

Total internal reflection

Task 1: See for yourself! (Levels 5–6)

You will need a ray box producing a single ray of light and a semicircular prism. Place the prism on a sheet of plain paper and draw around it with a sharp pencil. Shine the light onto the curved edge of the prism from a variety of different angles, starting with it going straight in at the centre of the curved side, and gradually making the angle between the incident ray and the normal greater – each time mark where the light ray goes in and where it comes out.

Note down what you see.

- 1 What happens to the ray of light when it goes straight into the prism along the normal?

.....

- 2 What then starts to happen as the angle gets bigger?

.....

- 3 What does total internal reflection look like?

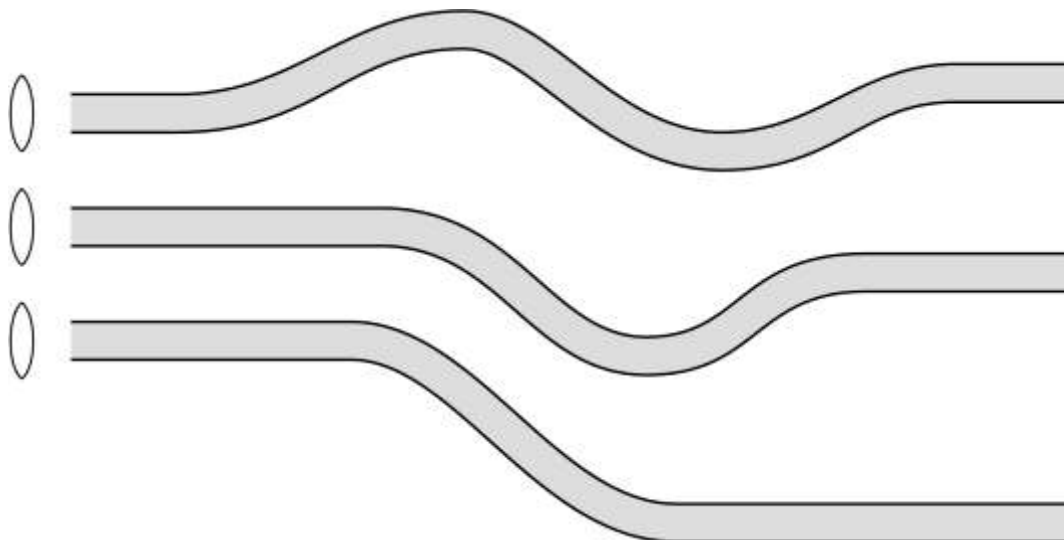
.....

- 4 At what angle of incidence did total internal reflection happen?

.....

Task 2: How to make light go around corners (Levels 6–7)

Look at Figure 2 on page 139 in your Pupil Book. For each of these curving optical fibres draw the path of a light ray travelling along it. Remember the fibre curves and bends but light always travels in straight lines.



Task 3: Why use fibre optics? (Levels 6–7)

Choose an application of optical fibres and produce a fact file explaining why they are suited to this application. Include the following.

- How fibre optics work in the context of the application you have chosen
- Why they are better than any alternative.