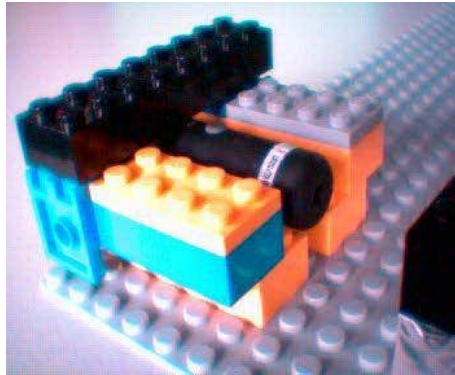
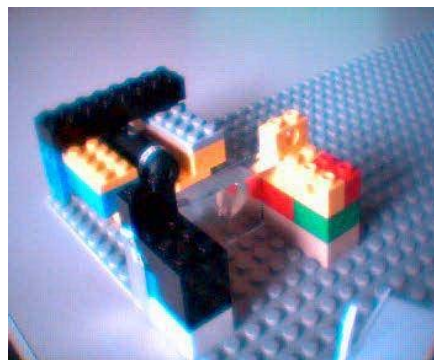
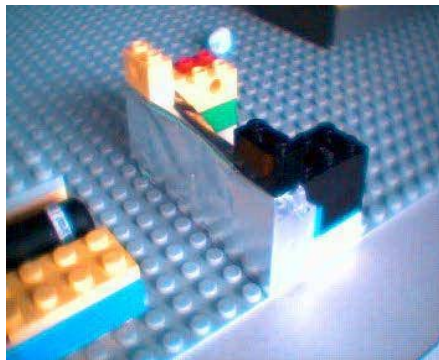


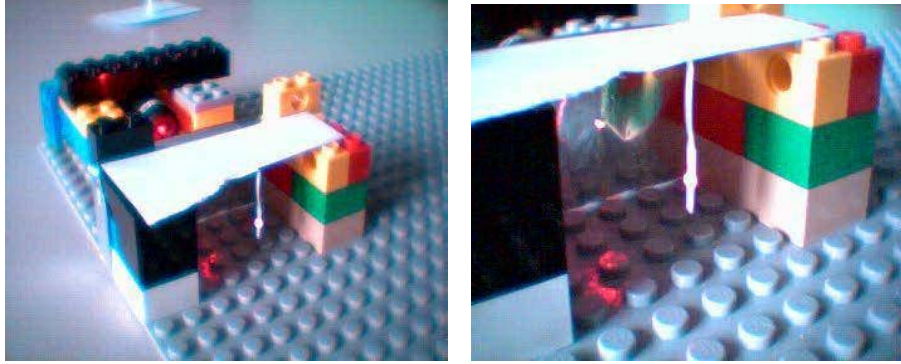
1. Use the same laser stand that you built the last time to secure the laser.



2. Using LEGOs, secure a strip of flattened aluminum foil as shown below. It should be placed about 3cm away from the laser. You can flatten the foil using your finger.



3. Shine the laser and poke a small hole using a pin. The hole should be less than 1mm in diameter.
4. Create a thin strip using plain paper as shown below. The paper should be double folded (I am not sure where the paper is double folded) and you can use water or saliva to secure it (where?). The final thickness of the paper should be about 0.2mm (on which side, do you really have control over the thickness?).
5. Position the slit about 3cm away from the pinhole so that the strip cuts the beam in two parts.



6. Shine the laser at a wall that is far away and position the slit such that the beam is split. You should see a pattern of lines on the wall. Measure the distance from the slit to the wall. Measure the distance between the center band and the first band on the pattern on the wall. Use the equation below to calculate the wavelength of your laser source. If you used the first band, then $n=1$, second band $n=2$, etc.

$$\lambda = \frac{2xd}{nL}$$

x = distance between the bands of light

d = separation of the slits

n = order of maximum to which x was measured

L = distance from slits to the screen

λ = wavelength

7. Repeat the experiment, but this time place a piece of wire in front of the pinhole. Calculate the wavelength again.
8. Remove the aluminum foil pinhole and take a look at the pattern on the wall. How does the pattern change?

Questions to think about:

1. What causes the bright and dark lines to appear on the wall?
2. What was the wavelength of the light source that you got based on your measurement? How does it compare to the actual laser wavelength? What do you think about the level of accuracy with which you estimated the wavelength?
3. How do your two wavelength estimates compare? Are they different or the same? Which one is more accurate? Why?
4. Why does the pattern you see on the wall change when you take the pinhole out?