

**Chemistry - Mrs. Bauck, PHUHS**

Unit 7: Stoichiometry – Chapter 10

State Standards (\*\*\*) = Chem 1H only)

**Topic: Stoichiometry**

SC.912.P.8.9 Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions.

4.0	Extensions/Applications	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the shortcut for volume-volume stoichiometry problems.</li> <li><input type="checkbox"/> Design an experiment using a typical stoichiometry problem, such as mass-mass or percent yield.</li> <li><input type="checkbox"/> Further investigate stoichiometric properties in virtual labs online.</li> </ul>
3.0	Learning Goal (Derived from State Standard)	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identify mole ratios, given a balanced equation. Use the principles of stoichiometry to perform calculations involving moles, mass, volume, representative particle conversion factors in any combination:</li> <li><input type="checkbox"/> MOL A → MOL B (1 step)</li> <li><input type="checkbox"/> MASS A → MASS B (3 steps)</li> <li><input type="checkbox"/> VOLUME A → VOLUME B (3 steps)</li> <li><input type="checkbox"/> RP A → RP B (3 steps)</li> <li><input type="checkbox"/> MASS A → RP B; RP A → MASS B (3 steps)</li> <li><input type="checkbox"/> VOL A → RP B; RP A → VOL B (3 steps)</li> <li><input type="checkbox"/> MASS A → VOL B; VOL A → MASS B (3 steps)</li> <li><input type="checkbox"/> MOL A → MASS B; MASS A → MOL B (2 steps)</li> <li><input type="checkbox"/> MOL A → RP B; RP A → MOL B (2 steps)</li> <li><input type="checkbox"/> MOL A → VOL B; VOL A → MOL B (2 steps)</li> <li><input type="checkbox"/> Mathematically identify limiting and excess reagents (reactants).</li> <li><input type="checkbox"/> Calculate the amount of product formed in a limiting reagent (reactant) problem, given the quantity of two reactants.</li> <li><input type="checkbox"/> Calculate percent yield, given actual and theoretical yields.</li> <li><input type="checkbox"/> Use theoretical yield from stoichiometry and experimental yield to calculate the percent yield of a reaction.</li> </ul>

2.0	Required Skills or Background Knowledge to accomplish Learning Goal	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Be able to identify six major acids, write their chemical formulas, and dissociate/"uncrisscross" them as needed: hydrochloric, acetic, nitric, carbonic, sulfuric, and phosphoric acids.</li> <li><input type="checkbox"/> Convert between moles, particles, mass, and volumes (of gases) in a sample of substance in one-step math problems.</li> <li><input type="checkbox"/> Convert between moles, particles, mass, and volumes (of gases) in a sample of substance in two-step math problems.</li> <li><input type="checkbox"/> Calculate molar mass of an element or a compound.</li> <li><input type="checkbox"/> Balance a chemical equation.</li> <li><input type="checkbox"/> Complete a chemical equation if no products are given.</li> <li><input type="checkbox"/> Determine the type of chemical reaction given the chemical equation.</li> <li><input type="checkbox"/> Define a mole as a unit used for counting atoms, molecules and formula units.</li> <li><input type="checkbox"/> Differentiate between atoms, ions, molecules, and formula units.</li> <li><input type="checkbox"/> Use the periodic table to identify metals and nonmetals.</li> <li><input type="checkbox"/> Determine the charge of a monatomic ion based on its placement in periodic table.</li> <li><input type="checkbox"/> Identify selected polyatomic ions and name them, and vice versa.</li> <li><input type="checkbox"/> Be able to name and write chemical formulas for ionic compounds (BI, TI, OTHER).</li> <li><input type="checkbox"/> Be able to name and write chemical formulas for covalent compounds (BM).</li> <li><input type="checkbox"/> Be able to round to the proper number of significant figures in all calculations.</li> </ul>
1.0	With help from the teacher, student has partial success with the goal	<p>With help from a teacher, students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Achieve partial success with 2.0 and/or 3.0.</li> </ul>
0.0	Even with help, the student has no success with the goal	<ul style="list-style-type: none"> <li><input type="checkbox"/> Even with help, student is unable to understand or complete any of the skills in scales 1.0 through 4.0.</li> </ul>