

Name:

Date:

Student Exploration: Ray Tracing (Lenses)

Directions: Follow the instructions to go through the simulation. Respond to the questions and prompts in the orange boxes.

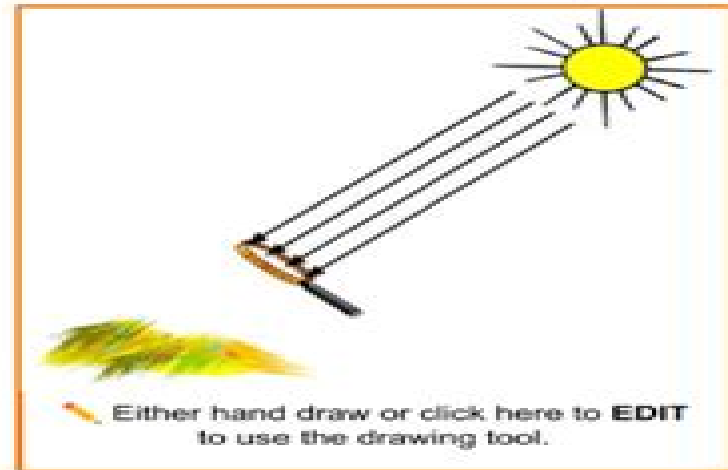
Vocabulary: concave lens, convex lens, focal point, image, magnification, real image, refraction, virtual image

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

Agnes is trapped on a desert island with nothing but a magnifying glass. She wants to use the glass to focus sunlight and start a fire. She holds the glass above some dry grass as shown at right.

1. On the diagram, draw the path the Sun rays will likely take from the magnifying glass to the grass.
2. A magnifying glass is an example of a **convex lens**—a lens that curves outward on both sides. Why is a convex lens useful for starting fires?

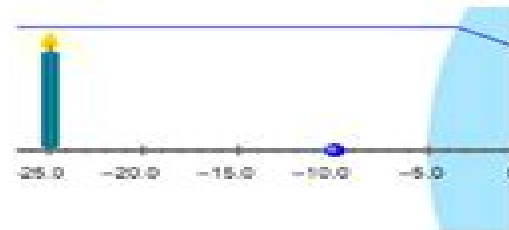
Because the lens can direct the light to a point, it focuses all the light there so that point heats up, and can catch fire.



Gizmo Warm-up

The *Ray Tracing (Lenses)* Gizmo shows light rays passing through a lens. The light rays are bent by **refraction** as they pass through the lens and form a focused **image** to the right of the lens.

To begin, turn on the **Colorize lines** checkbox. Under **Show lines**, turn off the **Central line** and the **Line through focal point** so that only the **Parallel line** is showing.



1. The blue dots in front of and behind the lens are the **focal points** of the lens. Move the candle on the left back and forth and up and down.

What is always true about the light ray that emerges from the right side of the lens?

It always goes through the focal point.

2. Turn off the **Parallel line** and turn on the **Line through focal point**. Move the candle. What do you notice

Answers For Gizmo Lab Ray Tracing Lenses

Robert R. Redfield

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

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