

1. What is the velocity of light in a glass whose index of refraction is 1.50?
2. Light travels at a velocity of  $2.25 \times 10^8$  m/s in water. Calculate the index of refraction of water.
3. What is the frequency of light that has a wavelength of  $4861\text{\AA}$  in a vacuum?
4. What is the frequency of this light in water?
5. What is the wavelength of this light in water?
6. In going from air to water, is light bent toward the normal (perpendicular), or away from the normal to the surface?

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$$c = 3.0 \times 10^8 \text{ m/sec}$$

7. In going from water to air, what is the critical angle (measured from the perpendicular), above which a ray from the water is totally reflected back into the water?

8. A piece of glass has a Lambert's Law absorption coefficient of  $0.5 \text{ cm}^{-1}$  for all wavelengths of light. Calculate the percent of a beam of white light that is absorbed in passing through one centimeter of this glass.

9. In general, as the density of a liquid increases, does the index of refraction increase or decrease?

10. Most liquids expand on heating. As the temperature of a liquid increases, would you expect its index of refraction to increase or decrease?