

Physics		Curriculum Checkpoints: What do students know and what can they do?				YT Clips	Further guidance
Year 10		Developing	Securing	Mastering	Excelling		
Summative Comment							
6. Waves	Substantive Knowledge	<p>To be able to provide examples of longitudinal and transverse waves, energy transfer by waves (including EM waves).</p> <p>To be able to describe the range of normal human hearing.</p> <p>To be able to define the term ultrasound.</p> <p>To be able to name the main groupings of the EM spectrum.</p> <p>To be able to describe the hazardous effects of gamma rays, X-rays and ultraviolet radiation.</p> <p>To be able to state that each colour in the visible spectrum has its own narrow band of wavelength.</p> <p>To be able to state that in a convex lens parallel rays of light are brought to a focus at the principal focus.</p> <p>To be able to state that the hotter the body the more radiation it emits in a given time.</p>	<p>To be able to describe the amplitude, wavelength, frequency and period of a wave. To be able to describe how sound waves travel through air or solids.</p> <p>To be able to describe examples of reflection, transmission and absorption of waves (EM waves) at material interfaces.</p> <p>To be able to describe how ultrasound waves can be used for medical and industrial imaging. To be able to describe how radio waves are produced.</p> <p>To be able to describe examples of energy transfer by EM waves.</p> <p>To be able to explain that a perfect black body absorbs all the radiation incident on it, and does not reflect or transmit any radiation.</p>	<p>To be able to describe how to measure the speed of sound waves in air.</p> <p>To be able to describe evidence that, for e.g. ripples on a water surface, it is the wave and not the water itself that travels.</p> <p>To be able to compare the groupings of the EM spectrum in terms of wavelength and frequency.</p> <p>To be able to explain the risks associated with the use of ionising and ultraviolet radiation.</p> <p>To be able to explain why each type of EM wave is suitable for the application.</p> <p>To be able to describe that colour filters absorb certain wavelengths and transmit other wavelengths.</p> <p>To be able to explain that the colour of an opaque object depends on which wavelengths are more strongly reflected.</p>	<p>To be able to explain the difference between transverse and longitudinal waves.</p> <p>To be able to explain how to calculate the depth of water using echo sounding.</p> <p>To be able to describe how different substances may absorb, transmit, refract or reflect EM waves in ways that vary with wavelength.</p> <p>To be able to explain how P and S waves can be used to deduce information about the structure of the Earth.</p> <p>To be able to evaluate the risks and consequences of exposure to radiation.</p> <p>To be able to explain how the temperature of a body is related to the balance between incoming radiation absorbed and radiation emitted.</p>	<p>https://www.youtube.com/playlist?list=PLidqgIGKox7UVC-8WC9dJoeBzwxPeXp-h7 Video 61-75.</p>	<p>Knowledge organiser</p> <p>Waves Exam Questions</p> <p>Waves extended writing questions</p> <p>Revision Book pages 73- 91</p>
		6. Waves	Disciplinary Knowledge	<p>To be able to use the wave equation $v = \lambda \times f$ to calculate wave speed.</p> <p>To be able to use ray diagrams to determine the nature of the image formed by a lens.</p>	<p>To be able to draw a labelled ray diagram to illustrate reflection of a wave at a boundary.</p>		
Physics		Curriculum Checkpoints: What do students know and what can they do?				YT Clips	Further guidance
Year 11		Developing	Securing	Mastering	Excelling		
Summative Comment							
8. Space	Substantive Knowledge	<p>To be able to describe how planets and dwarf planets are arranged in the Solar System.</p> <p>To be able to compare the orbital motions of planets, moons and artificial satellites. To be able to recall what stars are formed from.</p>	<p>To be able to recall that stars go through a life cycle.</p> <p>To be able to recall that elements heavier than iron are produced in a supernova.</p>	<p>To be able to explain the role of gravity in star formation.</p> <p>To be able to explain the stages in the life cycle of a star similar in size to our Sun and of a star much larger than our Sun.</p>	<p>To be able to explain the balance of forces in a stable star.</p> <p>To be able to describe the stages in the formation of elements.</p> <p>To be able to explain the role of fusion in the life cycle of a star.</p>	<p>https://www.youtube.com/playlist?list=PLidqgIGKox7UVC-8WC9dJoeBzwxPeXp-h7</p>	<p>Knowledge organiser</p> <p>Space exam questions</p>

8. Space	Disciplinary Knowledge	To be able to recall that an observed increase in wavelength of light results in red-shift. To be able to recall that the Big Bang suggests the Universe started from a small dense region.	To be able to explain how red- shift provides evidence for the Big Bang. To be able to recall that more distant galaxies are travelling away faster.	To be able to explain the role of gravity in enabling objects to describe circular orbits.	To be able to explain the relationship between speed and radius in stable orbits. To be able to explain how in a stable orbit that speed is constant but that velocity is changing.	https://www.youtube.com/watch?v=8WC9djoeBzwxPeXp h7 Video 84- 87	Space extended writing questions Revision Book pages 100-103
		<p>Physics</p> <p>Year 11</p> <p>Curriculum Checkpoints: What do students know and what can they do?</p>					YT Clips
Summative Comment		Developing	Securing	Mastering	Excelling		
7. Magnetism and Electromagnetism	Substantive Knowledge	To be able to recall that like poles repel, unlike poles attract. To be able to state how the strength of an electromagnet can be increased. To be able to state that a force acts on a current- carrying conductor in a magnetic field. To be able to state what the generator effect is. To be able to state that a dynamo generates d.c. and an alternator generates a.c. To be able to state what a basic transformer is and the difference between step-up and step-down. To be able to state that high p.d. are used to reduce power transmission losses.	To be able to state what the generator effect is and that a dynamo generates DC and an alternator generates AC. To be able to recognise that the poles of a magnet are the places where the magnetic forces are strongest To be able to describe that when a coil is rotated in a magnetic field an alternating current is induced in the coil. To be able to explain how the potential differences across the two coils depend on the number of turns on each coil and how the potential difference is induced.	To be able to recognise a magnetic field. To be able to explain what the size of a force on a conductor depends on. To be able to describe how when the p.d. is increased the current decreases for the same power transmitted. To be able to explain the behaviour of a magnetic compass. To be able to explain how electromagnets are used in devices.	To be able to explain that an induced magnet is only magnetic when it is in a magnetic field. To be able to explain that if the direction of motion of the conductor or the polarity of the magnetic field is reversed, the direction of the induced potential difference and any induced current is reversed. To be able to explain generator effect & use in a dynamo to generate d.c. with the use of commutator; and is used in an alternator to generate a.c. To be able to explain how power transmission losses are related to the square of the current.	https://www.youtube.com/watch?v=LidqgIGKox7UVC-8WC9djoeBzwxPeXp h7 Video 84- 87	Knowledge organiser Waves Exam Questions Waves extended writing questions Revision Book pages 73- 91
		7. Magnetism and Electromagnetism	Disciplinary Knowledge	To be able to plot the magnetic field around a bar magnet. To be able to draw the magnetic field around a conducting wire and a solenoid.	To be able to describe the motor effect that applies to a current-carrying conductor in a magnetic field. To be able to recognise how size of the induced p.d. can be increased by increasing the speed of movement or by increasing the strength of the magnetic field.	To be able to describe the motor effect that applies to a current-carrying conductor in a magnetic field. To be able to draw graphs of potential difference generated in the coil against time. To be able to manipulate equations.	To be able to explain Fleming's left-hand rule. To be able to use the equation $F = BIL$ to calculate the force on a conductor. To be able to describe how to draw and interpret graphs of potential difference generated in the coil against time. To be able to use and apply the expression $V_p/V_s = n_p/n_s$.