

Indexes of Refraction

Air or vacuum: 1.00

Water: 1.33

Maple Syrup 1.46

CR39 (Eyeglass Plastic): 1.498

Crown Glass: 1.523

Barium glass: 1.60

Rubbing Alcohol 1.38

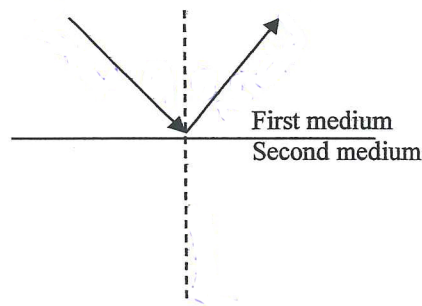
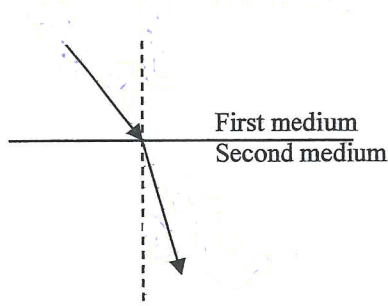
Flint glass: 1.70

Polycarbonate: 1.586

Diamond: 2.45

 $c = \text{speed of light} = 3 \times 10^8 \text{ m/s}$ Index of refraction, $n = c / (\text{light velocity in substance})$ Snell's Law: $n_1 \sin \theta_1 = n_2 \sin \theta_2$

1. Which diagram below shows reflection and which shows refraction?



- In the diagram above that shows reflection, label the incident ray, the reflected ray, the normal, the angle of incidence (θ_1), and the angle of reflection (θ_2).
- In the diagram above that shows refraction, label the incident ray, the refracted ray, the normal, the angle of incidence (θ_1), and the angle of refraction (θ_2).
- Using Snell's Law, calculate the angle of refraction when a light wave travels from air ($n = 1$) into water ($n = 1.33$) at an incident angle of 35 degrees.
- A ray of light traveling from air into water strikes the surface at an angle of 60 degrees. What will the angle of refraction be?
- A ray of light traveling from air into crown glass strikes the surface at an angle of 30 degrees. What will the angle of refraction be?
- You buy a small patch of land in Africa. You happen to notice a strange crystal is found all over your land. To determine what it is, you pass a beam of light through it. You observe that the light enters the crystal at a 30-degree angle from the normal and is bent 11.776 degrees from the normal. What is the strange crystal?