

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12 Physics	<p>Content delivered: Topic 1 Units and estimation Topics 3.1.1 – 3.1.4 Electric current Electrical energy transfer Current and voltage Resistivity Topics 5.1.1 - 5.1.2 Wave basics Wave types Topics 5.2.1 – 5.2.4 Wave phase and superposition Stationary waves Diffraction Wave Interference</p>	<p>Content delivered: Topics 3.1.5, 3.1.6 Conduction and resistance Semiconductors Topics 3.2.1 – 3.2.5 Series and parallel circuits Electrical circuit rules Potential dividers Emf and internal resistance Power in electric circuits Topics 5.3.1 – 5.3.5 Refraction Total internal reflection Lenses image formation polarisation</p>	<p>Content delivered: Topics 2.1.1 – 2.1.6 Velocity and acceleration Motion graphs Adding forces Moments Newton’s Laws of Motion Kinematics equations 5.4.1 – 5.4.4 Wave-particle duality The photoelectric effect Electron diffraction and interference Atomic electron energies</p>	<p>Content delivered: Topics 2.1.7 – 2.1.8 Resolving vectors Projectiles Topics 2.2.1, 2.2.2 Gravitational potential & kinetic energies Work and power Topics 4.1.1 – 4.1.4 Fluids, density and upthrust Fluid movement Drag act Terminal velocity</p>	<p>Content delivered: Topics 2.3.1, 2.3.2 Momentum Conservation of momentum Topics 4.2.1 – 4.2.3 Hooke’s Law Stress, strain and the Young Modulus Stress-strain graphs</p>	<p>Content delivered: Topics 6.1.1, 6.1.2 Energy in collisions More collisions Topics 9.1.1, 9.1.2 Heat and temperature Internal energy</p>
<p>Key Words Level 2 Level 3</p>	<p>Topic 1: Absolute uncertainty, random uncertainty, percentage uncertainty, measurement, reading, judgement, zero error, systematic error, prefix, SI unit, base unit Topics 3.1.1 – 3.1.4: Coulomb, Ampere, Volt, Watt, Ohm, resistance, resistivity, current, potential difference, I-V plot, electron, charge, series, parallel, cross-sectional area Topics 5.1.1, 5.1.2: energy transfer, periodic, oscillation, amplitude, wavelength, frequency, period, peak, trough, equilibrium, medium, transverse, longitudinal, compression, rarefaction Topic 5.2.1 – 5.2.4: interference, superposition, destructive interference, constructive interference, super-crest, phase, phase change, stationary wave, standing wave, first harmonic, second harmonic, third harmonic, Young’s slits, diffraction grating</p>	<p>Topics 3.1.5, 3.1.6: Electric field, EMF, drift velocity, volume, electron density, transport equation, semiconductor, valence band, impurity, conduction band, ion, ‘hole’, diode, LDR, thermistor, temperature coefficient, superconductor, resistivity, critical temperature Topics 3.2.1 – 3.2.5: current, series, parallel, potential difference, EMF, resistance, Ohm, Kirchoff’s current law, Kirchoff’s voltage law, conservation of charge, Ohm’s Law, potential divider, potentiometer, electromotive force, internal resistance, load, terminal pd, lost volts, electrical work, electrical power, dissipate, efficiency, useful output Topics 5.3.1 – 5.3.4: reflection, refraction, refractive index, optical density, angle of incidence, angle of reflection, angle of refraction, Snell’s Law, normal, medium, total internal reflection, critical angle, optical fibre, endoscope, convex, concave, focus, focal point, focal length, virtual focus, image, object, virtual image, upright, inverted, diminished, real image, diverging lens, converging lens, power, diopetre, magnification, object distance, image distance, polarisation, electric field, polarising filter, unpolarised, polaroid filter</p>	<p>Topics 2.1.1 – 2.1.6: rate, speed, displacement, time, velocity, delta, scalar, vector, average speed, instantaneous speed, acceleration, initial, final, displacement-time graph, velocity-time graph, resultant vector, moment, equilibrium, principle of moments, clockwise, anticlockwise, centre of gravity, regular object, irregular object, Newton’s First Law, Newton’s Second Law, Newton’s Third Law, reaction, uniform motion, suvat equation, kinematics, acceleration of free-fall 5.4.1 – 5.4.4: Huygen’s Principle, wavelet, wavefront, secondary wavefront, photon, wave, particle, quantisation, diffraction, Millikan’s Oil Drop Experiment, wave-particle duality, photoelectric effect, photoelectron, work function, threshold frequency, stopping potential, gold-leaf electroscope, electron diffraction, de Broglie wavelength, 2-slit interference, energy level, excitation, de-excitation, ground state, ionisation energy, transition, line spectrum, intensity</p>	<p>Topics 2.1.7 – 2.1.8: resolving, horizontal component, vertical component, vector sum, perpendicular, co-planar, Pythagoras’ Theorem, parallelogram rule, free-body diagram projectile, time-of-flight Topics 2.2.1 - 2.2.2: gravitational potential energy, kinetic energy, gravitational field strength, conservation of energy, work done, transfer, dissipation, power, Joule, Watt, efficiency, kilo-, mega-, giga-, tera-, Topics 4.1.1 – 4.1.4: fluid, density, upthrust, Archimedes’ Principle, hydrometer, laminar flow, streamline, turbulent flow, Newtonian fluid, non-Newtonian fluid, friction, boundary layer, viscosity, coefficient of viscosity, drag, terminal velocity, Stoke’s Law, Stokes’ force</p>	<p>Topics 2.3.1, 2.3.2: momentum, mass, velocity, conservation of momentum, Newton’s Second Law of motion, Newton’s Third Law of motion, recoil velocity, linear, explosion Topics 4.2.1 – 4.2.3: Hooke’s Law, tension, compression, extension, limit of proportionality, elastic limit, spring constant, hysteresis, elastic strain energy, force-extension graph, force-compression graph, stress, strain, Young Modulus, stiffness, gradient, elastic region, plastic region</p>	<p>Topics 6.1.1, 6.1.2: momentum, conservation of momentum, impulse, resultant force Topics 9.1.1, 9.1.2: Temperature, heat, kinetic theory, kinetic energy, potential energy, absolute temperature, absolute zero, kelvin, Celsius, internal energy, Maxwell-Boltzmann Distribution, root-mean-square speed</p>
<p>Where previous knowledge has occurred and future development KS2 → KS3 → KS4 → KS5</p>	<p>KS2: Scientific Enquiry KS3: Energy KS4: Properties of Waves KS5:</p>	<p>KS2: Light KS3: Electricity KS4: Properties of Waves KS5:</p>	<p>KS2: Forces KS3: Speed, distance and time KS4: Particle model KS5:</p>	<p>KS2: Types of energy KS3: Energy conservation KS4: Vectors and scalars KS5:</p>	<p>KS2: Materials KS3: Speed, distance and time KS4: Forces and extension KS5:</p>	<p>KS2: States of matter KS3: Forces and motion KS4: Kinetic theory KS5:</p>
<p>Common Misconceptions</p>	<p>High electric currents involve electrons that are moving with higher velocity.</p>	<p>Magnifying glasses form a real image that can be projected onto a screen.</p>	<p>The acceleration of falling objects is not independent of mass.</p>	<p>Horizontal and vertical motion of a projectile are not independent.</p>	<p>Objects fired from a cannon do not experience the same force as the cannon itself.</p>	<p>Kinetic energy of particles and kinetic energy of a macroscopic object are linked.</p>
<p>Literacy</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>	<p>Required practical write-ups. Completion of extended writing exam questions. NHTW grids completed.</p>
<p>Numeracy</p>	<p>Rearranging and substituting into equations. Converting between units.</p>	<p>Rearranging and substituting into equations. Converting between units. Estimation of quantities. Use of</p>	<p>Rearranging and substituting into equations. Converting between units.</p>	<p>Rearranging and substituting into equations. Converting between units. Estimation of quantities Application of</p>	<p>Plotting and reading from graphs. Measurement of gradients and area under the line.</p>	

	Estimation of quantities. Reading a vernier scale.	reciprocals in rearranging the lens formula. Measurement of angles. Constructing a normal to a surface.	Estimation of quantities. Use of non-familiar units and quantities.	Pythagoras' Theorem, calculation of volume of a sphere. Scale drawing		
Homework	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes
Assessment this half-term	Mini test 5.2.1 - 4	Mini test 3.2.1 - 5 CP3, CP6	Mini test 2.1.1 - 6 CP1	Mini test 2.1.7 - 8 CP4	Mini test 4.2.1 - 3 CP5	Mock exams – 2 x paper 1
Career opportunities Employment Links	LIFE SKILLS: Reading accurate measuring equipment EMPLOYMENT: Sound engineer	LIFE SKILLS: Understanding how electrical appliances work EMPLOYMENT: Optician	LIFE SKILLS: Quantitative understanding of trajectories in ball games etc. EMPLOYMENT: Civil engineer	LIFE SKILLS: Understanding of why vehicles have a maximum speed EMPLOYMENT: Architect	LIFE SKILLS: Understanding why some things 'give' before breaking. EMPLOYMENT: Materials scientist	LIFE SKILLS: How do safety features such as seatbelts, crash helmets and airbags work? EMPLOYMENT: Vehicle safety inspector
Enrichment						CERN Trip
Practical activities/HSW	Simple pendulum & materials kit CP2 – Resistivity CP8 – Measure wavelength of CP7 – Melde's experiment (waves on string) laser light	Series and parallel circuits CP3 – Emf and internal resistance CP6 – Speed of sound	CP1 – Acceleration due to free-fall	CP4 – Viscosity of a liquid	CP5 – Young's modulus	
Employability Skills	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork
IT Skills	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes
Notes/developments /standardisation comments						