Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MOLE LAB

\*A mole of any substance contains\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ particles.

\*A mole of lead will be **heavier or lighter** than a mole of oxygen because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*The mass of a mole of a substance can be found using the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the substance.

\*The units of molar mass are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Procedure Part 1: Sugar in gum**

1. Find the mass of a piece of gum (in wrapper) before chewing.
2. Chew the gum for 5 minutes.
3. Find the mass of the gum (on the wrapper) after chewing.
4. Throw the gum in the trash.
5. Why was there a change in mass?
6. The sugar has a chemical formula of C6H12O6. Calculate the molar mass (g/mol).
7. Calculate the number of moles of sugar you consumed while chewing the gum.
8. Calculate the number of molecules of sugar you consumed while chewing the gum.

**Procedure Part 2: Burning a candle**

1. Find the before mass of a candle.
2. Light the candle and allow it to burn for 5 minutes. Do not play with the wax!
3. Without losing any of the wax, re-mass the candle.

Wax is a mixture of different hydrocarbons. We will assume the chemical formula for wax is C25H52.

1. Find the molar mass. (g/mol)
2. How many **atoms** of C are in one molecule of wax? \_\_\_\_\_\_\_\_\_\_
3. How many **atoms** of H are in one molecule of wax? \_\_\_\_\_\_\_\_\_\_
4. What **% of the molar mass is Carbon?** (total mass of C/molar mass) x 100%
5. How many **grams of Carbon** would have been in the candle before burning?
6. How many moles of wax were used up during burning?

**Procedure Part 3: Molecules in your name**

1.  Find the mass of a crayon.
2. Write your full name on a piece of paper.
3. Find the mass of the crayon again.
4. Repeat steps #1-3 with the chalk.
5. Find the **molar mass** of the crayon. (Made of wax- C25H52)
6. How many **moles of wax** were in your name?
7. How many **molecules of wax** were in your name?
8. Find the **molar mass of the chalk**. (CaSO4) (Did you know chalk isn’t made from chalk anymore!!!)
9. How many moles of chalk were in your name?
10. How many molecules of chalk were in your name?
11. You should have used approximately the same mass of crayon and chalk when writing your name. Why were there LESS molecules of chalk used than crayon?

**Procedure Part 4:**

Measure the items and fill in the chart below.

1. A substance has a mass of 90.1 grams and contains 3.0 x 1023 molecules. Which of the 3 substances in the chart above is it? (Solve for moles first using the molecules given, then set up a ratio to find g in 1 mole.)