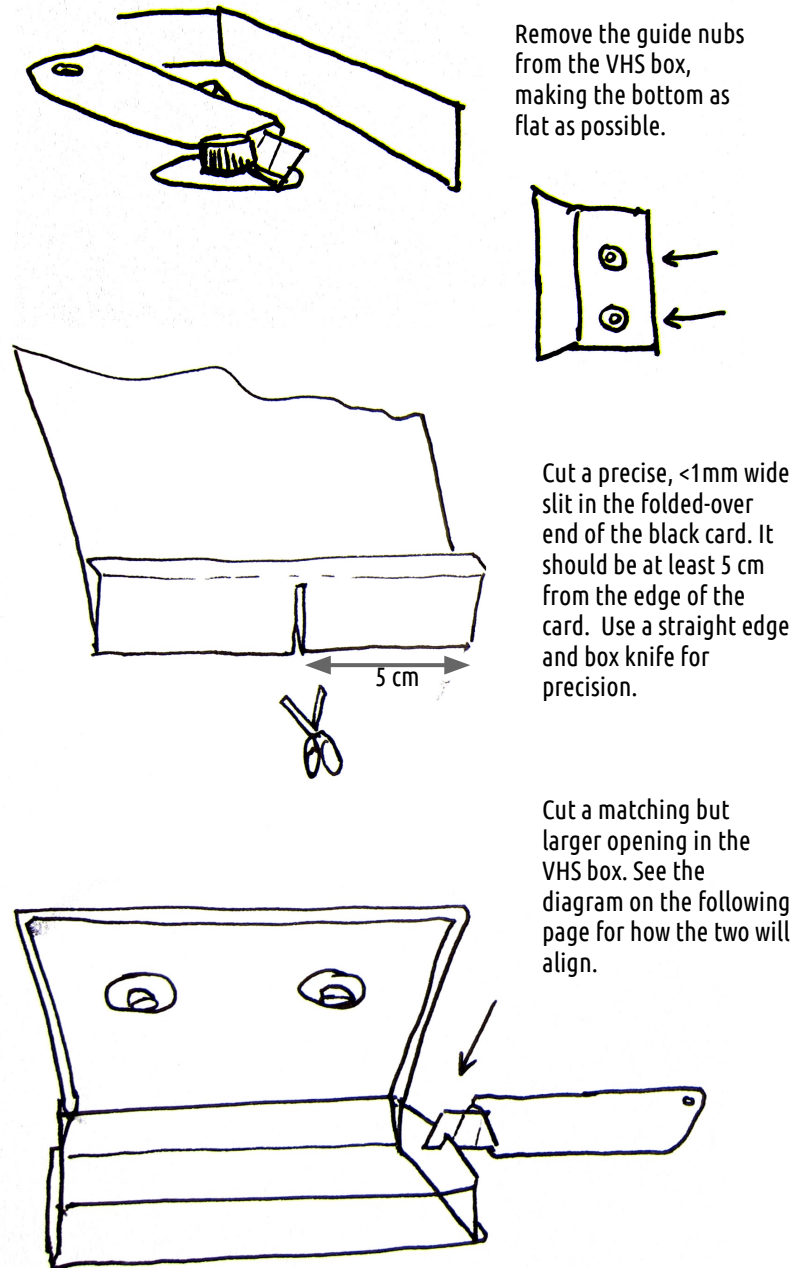
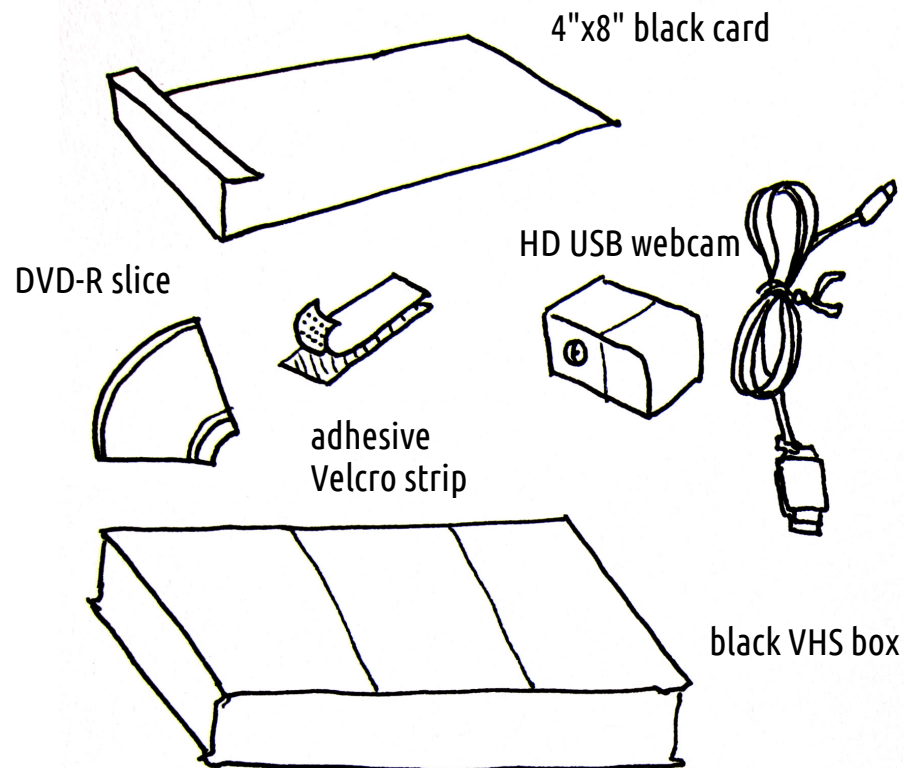


# PLOTS DIY Spectrometer Assembly Guide

v1.0 - <http://publiclaboratory.org/tool/spectrometer>  
Released under the CERN Open Hardware License 1.1

You'll need:



## Prepare the webcam

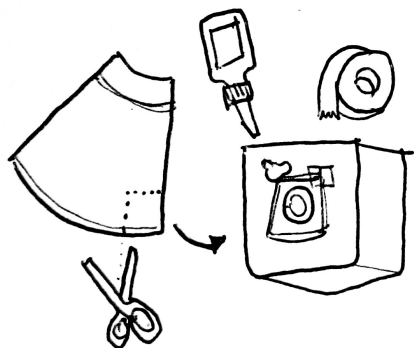
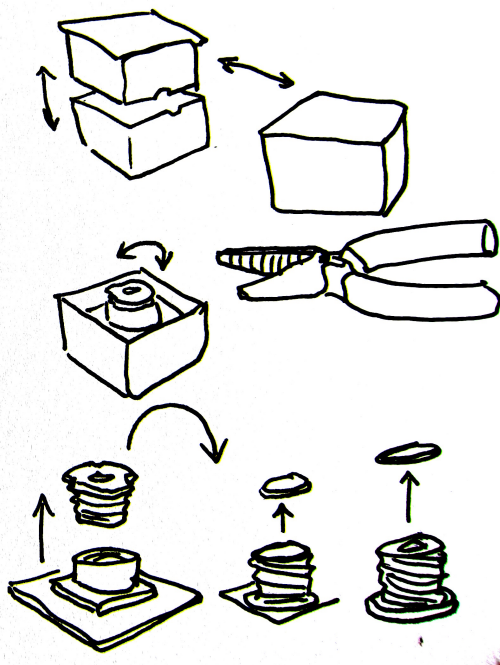
The webcam needs to be opened to remove the infrared-blocking filter and to be refocused. These instructions are for the rectangular webcam which ships with the 2.0 version of the kit, but most webcams' lenses can be unscrewed and their filters removed in a similar way. Read more on the Public Lab website.

Snap off the half of the webcam which has no electronics in it (it's just a clip) and use pliers to gently pry open the half which contains the camera.

Gently unscrew the lens using pliers. Heating it with a hair dryer can loosen the screw.

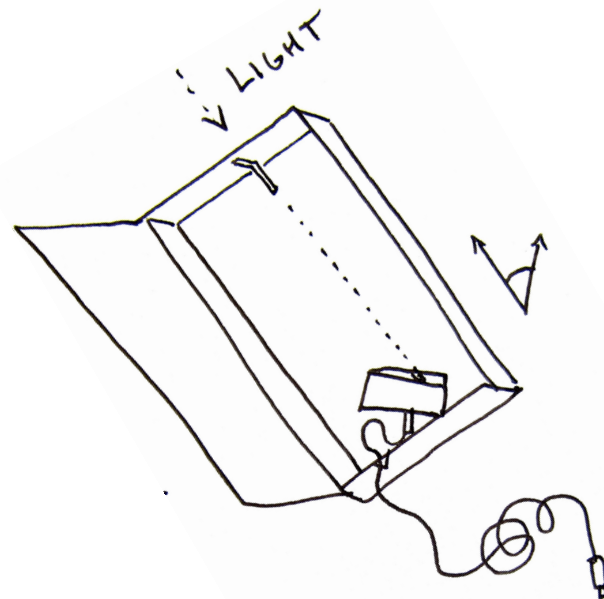
Once removed, use tweezers or a box knife to carefully remove the iridescent filter on the back side of the lens tube. It will look reddish or blueish depending on the light.

Screw the lens back in place and plug in the camera. While looking through the camera on your computer, adjust the focus to about 8 inches away, such that the slit will be in focus when it's on the opposite end of the VHS case (see diagram opposite). Point it at a bar code to make sure the focus is precise.



Cut a small square (~1cm square) of DVD-R close to the outer edge. Glue or tape it over the lens, keeping the track lines oriented vertically when viewed through the webcam -- parallel to the slit. Be careful not to get fingerprints on the DVD-R "diffraction grating" -- it acts as a prism to split the light into different wavelengths.

Superglue can fog the DVD surface, so try hot glue or tape.



## Assemble the spectrometer

Place the webcam opposite the slit such that the lens is in line with where light will enter the box. It should be at roughly a 45 degree angle to the slit, but you may have to adjust this angle once you begin recording spectra.

Cut an extra notch in the box for the USB cable to come out; a knot in the cable, inside the box, will ensure that the camera is not moved if the cable is yanked.

Black gaffer tape may be needed to stop any additional light leaks and reduce reflections, especially along the spine of the box.

Visit <http://spectralworkbench.org> to begin calibrating and recording spectra.