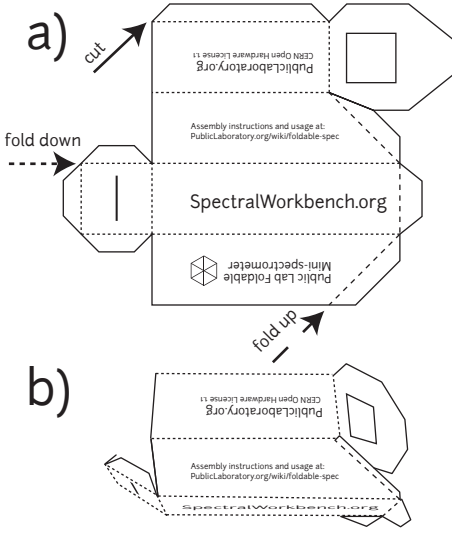


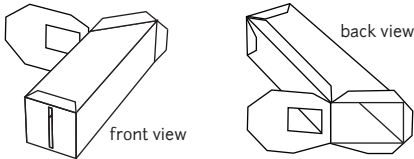
# 1. cut and fold

Cut along the outer edge.

Fold up or down as indicated by the dotted and dashed lines. All labels should stay on the outside.

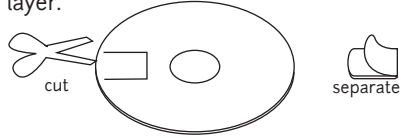


Except for the door for the diffraction grating, tape all flaps down onto the outside.



# 2. make a diffraction grating from a DVD-R

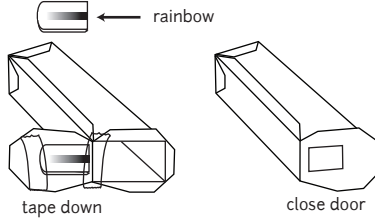
A diffraction grating is a series of close slits that disperses light by frequency. To make one from a DVD-R cut a square from the outer edge. Peel off the reflective layer and use the transparent layer.



An ideal diffraction grating would have perfectly parallel lines that produce a spectral rainbow perpendicular to the grating. A DVD has a curved grating that is not ideal, but very accurate, especially its outer edge.

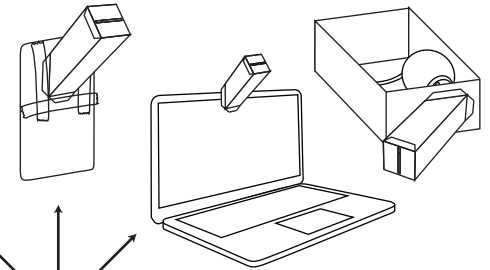


To work as a spectral grating the DVD-R must be placed so that its grating is vertical and its spectral rainbow is horizontal. Tape or glue your piece to the inside of the spectrometer's door, then tape or glue the door closed.

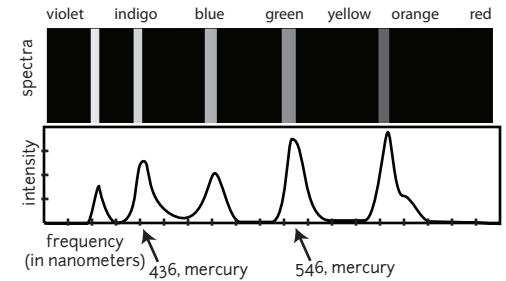


# 3. attach to a phone, webcam, or laptop

The spectrometer can be mounted on a camera phone, laptop, or with the help of a box, attached to a webcam. Line up carefully so that the rainbow is in the middle of the image, and tape down firmly so that the spectrometer stays rigid.

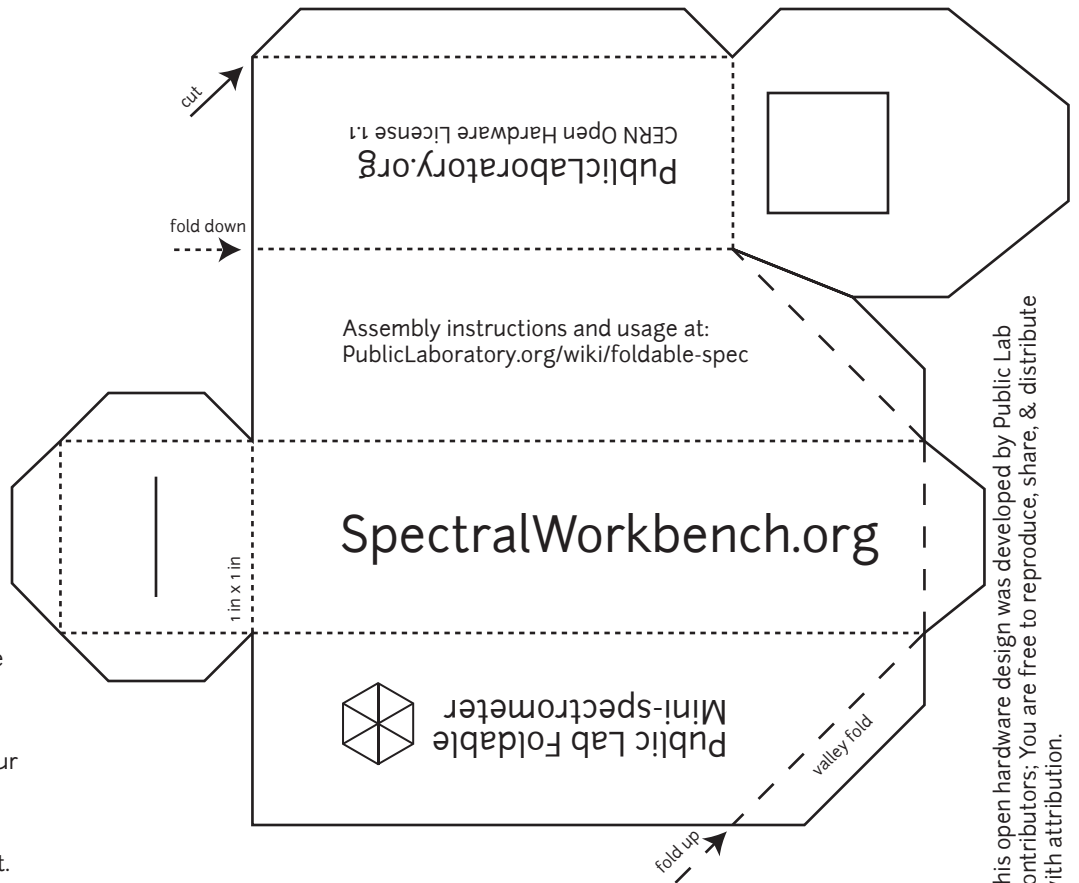


**reading spectra**  
Every element absorbs and reflects light differently, allowing a spectrometer to identify it. Compact fluorescents all contain mercury, visible in the spectrum below. These lines are useful for calibration.



Join up, calibrate, & share spectra go online to [Spectralworkbench.org](http://Spectralworkbench.org) and click "upload spectra" and then the "configure" button. Follow calibration instructions, and you'll be ready to accurately quantify your spectra!

Don't forget to share and publish your research as Research Notes on [Publiclaboratory.org](http://Publiclaboratory.org), and ask questions through the Public Laboratory Spectrometry mailing list.



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