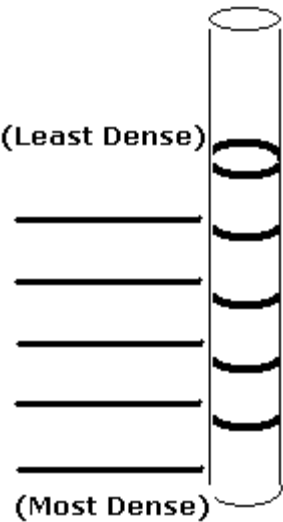
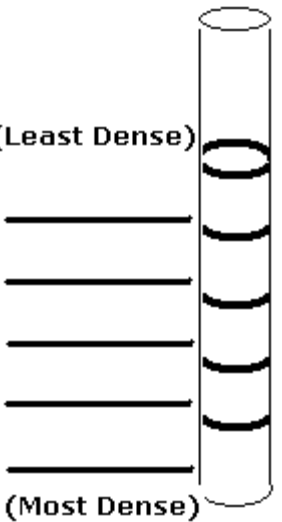
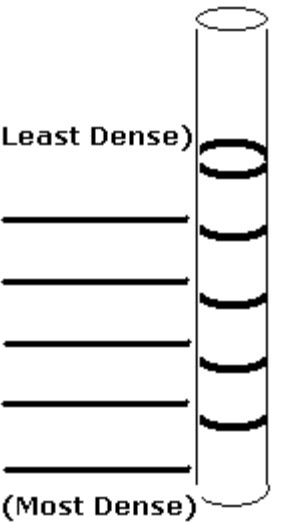


**Objective:** Demonstrate an understanding of density by calculating the density of five liquids. Then create a density column where the least dense liquid is on top and the most dense liquid is on the bottom.

**LIQUIDS:** Alcohol, Cooking Oil, Dish Soap, Syrup, Water

**INITIAL PREDICTION** - Examine the list of liquids (5) above. In the first column below, make a prediction of the relative densities of each item by identifying which liquid is the least dense (on top) and the most dense (on bottom).

<u>Initial Prediction</u>	<u>Calculated Prediction</u>	<u>Final Observation</u>
		

**Measurements & Density Calculations**      Density = Mass/Volume       $D = M/V$

Using a graduated cylinder, measure between 3 – 4 mL of each liquid in order to calculate the density. Remember that each of these measuring devices is precise to **two decimal places**. (*Significant Figures*)

<u>LIQUIDS</u>	Mass (g) of empty Graduated Cylinder	Mass of G-Cylinder with 3-4 mL liquid	Mass of Liquid	Volume of Liquid (3-4 mL)	Density of Liquid (g/mL)
1)					
2)					
3)					
4)					
5)					

**CALCULATED PREDICTIONS** – Based on the density calculations above, make a second (new) prediction as to the order of the liquids from least dense (top) to most dense (bottom).

**STOP** – Show this information to your teacher before moving on to the next step.

**Making OBSERVATIONS When Mixing the Liquids** – Add the most dense liquid first (about 2 cm). Before adding the second liquid, be prepared to make some observations.

1) What did you observe when you added the **SECOND** liquid?

2) What did you observe when you added the **THIRD** liquid?

3) What did you observe when you added the **FOURTH** liquid?

4) What did you observe when you added the **FIFTH** (Last) liquid?

6) **FINAL OBSERVATIONS** – Now complete the last drawing based upon all of your observations – This drawing should include the correct arrangement of liquids.

7) What happened to the alcohol (green) and water (blue) when they were mixed?

8) Based on your answer to #7 above, **WHY** do you think this occurred?

9) If a new liquid (with a density of 0.52 g/mL) were added, where would it be located within the column.

10) Imagine an oil tanker crashed and spilled all of its oil into the ocean. What happens to the spilled oil?