

LAB 3: Diffraction Grating

Objective:

To understand how a diffraction grating scatters light into different orders.

General Safety Guidelines:

Do not point the laser directly into eyes.

Lab Equipment:

Laser pointer, diffraction grating, printed angle protractor.

Procedure:

1. Place the printed protractor sheet on the lab bench and place the wooden block with attached grating at the origin on the sheet. Do not touch the diffraction grating and be sure that it is perfectly flat against the wooden block.
2. Use the laser pointer to point the beam on the grating and measure the angle on sheet of the reflected beam. Measure the diffracted angle when the angle of incidence is 0, 10, 20 degrees. If you can see the diffracted angle for angle of incidence > 20, you can note it as additional reading(s).

Data and Analysis:

Make the following chart

Incoming Angle	Outgoing Angle
0	
10	
20	

Plot Incoming Angle vs Outgoing Angle
Calculate the spacing of the grating

Questions:

1. Explain how a diffraction grating can also be used as a prism.
2. If light is normally incident on a diffraction grating with a spacing of 1um between slits and an outgoing angle of 50 degrees, determine the wavelength of light. If the same beam of light

were incident at an angle of 30 degrees what is the new outgoing angle? (assume order of 1)