

WARNING — This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

(The chemicals used in this activity are isopropyl alcohol and salt.)

The Density of Liquids

1. Find the mass of the vials labeled *Water*, *Salt Water*, and *Alcohol*. Fill the vials with 40 mL of the liquid indicated on the label. Calculate the mass of each sample of liquid (mass of liquid = mass of vial plus liquid – mass of vial). Record all data in the table.
2. Calculate the density of each liquid (density = mass/Volume).
3. Observe and record the float height of the dowel in each liquid.

Data Table The Density of Liquids					
Liquid	Mass of Vial (g)	Mass of Vial + Liquid (g)	Mass of Liquid (g)	Density (g/mL)	Float Height (cm)
Alcohol					
Water					
Salt water					

4. List the liquids in order of increasing density.

5. Which has a greater mass: a liter of water or a liter of salt water? Why?

6. Which has a greater volume: 1,000 g of water or 1,000 g of alcohol?

7. Which has greater density: 100 g of water or 1,000 g of water?

8. List the liquids in order of increasing float height of the dowels.

9. Describe the correlation that exists between the density of a liquid and the float height of a dowel in that liquid.

Pressure and Volume of a Gas

1. Record your data in the table.

Number of Books	Mass of Books (kg)	Units of Air Pressure	Volume of Air (cc)
0			
1			
2			
3			
4			

2. Graph your data from the table. Be sure to label both axes.

Based on your graph, what can you conclude about the relationship between the pressure of the air in the syringe and the volume that the air occupies?

3. Draw a diagram of how the air molecules might look in a syringe whose plunger is fully extended.
4. Draw a diagram of how the air molecules in that same syringe might look if the plunger were pushed down halfway.