**Density Worksheet** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Define mass?
2. Define volume?
3. Define density and show the formula for calculating density.
4. Why does changing the shape of an object have no effect on the density of that object?
5. . Aluminum is used to make airplanes. Cast iron is used to make weightlifting equipment. Explain why the densities of these metals make them useful for these purposes?
6. What is the density of water? Water 1g = 1ml = 1cm3
7. Why does an air bubble rise to the surface of a glass of water?

8. Calculate the densities of the following objects. **Remember to place units after each number.**

**Object A** length = 6cm width = 3cm height = 1cm mass = 36g

volume = \_\_\_\_\_ density = \_\_\_\_\_

**Object B** length = 10cm width = 5cm height = 2cm mass = 300g

volume = \_\_\_\_\_ density = \_\_\_\_\_

**Object C** Use the water displacement method to determine the density of object C (silly putty).

initial water level in graduated cylinder = 25ml

final water level after placing silly putty into graduated cylinder = 29ml

mass of silly putty=8g

volume = \_\_\_\_\_ density = \_\_\_\_\_

9. Which of the following materials will float on water (density 1 g/ml)? Assuming the materials don’t mix, show how the materials would "stack up" in a graduated cylinder.

air = .001 g/cm3

corn oil = .93 g/cm3

glycerine = 1.26 g/cm3

corn syrup = 1.38 g/cm3

wood = .85 g/cm3

steel = 7.81 g/cm3

rubber = 1.34 g/cm3

ice = .92 g/cm3

water = 1.00 g/cm3

*In order to receive full credit, you must show ALL work.*

1. 100 grams of a liquid completely fill a 200 mL bottle. What is the density of the liquid?

2. A solution has a density of 1.50 g/mL. How many grams are needed to obtain 10.0 mL of solution?

3. If a block of copper measures 2.00 cm x 4.00 cm x 5.00 cm and weighs 356 grams, what is its density?

4. The density of mercury is 13.6 g/mL.

a. what is the mass of 8.20 mL of mercury?

b. what volume would 120 grams of mercury occupy?

5. A piece of silver has a mass of 2800 grams and occupies a volume of 266 cm3. What is the density of silver?

6. A bottle has a capacity of 1.2 liters. If the density of ether is 0.74 g/mL, what mass of ether can the bottle hold?

7. A student pipets 5.00 mL of ethanol into a flask weighing 15.25 grams. She finds that the mass of the flask *plus* ethanol = 19.17 grams. Calculate the density of ethyl alcohol.

8. Peanut oil has a density of 0.92 g/mL. If a recipe calls for ¼ cup of peanut oil, what mass of peanut oil is required? (Hint: 1 cup = 237 mL).

9. Suppose you find a chunk of what *appears* to be gold in the sand at the beach. Devise a simple experiment to determine whether or not you’ve struck it rich. Please list all lab equipment required and list the **specific** steps you would take.