

## Exploring Lenses Lab

### Teacher's Guide

**Topic:**

Refraction and Lenses

**The following information is provided to the student:**

**Question:**

How would you describe the images formed by a converging and a diverging lens for nearby and distant objects?

**Purpose:**

To describe the orientation and relative size of the images produced by a converging and a diverging lens for nearby and distant object locations.

A complete lab write-up includes a Title, a Purpose, a Data section, a Conclusion/Discussion. The Data section should document the observations of relative size and orientation in an organized manner; a table would be a wonderful idea. The Conclusion/Discussion should include an organized paragraph in which you respond to the question raised in the Purpose of the lab.

**Materials Required:**

Converging lens; diverging lens.

**Description of Procedure:**

A converging and a diverging lens are distributed to each student lab group. Students take turns to look through each of the lenses at the images of nearby objects and faraway objects. Attention is given to the relative size and the orientation of the images. Observations are documented in the Data section of their lab notebooks. Students answer the question posed in the Purpose of the lab.

**Alternative Materials and Procedure:**

Alternative materials and procedures are not recommended.

**Safety Concern:**

There is always a higher than usual level of risk associated with working in a science lab. Teachers should be aware of this and take the necessary precautions to insure that the working environment is as safe as possible. Student *horseplay* and off-task behaviors should not be tolerated.

**Suggestions, Precautions, Notes:**

1. This is a short activity providing students a first exposure to the topic of lenses and the characteristics of the images which they produced. As ray diagrams and mathematics are introduced during the discussion of lenses, take the time to return to the results of this lab.

**Auxiliary Materials:**

None

## The Laboratory

### Scoring Rubric:

<b>RL8. Exploring Lenses Lab</b>	<b>Score</b>
____ Included, labeled and organized all parts of the lab report. ____ Data section includes an organized record of observations of orientation and relative size for the two types of lenses and for the two distances (nearby and distant). Observations are clear and accurate. ____ Conclusion/Discussion describes the relative size and orientation of the images of distant and nearby objects for converging and diverging lenses.	____/____

### Connections to The Physics Classroom Tutorial:

The following reading is a suitable accompaniment to this lab:

<http://www.physicsclassroom.com/Class/refrn/u14l5a.cfm>

<http://www.physicsclassroom.com/Class/refrn/u14lb5.cfm>

### Connections to Minds on Physics Internet Modules:

Sublevel 7 of the Refraction and Lenses module is a suitable accompaniment to this lab:

<http://www.physicsclassroom.com/mop/module.cfm>