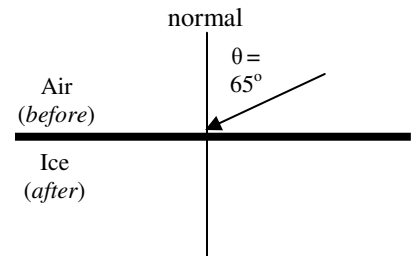


2009 Light 4

- How many seconds are there in a minute?
 - How many seconds are there in an hour?
 - What is the speed of light?
 - So, how far can light travel in an hour?
- What is a real image?
- Turns out that all real images are i _____.

From the "Refraction" notes:

- What is the index of refraction for ice?
- In which substance does light travel faster: a diamond or glass?
- Substance A has an index of refraction of 1.25. Substance B has an index of refraction of 1.64. In which substance does light travel slower?
- Calculate the speed of light in ice (follow the example).
- Light is traveling at an angle of 65° in air before it refracts into a block of ice. Following the example, use Snell's Law to find the angle that the light have inside the ice.



- The diagram at the right is from the index of refraction lab we did in class. I have provided a protractor for those of you that do not have one. The different light rays are numbered.

- Which light ray is the incident ray?
- What is the angle of incidence?
- Which ray is the reflected ray?
- What is the angle of reflection?
- How do these angles compare?

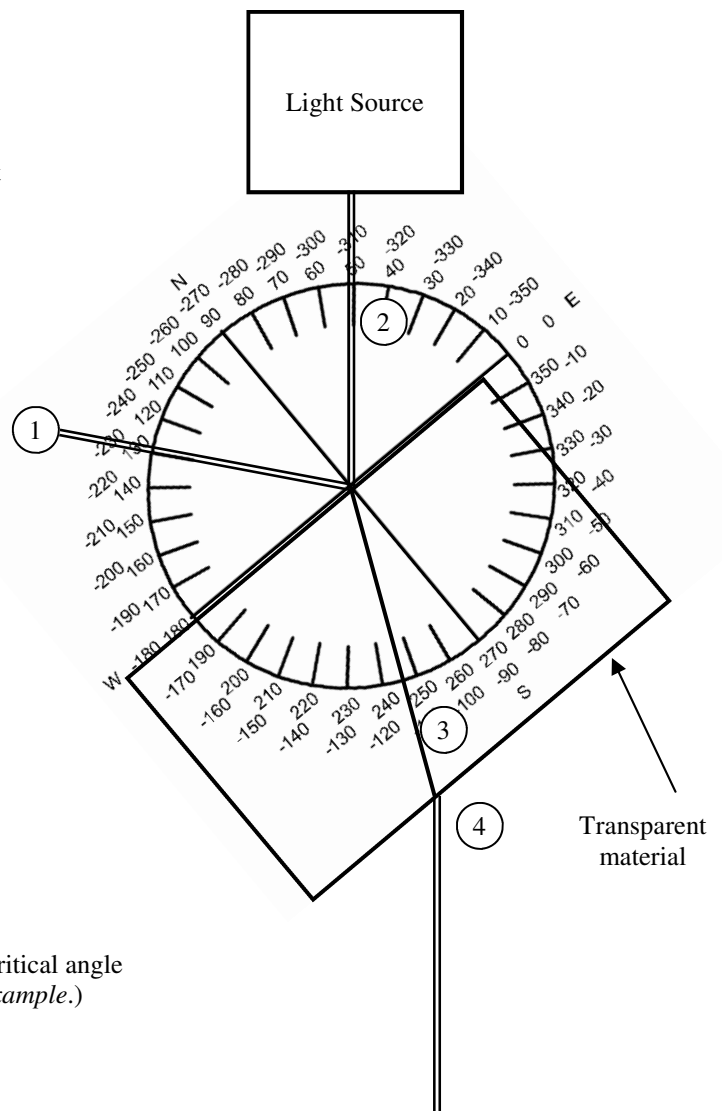
(This is ALWAYS the case. This is known as the "Law of Reflection".)

- Which ray is the ray that refracts inside the block?
- For Snell's Law, what is θ_1 ?
- What is θ_2 ?
- What is n_1 ?
- Calculate the index of refraction for this material.

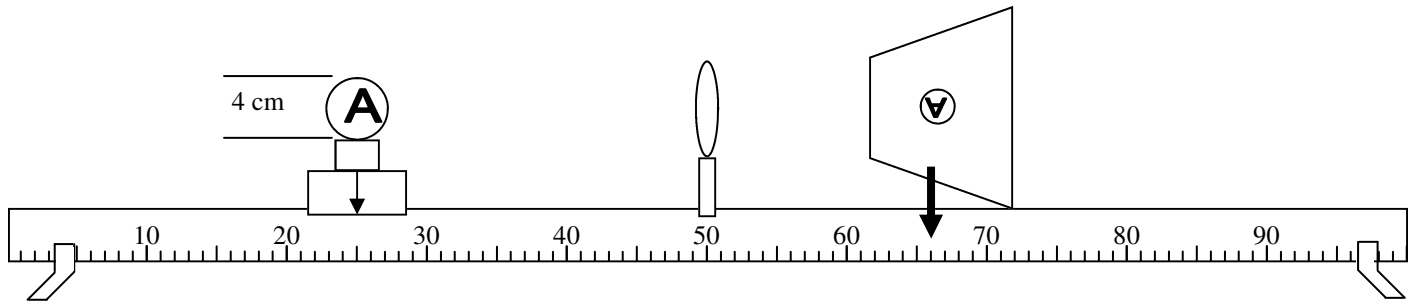
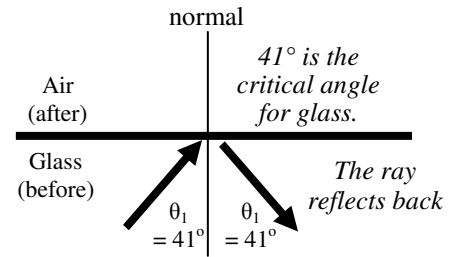
- Using the table of indexes of refractions, what material is this?

From the "Critical Angle" section of the "Refraction Notes":

- Somhow a diamond is frozen in a block of ice. What is the critical angle for light passing from the diamond into the ice? (Follow the example.)



11. A. Is there a critical angle when water passes from air to water?
 B. Why or why not?
12. 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?



Use the “Lens Equation” Notes to answer the following:

13. Use the above diagram to answer the following questions.
 A. p is the distance from the lens to the object. $p =$
 B. q is the distance from the lens to the image. $q =$
 C. Calculate the focal length of the lens.

 D. Calculate the magnification of the lens.

 E. h is the height of the object. $h =$
 F. Calculate the height of the image.
14. Which side of a lens is real?
15. Which side of a mirror is real?
16. + or – (read the notes carefully. The information is throughout the notes). (*Study Help*)
 A. ____ f for a virtual focal point. I. ____ q for a real image.
 B. ____ f for a real focal point. J. ____ h for any object.
 C. ____ f for a convergent device. K. ____ h' if the image is upright.
 D. ____ f for a convex mirror. L. ____ h' if the image is inverted.
 E. ____ p (object distance) M. ____ h' for a real image.
 F. ____ q if the image is on the virtual side. N. ____ M if the image is upright.
 G. ____ q if the image is on the real side. O. ____ M if the image is virtual.
 H. ____ q if the image is on the right side of a lens. P. ____ M if the image is inverted.
17. Two organisms are most closely related when they are in the same:
 A. Class B. Kingdom C. Order D. Phylum

TAKS, next page

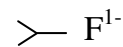
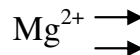
Electron Arrows

Electron arrows are an easy way to visualize electrons being given or accepted by atoms.

The Symbols

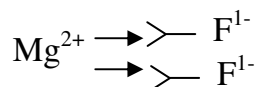
- Losing 1 electron
 > Gaining 1 electron
 →> An ionic bond

The number of electron arrows comes from the oxidation numbers. Positives give electrons; negatives receive.

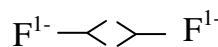


Magnesium's oxidation number is +2, so it will lose 2 electrons.

Sulfur's oxidation number is -1, so it will gain 1 electron.



Balanced ionic compound:
MgF₂



Balanced covalent compound:
F₂

Two kinds of bonds: Ionic bonds—between ions of a metal and a nonmetal. Electrons are actually given and received.
 Covalent bonds—between nonmetals. Electrons are shared, but not given. Not as strong.

18. For each of the following draw them with electron arrows, give the formula, and tell whether covalent or ionic.

A. Sodium and oxygen

B. Oxygen and Chlorine

B. Calcium and Iodine

Formula:
Type:

Formula:
Type:

Formula:
Type: