

Today	Ch 26 Geometric Optics: Rarefaction 1 <sup>st</sup> ½ HW21Redo, HW23
Wednesday	Ch 26 Geometric Optics: Rarefaction 2 <sup>nd</sup> ½ HW22Redo, HW24
Lab	7 Geometric Optics

## Chapter 26 The Refraction of Light: Lenses and Optical Instruments

### Introduction

#### 26.1 The Index of Refraction & speed of light

#### 26.2 Snell's Law

- What repercussion does this have for light's transmission?
  - Water refraction
    - Snell's Law
      - Indices of Refraction.

**Example 1:** You're playing the dive-for-the-brick-game in a friend's pool. The brick is tossed out into the deep end. Laying on your raft it looks like you should aim for 50° below straight down. Given that the refractive index of air is  $\sim 1$ , and that of water is about  $1 \frac{1}{3}$ , at what angle should you *really* aim?

- Apparent Depth
- Offset through a thick window

**Example 2 / Classwork:** In lab, you traced a light beam through a piece of Plexiglas. If the angle of incidence was 30° and the angle of transmission was 19°, then what was the speed of light in the Plexiglas?

#### 26.3 Total Internal Reflection

**Example 3:** For what angle of incidence would light cease to transmit from glass into air, i.e., what is this interface's *critical angle*?

### HW 24

3. The frequency of a light wave is the same when the light travels in ethyl alcohol as it is when it travels in carbon disulfide. Find the ratio of the wavelength of the light in ethyl alcohol to that in carbon disulfide.

10. A ray of light traveling in material A strikes the interface between materials A and B at an angle of incidence of 72°. The angle of refraction is 56°. Find the ratio  $n_A/n_B$  of the refractive indices of the two materials.

24. What is the critical angle for light emerging from carbon disulfide into air?