Physics Curriculum Overview - Year 10 - Triple

	Unit	Details
Oct - Feb	**Forces**	Pupils will define scalar and vector quantities and be able to represent vectors using scale diagrams. They will further develop their understanding of balanced and unbalanced forces and moments from KS3 and start to incorporate free body diagrams and trigonometry. Pupils will recall the relationship between mass and weight from KS3, defining the centre of mass for an object and its relationship to stability. They will also investigate the effect of forces on stretching different materials, applying Hooke's law where appropriate for objects extending and compressing. Pupils will be able to further progress their KS3 understanding of pressure, both qualitatively and quantitatively. They will do this by referencing particle behaviour. They will be able to calculate pressure in fluids, including atmospheric pressure. They will be able to explain upthrust, introduced in KS3, and apply the concept to understand why only some objects float. Pupils will continue to analyse the motion of objects, with the speed-distance-time relation as a base. They will be able to understand and represent motion graphically, with the quantities given by the gradient and area understood for each situation. They will gain an understanding of acceleration via calculations and practical investigations. Circular motion will also be covered. Pupils will be introduced to Newton's Three Laws of Motion and the concept of inertia, understanding their relevance to an object's motion. The concept of terminal velocity will be explained for objects falling through fluids. Pupils will be able to state and explain the safety features in a car. They will also analyse the forces and factors involved in stopping a car. They will be introduced to thinking distance, braking distance, and the summation of these to make the stopping distance. Pupils will understand momentum and its conservation, along with the range of typical human reaction times.
Mar - May	**Waves**	Pupils will observe and describe the properties of mechanical and electromagnetic waves in terms of energy transfer and the relevance of mediums as a method of transmission. Pupils will expand on their understanding of the electromagnetic spectrum from KS3, stating the speed of EM waves in a vacuum, along with potential dangers and applications of each region of the EM spectrum.They will be able to compare transverse and longitudinal waves by examining the relationship between the direction of energy transfer and the oscillations. Pupils will be able to describe reflection, refraction, absorption and transmission - investigating where appropriate. They will be able to display an understanding of ultrasound and the transmission of sound waves through mediums of different densities in terms of the vibration of particles in the mediums. Pupils will further investigate convex and concave lenses, understand the difference between real and virtual images and confidently draw ray diagrams. They will be able to state why objects appear to be certain colours, describing their appearance in the presence of different coloured lights.
Jun - Jul	**Space**	Pupils can describe the formation of the solar system, as well as the life cycle of both Sun-like stars and stars much more massive than our Sun. They will understand the importance of supernovae in the production of heavy elements and star formation. They will also examine the orbits of planets, knowing the role of centripetal force and acceleration in orbital motion. Pupils will also gain further understanding of the origin of the Universe through the Big Bang theory in greater detail than KS3, as well as its potential future, including theories surrounding the redshift of galaxies, the CMBR, dark matter and dark energy.