

Air Cannon

P8-5700



TEACHER'S NOTES:

Assemble the Air Cannon according to the instructions in the box. To use, hold the grip in your less dominant hand, aiming the small end of the cannon away from you. Pull the plunger back and release to fire a ball of air up to 30 feet away!

When the air is forced out the small hole, friction with the edge of the hole slows the outer edge of the air. The faster-moving air in the center causes a flow pattern called a vortex. This toroidal vortex ring looks like a swirling donut. Vortices are very efficient at traveling long distances. Some natural examples of vortices include dust devils, whirlwinds, and hurricanes.

EXPERIMENTS:

1. Compare the transfer of energy to the transfer of matter. The light and sound from the Air Cannon travel across the room as waves, but the blast of air is the same matter that was inside the can. Emphasize this fact with smoke, fog, or perfume, as described below.
2. Blow out candles. How far away can you stand?
3. Create smoke rings. Oil-based fog can leave a residue inside the cannon, so try using dry ice. A simple fog generator can be made by putting dry ice with some hot water in a deep container. As the fog builds, scoop it out with a bowl and pour it into the cannon. Rings will be easiest to see if brightly lit and/or launched in front of a dark background.
4. Send a scent. Spray a little bit of perfume in the cannon and send a scented vortex to someone across the room.
5. Launches can result in either a ball or a ring of air. Pulling the plunger directly back from the hole is more likely to produce a ring.

RELATED PRODUCTS:

Bernoulli Bags (P6-7350). The long plastic bag illustrates Bernoulli's principle. Use a single breath to decrease the pressure and fill the whole bag.

Tornado Tube (P1-1120). Study the vortex that forms when one soda bottle empties into another through the tube.

