

Online PhET Lab - Refraction of Light

I. Introduction

In this activity you will be investigating how light is bent at the boundary between two materials and what determines the amount of bending. You will be using one of the simulations from PhET Interactive Simulations. The simulation is called **Bending Light** ([https://phet.colorado.edu/simulations/](https://phet.colorado.edu/simulations/https://phet.colorado.edu/simulations/)). This is the link for the simulation: [https://phet.colorado.edu/simulations/](https://phet.colorado.edu/simulations/https://phet.colorado.edu/simulations/). For this activity you will use the **More Tools** window. Keep the wavelength of the light at 500 nm.

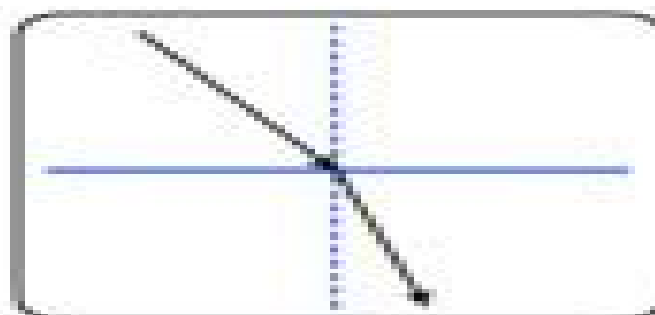


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Vocabulary: incident ray, refracted ray, angle of incidence, angle of refraction, angle of reflection, index of refraction, critical angle, total (internal) reflection, intensity

1.) The diagram below shows the path of a ray of light as it travels through air, across the air-water boundary, and through the water. Before using the simulation label the following items on the diagram:

- a) the air-water boundary with an **R**.
- b) the normal line with an **N**.
- c) the incident ray with an **I**.
- d) the refracted ray with an **R**.
- e) the angle of incidence with an **α** .
- f) the angle of refraction with an **β** .



II. Refraction, The Bending of Light

Refraction is the bending of light as it passes, at an angle, from a material with one index of refraction to a material with a different index of refraction. In the following investigations you will be exploring the factors that affect the refraction of light.

Investigation No. 1

Set the indices of refraction so that they are the same for both materials. Measure the angle of refraction for the following angles of incidence. Enter your chosen indices of refraction below.

Index of refraction top material:

Index of refraction bottom material:

angle of incidence (α)	0°	30°	45°	60°	90°
angle of refraction (β)					

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