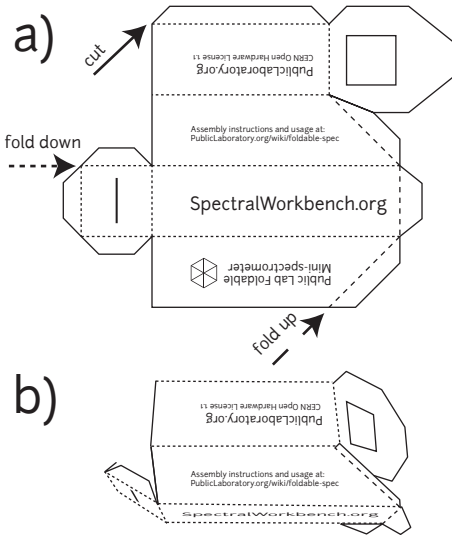
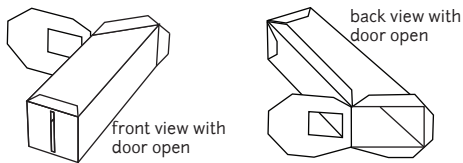


# 1. cut and fold

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 diffraction grating door, glue or tape all flaps down onto the outside.

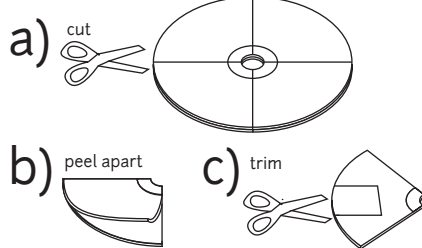


# 2. make a diffraction grating from a DVD-R

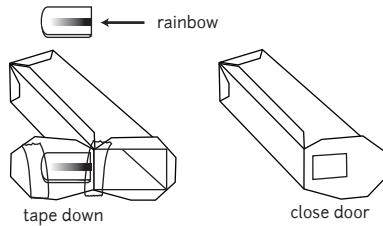
A diffraction grating is a series of close slits that disperse light.



To make one from a DVD-R, split it into quarters, peel off the reflective layer and trim a small clean square out of the transparent layer. Try to pick a clean piece without fingerprints or scratches.

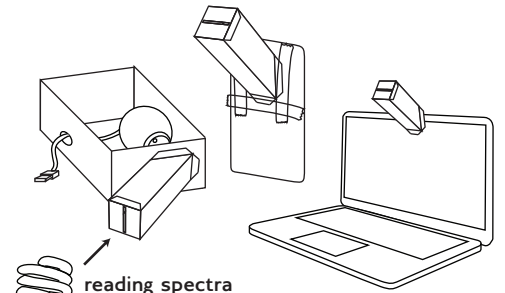


To work as a diffraction grating the DVD-R must be placed so that its grating is vertical, making a horizontal spectral rainbow. Tape your DVD piece to the inside of the spectrometer's door, then tape or glue the door closed.



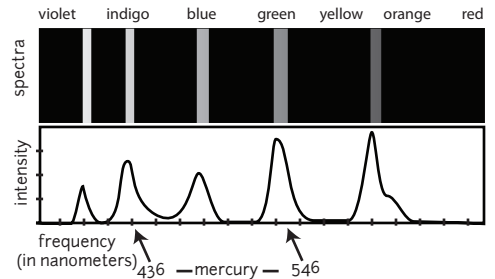
# 3. attach to a webcam, phone, or laptop

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.



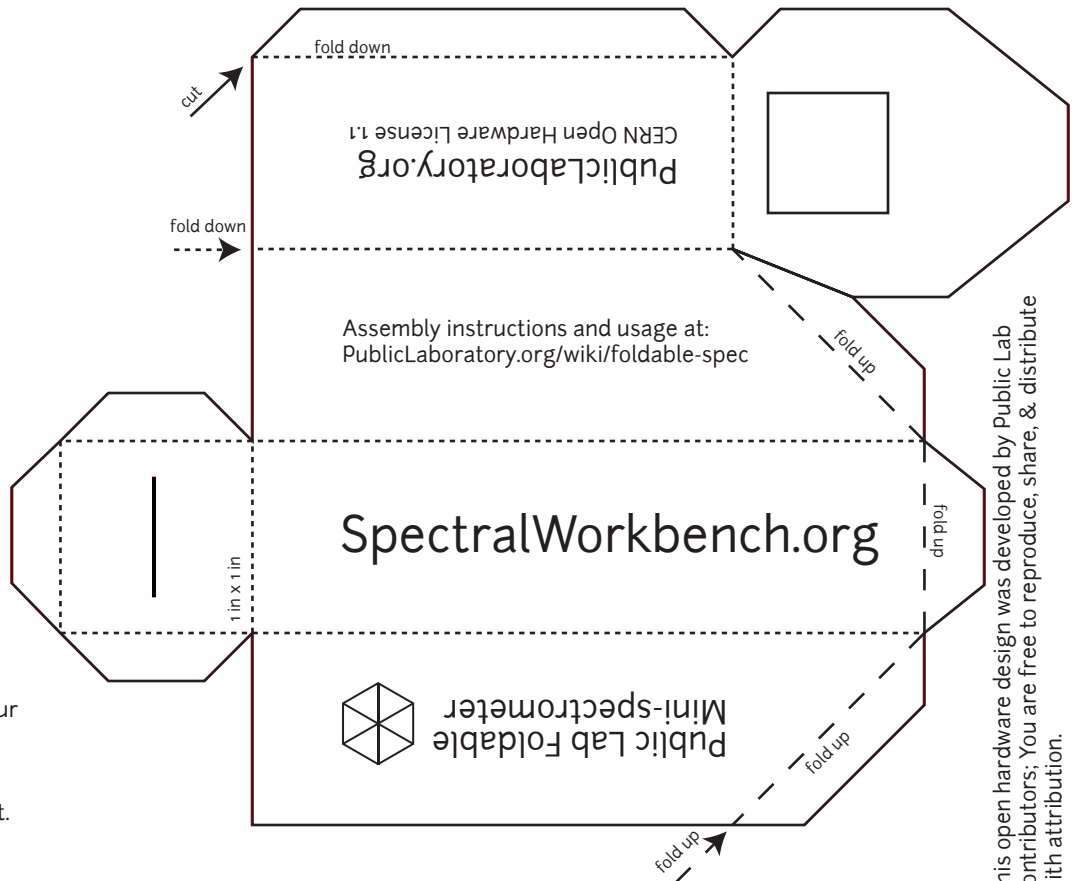
## reading spectra

Every molecule emits only certain frequencies of light, and under the right conditions a spectrometer can detect these as rainbow bands. With two clear bands, the mercury in compact fluorescents makes calibration easy.



Join up, calibrate, & share spectra  
Go online to [Spectralworkbench.org](http://Spectralworkbench.org), follow the calibration instructions, and you'll be ready to upload calibrated 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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