1. Observe the laboratory fluorescent lights with your spectroscope. Hold it so that the source (fluorescent light) is visible through the slit when you look through the grating. When the source and slit are properly aligned you will see a single line or a number of lines, depending on the source, appearing on the graph paper. This is the spectrum of the fluorescent light.

2. This may seem like a silly question, but it's not. What is the actual location of the spectrum? Is it really inside the box? (To answer this, try taking the lid off your spectroscope and observing the graph paper without looking through the grating.)

3. What differences in the spectrum would you see if the spectroscope were made out of a giant pizza box?

4. Now let's change some things. Vary the slit width by unpeeling one of the pieces of tape and repositioning the razor blades. If you make the slit larger or smaller, what happens to the fluorescent light spectrum? Draw a few simple pictures in your lab book to illustrate what you see.

5. Does the slit have to be a long thin *rectangle*?

6. What is the relationship between the distance of the source from the spectroscope and the characteristics of the spectrum?

C. Calibration of the Spectroscope

Each spectroscope will be slightly different from any other, so each instrument must be individually calibrated. The lines of light observed when using the spectroscope are the transmitted beams which are diffracted, or bent, by the grating and then strike your eye. The spectrum is not reflected or projected to the graph paper. Consequently, the spectroscope must be calibrated from at least two *observed* and *known* lines. We will use the mercury lines as the calibration standard. There are four emission lines in the visible spectrum of mercury; their colors and wavelengths (nm) are shown in Table 1. The three lines which you should be able to easily observe when looking at the mercury lamp occur at 435.8 nm (blue), 546.1 nm (green), and 578.0 nm (yellow). A fourth line, which is a little more difficult to observe, occurs at 404.7 nm (violet). If you see only one line at the blue end of the spectrum, it is almost certainly the 435.8 nm blue line. Observation of *at least* two known lines will give the exact position of particular wavelengths on the scale and enables you to find how many nm units correspond to one division on the scale.

Table 1. Known Emission Lines of Mercury

Line Color	Wavelength (nm)
Violet	404.7
Blue	435.8
Green	546.1
Yellow	578.0