Unit P1 - Revision Lesson 1 The Solar System

Specification learning outcomes	HSW statements	Exemplar teaching activities	Main differentiation	Resource sheets
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	**HSW 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14**	<u>The theme for this lesson is waves and how they are used to explore the Solar System.</u> **Starter:** *Solar System model***.** Ask students to draw the Solar System as they understand it. This should be a straightforward introductory task to get them thinking about cosmological models. Follow up by asking why they believe this is the way things are and then why scientists believe in this model. The discussion could then extend to the currently accepted model of the whole Universe. **Main:** *Comparing astronomical observations.* Worksheet P1.1b will help students to revise the different ways that scientists study the Solar System. The worksheet could also be used to remind students of the work done by Ptolemy, Copernicus and Galileo. Copernicus is not mentioned on the worksheet but you could go back to the models discussed in the starter. *Refraction questions.* Worksheet P1.2c will help students to revise refraction and to find the focal length of a lens. *Exam paper practice.* Nov 2011 Foundation Physics paper (5PH1F) Qu 5 asked pupils about practical work with lenses and could be used as a revision exercise. The final question is a 6 mark extended writing question which revises reflecting and refracting telescopes. Students could be asked to either answer the question or write the mark scheme as a revision exercise. *Amplitude, frequency and wavelength.* Worksheet P1.5b will help students to revise basic properties of waves. **Plenary:** *True/false*. Ask students to work in small groups to write a set of five statements about contents of this topic, three of which are to contain errors. They then swap statements with another group to identify the incorrect statements and write correct versions. **Homework:** Worksheets P1.5c (for students requiring extra support) and P1.5d (for those working at a higher level) contain questions on wave speeds.	**Stretch:** Worksheet P1.2d should be used if students are studying for the Higher tier exam. **Support:** Worksheet P1.4b supports students with their revision of telescopes. It may also be a good idea to revise the terms 'reflection' and 'refraction'. Worksheet P1.5a is at a lower level so some students might complete only this worksheet when revising waves.	Worksheet P1.1b Worksheet P1.2c Worksheet P1.2d Worksheet P1.4b Worksheet P1.5a Worksheet P1.5b Worksheet P1.5c Worksheet P1.5d [Exam paper Nov '11 5PH1F Qu 5]

reflected and refracted at boundaries between different materials. **H** **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) × wavelength (metre, m) $v = f \times \lambda$ Wave speed (metre/second, m/s) = distance (metre, m)/time (second, s) $v = \frac{x}{t}$				