Year 12 Summer Term Curriculum Plan (A Level Physics)

Overview for Topic 6 – further mechanics Students should understand and identify the main components that forces can change the momentum over time. How kinetic energy changes in different types of collisions, whilst momentum is conserved. This will extend to events happening in two dimensions. Students will also be discussing real life situations with regards to circular motion from looking at engineers making carousels to the moon orbiting the earth and the earth orbiting the sun motion of objects in circles is very common in everyday life which can be investigated and explored further sub atomic particles accelerated in the large Hadron Collider.

Overview for Topic 5 – Waves and the Particle nature of light Students should understand diffraction and interference and the applications of this in industry and the development of musical instruments. Further study will explain the details of refraction in different materials and how this leads to the properties of different types of lenses and combinations used in many optical instruments such as telescope and microscopes which students will use frequently within their studies. Applications on how to calculate magnifications and the phenomenon of polarisation. Another part of this chapter students will discuss the ideas about EM radiation like light and particles such as electrons can behave as both waves and particles.

Content covered by Mrs Williams-Hewitt	Content covered by Mr Crossley
6.1 Further momentum Y13 content Students should be able to: ● explain the difference between elastic and inelastic collisions ● make calculations based on the conservation of linear momentum to determine energy changes in collisions ● derive and use the equation for the kinetic energy of a non-relativistic particle.	5.4 Quantum mechanics Students should be able to ● Understand how the behaviour of the Electromagnetic radiation can be described in terms of both waves and photons. ● Use the equation E=hf for the energy of a photon of Electromagnetic radiation.
Students should be able to: ● apply the conservation of linear momentum to situations in two dimensions ● analyse collisions in two dimensions ● calculate impulses and changes in momentum.	Students should be able to ● Explain the photoelectric effect and experimental observations of it. ● Understand how the photoelectric effect provides evidence for the photon model of light. ● Use the photoelectric effect equation
Students should be able to: ● express angular displacement in radians and in degrees, and convert between these units ● define angular velocity, and make calculations using it	Students should be able to ● Explain how diffraction experiments provide evidence for the wave nature of electrons ● Describe other evidence for the wave nature of electrons ● use the de Broglie wave equation $\lambda = h/p$
Students should be able to ● define centripetal acceleration, and derive and use the equations for it ● explain that a centripetal force is required to produce and maintain circular motion ● use the equations for centripetal force.	Students should be able to ● Understand atomic line spectra in terms of energy level transitions ● Calculate the frequency of radiation emitted and absorbed in an electron energy transition.
Students should be able to: ● explain that a centripetal force is required to produce and maintain circular motion ● use the equations for centripetal force	Y 13 content reading around topic 7 electric and magnetic fields Core practical work CP8 (if not already done)
● Topic 6 assessment ● Core practical work CP9,CP10	● Topic 5 assessment
● Year 13 transition work core practical work	● Year 13 transition work core practical