

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 (HTML5). This is the link for the simulation: <https://phet.colorado.edu/simulations/bending-light>. For this activity you will use the Mouse Tools window. Keep the wavelengths of the light at 500 nm.

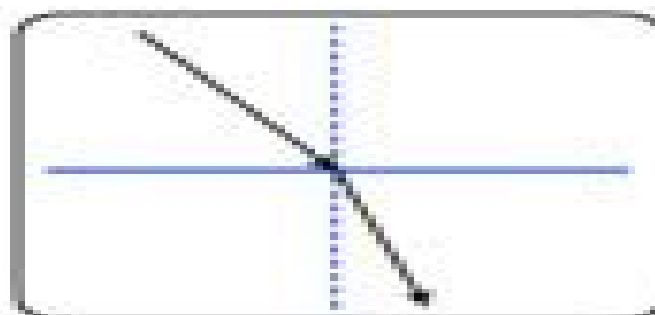


Mouse Tools

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 a **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)					

Phet Refraction Simulation Answer Key

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Table of Contents Phet Refraction Simulation Answer Key

1. Understanding the eBook Phet Refraction Simulation Answer Key
 - The Rise of Digital Reading Phet Refraction Simulation Answer Key
 - Advantages of eBooks Over Traditional Books
2. Identifying Phet Refraction Simulation Answer Key
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Phet Refraction Simulation Answer Key
 - User-Friendly Interface
4. Exploring eBook Recommendations from Phet Refraction Simulation Answer Key
 - Personalized Recommendations
 - Phet Refraction Simulation Answer Key User Reviews and Ratings
 - Phet Refraction Simulation Answer Key and Bestseller Lists
5. Accessing Phet Refraction Simulation Answer Key Free and Paid eBooks

- Phet Refraction Simulation Answer Key Public Domain eBooks
 - Phet Refraction Simulation Answer Key eBook Subscription Services
 - Phet Refraction Simulation Answer Key Budget-Friendly Options
6. Navigating Phet Refraction Simulation Answer Key eBook Formats
- ePub, PDF, MOBI, and More
 - Phet Refraction Simulation Answer Key Compatibility with Devices
 - Phet Refraction Simulation Answer Key Enhanced eBook Features
7. Enhancing Your Reading Experience
- Adjustable Fonts and Text Sizes of Phet Refraction Simulation Answer Key
 - Highlighting and Note-Taking Phet Refraction Simulation Answer Key
 - Interactive Elements Phet Refraction Simulation Answer Key
8. Staying Engaged with Phet Refraction Simulation Answer Key
- Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Phet Refraction Simulation Answer Key
9. Balancing eBooks and Physical Books Phet Refraction Simulation Answer Key
- Benefits of a Digital Library
 - Creating a Diverse Reading Collection Phet Refraction Simulation Answer Key
10. Overcoming Reading Challenges
- Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Phet Refraction Simulation Answer Key
- Setting Reading Goals Phet Refraction Simulation Answer Key
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Phet Refraction Simulation Answer Key
- Fact-Checking eBook Content of Phet Refraction Simulation Answer Key
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development

- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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