A-day: Due Tues., Mar 10
B-day: Due Wed., Mar 11

2009 Light 5

Name: _____

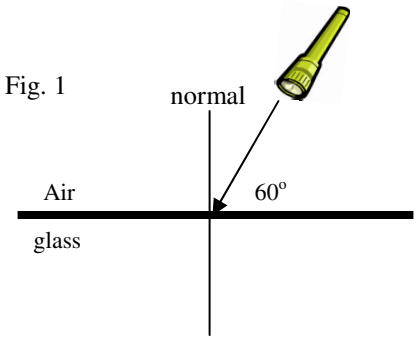


Fig. 1

From the "Refraction" notes:

1. Snell's Law: $n_1\sin\theta_1 = n_2\sin\theta_2$ the 1's stand for the first substance (where the light is coming from) and the 2's are the second substance.
   A. What is substance 1 for figure 1?
   B. What is substance 2 for figure 1?
   C. What is substance 1 for figure 2?

2. The n's are the i_____ of r_____ for each substance. (*Use the table on the notes for the values for n.)*
   A. What is n_1 for figure 1?
   B. What is n_2 for figure 1?
   C. What is n_1 for figure 2?

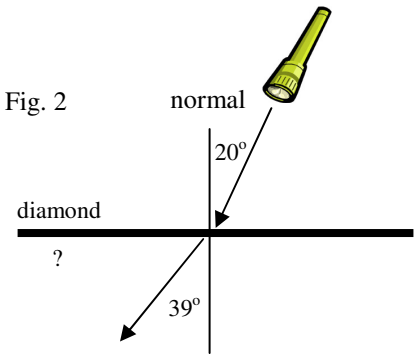
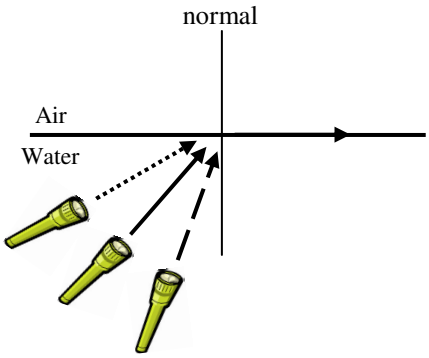


Fig. 2

3. θ is the angle that light is traveling in the substance, measured from the normal, which is an imaginary light perpendicular to the substance.
   A. What is θ_1 for figure 1?
   B. Use Snell's Law to calculate θ_2 for figure 1? (*Check example on notes for math help.)*
   C. What is θ_1 for figure 2? D. What is is θ_2 for figure 2?
   E. Calculate the index of refraction for substance 2 in figure 2.



4. Likewise, when using the critical angle formula, the 1's refer to substance 1 (where the light starts). Calculate the critical angle of light passing from glass to water.

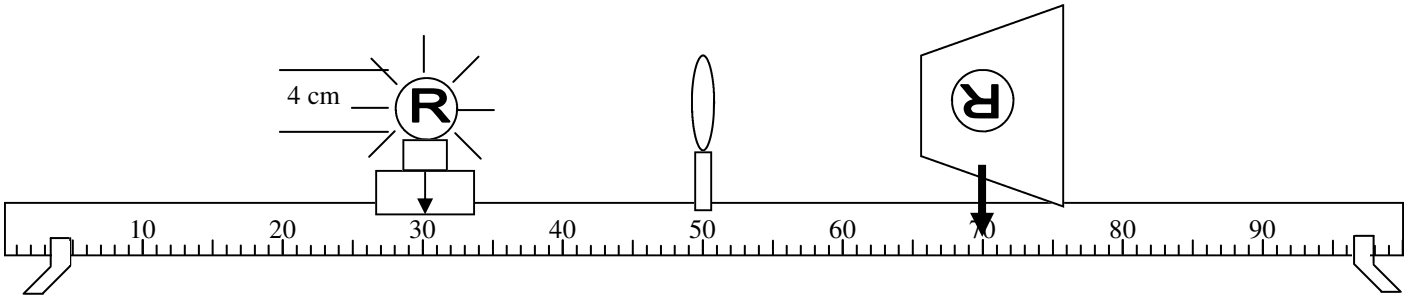
5. In figure 3, there are three lines: solid; dashed; dotted. The solid line is the critical angle for light passing from water to air. Remember that all angles must be measured from the normal, not the surface.
   A. Which line shows an angle greater than θ_C?
   B. Which line shows an angle less than θ_C?
   C. Which line will refract?
   D. Which line will reflect back?
   E. Calculate the critical angle for this boundary.

Turn to the "Lens Equation" notes:

6. Give the correct variables for the following:

   A. _____Distance to the image.
   B. _____Height of the object.
   C. _____Magnification.
   D. ____ Distance to the object.
   E. ____ Height of the image.

7. + or −? (*These are right on the notes—no excuses.)*
   A. _____p for an upright image?
   B. _____q if the image is real?
   C. _____q if the image is virtual?
   D. _____h for a virtual image?
   E. ____ h for a real image?
   F. ____ M for a real image?
   G. ____ h' for a real image?
   H. ____ h' for a virtual image?



8. Use the diagram above to answer the following:
   A. p = B. q = C. h =
   D. Calculate the focal length for this lens. (*The notes show how to do the math.)*

   Notice that if the object is at a point twice the focal length from the lens, the image is too. This point (distance) is known as the radius of curvature "C". C always = 2f.
   E. Calculate the magnification of the lens.

   F. Calculate the size of the image.

9. When mRNA is turned into tRNA, this is called:
10. When DNA is turned into mRNA in the nucleus, this is called:
11. The three nitrogen base code that tells the r_____ which a_____ a_____ to make is called a:
12. When DNA is replicated and a mistake occurs, we call this a:
13. Using the chart, what amino acid comes from ACC?
14. A) If P is purple and p is white, which is dominant?
    B) Given the following punnet square, how many different phenotypes are there?

    C) How many different genotypes are there?

	P	*P*
P	*PP*	*PP*
p	*Pp*	*Pp*

    D) How likely is it that there will be a pea plant with white flowers?

15. Since plants make their own food thru _____, are they autotrophs or heterotrophs?

Codon Chart

Second Position

First Position (5′)	U	C	A	G	Third Position (3′)
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

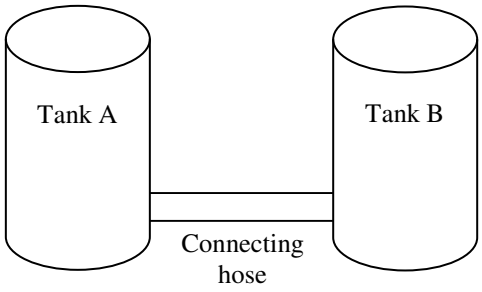
$^{5'}$AGAUCGAGU$^{3'}$ → $^{5'}$A<u>C</u>AUCGAGU$^{3'}$

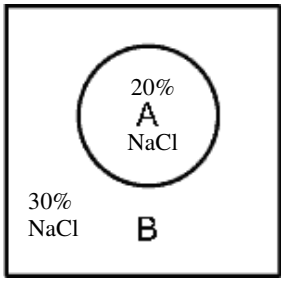
TAKS, next page

16. Which kingdom?
    A) Flat worms?
    B) Ferns?
    C) A bacteria that lives in extreme environments.
    D) Made up of decomposers (heterotrophs), like mushrooms.

17. If Tank A is full of water and Tank B is empty, which way does the water flow?

18. If Tank A has a pressure of 20 pascals and Tank B has a pressure of 55 pascals, which way does air flow?





19. A) In which region is there more table salt (by percent)?
    B) In which region is there more water (by percent)?
    C) If there is a semi-permeable membrane around A than allows only water to flow, does water flow from A to B or from B to A?
    D) Over time, does A swell (get bigger) or shrink (get smaller)?
    E) This flow of water is known as:

    F) If the salt were moving, it would be known as d_____.