

## Experiment: The Cartesian Diver Sink or Swim

Name: \_\_\_\_\_

Many conveniences in life depend on how gases behave. For example, in a car, a gaseous mixture of gasoline and air fills the cylinders. Then spark plugs set off a chemical explosion that causes gas pressure, temperature, and finally volume to change inside the cylinder. The resulting forces ultimately move the car forward. In this activity, you will use simple materials to investigate how pressure and temperature affect the volume of gases.

### Equipment:

2 liter bottle with cap

Glass medicine dropper

Large beaker

Grease pencil

Ice

Hot plate

### Procedure:

1. Completely fill a 2 liter bottle with room temperature water.
2. Fill the large beaker with room temperature water. Draw some of the water into the dropper. Place the dropper in the beaker with the bulb side toward the surface of the water and see if the dropper sinks or floats. You want it to float with a very small portion of the bulb above the water surface. Adjust the volume of water in the dropper until it does this. Use a grease pencil or waterproof marker to mark the air/water level in the dropper.
3. Remove the dropper from the beaker, leaving the water inside the dropper. Place the dropper into the filled 2 liter bottle with the bulb end up. Screw the cap on the 2 liter bottle tightly.
4. Watch the dropper as you squeeze the sides of the bottle slowly, then release the sides of the bottle.

What happens to the air level inside the dropper?

5. Remove the dropper from the bottle and place it in the large beaker. Make sure it still floats. Remove the dropper from the beaker but make sure the water stays in the dropper and you can still see the marking for the air/water level

