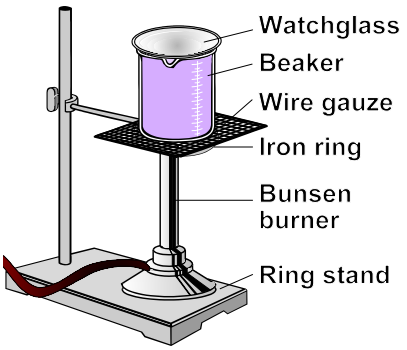
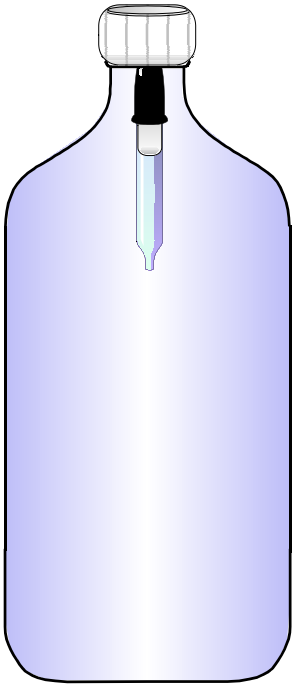
Comparing Solids, Liquids, and Gases

Make the following observations. Then answer the questions that follow.

Gases (Teacher demonstration)

- Volume of a gas
  - ★ Place a few crystals of iodine in a small beaker and cover it with a watchglass
  - ★ Place the beaker on a wire gauze on a ringstand and heat it with a Bunsen burner
  - ★ Note what happens to the color overtime
  - ★ Note how much of the space in the beaker is occupied by the gas

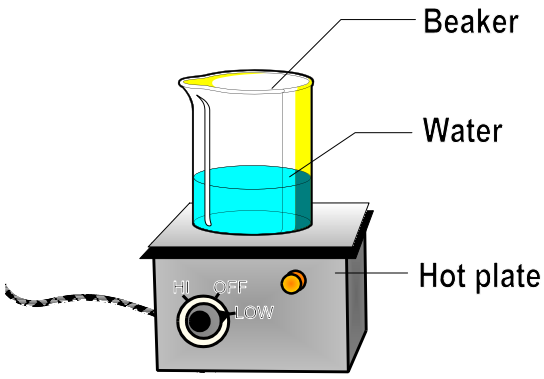




- Effect of pressure on the volume of a gas
  - ★ Squeeze the container (soda bottle) in which a floating Cartesian diver (medicine dropper) is located
  - ★ Note what happens to the diver
  - ★ Note what happens to the size of the air bubble in the dropper when the container is squeezed

Liquids (Student Activity)

- Diffusion in water
  - ★ Put a beaker of water on a hotplate set on low
  - ★ Allow the water to sit until it is still
  - ★ Put a drop of food coloring in the water and wait five minutes
  - ★ Note what the food coloring does
- Shape and volume
  - ★ Pour 10 mL of water into a 100 mL graduate
  - ★ Transfer the water to a 25 mL graduate
  - ★ Transfer the water to a 10 mL graduate
  - ★ Note what happens to its shape and volume



Answer the questions below based on your observations.

1. As the amount of gas increases, what happens to its color? _____

   _____

2. From the moment the purple gas becomes visible until heating stops, how much of the container is occupied by the gas? _____

Continue ☞

3. What happens to the size of the air bubble in the medicine dropper when the soda bottle is squeezed? _____

   a. What happens to gases under pressure? _____

   b. What happens to liquids under pressure? _____

4. What happens to the medicine dropper when the soda bottle is squeezed? Why? _____

5. What does the food coloring do when you add it to the water? What does this tell you about the behavior of the water molecules? _____

6. What happens to the shape of a liquid as it is transferred from one container to another? _____

7. What happens to the volume of a liquid as it is transferred from one container to another? _____

8. How would a solid, such as a coin or a rock, behave under similar circumstances?

   a. Would it spread to fill its container? _____

   b. Would its shape or volume be influenced by its container? _____

   c. Would its volume change if you squeezed it? _____

   d. Would food coloring diffuse evenly through it? _____

9. Based on your observations, compare the properties of a solid, a liquid ,and a gas. _____