**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 GoalsStudents 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 GoalsStudents 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
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| Big IdeasStudents 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 |
| SolutionSolubleInsolubleComposition ReactionDecomposition ReactionSingle DisplacementDouble Displacement ReactionCombustion ReactionSolute SolventSolubilitySaturatedUnsaturatedSupersaturated MolarityDilutionElectrolyteNon-electrolyte | Arrhenius AcidArrhenius BaseBronsted – Lowry AcidBronsted – Lowry BaseConjugate Acid Conjugate BaseHydronium ionHydroxide ionpHacid base indicatormonoprotic aciddiprotic acidStrong acid / baseWeak acid / baseTitrationNeutralizationEquivalence pointEnd point |

 