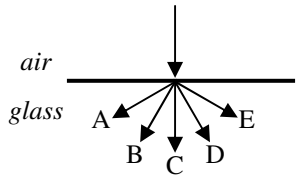
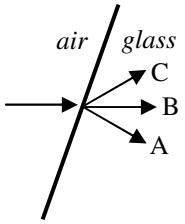
A-day: Due Tues., Mar 11 (Assigned Fri., Mar 10)
B-day: Due Wed., Mar 12 (Assigned Mon., Mar 7)

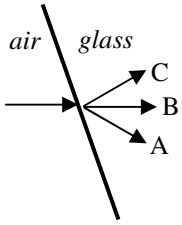
2008 Light 5

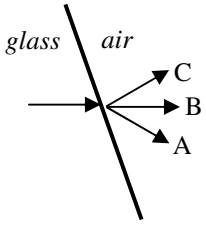
1. In which material is light faster: air or glass?
   Why?

2. For the following situations decide which way the light ray will refract.







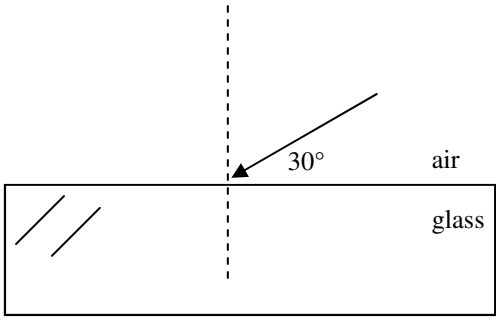


3. Why does light refract (*and be specific as for angles)*?

4. Find the speed of light in ice. (*Show ALL work.)*
   Variables: Equation: Solve:

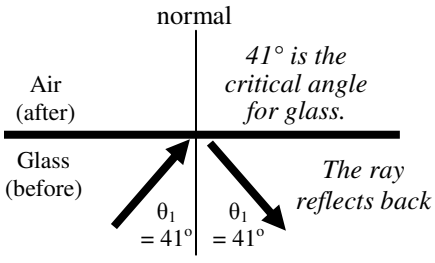
5. For substance A, n = 2.45; substance B n = 1.65.
   A. Which one is denser?
   B. In which substance will light have the fastest velocity?

6. Use the diagram at the right to answer the following questions.
   A. Which is the first substance light is traveling in?
   B. For Snell's Law ($n_1 \sin\theta_1 = n_2 \sin\theta_2$), n_1 is air or glass?
   C. If all angles must be from the normal, what is θ_1?
   D. Draw what will happen to the light in the glass AND after it passes all the way thru the glass.
   D. Find the angle of refraction in glass.
   Variables: Equation: Solve:

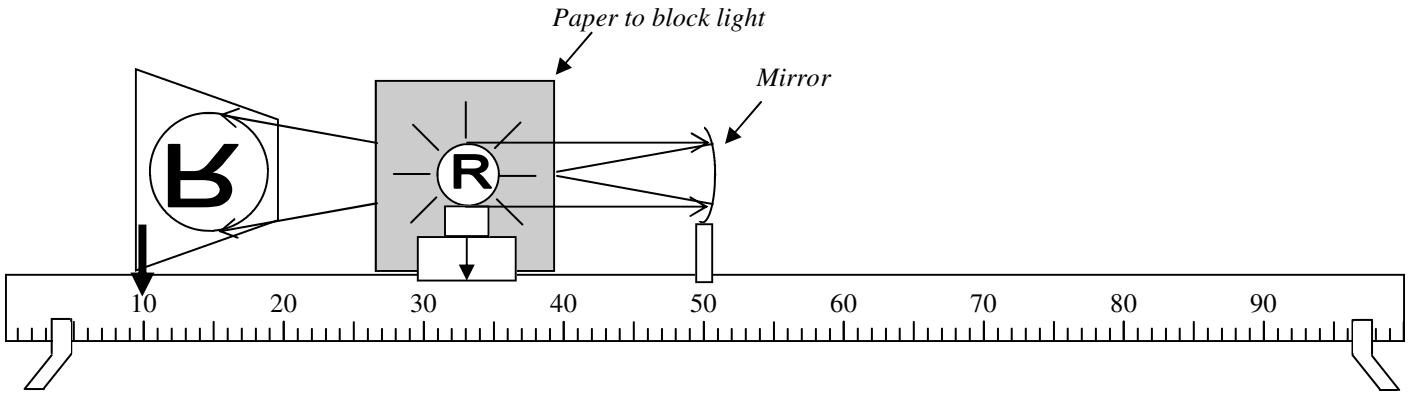


7. 41° is the critical angle for glass (see diagram).
   A. At 40°, will light reflect or refract from glass to air?
   B. At 42°, will light reflect or refract from glass to air?

8. Find the critical angle of light crossing from diamond and air.
   Variables: Equation: Solve:



9. What is the critical angle from air to ice? (*Use the index of refraction table on the notes.)*



10. The diagram above shows the image made from a concave mirror. The dark paper is to block the light from the light source so it isn't faded. The light is at 33 cm; the paper with the inverted R is at 10 cm.
    A. Is it a real or virtual image?
    B. Is h' positive or negative?
    C. Is the mirror convergent or divergent?
    D. Is the focal length positive or negative?
    E. Which side of the mirror is real: left or right?
    F. Since the image is on the left, is q positive or negative?
    G. Calculate the focal length of the mirror.

    H. If the light bulb is 3.5 cm tall, how tall is the image?

To simplify: all real images are always inverted and ALWAYS on the real side of a device.

11. Positive or negative?

A. _____The left side of a mirror.
B. _____The left side of a lens.
C. _____p for a mirror.
D. _____f for a concave mirror.
E. _____f for a convex lens.
F. _____q for a real image.
G. _____p for a virtual image.
H. ____ q if the image is inverted.
I. ____ h if the image is real.
J. ____ h' if the image is upright.
K. ____ M for a real image.
L. ____ M if the image is on the left side of a lens.