

## Measuring Activity

name: \_\_\_\_\_

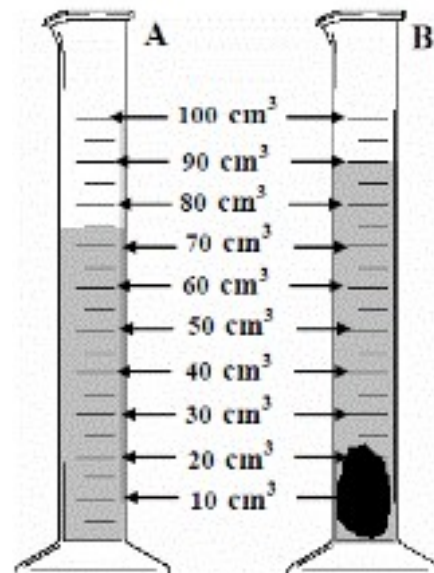
Objective: to practice measuring, using formulas and correct significant figures, and dimensional analysis.

Using the electronic balances, measure the mass of each ALL OF the metal in the beakers. Using graduated cylinders, measure the volumes of each sample of metal. On WHITE PAPER calculate measured density and percent error for each. Only put "answers" below.

SHOW ALL WORK NEATLY ON LOOSE LEAF PAPER.

Units and Sig Figs count always.

Displacement method of determining volume. At left, the starting point shows 74.9 mL of water. After the metal is put into the water, the new volume is 90.0 mL. The DIFFERENCE is the volume of the metal blob shown in black. That hunk of metal has volume of 15.1 mL or 15.1 cm<sup>3</sup>, they are the same thing.



**YOU MUST MEASURE TO THE NEAREST 10th mL, and**

**never ever "round" scale measurements.....** \_\_\_\_\_ **your initials**

Data Table	Chemical symbol	Mass in grams (Don't round!)	Volume in cm <sup>3</sup>	Measured density g/cm <sup>3</sup>	Actual density g/cm <sup>3</sup>	Your % error
Tin						
Iron (nails)						
Bismuth						

Do on loose-leaf paper. Show all work + formulas. Dimensional analysis requires you use units and correct SF always.

1. Convert mass of TIN into tons and convert that into scientific notation.
2. Convert mass of IRON into milligrams and convert that into scientific notation.
3. Convert mass of BISMUTH into ounces and convert that into scientific notation.

Use these conversion factors, or LOOK at table B, on the reference tables.

Don't go onto the internet for weird conversion factors.

$$454 \text{ g} = 1 \text{ pound} = 16 \text{ oz.}$$

$$2000 \text{ p} = 1 \text{ ton}$$

$$1000 \text{ mg} = 1 \text{ gram}$$

$$1000\text{g} = 1 \text{ kg}$$

## Questions

- Describe carbon dioxide gas in a qualitative way.
- Describe gold metal in a quantitative way.
- If you have a positive percent error, what does a positive percent error indicate?
- If you have a negative percent error, what does a negative percent error indicate?

In the boxes below, the small numbers top left of each box are the ATOMIC NUMBERS of the elements from the Periodic Table. Each need to have a symbol and a name, and an indication if the atom is a metal or a non-metal. There are five examples to follow. Do all of the blanks. Use table S if you need to.

1  H Hydrogen nonmetal	2	3	4	5
6	7	8	9	10  Ne Neon nonmetal
11	12  Mg Magnesium metal	13	14	15
16	17	18	19	20
21	22	23	24	25  Mn Manganese metal
26	27  Co Cobalt metal	28	29	30