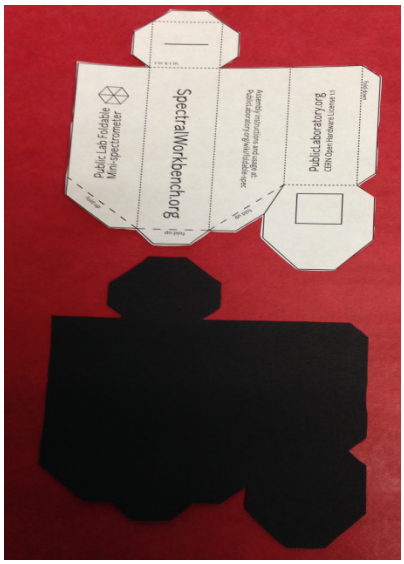
Contemporary Physics

Instructions to make a spectrometer for a cell phone

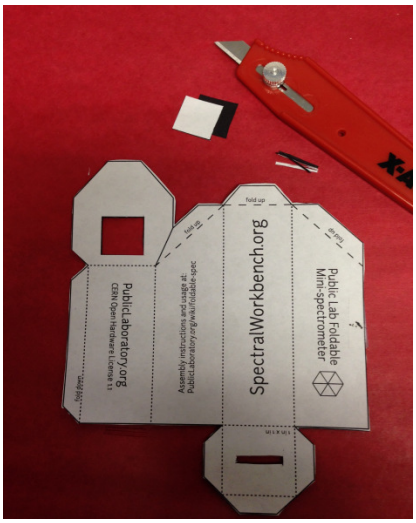
These instructions add some hints to the Public Labs instructions on building a spectrometer that can be attached to a cell phone or to a webcam. The Public Lab document can be obtained at this link.

Common rule: solid lines to cut, long dashed lines for folding up, small dashed lines for folding down.

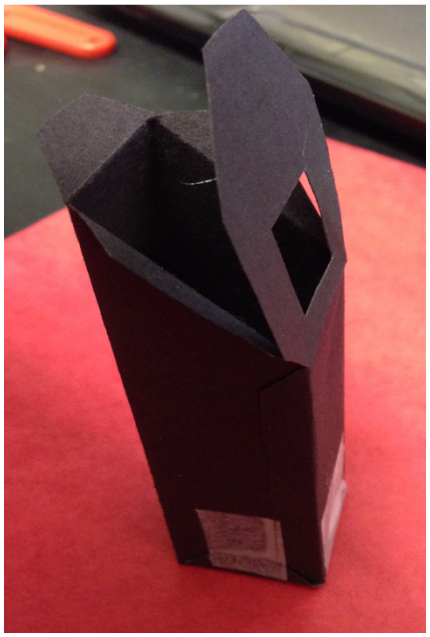
1) Print the spectral workbench pdf document on how to make a spectrometer and tape it to a preferably black color hard paper. Cut the solid edge of the paper.



2) Temporally tape both papers together. With a blade, make the initial slit of size ~ 2mmX15mm. Similarly trace the solid square on the opposite side with the blade. You will get something like this:



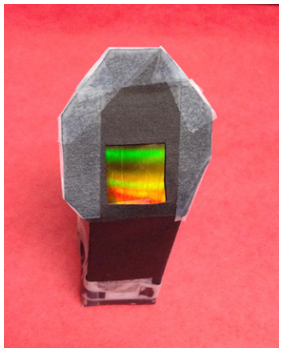
3) Follow the folding rules: long dashed lines folded up, and short dashed lines folded down. Then start to tape the paper to create the body for the spectroscope. Keep the top open so far.



4) The slit is going to be located near the light source. A small light source is needed for the diffraction to work best. Slit is a good idea but you need to modify the slit. Use black tape to create a slit width to be less than 1mm.

5) Now let's create the diffraction grating of the CD/DVD. Cut a quarter of the CD or DVD you are going to use. Peel off the reflective layer. Cut a clean square of this reflective layer and tape it from inside of the spectroscope holder. Be sure that the diffraction grating lines are vertical so that you will see a horizontal spectral rainbow.

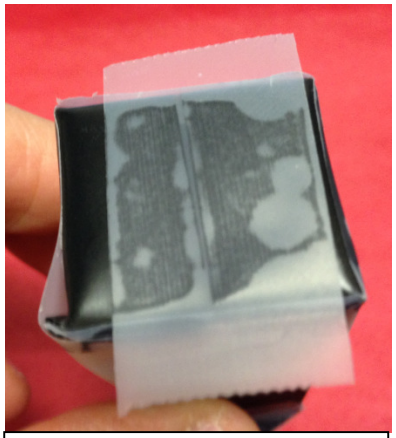
The final product looks like this:



6) Now your spectrometer is ready. Look at different light sources. Please do not look at the sun directly it will burn/ damage your retina. If you want to look at the sun light spectrum find a reflection to look at. You can tape your spectrometer into your cell phone or your computer.

7) Take some photos if you find your photo is saturated just put a semi clear tape to cover the slit. This semi clear tape will work as a diffuser.

Spectral lines of fluorescent light shows saturation.



Semi clear tape used as a diffuser to solve saturation.

Spectral lines of fluorescent light after using the diffuser.