

## Station 5: Soda Bottle and Ping Pong Ball

### Materials

- Soda bottle
- 1 Ping pong ball
- Graduated cylinder
- Metric ruler
- Beaker to collect water
- A barometer

### Procedure

1. Obtain a reading of atmospheric pressure from the barometer at the station. Record this on the activity sheet.
2. Fill the bottle all the way to the top with water.
3. Push the ping pong ball onto the top to squeeze out a small amount of water.
4. Now, pour off about one third of the water in the bottle into the graduated cylinder and record this amount as  $V_0$  on the activity sheet.
5. Hold the ping pong ball on top of the bottle and invert it over the beaker. Hold the ball loosely against the opening so that some water is allowed to leak out into the beaker. Don't jiggle or rotate the ball during this process or you may allow too much water to escape and introduce an error into your data.
6. Eventually, enough water will leak out that the pressure on both sides of the ball will be the same and you can take your hand away and the ball will stay. Add the water that leaked out to the graduated cylinder and record this total amount as  $V_1$  on the activity sheet.
7. Measure the distance from the mouth of the bottle to the top of the water it encloses and record this distance as  $D$  on the activity sheet.
8. Complete the calculations called for on your activity sheet to determine the atmospheric pressure in your classroom. Compare your calculated value to the reading you took off the barometer and answer the questions on the activity sheet.