

Summary of Module 3 Activities

Light Through an Acrylic Block: A Demonstration: 10-15 minutes

Starting with a laser shining at normal incidence to an acrylic block, the teacher will slowly increase the incident angle. The students will observe that the path of the light changes as the incident angle increases.



Three Lasers Converging at a Focal Point : A Demonstration : 15-20 minutes

When parallel light beams encounter an object such as a lens, its shape can cause different light rays to bend by different amounts. Students predict the path of the rays through an acrylic block and through a lens, then determine if they are correct by using a mister or chalk dust to expose the laser beams.

Finding the Focal Length Using a Distant Object: 30-40 minutes

When looking at a brightly colored lamp on one side of the room, students will measure the focal length of a lens by forming an image of the light on a screen and measuring the distance between the lens and the screen.



Simple Magnifiers: 30-40 minutes

In this activity, students will explore the magnifying properties of the lenses and notice the connection between how much the lens is curved and its ability to magnify. The students can also see how a juice bottle filled with water can be used as a magnifier as well.

Build a Refracting Telescope I: 30-40 minutes

This is the first of several activities relating to refracting telescopes. Students will first determine how to arrange two lenses so that when they look through them they will see a magnified image of a distant object.



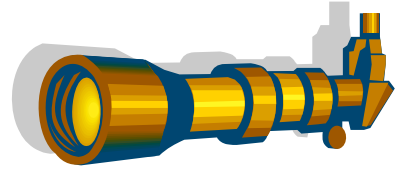
Build a Refracting Telescope II: 30-40 minutes

Using the configuration of lenses that they found previously, students will create a magnified image of a distant object. By placing the velum screen in varying locations, students will determine the function of each lens in a basic refracting telescope.



Build a Refracting Telescope III: 20-30 minutes

The students in groups of two or three will build the refracting telescope from the kit. They will then look through the telescope at distant objects, making notes about their observations.



A Measure of Resolution: 30-40 minutes

Using the telescopes from the previous activity, students will make and graph measurements to compare the telescope's resolution with that of their eye. Additional options include the comparison of the telescope's measured resolution to its theoretical resolution.

Build a Three-Lens Refracting Telescope: An Activity for Student Assessment: 50-60 minutes

What happens to a telescope's image when a third lens is added to the system? Students will find that a third lens creates an upright image and will draw the optical layout of such a system.

A Different Type of Lens: 20-30 minutes

Students will explore the structure and applications of a Fresnel lens. These lenses can be made extremely large, yet lightweight. Students will explore some of the properties of a Fresnel lens.

It's Done with Mirrors.... a Reflection on You! 20-30 minutes

This activity is used as a teaser for modules to come. The teacher will place the brightly colored lamp in the corner of the room. The students are then asked to use the mirror to create an image of the object on the velum screen and to find the mirror's focal length.

