YEAR 11 OVERVIEW 2020/21 – PHYSICS

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 11	**Forces (2)**	**Forces (2)**	**Waves**	**Electricity & Magnetism (2)**	**Space**	
	For an object moving at constant speed the distance travelled in a specific time can be calculated using the equation: $s = v\,t$ The relationship between distance and time can be shown graphically. This can then be used to calculate values for speed, acceleration and deceleration. Newton's Laws consider what happens to an object's motion depending on the forces acting upon it.	The distance it takes for a vehicle to stop is dependent upon the reaction time (thinking distance) and the braking distance. Various external factors influence stopping distance. ***SEPARATE SCIENCE:*** Momentum can be calculated using: $p = m\,v$ In a closed system, momentum is conserved. When a force acts on an object that is moving, or able to move, a change in momentum occurs. **Waves** Waves can be described as either transverse or longitudinal. Their motion can be described in terms of their amplitude, wavelength, frequency and period. ***SEPARATE SCIENCE:*** Waves can be reflected at the boundary between two different materials. The differences in velocity, absorption and reflection of different waves in solids and liquids allow them to be used for detection and exploration.	Electromagnetic waves transfer energy from the source of the waves to an absorber. The waves that form the electromagnetic spectrum are grouped in terms of their wavelength and their frequency. Whilst some electromagnetic waves have useful applications, they can also present dangers for the human body. ***SEPARATE SCIENCE:*** A lens forms an image by refracting light. The magnification produced by a lens can be calculated using: $\text{Magnification} = \frac{\text{image height}}{\text{object height}}$ Each colour within the visible light spectrum has its own narrow band of wavelength and frequency. A perfect black body is an object that absorbs all of the radiation incident on it. A black body does not reflect or transmit any radiation.	The poles of a magnet are the places where the magnetic forces are strongest. The region around a magnet where a force acts on another magnet is called the magnetic field. The direction of a magnetic field line is from the north (seeking) pole of a magnet to the south(seeking) pole of the magnet. A magnetic compass contains a small bar magnet. The Earth has a magnetic field. The compass needle points in the direction of the Earth's magnetic field. When a current flows through a conducting wire a magnetic field is produced around the wire. The strength of the magnetic field depends on the current through the wire and the distance from the wire. When a conductor carrying a current is placed in a magnetic field the magnet producing the field and the conductor exert a force on each other. This is called the motor effect. ***SEPARATE SCIENCE:*** Loudspeakers and headphones use the motor effect to convert variations in current in electrical circuits to the pressure variations in sound waves. The generator effect: this can be used in an alternator to generate ac and in a dynamo to generate dc.	***THIS COMPONENT IS FOR SEPARATE SCIENCE STUDENTS ONLY*** The Sun (a star) was formed from a cloud of dust and gas (nebula) pulled together by gravitational attraction. Each star goes through a life cycle which is determined by the size of the star. Gravity provides the force that allows planets and satellites (both natural and artificial) to maintain their circular orbits. There is an observed increase in the wavelength of light from most distant galaxies. The further away the galaxies, the faster they are moving and the bigger the observed increase in wavelength. This effect is called red-shift. ***ALL STUDENTS WILL ALSO COMPLETE EXAM PREPARATION:*** Extensive and explicit recall of knowledge to facilitate effective rehearsal of exam technique. Links between different sections of knowledge are embedded further.	