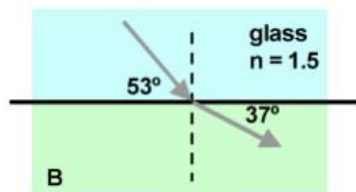
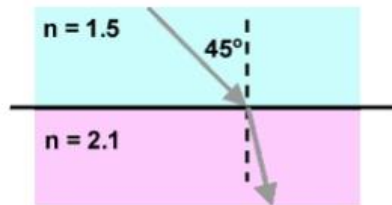


HW 8

- Find the energy of (a) a photon having a frequency of 5.00×10^{17} Hz and (b) a photon having a wavelength of 3.00×10^2 nm. Express your answers in units of electron volts, noting that $1 \text{ eV} = 1.60 \times 10^{-19} \text{ J}$.
- Calculate the refracted index for medium B



- Calculate the refracted angle.



- A ray of light in air strikes a block of quartz at an angle of incidence of 30° . The angle of refraction is 20° . What is the index of refraction of the quartz?
- The wavelength of red helium–neon laser light in air is 632.8 nm. (a) What is its frequency? (b) What is its wavelength in glass that has an index of refraction of 1.50? (c) What is its speed in the glass?
- Figure P35.8 shows a refracted light beam in linseed oil making an angle of $\phi = 20.0^\circ$ with the normal line NN' . The index of refraction of linseed oil is 1.48. Determine the angles (a) θ and (b) θ' .

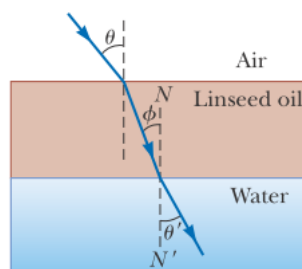
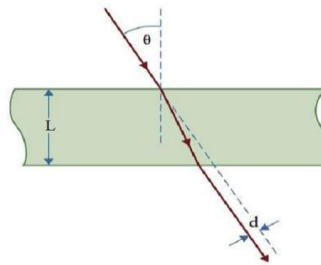


Figure P35.8

7. A ray of light strikes a flat block of glass ($n = 1.50$) of thickness 2.00 cm at an angle of 30.0° with the normal. Trace the light beam through the glass and find the angles of incidence and refraction at each surface. Calculate the lateral shift of the light ray d



8. For 589-nm light, calculate the critical angle for the following materials surrounded by air: (a) cubic zirconia, $n = 2.20$, (b) flint glass, $n = 1.66$ and (c) ice, $n = 1.309$.