

Blue Pathway									
Purple Pathway									
Orange Pathway									
	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	Step 11	Step 12	
AO1 Remember	Describe how light behaves in different materials	Describe how pinhole cameras, eyes and lenses work	Remember key facts about most areas of Science.	Explain dispersion using wave speed	Explain refraction using particles and wave speed.	Explain why each type of EM wave is suitable for its application	Use accurate and appropriate scientific language and units	Explain changes in speed and wavelength with reference to events at boundaries	
	Describe transverse and longitudinal waves and give examples	Describe colours using frequency	State relationship between period and frequency	Explain how we see colours in different colour light	Describe how different substances transmit, absorb, reflect, refract	Describe how radio waves are produced and can induce oscillations in circuits	Explain how the temperature of a body is related to balance of incoming and emitted radiation.		
		Explain how sound travels using particles	Describe how sound is used to transmit a signal	Explain why sound is longitudinal with reference to vibration and energy transfer	Explain P and S waves			Recall all key areas of Science	
AO2 Application	Describe hazards and uses of EM waves	Use theories to make simple explanations of events.	Use the wave equation.	Rearrange equations in calculations	Explain a perfect black body	Rearrange and apply wave equation	Use wave front diagrams to explain refraction	Rearrange and apply wave equation and concepts of transverse and longitudinal waves	Relate the colour of an object to its impact on wave behaviour
			Use evidence to support theories of wave behaviour						
	Consistently use equations in calculations.	Consistently use and sometimes rearrange equations in calculations.	Interpret data and use it to support evidence.	Describe types of sound waves and their uses	Use diagrams to show how lenses work	Explain that colour depends on wavelength strongly reflected	Use wave diagrams to determine the position and magnification of images	Use ray diagrams to support explanations relating to image formation	Interpret a range of evidence to suggest relationship between radiation and temperature
AO3 Analyse and Evaluate	Recognise anomalous results and spot some causes of error in experimental procedures.	Write reasoned explanations of a conclusion based on the experimental data	Compare light waves and waves in matter	Identify some causes of error in data or experimental procedures.	Compare EM waves	Suggest further questions that may arise from results of investigations and data analysis and evaluation.	Evaluate information systematically to develop arguments and explanations.	Evaluate applications of EM waves using risks and benefits	Analyse and evaluate more complex applications of EM waves
			Evaluate the reliability of methods in detail.		Critically evaluate how velocity, absorption & reflection can produce images				
AO3 Experimental Procedures	Identify variables in an investigation	Use a ripple tank to explore wave behaviour	Compare waves in a ripple tank with waves on a string	Use measurements taken from a ripple tank to give wavelength, frequency & speed of a wave	Use measurements taken from a ripple tank to give wavelength, frequency & speed of a wave	Safely carry out practical investigations by creating a full risk assessment	Explain accuracy, precision, resolution and reliability	Use all the correct scientific language throughout.	
		Explain importance of sampling technique & control variables							Correctly use an appropriate number of decimal places