

**Answer on Question #46803, Physics, Other**

A ray of light travels from air to glass. The incident ray makes an angle of 45 degrees while the refracted ray makes an angle of 30 degrees with the normal to the interface. The speed of light in air is  $3.0 \times 10^8 \text{ m/s}$ . What is the speed of light in glass?

**$2.12 \times 10^8 \text{ m/s}$**

$4.24 \times 10^8 \text{ m/s}$

$3.73 \times 10^8 \text{ m/s}$

$3.00 \times 10^8 \text{ m/s}$

Using Snell's law:

$$\frac{\sin \theta_1}{\sin \theta_2} = \frac{v_1}{v_2}$$

Where  $v_i$  is the velocity of light in the respective medium.

$$v_2 = v_1 \frac{\sin \theta_2}{\sin \theta_1} = 3.0 \cdot 10^8 \frac{\text{m}}{\text{s}} \frac{\sin 30^\circ}{\sin 45^\circ} \approx 2.12 \cdot 10^8 \frac{\text{m}}{\text{s}}$$

**Answer:** the speed of light in glass is  $\approx 2.12 \cdot 10^8 \frac{\text{m}}{\text{s}}$