


Chemistry Curriculum Bundle #10

Title		Suggested Dates
Solutions, Acids and Bases		3/22 – 4/16 (19 days)

Big Idea/Enduring Understanding	Guiding Questions
Acids and bases have some similar and different properties.	What is worse: an acid burn or a base burn?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
<p>12 The student knows the factors that influence the solubility of solutes in a solvent.</p> <p>12A Demonstrate and explain effects of temperature and the nature of solid solutes on the solubility of solids.</p>	<p><i>Including</i></p> <ul style="list-style-type: none"> • Interpret solubility curves for given substances • Describe and differentiate between <ul style="list-style-type: none"> • Solutions • Colloids • Suspensions <p><i>investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area</i></p>	<p>PowerPoint Solubility Curves See chemistry resource folder</p> <p>A Demo a Day Volume 2 A Year of Chemical Demonstrations Flinn Scientific, Inc. Solutions, Colloids, and Suspensions Demo Pg. 182</p> <p>A Demo a Day Volume 2 A Year of Chemical Demonstrations Flinn Scientific, Inc. What's in a Solution Demo? Pg. 180</p>
<p>12 The student knows the factors that influence the solubility of solutes in a solvent.</p> <p>12C Evaluate the significance of water as a solvent in living organisms and in the environment.</p>	<p><i>Including</i></p> <ul style="list-style-type: none"> • Describe the physical properties of water including density of each phase, use as a solvent, and surface tension • Describe the significance of intermolecular forces to the behavior of water <p><i>describe the unique role of water in chemical and biological systems</i></p>	<p>Surface Tension Demo http://webacc.fsd38.ab.ca/schools/spitzee/CLASS_ACTS/Skeet/Chemistry/Chemistry_Notes.htm</p> <p>Water Animation See chemistry resource folder</p>

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<p>12 The student knows the factors that influence the solubility of solutes in a solvent.</p> <p>12B Develop general rules for solubility through investigations with aqueous solutions.</p>	<p>Including</p> <ul style="list-style-type: none"> • Explain the factors that affect the rate of solubility of a solid in solution <ul style="list-style-type: none"> • Temperature • Surface area • Agitation • Explain the relation between pressure and solubility of a gas • Read and interpret a solubility chart • Write net ionic equations (PAP) <p><i>develop and use general rules regarding solubility through investigations with aqueous solutions</i></p> <p><i>calculate the concentration of solutions in units of molarity</i></p> <p><i>use molarity to calculate the dilutions of solutions</i></p>	<p>Lab: Solubility of a Salt See chemistry resource folder</p> <p>Lab: Factors Affect Solubility See chemistry resource folder</p> <p>A Demo a Day Volume 2 A Year of Chemical Demonstrations Flinn Scientific, Inc. Gases Have it Backwards Demo Pg. 186-187</p> <p>A Demo a Day Volume 2 A Year of Chemical Demonstrations Flinn Scientific, Inc. Differential Solubility Demo Pg. 189</p> <p>(PAP) Laying the Foundation: A Resource and Strategies Guide for Chemistry Lesson 14: Net Ionic Equations Pg. 410</p>
<p>8 The student knows how atoms form bonds to acquire a stable arrangement of electrons.</p> <p>8D Describe the influence of intermolecular forces on the physical and chemical properties of covalent compounds.</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe and distinguish among the intermolecular forces <ul style="list-style-type: none"> ○ Dipole forces ○ Hydrogen bonds ○ London dispersion forces • Relate intermolecular forces to boiling point, melting point, surface tension, and the three phase of matter 	<p>Laying the Foundation: A Resource and Strategies Guide for Chemistry Lesson 11: Don't Flip Your Lid Pg. 376</p> <p>Lab: Intermolecular Forces See chemistry resource folder</p>
<p>13 The student knows relationships among the concentration, electrical conductivity, and colligative properties of a solution.</p> <p>13A Compare unsaturated, saturated, and supersaturated solutions.</p>	<p>Including</p> <ul style="list-style-type: none"> • Differentiate among solutions that are <ul style="list-style-type: none"> ○ Dilute ○ Concentrated ○ Unsaturated ○ Saturated ○ Supersaturated • Calculate dilution problems, given initial or final concentration • Differentiate between molarity (M) and molality (m) and calculate each 	<p>Lab: Types of Solutions See chemistry resource folder</p> <p>Lab: Solution Concentration See chemistry resource folder</p> <p>(PAP) Lab: Molarity Murder Investigation See chemistry resource folder</p>

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	<i>distinguish between types of solutions such as electrolytes and nonelectrolytes and unsaturated, saturated, and supersaturated solutions</i>	
<p>13 The student knows relationships among the concentration, electrical conductivity, and colligative properties of a solution.</p> <p>13C Measure and compare the rates of reaction of a solid reactant in solutions of varying concentration.</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe effect of reaction rate, according to: <ul style="list-style-type: none"> ○ The exposed surface area of the reactants ○ The concentration of the reactants ○ Temperature ○ Catalyst ○ Agitation/Collision • Describe the importance of the collision theory to reaction rates • Describe how catalysts can be used to affect the rate of a reaction (PAP) 	<p>Lab: Temperature and Reaction Rate See chemistry resource folder</p> <p>Lab: Factors Affect Reaction Rate See chemistry resource folder</p> <p>Iodine Clock Rxn Demo Flinn Scientific, Inc. See chemistry resource folder</p> <p>Pink Catalyst Demo Flinn Scientific, Inc. See chemistry resource folder</p>
<p>13 The student knows relationships among the concentration, electrical conductivity, and colligative properties of a solution.</p> <p>13B Interpret relationships among ionic and covalent compounds, electrical conductivity, and colligative properties of water.</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe and demonstrate how adding a nonvolatile solute affects colligative properties. <ul style="list-style-type: none"> ○ Vapor pressure ○ Freezing point ○ Boiling point 	<p>Lab: Colligative Properties Nancy Miller See chemistry resource folder</p> <p>Laying the Foundation: A Resource and Strategies Guide for Chemistry Lesson 23: Colligative Properties Pg. 522</p>
<p>14 The student knows the properties and behavior of acids and bases.</p> <p>14A Analyze and measure common household products using a variety of indicators to classify the products as acids or bases.</p>	<p>Including</p> <ul style="list-style-type: none"> • Differentiate between strong and weak acids and bases in terms of degree of ionization • Compare the properties of acids, bases, and salts according to <ul style="list-style-type: none"> ○ Arrhenius ○ Bronsted Lowry ○ Lewis (PAP) • Describe and calculate the concentration of solutions in terms of pH and pOH • Analyze solution pH using indicators <p><i>define acids and bases and distinguish between Arrhenius and Bronsted-Lowery definitions and predict products in acid base reactions that form water</i></p>	<p>Lab: Investigating what is in your cupboard See chemistry resource folder</p> <p>Lab: Indicators See chemistry resource folder</p> <p>Lab: Acids and Bases http://education.llnl.gov/bep/science/9/sPh.html</p> <p>Online pH meter http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/acidbasepH/ph_meter.html</p>

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define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution

distinguish between degrees of dissociation for strong and weak acids and bases