Name _____ Date _____ Period _____

Lab: Density

COORDINATED SCIENCE 1

Background: *A cube of polished aluminum and a cube of silver that are the same size not only look similar but also have the same volume. The* ***mass*** *and* ***volume*** *of an object can be used to find the* ***density*** *of the material the object is made of.* ***Density*** *is the* ***mass per unit volume*** *of a material. You find density by dividing an object's mass by the object's volume. For example, the density of an object having a* ***mass*** *of* ***10 g*** *and a* ***volume*** *of* ***2 cm^3*** *is* ***5 g/cm^3****.*

Purpose: The purpose of this lab is to determine the density of a variety of materials.

Materials:

- Half-pint milk carton
- Scissors
- Metric ruler
- Graduated cylinder
- Water
- Assorted small rocks
- Small blocks of wood (two kinds of wood)
- Balance

<u>PART !: Calculating the Density of Water</u>

1. You will need the base of a small milk carton. Open the top and use scissors to carefully cut off the top.

2. Find the mass of the empty carton in grams

Mass empty carton = **_____grams**

3. Fill the milk carton to the very top with water then find it's mass again

Mass combined = **_____grams**

4. Find the mass of the water alone by subtracting the mass of the empty carton from the combined mass of carton and water.

Mass of water = _____grams

5. Pour the water out of the milk container and then calculate the volume of the milk carton. Measure the length, width, and height and find the volume with the formula: ***V = l x w x h***

Volume of water = **_____cm^3**

6. To find the density of water, divide the mass of the water by its volume. (Remember density equals mass divided by volume)

Density of water = _____g/mL

7. The metric system is set up so that one milliliter (***1 mL***) of water is equal to a volume of one cubic centimeter (***1 cm^3***) and has a mass of one gram (***1 g***). How is this useful?

PART I!: Calculating the Density of a Rock

1. Choose a rock and find it's mass

Mass of rock = _____ *grams*

2. Put about 20 mL of water in the graduated cylinder and then drop the rock in

3. Find the volume of the rock by determining the water displacement (how much water did it displace or move up the graduated cylinder)

Volume of rock = _____ *cm^3*

4. Calculate the density of the rock (***Density = Mass / Volume***)

Density of rock = _____ *g/mL*

5. How does the density of the rock compare to the density of water?

6. Why do rocks sink in water?

7. What would the density of a material have to be in order to float on water?

PART II!: Calculating the Density of Various Woods

1. Obtain a block of each type of wood

2. Measure the length, width, and height of the block of wood in millimeters (mm) and then convert this into centimeters (cm)

Length of Block 1 _____***mm*** Width of Block 1 _____***mm*** Height of Block 1 _____***mm***

Length of Block 1 _____***cm*** Width of Block 1 _____***cm*** Height of Block 1 _____***cm***

Volume of Block 1 _____***cm***

Length of Block 2 _____***mm*** Width of Block 2 _____***mm*** Height of Block 2 _____***mm***

Length of Block 2 _____***cm*** Width of Block 2 _____***cm*** Height of Block 2 _____***cm***

Volume of Block 2 _____***cm***

3. Find the mass of each block

Mass Block 1 _____***grams*** Mass of Block 2 _____***grams***

4. Calculate the density of the each wood block.

Density Block 1 _____***g/mL*** Density of Block 2 _____ ***g/mL***

5. How did the density of each of the blocks of wood compare to the density of water?

6. What conclusions can you make about each of the wooden blocks?

1.