

# Air Cannon

## **The Action**

Forcing a large amount of air through a confined opening will extinguish a candle placed several meters away.

## **Grade Level**

Grade 7 - Force and Motion

Grade 7 - Structures and Designs

Grade 9 - Fluids and Motion

## **Materials**

- A 5 gallon plastic pail or a small plastic garbage can
- Large plastic garbage bag or a large rubber sheet (shower curtain)
- Duct tape or a large clamp
- Saw or suitable cutting tool
- Candle and holder
- Matches

## **Instructions**

- Cut a circular hole into the bottom of the bucket (~2.5 cm - 3 cm).
- Stretch the plastic bag or rubber sheet over the open end of the bucket and secure it in place using the duct tape or clamp. The large open end of the bucket covered with the plastic will look something like the head of a drum.
- Set up and light the candle a few meters from the end of the bucket in which the hole is cut.
- Strike the covered end of the bucket and a puff of air will shoot out of the small hole but in the base of the bucket. The air will be sufficient to extinguish the candle.

## **Safety**

Be careful when cutting the hole in the bottom of the bucket - a sharp knife or saw is needed. Also, be sure that there is nothing flammable behind the candle as the puff of air will blow the candle out and the flame may blow onto something else.

## **Hints**

- Be patient - the puff of air may take a second or two to come out. Have the bucket and candle at a set position as it is hard to aim. Also, be aware that outside air currents (fans or air conditioners) may affect the results of this experiment.

## **Science Principle**

When the drum is pushed in, a wave of air is pushed towards the opening of the bucket. The hole in the bucket is smaller than the wave of air coming to it so a higher pressure is created inside the bucket. This higher pressure is able to escape through the small hole by pushing the air outside the hole in the bucket. In relation to force, the greater the force, the higher the pressure created, the stronger the puff of air.