

Answer on Question 77263, Physics, Other

Question:

Light travels from flint glass into water. The angle of incidence is 40° . What is the angle of refraction?

Solution:

We can find the angle of refraction from the Snell's law:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2,$$

here, $n_1 = 1.58$ is the index of refraction of flint glass, $n_2 = 1.33$ is the index of refraction of water, $\theta_1 = 40^\circ$ is the angle of incidence, θ_2 is the angle of refraction.

Then, from this formula we can find the angle of refraction:

$$\sin \theta_2 = \frac{n_1}{n_2} \sin \theta_1,$$

$$\theta_2 = \sin^{-1} \left(\frac{n_1}{n_2} \sin \theta_1 \right) = \sin^{-1} \left(\frac{1.58}{1.33} \sin 40^\circ \right) = 50^\circ.$$

Answer:

$$\theta_2 = 50^\circ.$$

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