

## Measuring Activity

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

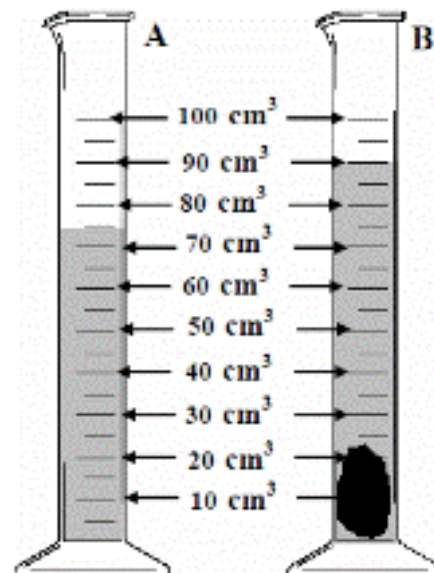
Objective: to practice measuring, using formulas and correct significant figures, and dimensional analysis.

Using the electronic balances, measure the mass of each of the metals in the data table. Using graduated cylinders, measure the volumes of each as well. Using proper formula, determine the density of each piece of metal. Using table S, determine the actual densities, then do % error for each of your density measurements.

SHOW WORK NEATLY ON LOOSE LEAF PAPER.

Units and Sig Figs count always. Put answers only in boxes but do the math on a separate sheet of paper.

Displacement method of determining volume. At left, the starting point shows 75.0 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 15.0 mL or 15.0 cm<sup>3</sup>, they are the same thing.



Data Table	Chemical symbol	Mass in grams	Volume in cm <sup>3</sup>	Measured density g/cm <sup>3</sup>	Actual density g/cm <sup>3</sup>	Your % error
Bismuth						
Iron						
Lead						

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

1. Convert mass of BISMUTH into tons and put answer into scientific notation.
2. Convert mass of IRON into milligrams
3. Convert mass of LEAD into ounces

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 the bismuth metal in a qualitative way. Then describe it in a quantitative way.
- If you have a positive percent error, what does a + percent error indicate?
- If you have a negative percent error, what does a negative percent error indicate?
- If you have a percent error that has NO sign, not positive or negative, what does that show?
- 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 <b>H</b> Hydrogen nonmetal	2	3	4	5
6	7	8	9	10 <b>Ne</b> Neon nonmetal
11	12 <b>Mg</b> Magnesium metal	13	14	15
16	17	18	19	20
21	22	23	24	25 <b>Mn</b> Manganese metal
26	27 <b>Co</b> Cobalt metal	28	29	30