

Making Models Lab

What Is the Shape of a Raindrop?

What shape do you think of when you picture a raindrop? Most people picture a teardrop shape, wide on the bottom and pointy on the top. Is that the actual shape of a raindrop? In this experiment, you will create model raindrops and observe their shapes. You will find out the shape of a raindrop.

OBJECTIVES

Model the way raindrops behave in a cloud. Investigate the shape of raindrops by performing an experiment.

Observe the shape, or shapes, of raindrops.

MATERIALS

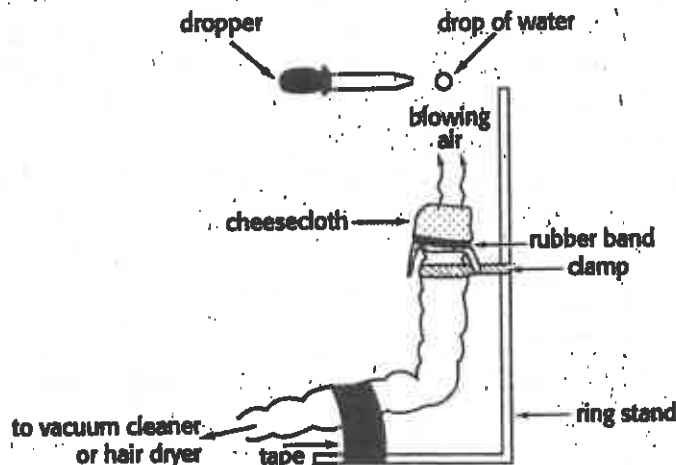
- beaker or cup
- clamp
- dropper
- plastic flexible pipe
- paper towel or cheesecloth
- ring stand
- rubber band
- vacuum cleaner or hair dryer
- water
- wide clear tape or duct tape

SAFETY



PROCEDURE

1. Attach a plastic pipe to the exhaust port of a vacuum cleaner (or a hair dryer set on "cool"). Attach the open end of the pipe to a ring stand using the clamp. Place a layer of cheesecloth (or paper towel) over the opening of the plastic pipe. Secure the cheesecloth with a rubber band. Tape the vacuum tube to the base of the ring stand or countertop to keep the force of the air from flipping the ring stand.



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2. Turn on the vacuum cleaner.
3. **CAUTION:** Never place drops of water directly over an electrical appliance. There is a danger of electrocution. Fill a dropper with water. Squeeze one drop of water into the air stream. The drop should be suspended in the air stream, just as a drop of water in a cloud would be suspended by upward air currents. If the air stream is too strong to suspend a drop, place another layer of cheesecloth over the opening of the plastic pipe. **CAUTION:** Use only water droplets in the wind stream as directed—do not use any other materials. Wipe up any spilled water immediately.
4. Observe the shape of the "raindrop." Write your observations below.

5. Draw the raindrop.

6. Repeat the experiment two more times. Report your observations below.

What Is the Shape of a Raindrop? *continued*

ANALYSIS AND CONCLUSION

- 1. Explaining Events** Describe what happened when you placed a drop of water into the air stream.

- 2. Analyzing Results** Was the shape of the water drop the shape that you expected? Explain.

- 3. Evaluating Models** How do you think this model compares to the natural processes that determine the shape of a raindrop? Explain.

EXTENSION

- 1. Making Models** Repeat the experiment using different sizes of water drops and/or different air speeds. Report the results to your class.

- 2. Research and Communication** Many scientists are interested in studying the shape of raindrops. NASA has even done experiments about the shape of raindrops in microgravity on the *International Space Station*. Research the shape of raindrops on the Internet or at the library. Report your results to the class.
