ACTIVITY AT HOME

PINK PALACE MUSEUM

Physics

Optics

SHAPE UP

How does the shape of a lens effect its magnification?

Materials

Clear plastic food wrap

Clear drinking glass

Tap water

Sheet of newspaper or a magazine page

Procedure

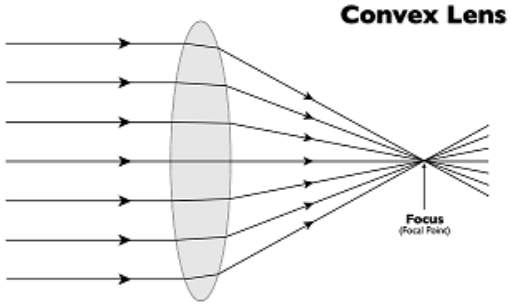
- Tear off a 12 inch (30 cm) piece of plastic wrap
- Line the inside of the cup with the wrap.
- Pour about 2 inches (5cm) of water into the lined class.
- Lay the sheet of newspaper on a table.
- Set the glass of water on top of the newspaper.
- Look down through the water and compare the letters viewed through the water with those not underneath the glass.

Procedure (continued)

- Lift the plastic-wrap lining so that the bottom of the plastic is about 1 inch (2.5cm) above the bottom of the glass. The bottom of the plastic wrap should now curve outward from the weight of the water.
- Look through the curved water surface and observe the printed letters.
- Describe any difference in the size of the letters viewed through the water with the letters that are not covered by the glass of water.
- Does the depth of the water affect its magnification? Repeat the original experiment using different amounts of water in the glass.
- How does the amount of curve in the water's surface affect the magnification? Repeat the original experiment using larger and smaller glasses.
- Vary the distance the plastic wrap is lifted from the bottom of the glasses to change the shape of the bottom of the plastic wrap.

Results

When the surface of the water was curved, it magnified (caused to appear larger) the letters, but when the water's surface was flat, it did not.



Why?

The shape of the water's surface caused the **magnification**. When the water curves outward, it acts like a **convex lens** (a lens that is thicker in the center than at the edges). Light rays moving through the curved surface of the water lens are refracted (change direction), producing an enlarged image of the object.

This activity adapted from *Earth Science for Every Kid*.

To learn more about light and lenses, check out the Pink Palace Museum's *Light and Color* program and *The Development of Microscopes* Exhibit