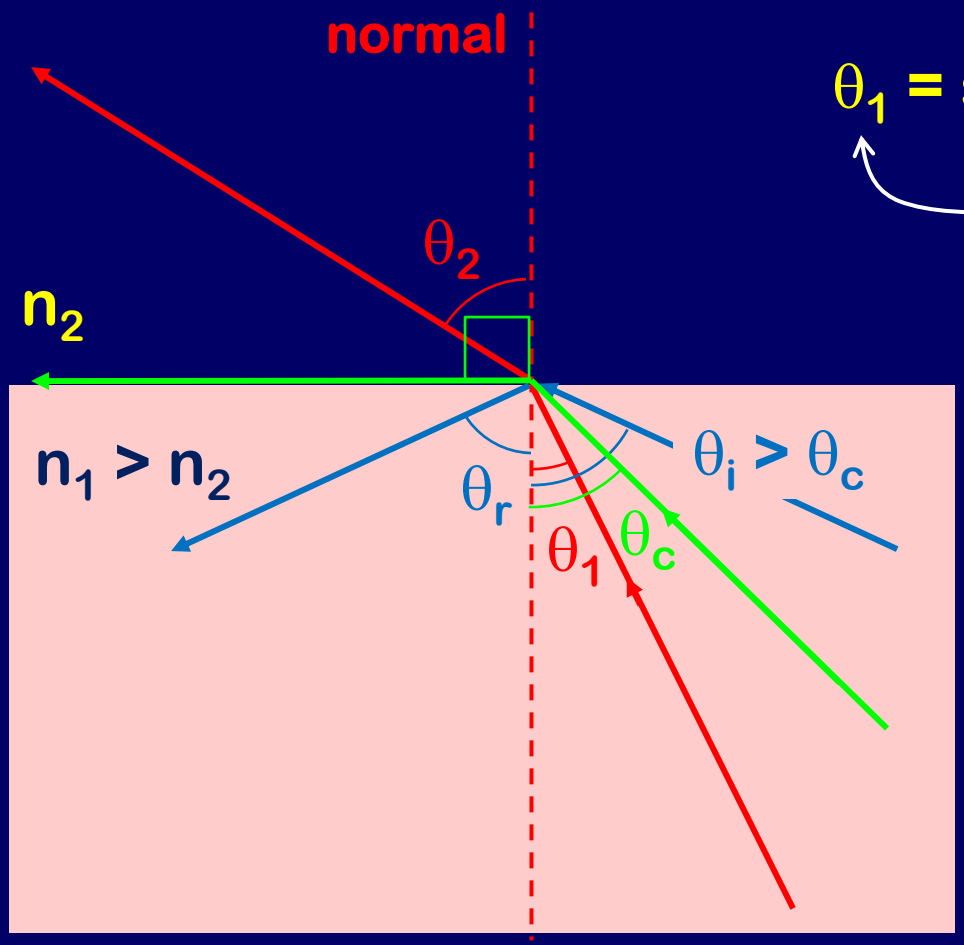
1) Total Internal Reflection

Snell's Law: $n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$

$(n_1 > n_2 \Rightarrow \theta_2 > \theta_1)$



$\theta_1 = \sin^{-1}(n_2/n_1)$ then $\theta_2 = 90$

"critical angle"

Light incident at a larger angle will only have reflection ($\theta_i = \theta_r$)

For water/air:
n_1=1.33, n_2=1
$\theta_1 = \sin^{-1}(n_2/n_1)$
$= 48.8^0$