Year Group: 12	Subject: Physics	Term: Summer 2021
Topic	**Key Learning points**	**Assessment**
Topic 4: Materials **Topic 6 Further mechanics**	*End Point: To understand the determine the conservation of linear momentum from data and analysis. Carry out a detailed practical and analysis of uncertainties and to compare their measured values with those from a data book.* • *Continuation of fluids.. stress and strain and complete core prac 4 Core Practical 4: Use a falling-ball method to determine the viscosity of a liquid. Students are instructed to plot vterm against r2 and to derive the coefficient of viscosity from the gradient. (using fairy liquid)* • explain the difference between elastic and inelastic collisions and 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. • apply the conservation of linear momentum to situations in two dimensions and analyse collisions in two dimensions • calculate impulses and changes in momentum. • students to successfully complete collisions in 2 D practical in Pairs • express angular displacement in radians and in degrees, and convert between these units • define angular velocity, and make calculations using it and define centripetal acceleration, and derive and use the equations for it • explain that a centripetal force is required to produce and maintain circular motion and use the equations for centripetal force.	Students will be formatively assessed during each topic by past paper questions completed in lesson time. • Students will complete homework assignments as ongoing assessment of understanding. • Teachers will provide students with targeted feedback, based on their test performance. At the end of the term students will have a summative assessment. This will be a 60-mark exam paper which will be marked by their teacher.
Topic 5: waves and particle nature of light **Wave particle duality**	*End Point: To understand the mechanisms of waves and be able to explain how our understanding of microscopy occurs with diffraction using various filters and spectroscopy* • Understand what is meant by Huygens' construction and how it can be used to predict progress of wavefronts • Understand how light can be observed acting with a particle nature, and experimental evidence for this using formula E = h f to calculate energy of a light photon • Understand how electrons can be observed acting with a wave nature, and experimental evidence for this • Understand what is meant by a photoelectron what is meant by work function and threshold frequencies when talking about the photoelectric effect and to express energies in electronvolts (eV) • Be able to describe the electron diffraction experiment and use the de Broglie equation λ = h / p • Be able to explain why electron microscopes can reveal more detail than visible light microscopes • Be able to describe electron energy levels when in a free atom as discrete levels. Relate to ionisation energies • Understand atomic line spectra (absorption and emission) in terms of transitions between discrete energy levels • Understand how to calculate the frequency of radiation that could be emitted or absorbed in a transition between energy levels • Be able to calculate intensity of radiation I = P / A	