

## Chapter 6 Outline

Lesson length = 65 mins

Lessons available: 12-13

Section	Lessons	Main concepts and key words	In class	Private study
6.1	2	Phase, amplitude, superposition, phasor, radians, path difference, phase difference	Demos: A10D Loudspeaker and baffle, A30E Hearing superposition, A40E Beats? Displays 2O, 4O, 6O, 8O Q10W Phase difference and superposition Experiments (students do one then present findings): A50P Slinky, A60P Superposition of microwaves, A70P Partial reflection of microwaves, A90E Interference patterns in a ripple tank;	Q20W Superposition of waves: A drawing exercise Read first section  Q40S Superposition of sound waves, Q80X Superposition outside the laboratory (for report-back later), Q30S Lloyd's mirror for microwaves?
6.1	1-2	Standing waves, coherence	Demos: Slinky again, A100E Standing waves on a rubber cord Displays 12O, 14O Experiments A110P Standing waves in sound, 130P Standing waves with microwaves	Q90S Standing waves on a string, 100S Standing waves in pipes Reading 10T or 20T Extra: Qs from SG p.138
6.2	1-2	History of ideas about light, speed of light,  Wavelets and Huygen's construction, reflection, refraction	Much of this section is done as homework. Use class time for report-back on Q80X  Displays 20O, 30O, 50S, wavelet explanation of reflection and refraction Use Qs from SG p.145 as focus for class discussion	Read SG and Reading 30T Historical attempts to measure the speed of light, Q110S Measuring of the speed of light A160S Why Snell's law? Extra: Reading 70S Reminder: More about Snell's Law
6.3	2	2-slit interference, $\lambda = x(d/L)$	Quick demos: A210E Interference patterns in a soap film, A220E Diffraction by a slit Perhaps Q140X Colours of thin films Display 55O, maybe Q130X Calculating wavelength in two-slit interference Experiment A230E Measuring wavelength with Young's slits	Q150S Questions on the two-slit experiment Choose 1 of Q160S, 170S, 180S, 190S

6.3	2	Diffraction grating $n\lambda = d\sin\theta$	Grating formula, display 65O Experiment A240E 'Measuring the wavelength of laser light'	Display 60S, experiment A250H Using a CD as a reflection grating Q200S Grating calculations Perhaps Q210S Using diffraction gratings
6.4	2-3	Understanding phasors  Phasor explanation of Young's slits Single-slit diffraction, angle of spread = $d\sin\theta$	Modelling activities A260S Introducing phasors, A270S Amplitude and frequency of oscillations with phasors, A280S Two phasors at once, A300S Phasors across space. If time extend to 340S Summing two phasors over time, 310S Beats If useful, experiment A290E Visualising phasors: Coloured thread, or start Q220S, 230S A330S Phasors to account for two slits, displays 70S, 80S  A350S Diffraction by phasors, display 90O	Q220S Phasors to oscillations, Q230S Wave to phasor, perhaps Q240S Linear and angular speed  Activities could be completed and/or repeated Qs from SG p.54 Make revision notes