

Ever Wonder About Air?

Make an air cannon and experiment with it to see what you can discover!

Materials

- A plastic soda bottle
- Scissors
- Clingy plastic wrap (any brand) or pieces cut from a plastic bag
- Rubber bands
- Pieces of paper

Optional Materials

- A saucer or dish
- Ping-pong balls
- Bubble maker toys
- Balloons
- Pan of water
- A small candle
- Sand or soil

Experiment

Building the Cannon

1. Cut the bottom off of the soda bottle.
2. Fold the plastic wrap and tightly seal it around the bottom of the bottle with a rubber band or two.

Experiment

1. From about 6 inches away, aim the open end of the bottle at some small pieces of paper. Tap the center of the plastic wrap with your finger. What happened?
2. Can you bounce balloons or bubbles in the air with your air cannon?
3. What do you think will happen if you shoot your cannon at a dish of water? What do you see?
4. How far do you think air can move a ping-pong ball?
5. Get a friend - how far away do you think they can get and still feel the air from your cannon?

Why does this happen?

When you tap the back of the bottle, the plastic wrap will push the air inside the tube out through the opening on the other end. The air forced out the opening travel through the air with enough force to move the pieces of paper.

This activity demonstrates the fact that air occupies space. As the plastic wrap is pushed into the interior of the bottle, the space inside the bottle gets smaller, forcing some of the air out of the hole. The smaller the hole, the faster the air comes out of the bottle.

Another name for the air cannon is "Vortex Generator". The air that shoots out of the cannon is invisible to us, but actually looks like a flat doughnut called a "vortex". The air looks like a vortex because the air at the center of the bottles hole is moving faster than the air around the sides of the hole. When you aim the air at a pan of water, you can sometimes see the vortex "doughnut" effect in the ripples of the water.

Air is made up of billions of molecules moving very quickly and colliding into each other and various objects in their path. When you aim the Air Cannon at something, the air molecules hit it (if you aim well). When the air molecules hit something they transfer some of their energy to it, making it move.