

Questions for Refractive Index and Wet Pants

Directions: After reading refractive index and wet pants answer the following questions. Remember to include part of the question in your answer.

1. What is refraction? (refracted)
2. What determines how much the light bends as it passes between objects?
3. How do you calculate the refractive index? (What is the formula)
4. What does a higher refractive index number mean?



Refractive Index

Using the data table on the second page of the reading answer the following questions.

5. In which of the transparent materials does light travel the slowest?
6. Why did you pick the answer you did?
7. Which of the transparent materials does light travel the quickest?
8. Why did you choose the answer you did?

Use the formula $c/n = \text{refractive index}$. c stands for speed in a vacuum and n is the speed in the transparent material.

Optical fibers are generally composed of silica. The speed of light through silica in a vacuum is 432,000 m/s, and the speed of light in the silica is 300,000m/s.

9. What is the refractive index of the material? (SHOW YOUR WORK)
10. Is silica refracting light faster or slower than water? (Hint use the table in the reading)

Birdbrains and fishy physics

11. Light passing from a material with a lower refractive index to one with a higher refractive index bends towards or away from the normal?
12. Using your knowledge of Silica (question 9 &10) if light traveled from air through Silica how would the light refract.
13. What evidence do we have that birds, like the great blue heron, understand refraction?

Extension: Go back to your lab station.

Procedures:

- a) Make sure your beaker is filled $\frac{3}{4}$ the way with water.
- b) Put a pencil in the water.
- c) Look from the bottom of the beaker up through the top.
- d) What do you notice (just discuss with your group)
- e) Remove the pencil and put in the
- f) Again look from the bottom of the beaker up through the top.

14. Write why did the object appear closer?