

13 Reflection and refraction – Part 1

—Answers

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Work through these after you have tried the questions yourself.

2.1 30° (the angle of reflection equals the angle of incidence).

2.2 it bends **toward** the normal.

2.3 $\sin \theta_2 = \frac{n_1}{n_2} \sin \theta_1 = \frac{1.00}{1.50} \sin 30^\circ = \frac{0.50}{1.50} = 0.333$, so $\theta_2 = 19.5^\circ$.

2.4 $n = \frac{c}{v} \Rightarrow v = \frac{c}{n} = \frac{3.0 \times 10^8}{1.5} = 2.0 \times 10^8$ m/s.

2.5 it is used in optical fibres to carry light signals; when light hits the inside surface steeply enough it reflects entirely, so no light escapes and it stays trapped in the fibre.