Physics Scheme of Learning

P12: Waves

<u>Intent – Rationale</u>

Waves are key part of Physics, and feature all the way through secondary school education and beyond. Waves are also a part of everyday life, and a key way in which are transferred. This topic builds on and goes beyond previous understanding of waves. It is an opportunity to development mathematical skills, including rearranging of waves.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning of	
Topic 8 Phys Waves and Sound Topic 9 Phys Light	 GCSE Physics P13 – Electromagnetic Spectrum, P14 – Ligh A level – Year 12 topic Waves 	
What are the links with other subjects in the curriculum?	What are the links to SMSC, British	
Base the content here on what you already know but there will be time in future to liaise further as part of our collaborative work	P12.1 The Nature of Waves GB4h P12.2 R.Prac 8 Waves Practical GB4a, GB4e, GB4f P12.4&5 Sound waves GB4e P12.6 Ultra sound SP4 P12.7 Seismic waves C1 SP2	
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developi	
FROM THE LIBRARY Matter and Waves-532	 Development of mathematical skills through use of the th Prefixes and standard form are used commonly in these of 	



energy and information, but not matter, ng equations and using standard form.				
loes this topic feed into?				
t				
/alues and Careers?				
ng mathematical skills?				
ree wave equations.				
alculations				

Physics Scheme of Learning

P12: Waves

Intent – Concepts







	What subject specific language will be used and developed in this topic?	What opportunities are available for assessing
ſ	amplitude	Completion of an end of topic test
	the height of a wave crest or trough of a transverse wave from the rest position. For oscillating motion, the amplitude is the	
	maximum distance moved by an oscillating object from its equilibrium position	P12.1 The Nature of Waves
	compression	Assessing students progress through Isaac Physics calcula
	squeezing together	P6: Wave Equation Practice: Word Problems: https://isaa
	echo	b087-45b5-bcf3-661ec239df16
	reflection of sound that can be heard	 P6: Frequency and Time Period Calculations: https://isaac
	electromagnetic waves	4655-004c-f36ab7e1d073
	frequency	4055-5041-150807210575
	Trequency the number of wave greate pagging a fixed point eveny second	D12.2 D Dree 0 M/ourse Drestical Development of prestical skill
	longitudinal wave crests passing a fixed point every second	P12.2 R.Prac 8 waves Practical - Development of practical skil
	Iongluainal waves	
	mochanical wave	P12.4&5 Sound waves - Answering of past exam questions th
	vibration that travels through a substance	
	move to and from about a certain position along a line	
	nrimary seismic wave (P-wave)	
	longitudinal waves that push or pull on the material that they move through as they travel through the Earth	
	rarefaction	
	stretched apart	
	reflection	
	the change of direction of a light ray or wave at a boundary when the ray or wave stays in the incident	
	medium	
	refraction	
	the change of direction of a light ray when it passes across a boundary between two transparent substances (including air)	
	secondary seismic wave (S-wave)	
	transverse waves that shake the Earth side to side as they pass through	
	seismic waves	
	sound wave at frequency greater than 20 000 Hz (the upper frequency limit of the human ear)	
	speed	
	the speed of an object (metres per second) = distance moved by the object (metres) ÷ time taken to move the distance	
	travelled (seconds)	
	transmission/transmitted	
	a wave passing through a substance	
	transverse wave	
	a wave where the vibration is perpendicular to the direction of energy transfer	
	ull about a wave at frequency greater than 20,000 Hz (the upper frequency limit of the human car)	
	vibrate	
	oscillate (move to and fro) ranidly about a certain position	
I	wavelength	
	the distance from one wave crest to the next	
1		



ig the progress of students?

ation boards: acphysics.org/gameboards#afba0a3b-

cphysics.org/gameboards#73fbda12-1b91-

ills from <u>lesson 2</u>

hrough the <u>assessed homework</u>

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resour
P12.1 The Nature of Waves	Can I draw diagrams to show the	Can I explain why light can	https://robertcarretrust.sharepoint.com/sites/RCT-Files-
	features of transverse and	travel in space but sound	Staff/Shared%20Documents/KSHS/Departments/Curriculum/Science
	longitudinal waves?	cannot	1)%20Course/P12%20Wave%20properties/Lesson%201%20-%20The
	Can I give examples of both		
	transverse and longitudinal		
	waves?		
	Can I describe the propagation of		
	waves?		
P12 2 B Prac 8 Wayes Practical	Can Lapply the wave equation to	Can Levaluate a practical	https://robertcarretrust.sharepoint.com/sites/RCT_Files_
	measured values from a real world		Staff/Shared%20Documents/KSHS/Departments/Curriculum/Science
	wave?		1)%20Course /P12%20Waye%20properties /Lesson%202%20-%20Waye
D12 2 Pofloction Refraction	Can I draw diagrams to show the	Can Lovalain the law of	1/220C001SE/F12/220Wave/220p10pErties/Less01/2202/220-220Wa
wave model	features of transverse and	call resplain the law of	L. Departments (curriculum Science (KS4 (PHTSICS KS4 (AQA GCSE [9-
wave model	longitudinal waves?	reflection and its application	
	Can I describe the propagation of		
	both transverse and longitudinal		
	waves?		
P12.4&5 Sound waves	Can I state the range of human	Can I explain why sound waves	https://robertcarretrust.sharepoint.com/sites/RCT-Files-
	hearing?	travel faster in solids than they	Staff/Shared%20Documents/KSHS/Departments/Curriculum/Science
	Can I describe how sound waves	do in liquids and gases?	1)%20Course/P12%20Wave%20properties/Lesson%204%20-%20Sou
	travel from a source to the ear and		
	the effect that this has inside the		
	ear?		
	Can I describe sound waves in		
D12 C Liltra cound	Can Laive similarities and	Con I describe and evaluin how	https://weberteenstruct.ekener.eint.eeer/eitee/DCT_Files
	differences between sound waves	acho sounding is used in a given	<u>https://robertcarretrust.snarepoint.com/sites/RCI-Files-</u>
	and ultrasound waves?	situation?	Staff/Shared%20Documents/KSHS/Departments/Curriculum/Science
	Can L state uses of ultrasound	Can I describe and explain how	1]%20Course/P12%20Wave%20properties/Lesson%205%20-%20The
	waves?	ultrasound waves are used to	
	Can I give advantages and	build up a picture of the inside of	
	disadvantages of using ultrasound	a human body?	
	waves for diagnosis?		
	Can I perform calculations on		
	ultrasound scans using the		
	equation: distance = speed x time?		
D42 7 6 1 4 1 4 4			
P12.7 Seismic waves	Can I state that P-waves and S-	Can I explain now earthquakes	https://robertcarretrust.sharepoint.com/sites/RCI-Files-
	Can I describe the properties of P	they are measured on?	<u>Staπ/Shared%20Documents/KSHS/Departments/Curriculum/Science</u>
	waves and S-waves?	Can I describe and explain how P-	1]%20Course/P12%20Wave%20properties/Lesson%206%20-%20Seis
		waves and S-waves travel	
		through the Earth's interior, and	
		how this allows us to build up a	
		picture of the Earth's interior?	



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e/KS4/PHYSICS%20KS4/AQA%20GCSE%20(9e%20nature%20of%20waves

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