Geometrical Optics

Reflection from a Plane Surface

Record the angles of reflection.

Table 1

Angle of Incidence (°)	**Angle of Reflection** (°)
30	
45	
60	

Determine if the mirror image of an object is reversed. Explain your steps.

Concave and Convex Mirrors and Lenses

Complete the table. Remember to include the correct sign with your answer.

Table 2

	Focal Length (cm)
Concave Mirror	
Convex Mirror	
Convex Lens	
Concave Lens	

Reflection/Refraction by Prism

Angle of the Prism

Measure the angle between the two reflected rays.

Determine R.

Directly measure the angle of the prism.

How does your measurement compare to a direct measurement of the angle of the prism?

Index of Refraction of the Prism

Measure the angle of deviation, D.

Find the index of refraction of the prism.

Total Internal Reflection

What is the angle of refraction of the light beam normally incident on the surface from inside the prism as it leaves the prism?

For the rotated prism, measure both the incident angle in the prism and the refracted angle in air.

Are these angles consistent with your earlier measurement of the index of refraction of the prism?

Calculate the index of refraction using the incident and refracted angle you just measured.

Does this value fall within 10% of the index of refraction you calculated for the prism from the angle of deviation.

Find the first angle where there is NO refracted ray of light that leaves the prism.

Is this consistent with Snell's law and the value of the index of refraction that you measured earlier?

Use Snell's law and the value of the index of refraction that you calculated earlier (using the angle of deflection) to calculate what value this angle should be.

Do the two angles fall within 10% of each other?

How does the critical angle depend on the indices of refraction of the two materials?