Curriculum Map

Subject: KS5 Physics

Time period	Autumn 1 (Year 12)	Spring 1 (Year 12)	Summer 1 (Year 12)	Autumn 2 (Year 13)	Spring 2 (Year 13)
Content *Declarative Knowledge – 'Know What'*	**0 Measurements, errors** - Fundamental (base) units: mass, length, time, amount of substance, temperature, electric current and their associated SI units. - Derived SI units. - Knowledge and use of the SI prefixes, values and standard form. - Students should be able to use the prefixes: T, G, M, k, c, m, μ, n, p, f. - Students should be able to convert between different units of the same quantity, eg J and eV, J and kW h. - Students should be able to identify random and systematic errors and suggest ways to reduce or remove them. - Precision, repeatability, reproducibility, resolution and accuracy. - Students should understand the link between the number of significant figures in the value of a quantity and its associated uncertainty. - Absolute, fractional and percentage uncertainties represent uncertainty in the final answer for a quantity. - Combination of absolute and percentage uncertainties. - Students should be able to combine uncertainties in cases	**1 Matter and radiation** - Can you represent a simple model of the atom, including the proton, neutron, and electron? - Can you describe charge and mass of the proton, neutron, and electron in SI units and relative units? - Can you explain the specific charge of the proton and the electron, and of nuclei and ions? - Can you define and use 'proton number Z, nucleon number A' nuclide notation? - Can you recognise and use the notation? - Can you define isotopes and use isotopic data? - Can you explain the strong nuclear force and its role in keeping the nucleus stable? - Can you describe short-range attraction up to approximately 3 fm and very-short range repulsion closer than approximately 0.5 fm? - Can you describe unstable nuclei; alpha and beta decay? - Can you use equations for alpha decay and β− decay, including the need for the neutrino? Can you explain how the existence of the neutrino was hypothesised to account for	**Ideal Gases** - Internal energy is the sum of the randomly distributed kinetic energies and potential energies of the particles in a body. - The internal energy of a system is increased when energy is transferred to it by heating or when work is done on it (and vice versa), eg a qualitative treatment of the first law of thermodynamics. - Appreciation that during a change of state the potential energies of the particle ensemble are changing but not the kinetic energies. Calculations involving transfer of energy. - For a change of temperature: Q = mc Δ where c is specific heat capacity. - Calculations including continuous flow. - For a change of state Q = ml where l is the specific latent heat. **Thermal energy transfer** - Gas laws as experimental relationships between p, V, T and the mass of the gas. - Concept of absolute zero of temperature.	**Unit 16: Circular Motion** Demonstrate knowledge, understanding and application of: - The radian - Period and frequency - Angular velocity - Net force perpendicular to the velocity of an object in a circular path - Linear (tangential) speed - Centripetal acceleration - Centripetal force **Unit 17: Oscillations** Demonstrate knowledge, understanding and application of: - Displacement, amplitude, period, frequency, angular frequency and phase difference - Angular frequency formula - Isochronous oscillators - Simple harmonic motion as −ω 2 x - PAG 10.1: an experiment to determine the period and frequency of simple harmonic oscillators - Solutions to the equation a = −ω 2 x - Velocity and maximum velocity by calculation - Graphical methods to relate the changes in	**Unit 23: Magnetic Fields** Demonstrate knowledge, understanding and application of: - Moving charges or permanent magnets as causes of magnetic fields - Magnetic field lines to map magnetic fields - Magnetic field patterns for long straight current-carrying conductors, a flat coil, and a long solenoid - Fleming's left hand rule - The force on a current carrying conductor - The magnetic flux density and the unit Tesla - PAG11.3: An experiment to find the magnetic field strength around a current carrying wire - The force on a charged particle traveling at right angles to a uniform magnetic field - Movement of charged particles in a uniform magnetic field - Movement of charged particles moving in a region occupied by both electric and magnetic fields - Velocity Selector - Magnetic flux and the unit Weber - Magnetic flux linkage

	where the measurements that give rise to the uncertainties are added, subtracted, multiplied, divided, or raised to powers. - Represent uncertainty in a data point on a graph using error bars. - Determine the uncertainties in the gradient and intercept of a straight-line graph. - Individual points on the graph may or may not have associated error bars. - Students should be able to estimate approximate values of physical quantities to the nearest order of magnitude. - Students should be able to use these estimates together with their knowledge of physics to produce further derived estimates also to the nearest order of magnitude. **6 Forces in action** - Can you describe the nature of scalars and vectors, and give examples of each? - Can you add vectors by calculation and scale drawing? - Can you resolve vectors into two components at right angles to each other, including components of forces along and perpendicular to an inclined plane? - Can you solve problems using resolved forces or a closed triangle? - Can you describe the conditions for equilibrium for two or three coplanar forces acting at a point?	conservation of energy in beta decay? - Can you explain that, for every type of particle, there is a corresponding antiparticle? - Can you compare particle and antiparticle mass, charge, and rest energy in MeV? - Can you explain that the positron, antiproton, antineutron, and antineutrino are the antiparticles of the electron, proton, neutron, and neutrino respectively? - Can you use the photon model of electromagnetic radiation and the Planck constant? - Can you explain annihilation and pair production, and the energies involved? - Can you explain the four fundamental interactions: gravity, electromagnetic, weak nuclear, and strong nuclear? - Can you describe the concept of exchange particles to explain forces between elementary particles? - Can you explain the electromagnetic force and virtual photons as the exchange particle? - Can you describe the weak interaction limited to β^- and β^+ decay, electron capture, and electron–proton collisions? - Can you describe W^+ and W^- as exchange particles? - Can you draw simple diagrams to represent reactions or interactions in terms of incoming and outgoing particles, and exchange particles?	- Ideal gas equation: $pV = nRT$ for n moles and $pV = NkT$ for N molecules. - Work done = $p\Delta V$ - Avogadro constant NA, molar gas constant R, Boltzmann constant k - Molar mass and molecular mass. **Molecular kinetic theory** - Brownian motion as evidence for existence of atoms. - Explanation of relationships between p, V and T in terms of a simple molecular model. - Students should understand that the gas laws are empirical in nature whereas the kinetic theory model arises from theory. - Assumptions leading to $pV = 1/3\ Nm\ c_{rms}^2$ including derivation of the equation and calculations. - A simple algebraic approach involving conservation of momentum is required. - Appreciation that for an ideal gas internal energy is kinetic energy of the atoms. - Use of average molecular kinetic energy equation. - Appreciation of how knowledge and understanding of the behaviour of a gas has changed over time.	displacement, velocity, and acceleration during shm - Interchange between kinetic and potential energy - Energy–displacement graphs - Effects of damping - Free and forced oscillations - Natural frequency and resonance - Amplitude-driving frequency graphs - PAG 10.3: An investigation to find spring constant from SHM **Unit 18: Gravitational Fields** Demonstrate knowledge, understanding and application of: - Gravitational fields being due to mass - Point masses - Gravitational field lines - Gravitational field strength - Gravitational fields as one of a number of forms of field - Kepler's three laws of planetary motion - Centripetal force on a planet - Equating c-p force to the gravitational force to find an expression for time period - Kepler's third law $T^2 \propto r^3$ applied to systems other than our Solar System - Geostationary orbit - Gravitational potential at a point	- Faraday's law of electromagnetic induction - Lenz's Law - Techniques and procedures used to investigate magnetic flux using search coils - Simple a.c. generator - The simple laminated iron-core transformer - PAG 11.1: An experiment to investigate transformers **Unit 24: Particle Physics** Demonstrate knowledge, understanding and application of: - The alpha-scattering experiment - Relative sizes of the atom ad the nucleus - The simple nuclear model of the atom - protons, neutrons and electrons - Proton number, nucleon number, isotopes, notation for the representation of nuclei - The strong nuclear force and its short-range nature - Radius of nuclei - Mean densities of atoms and nuclei - Particles and antiparticles: electron- positron, proton-antiproton, neutro- ati-neutron and neutrino, anti-neutrino - Relative masses and charges of particles and their corresponding antiparticles

Curriculum Map

	- Can you define equilibrium in the context of an object at rest or moving with constant velocity? - Can you define the moment of a force about a point as force × perpendicular distance from the point to the line of action of the force? - Can you define a couple as a pair of equal and opposite coplanar forces? - Can you define the moment of couple as force × perpendicular distance between the lines of action of the forces? - Can you explain the principle of moments? - Can you describe and define centre of mass? - Can you explain that the position of the centre of mass of uniform regular solid is at its centre? **7 Motion** - Can you define displacement, speed, velocity, and acceleration? - Can you calculate average and instantaneous speeds and velocities? - Can you draw a diagram to represent methods of uniform and non-uniform acceleration? - Can you explain the significance of areas of velocity–time and acceleration–time graphs, and gradients of displacement–time and velocity–time graphs for uniform and non-uniform acceleration?	- Can you explain that hadrons are subject to the strong interaction? - Can you define the two classes of hadrons: baryons (proton and neutron) and antibaryons (antiproton and antineutron)mesons (pion and kaon)? - Can you define the baryon number as a quantum number? - Can you explain conservation of baryon number? - Can you explain that the proton is the only stable baryon into which other baryons eventually decay? - Can you describe the pion as the exchange particle of the strong nuclear force? - Can you describe kaons as particles that can decay into pions? - Can you explain that leptons are subject to the weak interaction? - Can you describe leptons: electrons, muons, neutrinos (electron and muon types only), and their antiparticles? - Can you describe lepton number as a quantum number? - Can you explain conservation of lepton number for muon leptons and for electron leptons? - Can you describe the muon as a particle that decays into an electron? - Can you describe strange particles? - Can you describe strange particles as particles that are produced through the strong		- An expression for gravitational potential at a distance r - Force–distance graph for a point or spherical mass; work done - Changes in gravitational potential - Escape velocity **Unit 19: Stars** Demonstrate knowledge, understanding and application of: - The terms planet, planetary satellites, comets, solar systems, galaxie, and the Universe - The formation of a star from interstellar dust and gas in terms of gravitational collapse, fusion of hydrogen into helium, radiation and gas pressure - Evolution of low-mass stars like our Sun into a red giant and white dwarf - planetary nebula - Characteristics of a white dwarf; electron degeneracy pressure; Chandrasekhar limit - Evolution of a massive star into a red supergiant and then ether a neutron star or black hole; supernovae - Characteristics of neutron stars and black holes - Hertzsprung-Russell)(HR) diagrams as luminosity-temperature plots - Main sequence; red giants; red supergiants; white dwarfs	- Classification, examples and behaviours of hadrons and leptons - The simple quark model of hadrons in terms of up, down and strange quark and their anti-quarks - The quark model of the proton and the neutron - The charges of the up, down, strange, anti-up, anti-down and anti-strange as fractions of the elementary charge - Beta minus and Beta p[lus decay and the quark models for these decays - Quark transformation equations balanced in terms of charge - decay of particles in terms of the quark model **Unit 25: Radioactivity** Demonstrate knowledge, understanding and application of: - Radioactive decay - alpha particles, beta particles and gamma rays - nature, penetration and range of these radiations - PAG 7.2: An experiment to investigate the different properties of radiation - Nuclear decay equations for alpha, beta-minus and beta plus-decay - Balancing nuclear transformation equations - The spontaneous and random nature of decay - Activity of a source

	- Can you explain and use the equations for uniform acceleration? - Can you explain acceleration due to gravity, g? - Can you explain the independent effect of motion in horizontal and vertical directions of a uniform gravitational field? - Can you solve problems using the equations of uniform acceleration? - Can you define and explain the effects of friction? - Can you explain the effect of air resistance on the trajectory of a projectile? **8 Newtons laws** - Can you understand and apply the three laws of motion in appropriate situations? - Can you apply F = m a for situations where the mass is constant? - Can you define and explain the effects of friction? - Can you explain the effects of lift and drag forces? - Can you define and describe terminal speed? - Can you explain that air resistance increases with speed? - Can you explain the effect of air resistance on the factors that affect the maximum speed of a vehicle? **9 Forces and momentum** Can you apply the equation momentum = mass × velocity?	interaction and decay through the weak interaction (e.g., kaons)? - Can you describe strangeness (symbol s) as a quantum number to reflect the fact that strange particles are always created in pairs? - Can you explain conservation of strangeness in strong interactions? - Can you explain that strangeness can change by 0, +1, or –1 in weak interactions? - Can you explain that particle physics relies on the collaborative efforts of large teams of scientists and engineers to validate new knowledge? **2 Quarks and Leptons** - Can you describe the properties of quarks and antiquarks in terms of charge, baryon number, and strangeness? - Can you explain the combinations of quarks and antiquarks required for baryons (proton and neutron only), antibaryons (antiproton and antineutron only), and mesons (pion and kaon only)? - Can you show the decay of the neutron? - Can you explain the change of quark character in β− and β+ decay? - Can you apply the conservation laws for charge, baryon number, lepton number and strangeness to particle		- Energy levels of electrons in isolated gas atoms - The idea that energy levels have negative values - Emission spectral lines from hot gases in terms of transitions of electrons between discrete energy levels and mission of photons - different atoms have different spectral lines, which can be used to identify elements within stars - Continuous spectra, emission line spectra, and absorption line spectra - use of a transmission diffraction grating to determine the wavelength of light - The condition for maxima - PAG 5.1: An experiment to investigate diffraction gratings - Use of Wein's displacement law to estimate the peak surface temperature of a star - Luminosity of a star, Stefan;'s Law - Use of Wein's displacement law and Stefan's law to estimate the radius of a star **Unit 20: Cosmology** Demonstrate knowledge, understanding and application of: - Distances measured in astronomical units, light-years and parsecs	- Decay constant or an isotope - Simulation of radioactive decay - The half-life of an isotope - PAG 7.3: Techniques used to determine the half-life of an isotope - Graphical methods and spreadsheet modelling of equations for radioactive decay - Radioactive dating, such as carbon dating **Unit 26: Nuclear Physics** Demonstrate knowledge, understanding and application of: - Einstein's mass-energy equation - Energy released or absorbed in simple nuclear reactions - creation and annihilation of particle-antiparticle pairs - mass defect; binding energy; binding energy per nucleon - binding energy per nucleon against nucleon number curve; energy changes in reactions - binding energy of nuclear and masses of nuclei - induced nuclear fission; chain reaction - basic structure of a fission reactor; components - fuel rods, control rods and moderator - environmental impact of nuclear waste

Curriculum Map

	- Can you explain the conservation of linear momentum? - Can you apply the principle of conservation of linear momentum to problems in one dimension? - Can you explain force as the rate of change of momentum? - Can you explain that impulse = change in momentum? - Can you apply $F\Delta t = \Delta (mv)$, where F is constant? - Can you explain the significance of the area under a force–time graph? - Can you describe forces that vary with time? - Can you explain that impact force is related to contact time, and apply this to problems involving kicking a football, crumple zones and packaging? - Can you define and explain elastic and inelastic collisions, and explosions? - Can you explain momentum conservation issues in the context of ethical transport design? **10 Work energy power** - Can you explain that energy transferred, $W = F s \cos\theta$? - Can you use the formulae: - rate of doing work = rate of energy transfer, $P = \ = Fv$ - Can you explain variable forces? - Can you explain the significance of the area under a force–displacement graph? - Can you use the formula for efficiency?	interactions, given the necessary data? - Can you recognise that energy and momentum are conserved in interactions? **3 Quantum Physics** - Can you explain threshold frequency and the photon explanation of threshold frequency? - Can you explain work function ϕ and stopping potential? - Can you recognise and use the photoelectric equation: $h f = \phi + EK$ (max)? - Can you explain that EK (max) is the maximum kinetic energy of the photoelectrons? - Can you explain ionisation and excitation? - Can you describe the electron volt? - Can you convert eV into J and vice versa? - Can you use line spectra as evidence for transitions between discrete energy levels in atoms? - Can you use the formula $h f = E1 - E2$? - Can you explain why electron diffraction suggests that particles possess wave properties and the photoelectric effect suggests that electromagnetic waves have a particulate nature? - Can you calculate the de Broglie wavelength using , where mv is the momentum? - Can you explain how and why the amount of diffraction		- Stellar parallax - The equation relating the parallax in seconds of arc and the distance in parsec - The Doppler effect - Doppler shift of electromagnetic radiation - The Doppler equation for a source of electromagnetic radiation moving relative to an observer - Hubble's law for receding galaxies - Galactic redshift and the model of an expanding universe - Hubble's constant - The cosmological principle - The Big Bang theory - Experimental evidence for the Big Bang theory from microwave background radiation - The idea that the Big Bang gave rise to the expansion of space-time - Estimation of the age of the Universe - The evolution of the Universe after the Big Bang to the present - Current ideas about the composition of the Universe in terms of dark energy, dark matter and a small percentage of ordinary matter **Unit 21: Capacitance** Demonstrate knowledge, understanding and application of: - Capacitance - The unit Farad	- balancing nuclear transformation equations - nuclear fusion; fusion reactions and temperature **Unit 27: Medical Physics** Demonstrate knowledge, understanding and application of: - The basic structure of an X-Ray tube; components - heater (cathode), anode, target metal and high voltage supply - production of X-ray photons from an X-ray tube - Attenuation of X-rays - X-Ray attenuation mechanisms: simple scatter, photoelectric effect, Compton effect and pair production - X-ray imaging with contrast media - computerised axial tomography scanning - the advantages of a CAT scan over an X-ray image - Medical tracers technetium-99m and fluorine-18 - The gamma camera and its components, formation of gamma camera images - Diagnosis using the gamma camera - Positron emission tomography - Diagnosis using PET scanning - Ultrasound frequency - The piezoelectric effect - Ultrasound transducers - A-scans and B-scans

	- Can you explain the principle of conservation of energy? - Can you use the formula ΔEP = m g Δh and EK = 0.5 m v^2? - Can you explain and apply energy conservation to examples involving gravitational potential energy, kinetic energy, and work done against resistive forces? **12 Electricity** - Can you explain electric current as the rate of flow of charge? - Can you explain potential difference as work done per unit charge? - Can you use the formulae ? - Can you define resistance as ? - Can you recognise and use ohmic conductors, semiconductor diodes, and filament lamps? - Can you explain Ohm's law as a special case where I ∝ V under constant physical conditions? - Can you interpret characteristic graphs where I or V is on the horizontal axis? - Can you explain resistivity and use the equation ? - Can you describe the effect of temperature on the resistance of metal conductors and thermistors? - Can you describe application of thermistors as temperature sensors? - Can you describe and sketch how resistance varies with temperature for a metal wire and for a thermistor? - Can you describe superconductivity as a property	changes when the momentum of the particle is changed? - Can you explain that knowledge and understanding of the nature of matter changes over time? - Can you explain that changes in understanding of the nature of matter need to be evaluated through peer review and validated by the scientific community? **4 Waves** - Can you explain oscillation of particles in terms of amplitude, frequency, wavelength, speed, phase, and phase difference? - Can you explain that phase difference may be measured as angles (radians and degrees) or as fractions of a cycle? - Can you explain the nature of longitudinal and transverse waves, including sound, electromagnetic waves, and waves on a string? - Can you describe the direction of displacement of particles/fields relative to the direction of energy propagation? - Can you recall that all electromagnetic waves travel at the same speed in a vacuum? - Can you explain polarisation as evidence for the nature of transverse waves? - Can you apply your knowledge of polarisers to explain the function of Polaroid material and the alignment of aerials for transmission and reception?		- Charging and discharging of capacitors in terms of the flow of electrons - Total capacitance of capacitors in series and in parallel - PAG 9.2: An investigation of capacitors in series and parallel - p.d.-charge graphs for capacitors - Energy stored by capacitors - Discharging a capacitor through a resistor - time constant CR of a capacitor-resistor circuit - Exponential decay and the constant-ratio property of decay graphs - PAG 9.1: Investigating the charging and discharging of capacitors - Use of capacitors to store energy **Unit 22: Electric Fields** Demonstrate knowledge, understanding and application of: - Electric fields as being due to charges - Point charges - Electric field lines - The definition of electric field strength - Coulomb's law - The formula for calculating electric field strength - Similarities and differences between the gravitational field of a point mass and the electric field of a point charge	- Acoustic impedance of a medium - Reflection of ultrasound at a boundary - Impedance matching - the use of gel in ultrasound scanning - The Doppler effect in ultrasound - The speed of blood in the body

	of certain materials that have zero resistivity at/below a critical temperature which depends on the material? - Can you describe some applications of superconductors, including their use in the production of strong magnetic fields and the reduction of energy loss in transmission of electric power? - Have you carried out a practical to determine resistivity of a wire using a micrometer, ammeter, and voltmeter? **13 Circuits** - Can you carry out calculations for resistors in series and in parallel? - Can you explain and use the energy and power equations: E = I v t and - P = I V = I2 R = ? - Can you explain the relationships between currents, voltages and resistances in series and parallel circuits, including cells in series and identical cells in parallel? - Can you explain conservation of charge and conservation of energy in dc circuits? - Can you describe how the potential divider is used to supply constant or variable potential difference from a power supply? - Can you explain the use of variable resistors, thermistors, and light dependent resistors in the potential divider? - Can you use the formulae ?	- Can you define stationary waves? - Can you describe nodes and antinodes on strings? - Can you use the formula for first harmonic? - Can you describe the formation of stationary waves by two waves of the same frequency travelling in opposite directions? - Can you draw a diagram to explain the formation of stationary waves? - Can you describe stationary waves formed on a string and those produced with microwaves and sound waves? - Can you describe stationary waves on strings in terms of harmonics? - Have you carried out an investigation into how the frequency of stationary waves on a string varies with length, tension, and mass per unit length of the string? **5 Optics** - Can you define path difference and coherence? - Can you explain interference and diffraction using a laser as a source of monochromatic light? - Can you describe Young's double-slit experiment? - Can you describe the use of two coherent sources or the use of a single source with double slits to produce an interference pattern? - Can you explain fringe spacing using the equation ?		- Uniform electric field strength - Parallel-plate capacitor and permittivity - Motion of charged particles in a uniform electric field - Electric potential definition - Formula to calculate electric potential - Capacitance, C, for an isolated sphere - Force–distance graphs for point or spherical charges - Electric potential energy	

	- Can you explain terminal pd and emf? - Can you understand and perform calculations for circuits in which the internal resistance of the supply is not negligible? - Have you carried out an investigation into the emf and internal resistance of electric cells and batteries by measuring the variation of the terminal pd across the cell with the current in it? -	- Can you describe the production of an interference pattern using white light? - Can you describe safety issues associated with using lasers? - Can you describe and explain interference produced with sound and electromagnetic waves? - Can you explain how our knowledge and understanding of the nature of electromagnetic radiation has changed over time? - Have you carried out an investigation of interference effects using the Young double-slit experiment and the diffraction grating? - Can you describe the appearance of the diffraction pattern from a single slit using monochromatic and white light? - Can you describe how the width of the central diffraction maximum varies with wavelength and slit width? - Can you describe the diffraction pattern when light is shone on a plane transmission diffraction grating at normal incidence? - Can you derive $d\sin\theta = n\lambda$? - Can you suggest some applications of diffraction gratings? - Can you calculate the refractive index of a substance using ? - Can you recall that the refractive index of air is approximately 1?			

		- Can you recall and use Snell's law of refraction ($n_1 \sin \theta_1 = n_2 \sin \theta_2$) for a boundary? - Can you explain total internal reflection using ? - Can you explain fibre optics, including the function of the cladding? - Can you explain material and modal dispersion? - Can you explain the principles and consequences of pulse broadening and absorption**?** **11 Materials** - Can you calculate density? - Can you explain Hooke's law and the elastic limit? - Can you carry out calculations using $F = k\Delta L$, with k as stiffness and spring constant? - Can you define and explain tensile strain and tensile stress? - Can you define and explain elastic strain energy and breaking stress? - Can you use the formula: energy stored = $F \Delta L$ = area under force–extension graph - Can you describe plastic behaviour, fractures and brittle behaviour, and sketch force–extension graphs to show these behaviours? - Can you apply energy conservation to examples involving elastic strain energy and energy to deform? - Can you explain how spring energy is transformed to kinetic and gravitational potential energy?			

		- Can you interpret simple stress–strain curves? - Can you list and explain energy conservation issues in the context of ethical transport design? - Can you calculate the Young modulus? - Can you use stress–strain graphs to find the Young modulus? - Have you carried out a practical to determine the Young modulus by a simple method?			
Skills *Procedural Knowledge – 'Know How'*	**RPs** Develop experimental methods and techniques for analysing empirical data. Skills in planning, implementing, analysing and evaluating **Topic 7** - Investigation to find g by a free fall method **Topic 12** - Investigation to find the resistivity of a wire **Topic 13** - Investigation to find the internal resistance of a cell	**RPs** Develop experimental methods and techniques for analysing empirical data. Skills in planning, implementing, analysing and evaluating **Topic 11** - Investigation to find the Young's Modulus of a known material **Topic 4** - Investigation into factors affecting standing wave on a string **Topic 5** - Investigation to find the wavelength of a monochromatic light source		**Unit 16: Circular Motion** Describe techniques and procedures used to investigate circular motion **Unit 17: Oscillations** Techniques and procedures used to determine the period and frequency of simple harmonic oscillations **Unit 18: Gravitational Fields** **Unit 19: Stars** Techniques using a diffraction grating to establish wavelength of a monochromatic source **Unit 20: Cosmology** **Unit 21: Capacitance** Techniques for investigating capacitors in series and parallel, and charging and discharging capacitors	**Unit 23: Magnetic Fields** Techniques for investigating magnetic field strength **Unit 24: Particle Physics** **Unit 25: Radioactivity** Techniques for investigating absorption of alpha, beta and gamma **Unit 26: Nuclear Physics** **Unit 27: Medical Physics** **PAGs** Develop experimental methods and techniques for analysing empirical data. Skills in planning, implementing, analysing and evaluating

				Unit 22: Electric Fields **PAGs** Develop experimental methods and techniques for analysing empirical data. Skills in planning, implementing, analysing and evaluating	
Assessment	Year 12 Baseline Test Transition summer work End of Topic Assessments for each Unit. October End of ½ Term Test Christmas End of ½ Term Test RPs - Assessed by class teacher against list of Physics Specific skills and CPAC skills.	End of Topic Assessments for each Unit. Easter End of ½ Term Test RPs - Assessed by class teacher against list of Physics Specific skills and CPAC skills.	End of Topic Assessments for each Unit. RPs - Assessed by class teacher against list of Physics Specific skills and CPAC skills. Year 12 Threshold Exams	Year 12 Summer HBL End of Topic Assessments for each Unit. PAGs - Assessed by class teacher against list of Physics Specific skills and CPAC skills. October End of ½ Term Test	Trial Exams (January) End of Topic Assessments for each Unit. PAGs - Assessed by class teacher against list of Physics Specific skills and CPAC skills. Easter End of ½ Term Test