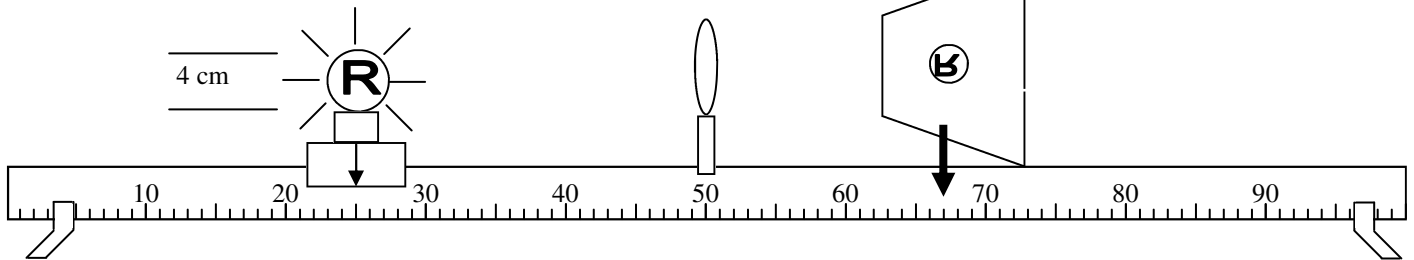
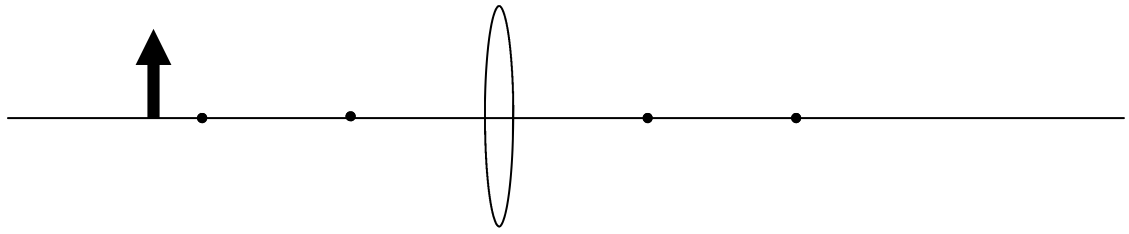
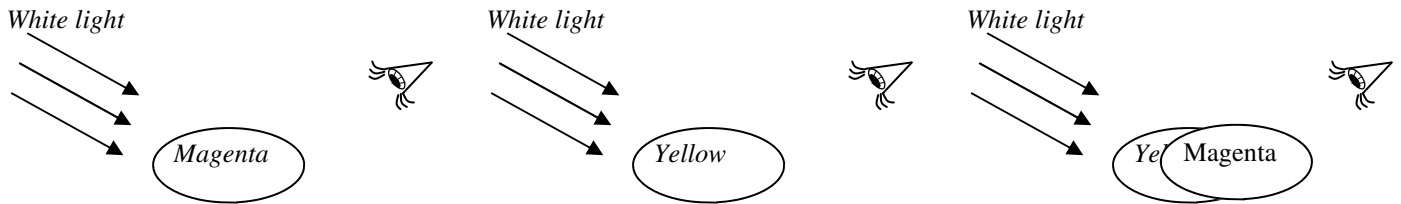


2009-10 Light 8

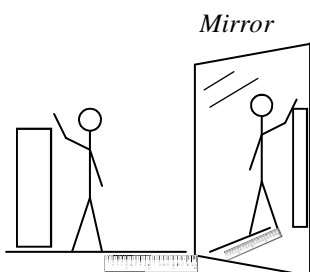
1. Draw the ray diagram at the right.



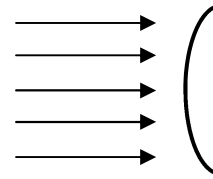
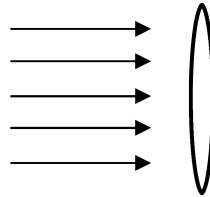
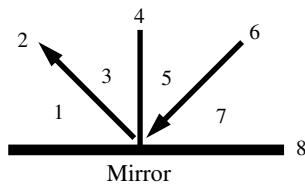
2. Label p , q , h , and h' on the diagram above.
- B. Is the image real or virtual?
 C. Is the image magnified or reduced?
 D. Will the value of (the number for) M be + or -?
 E. Is the image on the real or virtual side of the lens?
 F. Calculate the focal length.
- G. What is the radius of curvature for this lens?
 H. Label f and C on the diagram on both sides.
 I. Calculate the magnification.
 J. Calculate the height of the image.
- K. To make the image smaller, which way would you move the object?



3. What three lights make up white light?
4. A. What light is reflected off the magenta (draw it)?
 B. So what color does magenta absorb?
5. A. What color or colors does yellow reflect?
 B. What color does yellow absorb?
6. So, if magenta and yellow paints are mixed,
 A. What two colors are absorbed?
 B. What color is reflected?
7. Given red, green, and blue lights, which ones make yellow?
8. What is the focal point of a lens?

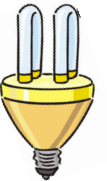
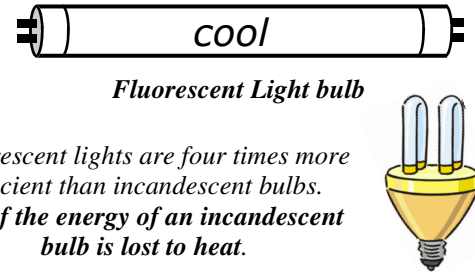
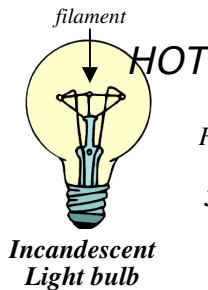


9. Slim Jim is standing in front of a flat mirror and has a meter stick between him and the mirror (he is one meter in front of the mirror).
 A. How far inside the mirror is his image?
 B. How far is Jim from his image?
10. X-rays have these characteristics: 1.5×10^9 Hz and 20 cm long.
 A. What is 1.5×10^9 Hz?
 B. What is 20 cm?
 C. Calculate the speed of the x-rays.



11. From the diagram above:
- The angle of incidence is:
 - The angle of reflection is:
 - The normal is:
 - How do the angle of incidence and the angle of reflection compare?
12. A. Convergent or divergent?
 B. Concave or convex
 C. Mirror or lens?
 D. Draw what happens to the rays.
13. A. Convergent or divergent?
 B. Concave or convex
 C. Mirror or lens?
 D. Draw what happens to the rays.

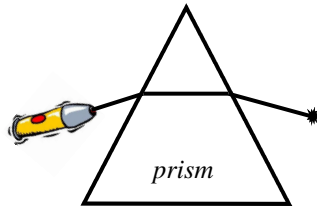
14. A. What kind of light is more efficient: incandescent or fluorescent light?
 B. Why?
 C. If I wanted to use a light bulb to keep me warm. Which type should I choose?



Lasers

LASER – Light Amplification by Stimulated Emission of Radiation

A laser gives off light of only one particular wavelength. Red lasers have a red beam, for example. This comes from forcing a substance (usually a gas) to give off light. This light bounces back and forth between mirrors, causing other atoms to give off more light. When the light is powerful enough it escapes as a laser beam.



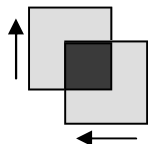
Make sure you reread thru the “Light” and “Color” notes.

Be able to calculate the index of refraction, the angles as light passes into a substance, critical angle, and velocity of light in other substances.

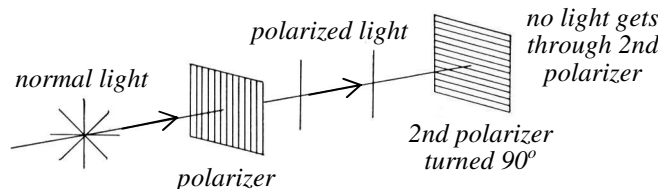
15. What is the speed of radio waves?
 16. What is the speed of x-rays?
 17. How far can radio waves go in 2 minutes?

Polarization

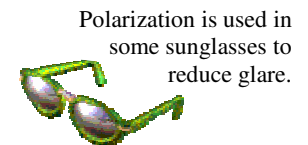
Normal light is chaotic, with transverse waves moving in all directions. A **polarizer** allows only light going one direction to go through (like a comb).



Each polarizer allows light through. Two perpendicular polarizers cancel out all light.



Only light in one direction can get through a polarizer. Two polarizers turned 90° can cancel out all light.



Polarization is how some computers and most calculators screens work..



18. Two polarizers are placed over a happy face at the right. In which situation is one of the polarizers turned 90°?

