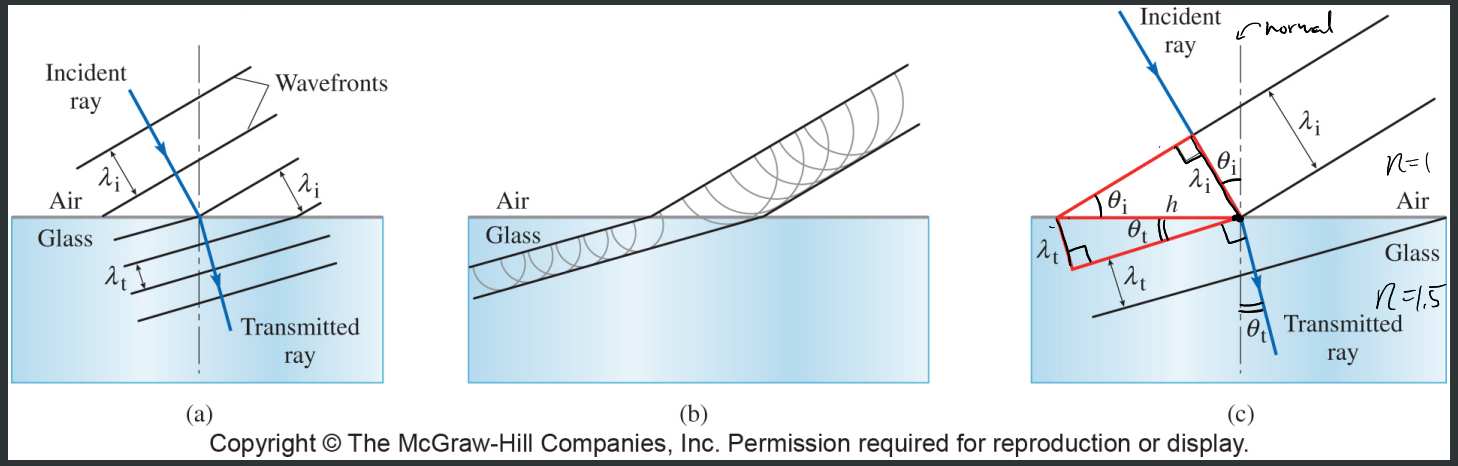
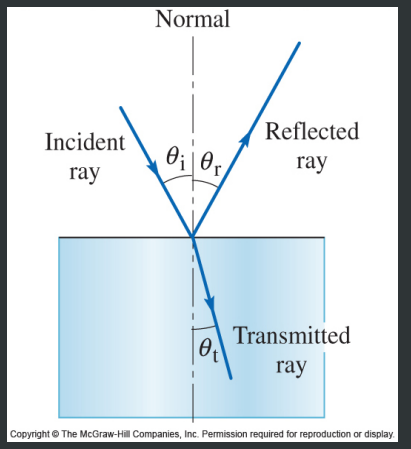
After this you can:

- discuss the principle of light refraction (① reflects ② transmitted into the material, but its path changes)
- discuss the use of Snell's Law to show the path change of light
- discuss image formation with lenses





$$\frac{c}{n} = V = \lambda \cdot f$$

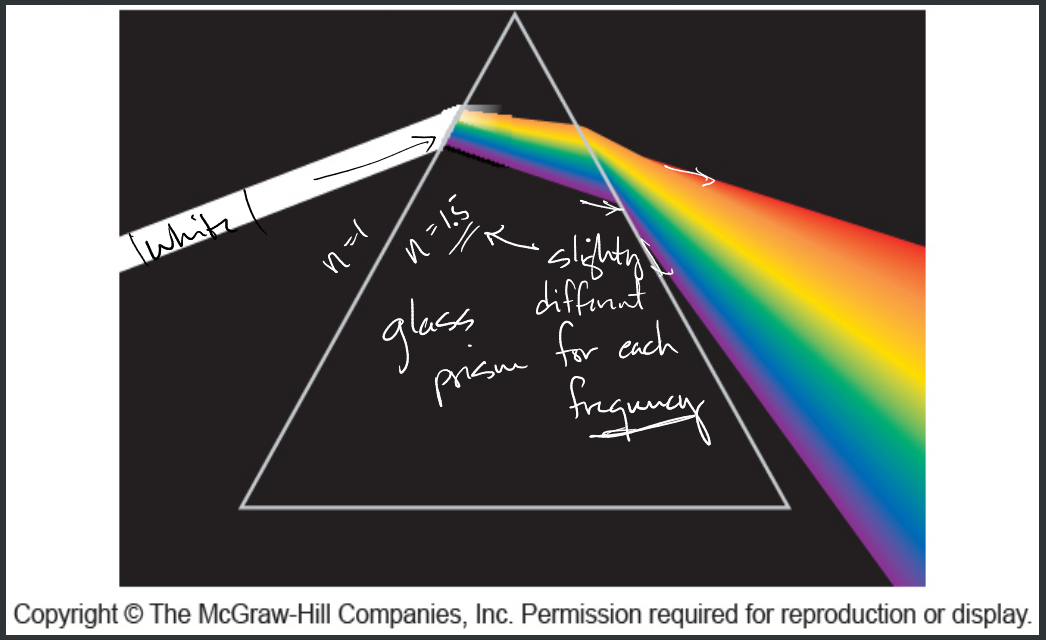
$$\frac{c}{n} = \lambda \cdot f$$

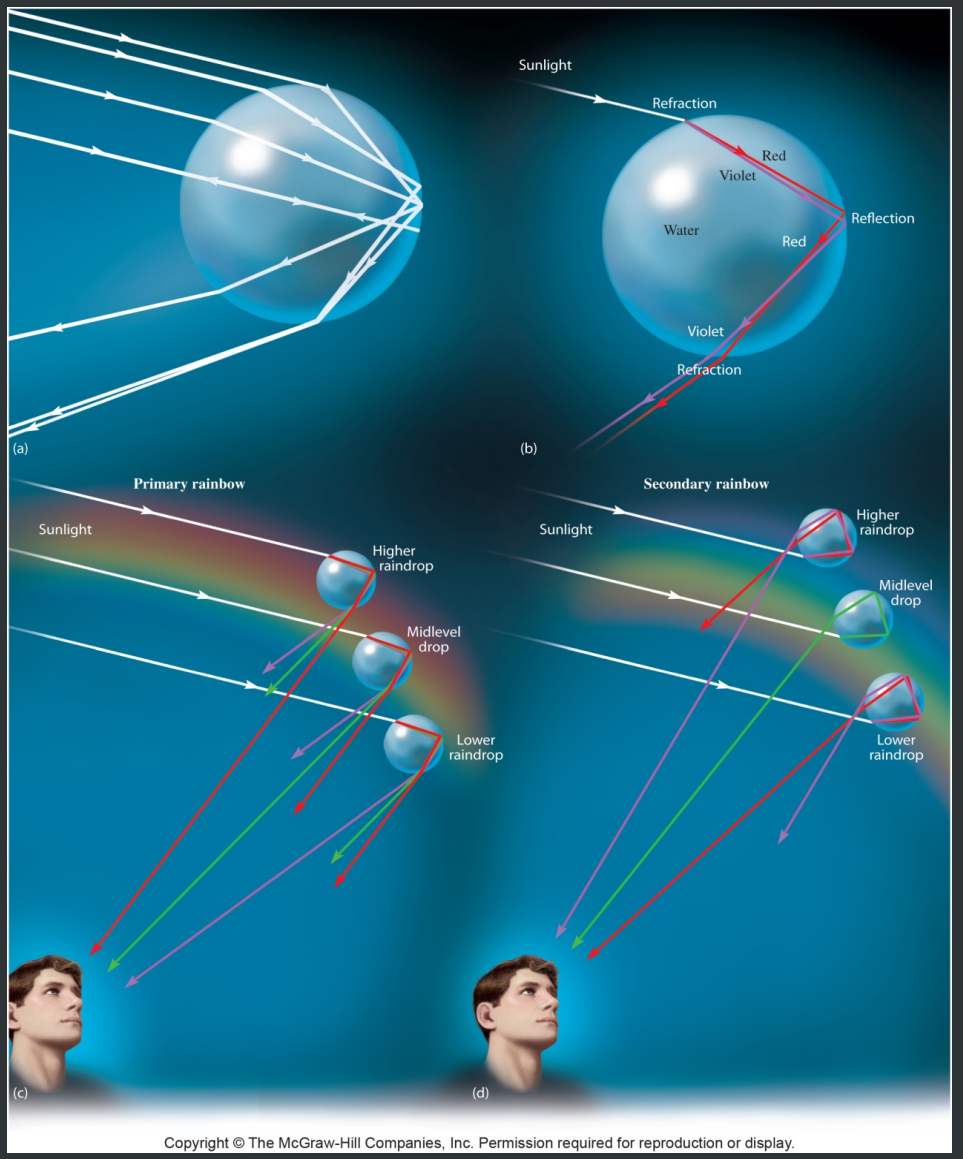
$$\frac{\lambda_t}{\lambda_i} = \frac{n_i}{n_t} = \frac{\sin(\theta_t)}{\sin(\theta_i)}$$

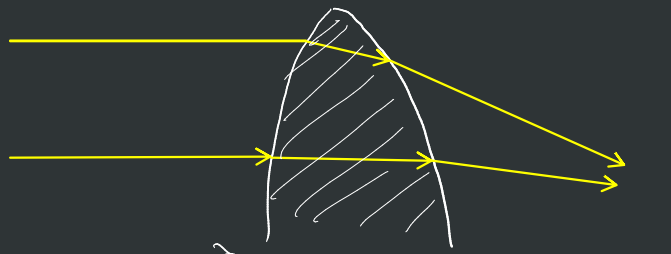
$$n_i \sin(\theta_i) = n_t \sin(\theta_t)$$

$$n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$$

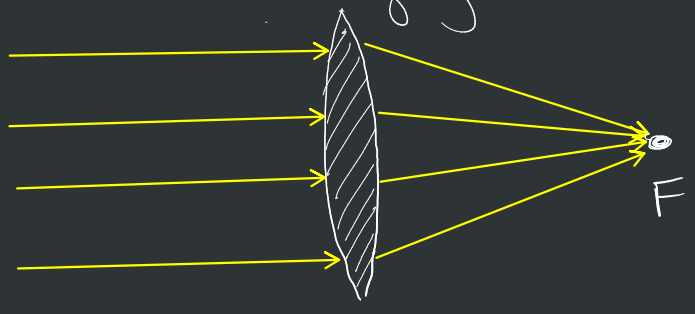
Snell's Law





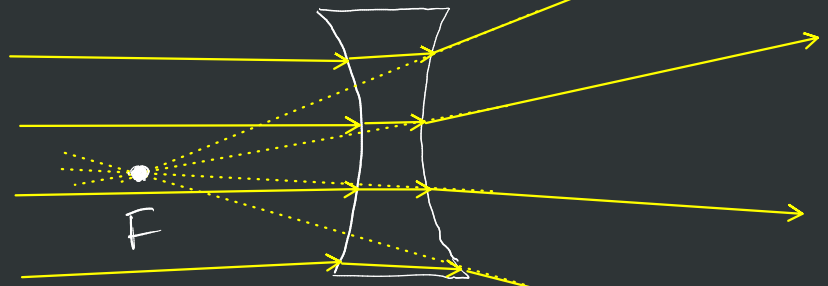


Converging lens



$f > 0$

Diverging



$f < 0$

D D O I I

$$\frac{1}{f} = \frac{n_2 - n_1}{n_1}\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

Lens Makers Equation

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$$ } thin lens equation

$$m = \frac{h'}{h} = -\frac{q}{p}$$ } magnification equations

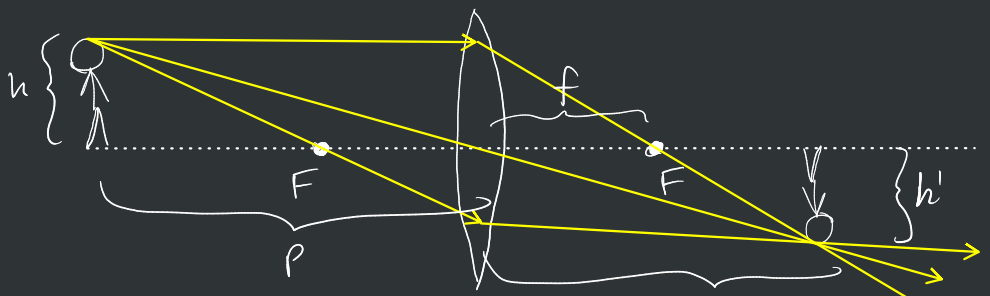


Table 23.3 Principal Rays and Principal Focal Points for Thin Lenses

Principal Ray/Focal Point	Converging Lens	Diverging Lens
Ray 1. An incident ray parallel to the principal axis	Passes through the principal focal point	Appears to come from the principal focal point
Ray 2. A ray incident at the optical center	Passes straight through the lens	Passes straight through the lens
Ray 3. A ray that *emerges* parallel to the principal axis	Appears to come from the secondary focal point	Appears to have been heading for the secondary focal point
Location of the principal focal point	Past the lens	Before the lens