AQA GCSE Physics Student Checklist

P12 Wave properties

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
P12.1 The nature of waves	I can state that waves can transfer energy and information without the transfer of matter.	☐	I can investigate wave motion through a spring model.	☐	I can explain the features of a longitudinal wave in terms of compressions and rarefactions by using a particle model.	☐
	I can identify waves as either transverse or longitudinal.	☐	I can compare transverse and longitudinal waves in terms of direction of vibration and propagation.	☐	I can discuss the features of a transverse wave in terms of particle or field behaviour.	☐
	I can identify waves as either mechanical or electromagnetic.	☐	I can compare electromagnetic and mechanical waves in terms of the need for a medium.	☐	I can compare mechanical waves and their particulate nature with electromagnetic waves and their field	☐
P12.2 The properties of waves	I can outline the derivation of the wave speed equation.	☐	I can outline the derivation of the wave speed equation.	☐	I can explain how the wave speed equation can be derived from fundamental principles.	☐
	I can calculate the period of a wave from its frequency.	☐	I can calculate the period of a wave from its frequency.	☐	I can perform calculations involving rearrangements of the period equation and the wave speed equation.	☐
	I can measure the speed of a water wave.	☐	I can calculate the wave speed from the frequency and wavelength.	☐	I can perform multi-stage calculations linking period, frequency, wave speed, and wavelength.	☐
P12.3 Reflection and refraction			I can describe refraction at a boundary in terms of wavefronts.	☐	I can use a wavefront model to explain refraction and reflection.	☐
			I can describe refraction including the reflected rays.	☐	I can describe the relationship between the angle of incidence and angle of refraction.	☐
			I can explain partial absorption as a decrease in the amplitude of a wave and therefore the energy carried.	☐	I can explain refraction in terms of changes in the speed of waves when they move between one medium and another.	☐

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P12.4 Sound waves	I can state that sound waves are produced when objects vibrate.	☐	I can explain how insulating materials can be used to absorb sound waves.	☐	I can calculate distances between objects by using the concept of echo location.	☐
	I can describe how echoes are produced through the reflection of sound waves.	☐	I can explain why sound waves cannot travel through a vacuum.	☐	I can describe the behaviour of sound waves in terms of vibrations and regions of compression and rarefaction.	☐
	I can describe how the speed of sound in air can be measured.	☐	I can plan an experiment to measure the speed of sound in air.	☐	I can evaluate data from speed of sound experiments to discuss the range of possible speeds for sound.	☐
P12.5 More about sound			I can describe the properties of a sound in terms of amplitude and frequency.	☐	I can outline the structure of the human ear in terms of transfer of waves and vibrations.	☐
			I can identify the range of frequencies that humans can hear.	☐	I can explain why the human ear has a limited range of frequencies it can detect.	☐
			I can measure the frequency of a sound wave using an oscilloscope and the relationship frequency = 1/period.	☐	I can compare the propagation of a sound wave in a solid and a gas.	☐
P12.6 The uses of ultrasound			I can compare ultrasound and audible sound waves in terms of frequency.	☐	I can investigate the reflection and absorption of ultrasound waves.	☐
			I can outline some uses of ultrasound in distance measurement.	☐	I can calculate the positions of objects or flaws in metal objects using data from an ultrasound trace.	☐
			I can describe the operation of an ultrasound transducer in terms of partial reflection.	☐	I can compare A- and B-type ultrasound scans.	☐

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P12.7 Seismic waves		☐	I can describe the internal structure of the Earth.	☐	I can explain in detail how the internal structure of the Earth can be determined by waves passing through	☐
		☐	I can compare the three types of seismic waves (P, S, L) in terms of the speed they travel and whether they are	☐	I can calculate the speed of different types of seismic waves.	☐
		☐	I can describe the operation of a seismometer.	☐	I can interpret seismographs to determine the difference in speeds of seismic waves.	☐