# Refractive Index Lab

Shine a laser beam into a tank of water donated by SPIE. Measure the angle of incidence (entrance) from perpendicular to the water surface. Measure the angle of refraction (below the surface) from perpendicular to the water surface. Snell's Law states that $n_i (\sin(\theta_i)) = n_r (\sin(\theta_r))$. $\theta_i$ is the angle of incidence, the angle at which the light hits the interface with another medium (off perpendicular). The $n_i$ refers to the refractive index of the medium through which light passes before it reaches the transition to another medium, (air in this case). $n = \frac{c}{v}$, where c is the speed of light in a vacuum, and v is the speed of light in the medium. The speed of light in air is very close to the speed of light in a vacuum, so we can use the approximation that the refractive index of air ($n_i$) is 1. $\theta_r$ is the angle (off perpendicular) after changing mediums. We can measure the angles and calculate the refractive index of water($n_r$ in this case). Then we can look up the refractive index of water in a book or online, and see if Snell's law was useful for us.

Write-up criteria: (in word, and correct spelling and grammar errors), then e-mail as an attachment to sshumway@sanjuanschools.org)

**Required elements of write-up**.

Comparison of refractive index of water calculated from angle measurements to published refractive index of water

Explanation of Procedures

Calculation of refractive index of water