripple tank, or vibration transducer, or microwave/radio wave source. • Use laser or light source to investigate characteristics of light, including interference and diffraction.	• Use ICT such as computer modelling, or data logger with a variety of sensors to collect data, or use of software to process data. • Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings • Use appropriate digital instruments to obtain a range of measurements	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings • Use appropriate digital instruments, , to obtain a range of measurements • Use methods to increase accuracy of measurements
Core Practicals	CP1: Acceleration of a free-falling object	CP2: Electrical resistivity CP3: E.m.f and internal resistance of a cell	CP4: Viscosity CP5: Young modulus	CP6: Speed of sound CP7: Factors effecting frequency of vibrating string CP8: Wavelength determination from diffraction grating	CP9: Relationship between force and change in momentum CP10: Use of ICT to analyse simple 2D collisions EXTRA: Determining the form of the pendulum equation	CP16: Determine value of unknown mass using resonant frequencies
Independent Learning Link	Mechanics (Part 1 and Part 2) Electricity	Mechanics (Part 1 and Part 2) Electricity	Waves Materials	Waves	Further mechanics	Further mechanics Oscillations

Year 13 Physics	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Knowledge	**Fields** • Gravitational fields • Electric fields • Magnetic fields • Alternating currents and potential differences **Nuclear radiation** • Review of GCSE • Fission and fusion • Equations for nuclear decay **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation • Development of scientific ideas over time	**Fields** • Gravitational fields • Electric fields • Magnetic fields • Alternating currents and potential differences **Capacitors** • Capacitors • Applications of capacitors **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation • Development of scientific ideas over time	**Thermodynamics** • Ideal gas laws • Black body radiators • Specific heat capacity and specific latent heat **Nuclear and particle physics** • Atomic structure • Particle accelerators • Standard Model **Working as a Physicist** • Base and derived units • Limitations of physical measurement • Estimation • Development of scientific ideas over time	**Space** • Estimating astronomical distances • Life cycles of stars • Redshift • Fate of the universe **Revision and exam preparation**	**Revision and exam preparation**	-
Numeracy in Physics	• Sketching relationships modelled by y = k/n and y = k/n^2 • Solve equations involving rates of change • Probability • Using log plots • Interpreting log plots	• Solve equations involving rates of change • Using log plots • Interpreting log plots • Algebraic manipulation	• Sketching relationships modelled by y = k/n^2 • Unit conversions	• Numeracy skills consolidation	• Numeracy skills consolidation	-
Practical Skills	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings. • Use appropriate digital instruments to obtain a range of measurements. • Use calipers and micrometers for small distances, using digital or vernier scales. • Use ionising radiation, including detectors.	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings. • Use appropriate digital instruments to obtain a range of measurements. • Design, construct and check circuits using DC power supplies, cells, and a range of circuit components.	• Use appropriate analogue apparatus to record a range of measurements and to interpolate between scale markings. • Use appropriate digital instruments to obtain a range of measurements. • Design, construct and check circuits using DC power supplies, cells, and a range of circuit components.	• Practical skills consolidation	• Practical skills consolidation	-
Core Practicals	CP15: Absorption of gamma radiation by lead	CP11: Capacitor charging and discharging	CP12: Calibrating a thermistor CP13: Determining the specific latent heat of a phase change CP14: Investigating pressure volume relationships			-
Independent Learning Link	Fields and capacitors Nuclear physics	Fields and capacitors Thermodynamics	Standard model Accelerators and detectors	Space IsaacPhysics		-