

Q: What are the two conditions required for total internal reflection?

Ans. The two conditions required for total internal reflection are -

(i) Light must travel from a denser medium to a rarer medium.

(ii) The angle of incidence inside the denser medium must be greater than the angle

Q: A fish in the pond of water appears at a depth of 6cm. What is the actual depth of the fish if the refractive index of air wrt water is $\frac{3}{4}$?

Ans
$$n_{21} = \frac{\text{real depth}}{\text{apparent depth}} \quad n_{12} = \frac{3}{4}$$

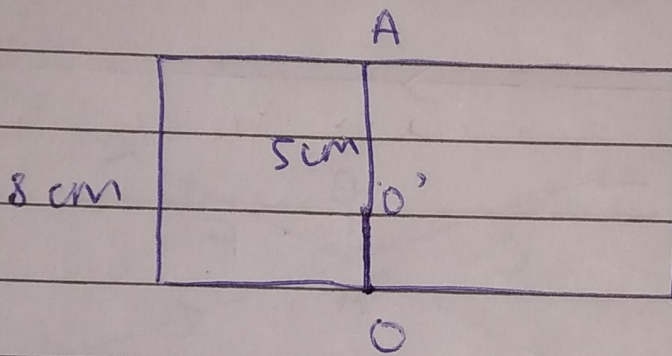
So,
$$n_{21} = \frac{3}{4} = \frac{4}{3}, \quad \text{apparent depth} = 6\text{cm}$$

real depth = $n_{21} \times \text{apparent depth}$
$$= \frac{4}{3} \times 6^2 = \frac{4}{3} \times 36 = 48$$

$$= 8\text{cm}. \text{ So the real depth is } 8\text{cm}$$

Q: A rectangular glass slab of thickness 8 cm is placed on a figure. The eye is kept exactly above this slab. If the refractive index of glass is 1.6, then by what dist. the figure will appear to be raised?

Ans



R.I. of glass slab = 1.6

$$n_{21} = \frac{\text{real depth}}{\text{apparent depth}}$$

$$\Rightarrow 1.6 = \frac{8 \text{ cm}}{\text{apparent depth}}$$

apparent depth

$$\Rightarrow \text{apparent depth} = \frac{8}{1.6} = 5 \text{ cm}$$

$$\begin{aligned} \text{normal shift (x)} &= 8 \text{ cm} - 5 \text{ cm} \\ &= 3 \text{ cm} \end{aligned}$$

So, the figure will appear to be raised by 3 cm.