

## Honors Chemistry – Unit 5 Review

Complete this review on your own piece of paper to help you review.

### Conceptual Review:

As you review for the Unit 5 (counting particles) celebration, make sure to review/complete your objectives and homework packet. Review the concept/significance of Avogadro's hypothesis and your lab work.

**Problem Solving Review:** Show all work, including units & substances. Box answers.

- Find the molar mass of the following:
  - sodium
  - oxygen gas ( $O_2$ )
  - lead(II) nitrate,  $Pb(NO_3)_2$
- Consider the masses of various hardware below, compared to the lightest.

Type	Mass (g)	Relative mass
Washer	1.74	
Hex nut	3.16	
Anchor		3.00
Bolt	7.64	

- On your paper, do the calculations necessary to complete the table. Label your answers
  - Explain the connection between these calculations and the atomic masses in the Periodic Table.
- Some mole relationships practice.
    - What is the mass of 0.0280 moles of nitrogen dioxide ( $NO_2$ ) molecules?
    - How many moles of chlorine molecules in a 25.0 g of chlorine gas?
    - How many particles of iron (III) chloride,  $FeCl_3$ , are there in 16.5 g of the substance?
    - What is the mass of 100. million atoms of gold? Could you mass this on a balance?

Formulas & Percent Composition:

- When 20.16 g sample of magnesium oxide reacts with carbon, carbon monoxide forms and 12.16 g of Mg metal remains. What is the empirical formula of the magnesium oxide compound?
- A compound of iron and oxygen is found to contain 28 g of iron and 8.0 g of oxygen. What is the % by mass of each element in the compound? What is the empirical formula of the compound?
- What is the molecular formula of each compound?

<u>Empirical Formula</u>	<u>Actual Molar Mass of Compound</u>
CH	78 g/mole
$NO_2$	92 g/mole

- A compound is analyzed and found to be composed of 40.0% carbon, 6.67% hydrogen and 53.3% oxygen. The molar mass of the compound is 180 g/mole. Determine the empirical and molecular formulas of this compound.