**Learning Goals for Types of Reactions and Solutions (Including Acids and Bases)**

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| Guiding Question: How can products of reactions be predicted? How does the type of solute and concentration of solute change the behavior of a solution? | |
| Content Goals  Students will be able to:   * Determine the type of reaction given the reactants, including each of the following: * Composition reactions * Decomposition reactions * Combustion reactions * Single displacement reactions * Double displacement reactions * Predict the products of a reaction, given the reactants, for each of the types above\ * Identify the state (s, l, g, aq) of reactants and products using a solubility table * Identify solutions as homogeneous mixtures of solutes and solvents * Interpret solubility curves and determine whether a solution is saturated, unsaturated, or super saturated using a solubility curve * Calculate concentration, moles of solute, mass of solute, or volume of solution based on molarity * Determine the concentration and / or volume of a diluted solution * Determine whether a solute is an electrolyte or non-electrolyte * Identify acids and bases based on formula or properties * Name common acids and bases * Differentiate between strong and weak AND concentrated and dilute acidic and basic solutions * Write a balanced equation for a neutralization reaction (doub displ) * Use titration data to determine the molarity of an acid or base * Predict color changes in indicators such as phenolphthalein * Determine pH based on concentration of acid or base * Determine acid or base concentration based on pH * Identify conjugate acid / base pairs | Skills Goals  Students will:   * Conduct laboratory investigations in a safe and productive manner * Use standard laboratory equipment properly to observe various chemical reactions * Make measurements to the correct degree of uncertainty * Present data in organized tables * Present calculations in organized format * Make a solution of given concentration * Determine concentration of solution based on experimental reaction or colligative properties * Summarize the main idea and key supporting statements in a scientific article * Evaluate an article for reliability * Conduct research to support or refute a scientific statement using reliable scientific sources |
| Big Ideas  Students will understand the concept and properties of solutions, specifically acids and bases, as well as how to determine the concentration of a solution using given values or experimental data. | |
| Assessment – How will I know if students have mastered content, skills, and big ideas?  Students will:   * Accurately predict products of reactions * Make solutions that will be used in laboratory demonstrations * Analyze results and error in experiment * Complete tests and quizzes on all topics in content goals * Summarize and evaluate information presented in a scientific article | |

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| KEY VOCABULARY | |
| Solution  Soluble  Insoluble  Composition Reaction  Decomposition Reaction  Single Displacement  Double Displacement Reaction  Combustion Reaction  Solute  Solvent  Solubility  Saturated  Unsaturated  Supersaturated  Molarity  Dilution  Electrolyte  Non-electrolyte | Arrhenius Acid  Arrhenius Base  Bronsted – Lowry Acid  Bronsted – Lowry Base  Conjugate Acid  Conjugate Base  Hydronium ion  Hydroxide ion  pH  acid base indicator  monoprotic acid  diprotic acid  Strong acid / base  Weak acid / base  Titration  Neutralization  Equivalence point  End point |

 