

GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

Question Set 2

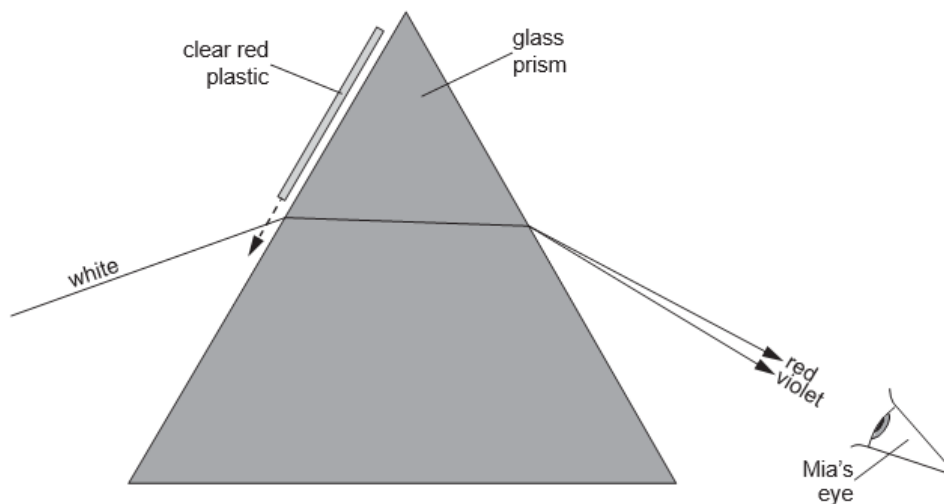
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This question is about light moving from one medium to another.

Mia uses a ray-box to send a ray of white light into a triangular glass prism. She sees a spectrum of colours coming out.

She slides a sheet of clear red plastic into the path of the light as shown in the diagram.

When the red plastic is in place, she sees that most of the colours in the spectrum have vanished.



(a) Complete the following sentences using the words below.

absorption frequency reflection refraction speed transmission

When light goes from air into glass, it changes direction.

This change of direction is called refraction.

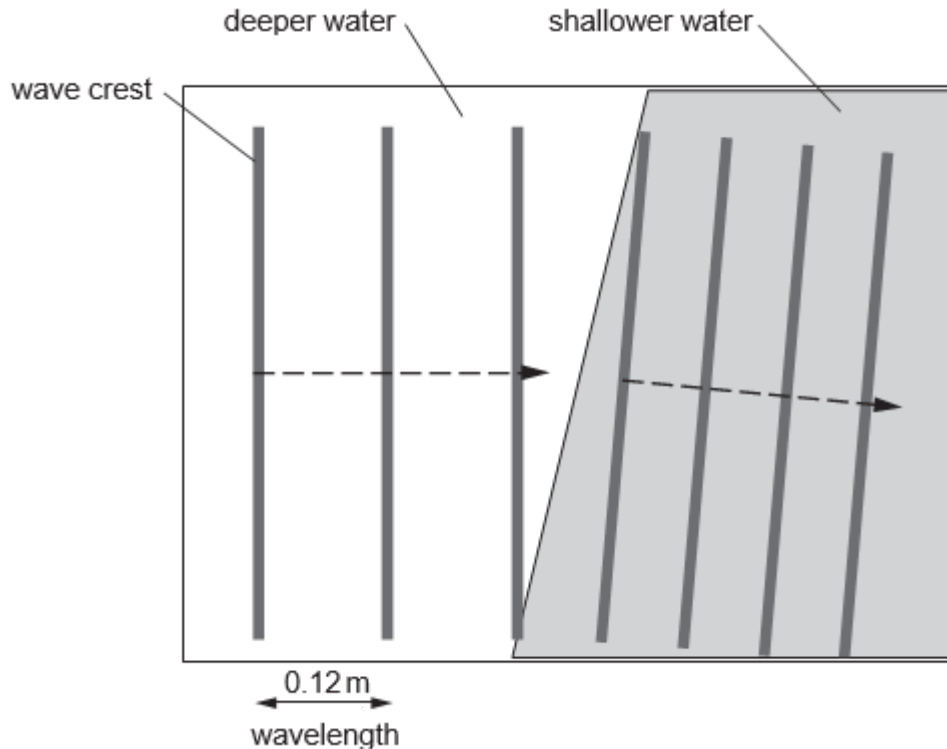
This happens because the light changes its speed when it enters the glass.

The red plastic removes all colours except red. This is called absorption [3]

(b) This behaviour can be modelled with water waves in a ripple tank.

The diagram shows water waves moving from deeper water into shallower water.

It is viewed from above the ripple tank, with the wave crests shown as thick grey stripes.



(i) The waves were produced at a frequency of 2.5 hertz (Hz).

Calculate the speed of the waves in the deeper water.

Use the equation: wave speed = frequency \times wavelength.

$$c = f\lambda = 2.5 \times 0.12 = 0.3 \text{ m/s}$$

Wave speed = 0.3 m/s [2]

(ii) Explain how the ripple tank diagram helps to explain the behaviour of light shown in part (a).

It shows the waves slowing down and changing direction which shows refraction. [2]

Total Marks for Question Set 2: 7

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