Curriculum Map: Physics year 12 spring

	Teacher 1	Teacher 2
Content Declarative knowledge 'I Know'	**4.4 – waves** To define compression, rarefaction, wavelength, amplitude, frequency, time period, displacement, coherent, phase difference, path difference, progressive, transverse, longitudinal, intensity, diffraction, refraction, reflection, polarisation, ionising, interference, total internal reflection, critical angle, constructive, destructive, stationary wave, node, antinode, harmonic, fundamental frequency To know the diagrams for diffraction, reflection and refraction To know the relationship between intensity and amplitude To know the components of the electromagnetic spectrum along with their wavelength values For each part of the spectrum – to list the dangers, uses and production of them To state which parts of the spectrum are ionising To give the differences between UVA, UVB and UVC radiation To know the similarities of the electromagnetic spectrum To know the difference between polarised and unpolarised light To quote Snell's law To recall the principle of superposition Give the difference between a double slit and a diffraction grating To Know the diagrams showing the different harmonics of a stationary wave	**3.3 – work energy and power** To state the Joule definition To know that work done equals energy transferred To give the forms of energy and list examples To recall the principle of conservation of energy To define power To know that efficiency is connected to wasted energy To define efficiency **3.4 – materials** To define elastic, plastic, brittle, strong, hard, ductile, malleable polymeric, limit of proportionality, elastic limit, deformation, youngs modulus, tensile, stress, strain To know the force extension graphs for brittle, ductile and polymeric materials To define hooke's law To recall what the spring constant is and the units of it To know the set up of equipment to determine the youngs modulus **3.5 – newtons laws of motion and momentum** To recall Newton's 3 laws of motion To draw force diagrams To define momentum, conservation of momentum and impulse To define elastic and inelastic collisions
Skills Procedural Knowledge 'I know how to'	**4.4 – waves** To know how to calculate the speed of a wave To determine the frequency and amplitude of a wave using an oscilloscope To calculate the intensity of a wave To describe how to measure the speed of a wave when it is undergoing diffraction To explain how x rays are produced To explain how a polasising filter works and what is happening to the light To use Malus's law to calculate the intensity of light passing through the filters To describe observations when using more than one filter and rotating them To use and apply snell's law To relate refractive index to the level of refraction To use path difference and phase difference to explain how constructive or destructive interference occurs To use the principle of superposition to calculate the results wave when 2 waves meet To describe the requirements necessary for us to have constructive and destructive interference To use the double slit equation	**3.3 – work energy and power** To use the equation for work done To use vector theory to calculate distance in relation to work done To calculate kinetic, gravitational, elastic and thermal energy To describe energy transfers between forms To calculate power using energy and work done To draw Sankey diagrams for a situation To calculate efficiency **3.4 – materials** To explain the difference between elastic and plastic and to label these points on a force extension graph To describe a force extension graph for a material To use Hooke's law to calculate force or spring constant Determine the spring constant experimentally using a graph of results To calculate work done from a force extension graph To describe the energy changes involved during plastic deformation

	To draw conclusions on how the wavelength is affected by changing difference variables To describe and explain the fringe patters using knowledge of path and phase difference again. To use the diffraction grating equation and apply it to questions To experimentally determine the wavelength of light using diffraction grating To take measurements of fringe spacing and compare results of wavelength To explain how a stationary wave if formed Describe how you get different stationary waves To use knowledge of nodes and antinodes to explain what is happening to the energy of the wave. To describe and conduct an experiment to measure the speed of sound in an open ended tube To describe an experiment to measure the speed of a wave on a string Use harmonic diagrams to calculate the wavelength of the wave To explain the difference in production of stationary waves between an open and a closed tube To label a diagram of a stationary wave with nodes and antinodes	To calculate Youngs modulus using both equations To know how to experimentally determine the Youngs modulus of a wire To know how to calculate the errors associated with the Young's modulus Calculate Youngs modulus from a stress strain graph To label force extension graphs for brittle, ductile and polymeric materials with any key labels (elastic limit for example) To relate the properties of materials to their graphs **3.5 – newtons laws of motion and momentum** To use Newton's 2nd law to calculate force or acceleration To apply Newton's 3rd law to explain the forces acting on an object and to draw free body diagrams of the situation To calculate momentum To apply conservation of momentum to different scenarios To calculate impulse using equation and also a force time graph. To use knowledge of momentum and energy transfers to solve both elastic and inelastic collisions
Strategies Conditional Knowledge 'I know when to'	**4.4 – waves** To know when to discuss total internal reflection or refraction To evaluate the results collected from the oscilloscope practical and to identify any improvements Apply knowledge of interference to explain how sound can sometimes have high and low amplitudes. To interpret the double slit equation to use proportionalities to describe relationships To analyse experimental length data to decide on levels of uncertainty in measurements when using diffraction gratings. Analyse diagrams of a stationary wave to draw conclusions on its wavelength and production To evaluate experimental method for determining speed of sound and discuss how some of the errors could be overcome	**3.3 – work energy and power** To interpret energy calculations and transfers to solve for another variable To know when to use each energy equation to solve a problem To compare efficiencies and draw conclusions on their energy consumption **3.4 – materials** To evaluate the accuracy of measurements in Youngs modulus practical and to suggest reasons behind the uncertainty Critically analyse value for Youngs modulus and compare to a true value **3.5 – newtons laws of motion and momentum** To interpret questions and apply knowledge of momentum to solve for different variables To relate impulse to newton's 2nd law and to derive it from first principles To interpret force time graphs to calculate the impulse To know when to use theory of elastic and theory of inelastic collisions in problems.
Key Questions	How are waves formed? How are waves used?	What happens when materials are stretched? What happens during collisions?
Assessment topics	End of unit 4.4 exam at Easter	End of 3.4 exam and whole of module 3 mock

Cross curricular links/Character Education	Maths – graphical analysis, algebraic equations, Music – stationary waves and harmonics Chemistry – ionising properties of electromagnetic waves		Maths – projectile motion, kinematic equations, graphs, trigonometric functions DT - material properties	