

Detailed unit content

In this specification bold text refers to higher tier only content. Italic text refers to practical investigations, which students are required to demonstrate an understanding of.

Throughout the unit

- 0.1 Use equations given in this unit, or in a given alternate form
- 0.2 **Use and rearrange equations given in this unit**
- 0.3 Demonstrate an understanding of which units are required in equations

Topic 1

Visible light and the Solar System

- 1.1 Describe how ideas about the structure of the Solar System have changed over time, including the change from the geocentric to the heliocentric models and the discovery of new planets
- 1.2 Demonstrate an understanding of how scientists use waves to find out information about our Universe, including:
 - a the Solar System
 - b the Milky Way
- 1.3 Discuss how Galileo's observations of Jupiter, using the telescope, provided evidence for the heliocentric model of the Solar System
- 1.4 Compare methods of observing the Universe using visible light, including the naked eye, photography and telescopes
- 1.5 Explain how to measure the focal length of a converging lens using a distant object
- 1.6 *Investigate the behaviour of converging lenses, including real and virtual images*
- 1.7 *Investigate the use of converging lenses to:*
 - a *measure the focal length using a distant object*
 - b *investigate factors which affect the magnification of a converging lens (formulae are not needed)*
- 1.8 Explain how the eyepiece of a simple telescope magnifies the image of a distant object produced by the objective lens (ray diagrams are not necessary)
- 1.9 Describe how a reflecting telescope works
- 1.10 Recall that waves are reflected and refracted at boundaries between different materials
- 1.11 **Explain how waves will be refracted at a boundary in terms of the change of speed and direction**
- 1.12 Describe that waves transfer energy and information without transferring matter

- 1.13 Use the terms of frequency, wavelength, amplitude and speed to describe waves
- 1.14 Differentiate between longitudinal and transverse waves by referring to sound, electromagnetic and seismic waves
- 1.15 Use both the equations below for all waves:

wave speed (metre/second, m/s) = frequency (hertz, Hz) \times wavelength (metre, m)

$$v = f \times \lambda$$

wave speed (metre/second, m/s) = distance (metre, m) / time (second, s)

$$v = \frac{x}{t}$$