Lenses & Optics Simulator

Download/Run from: **http:/phet.colorado.edu/en/simulation/bending-light**

Explore the PhET.

* Note the protractor, intensity tool, and normal line toggle.
* Note that you can change the index of refraction for both materials to air, glass, water, and custom settings.

1. Use the PhET sim to verify Snell’s Law. Use the following table (Choose any angles/n values you’d like) to verify Snell’s Law for 5 different values of n1, n2, θ1, & θ2.

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| --- | --- | --- | --- | --- | --- |
| n1 | n2 | Θ1 | Θ2 | n1sinθ1 | n2sinθ2 |
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2. Is there a trend between the density of a material and n?   
  
  
  
  
3. Is the angle of reflection altered by changing n?

4. What conclusions can you make about mystery substances A&B?

5. Calculate n for A & B. Using Google, what might these substances be?   
  
  
  
  
6. How can you identify an unknown substance using the index of refraction? Describe the procedures you would use.   
  
  
  
  
  
7. Use the intensity tool. How does changing n affect the intensity of the refracted and reflected light?

**Switch to the Prism Break tab on the top of the PhET**

Play around with various prisms and answer the following questions:

8. Is the reflection and refraction of light color-dependent? How can you tell?

9. Which shapes split white light into different colors the best? Is there a particular set-up that you found that demonstrates this well? Draw it below.

10. Given that white light can be split into colors, try to make a situation where light forms a rainbow. What shape did you use to do this? Draw it below.

11. Can you make a double rainbow? Draw it below.   
  
  
  
  
  
  
  
12. Can you separate different colors of light? Draw it below.