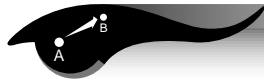


# Simple Magnifiers

## Objective



The student will experiment with magnifiers.

## Science and Mathematics Standards



Simple double-convex lenses can make good magnifiers. Some transparent bottles and jars bend light and magnify print. They may also reverse the print. Water in a jar or a drop of water can also serve as a magnifier.

## Science and Mathematics Standards



### Science Standards

- Science as Inquiry
- Physical Science

### Mathematics Standards

- Problem Solving
- Communication
- Connection
- Computation/Estimation
- Measurement

## Materials



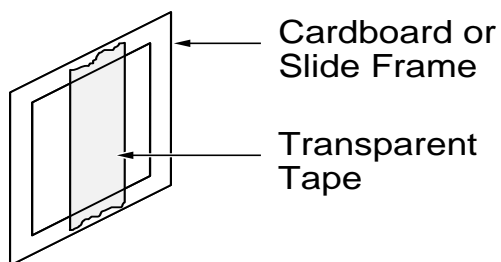
- photographic slide frame or thin piece of cardboard with a 1-inch square hole
- transparent tape
- small transparent sauce or condiment bottles
- jars of different shapes
- water
- old magazine or newspaper



## Procedures



1. Place a piece of transparent tape across the opening of the slide or cardboard. Wet one finger and place one small drop of water onto the tape.



2. Position the water drop above the newspaper or numbers. Can you read the letters or numbers?
3. Continue to experiment. Use a big drop of water. Use a tiny drop of water. Hold the drop very close to the letters and words. Move the drop slowly away from the words. Keep experimenting.
4. Now place the edges of the bottles close to the words. Do all of the bottles magnify? Do some of them magnify? Do they magnify better if you put water in them? Experiment with bottles of all shapes. Do some jars of water reverse letters?

## Observations, Data, and Conclusions



### Water Drop Magnifier

1. What did you see when you looked through the drop of water?
2. Could you read the letters? Did the letters and numbers appear larger?
3. How did you focus the water drop magnifier?
4. Which water drop magnified more, the large drop or the small drop? Why? Hint: How does the size of the water drop effect the way light is bent or refracted?

### Bottles and Jars that Magnify

5. What shape bottle or jar magnifies best?
6. What parts of bottles magnify best?
7. Do these bottles or jars magnify better with water in them?
8. Why do bottles magnify objects?

