# Determining Density

Name:_____

Water, in the metric system, was selected to have a **density** of one. This means that one cubic centimeter (also one milliliter) of water weighs exactly one gram.

Any substance having a density **less than** one will float on water. Any substance having a density **greater** than one will sink!

**DENSITY TABLE**
(All density numbers compared to water's density of 1.0)

| SOLIDS | METALS | LIQUIDS |
|---|---|---|
| Bone 2.0 | Aluminum 2.7 | Pure Water 1 |
| Brick 1.8 | Copper 8.9 | Sea Water 1.03 |
| Cork 0.2 | Gold 19.3 | Alcohol 0.8 |
| Ice 0.92 | Iron 7.8 | Glycerine 1.3 |
| Marble 2.7 | Lead 11.3 | Milk 1.03 |
| Paraffin 0.9 | Silver 10.5 | Turpentine 0.9 |
| Rubber 1.2 | | Mercury 13.6 |
| Bamboo 0.3 | | Gasoline 0.7 |
| Oak Wood 0.7 | | |
| Pine Wood 0.6 | | |

1. Study the Density Table.
   a. Name five substances that will float on water:
      i. _____
      ii. _____
      iii. _____
      iv. _____
      v. _____

   b. Name five substances that will sink in water:
      i. _____
      ii. _____
      iii. _____
      iv. _____
      v. _____

   c. What is the lease dense substance on the table?_____
   d. What is the most dense substance on the table?_____
   e. Mercury is a liquid with a density of 13.6. Which metal on the table would sink rather than float in mercury?_____
   f. Gasoline has a density of 0.7. Would you expect it to sink or float on water?_____
   g. You find a lump of what looks like gold. Based on what you learned in this investigation, how can you find out if it's really gold?_____

_____

_____

Name:_____ Period:_____

Use the following formulas to determine the missing measurements in the table below. Rank the objects from lowest (1) density to highest density (5).

**Density** = Mass / Volume  **Volume** = Mass / Density  **Mass** = Density X Volume

| Object | Mass (g) | Volume ($cm^3$) | Density ($g/cm^3$) | Rank |
|---|---|---|---|---|
| Blue Box | 6375 | | 15 | |
| Red box | 275 | 50 | | |
| Green box | | 2744 | 3.72 | |
| Yellow box | 3464 | | 4 | |
| Purple box | | 3744 | 2.4 | |

1. Calculate the volume of a brick measuring 15 cm long, 5 cm wide and 15 cm high. If its mass if 4500 grams, what is its density?

2. The density of Pepsi is 2.5 g/ml. The mass of Pepsi is 887.5 grams. What is the volume of a can of pepsi?

3. Which is more dense, a box of Captain Crunch with a mass of 368g, or the same size box of Cocoa Puffs with a mass of 259g?

4. Would the density of the brick in problem #1 change if the brick was cut in half? Explain why or why not.