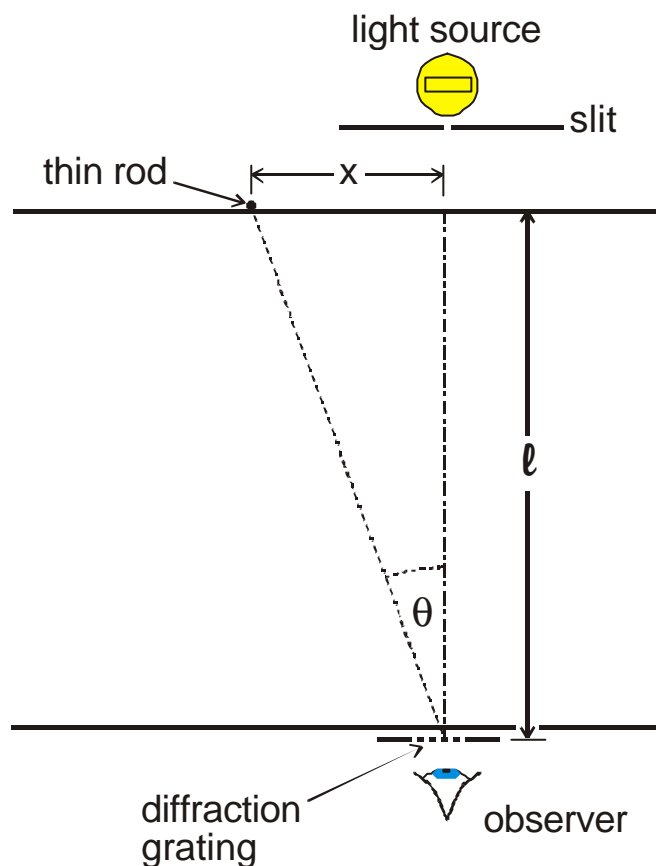


Experiment to estimate the wavelength of the light given by a sodium lamp

1. **Preparation:**
 - a) Read about continuous spectra and line spectra.
 - b) Revise the work about diffraction gratings (especially the equation relating distance between gratings to angular position of diffracted image).
 - c) See part 3 below.
2. Use a diffraction grating as shown in the diagram below.



One person looks through the diffraction grating while the other person places a thin rod so that its position coincides with the observer's view of one of the diffracted images of the slit. Mark the positions of as many images as can be seen. From the diagram it can be seen that the angle to be measured is given by

$$\theta = \tan^{-1}(x / l)$$

3. Calculate the maximum number of diffracted images *theoretically* produced by the diffraction gratings available. When you do the experiment, you will not be able to see as many images as your calculations suggest. Why not?

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