

Program Description:

Students examine a model of the human eye, identifying and discussing the function of the cornea, iris, pupil, lens, and retina. They analyze a camera obscura, comparing the structures of the camera with the structures of the eye. They build a camera obscura with a lens and adjustable screen, exploring focus and image reversal. They then adapt their cameras to function as projectors by adding a light and an image to be projected.

Learning Objectives:

- . Students will understand the function of key parts of a camera and the human eye.
- . Students will develop and use an understanding of properties of light, including intensity, reflection, absorption, and refraction as they build a working camera obscura and projector.
- . Students will be introduced to and start wondering about properties of lenses, including focus and image reversal.

Alignment with Connecticut Core Science Curriculum Framework:

5.1 Grade Level Concept 2: *Light is a form of energy that travels in a straight line and can be reflected by a mirror, refracted by a lens, or absorbed by objects.*

Grade Level Expectations:

1. Light travels in straight paths away from a source of illumination in all directions until it hits an object. Some sources of illumination produce their own light, other sources of illumination reflect light produced by something else.
2. Light interacts with objects in various ways; it can be reflected off the object, absorbed by the object, or refracted through the object.
7. Light changes direction (“refracts”) as it passes from one transparent material to another (for example, as it passes from air to water or through lenses).

5.2 *Perceiving and responding to information about the environment is critical to the survival of organisms.*

Grade Level Expectations:

5. The human eye is structured to collect light through the cornea and pupil. The amount of light that enters the eye is controlled by the iris. The cornea and the lens refract the light and focus it onto the retina and the optic nerve where it is transformed into electrical signals that are sent to different parts of the brain.

5.4 *Advances in technology allow individuals to acquire new information about the world.*

Grade Level Expectations:

1. People design optical tools that enable them to see things better or to see what cannot be seen by human eyes alone. Optical tools change the path of light by reflecting or refracting it.
8. Cameras have parts that function similarly to the human eye.

Key Vocabulary: *lens, reflection, refraction, absorption, focus, cornea, iris, pupil, lens, retina*

Preparation for Visit:

You may want to discuss the following questions with your students to prepare them for their visit.

- What is a lens? What does it do? What are some uses for lenses?