



Chemistry Curriculum Bundle #10

Title	 ASSESSMENT INFO	 9	Suggested Dates
Solutions, Acids and Bases			3/21 – 4/15 (20 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>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10B develop and use general rules regarding solubility through investigations with aqueous solutions;</p> <p>10F investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area;</p>	<p>Including</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 • Calculations based on solubility graphs 	<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>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10A describe the unique role of water in chemical and biological systems;</p>	<p>Describe intermolecular forces. CCRS <i>a. Distinguish between dispersion forces, dipole interactions, and hydrogen bonding. Identify the most important intermolecular force acting on substance.</i> CCRS</p> <p>Including</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>Water Animation See chemistry resource folder</p>

Chemistry Curriculum Bundle #10

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<p>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10A describe the unique role of water in chemical and biological systems;</p>	<p>Describe intermolecular forces. CCRS <i>a. Distinguish between dispersion forces, dipole interactions, and hydrogen bonding. Identify the most important intermolecular force acting on substance.</i> CCRS</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>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10E distinguish between types of solutions such as electrolytes and nonelectrolytes and unsaturated,</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 	<p>Lab: Types of Solutions See chemistry resource folder</p> <p>Lab: Solution Concentration See chemistry resource folder</p>

Chemistry Curriculum Bundle #10

<p>saturated, and supersaturated solutions;</p> <p>10D use molarity to calculate the dilutions of solutions;</p> <p>10C calculate the concentration of solutions in units of molarity;</p>	<ul style="list-style-type: none"> ○ Supersaturated ● Calculate dilution problems, given initial or final concentration ● Calculate molarity (M) ● Calculate molarity or volume by dilution ● Differentiate between calculations of molarity (M) and molality (m) (PAP) 	<p>(PAP) Lab: Molarity Murder Investigation See chemistry resource folder</p>
<p>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10F investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area;</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) ● Describe and demonstrate how adding a nonvolatile solute affects colligative properties (PAP) <ul style="list-style-type: none"> ○ Vapor pressure ○ Freezing point ○ Boiling point 	<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>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>10 Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</p> <p>10G define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water;</p> <p>10I define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution; and</p> <p>10J distinguish between degrees of dissociation for</p>	<p>Describe the properties of acids and bases, and identify the products of a neutralization reaction. CCRS</p> <p><i>a. Define pH and describe acid and base solutions in terms of pH. Use hydrogen ion or hydroxide ion concentrations to determine the pH of an acid or base solution.</i></p> <p><i>b. Use both commercial and noncommercial indicators to identify acid, base, and neutral solutions in a lab experiment.</i></p> <p><i>c. Distinguish between the Arrhenius and Bronsted definitions of acids and bases.</i></p> <p><i>Identify conjugate acid-base pairs.</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>

Chemistry Curriculum Bundle #10

strong and weak acids and bases.	<p>e. Measure and compare the pH of various common acids and bases (e.g., household cleaners, vinegar, citrus juice). <i>CCRS</i></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• Identify the conjugate acid/base pairs , strong or weak acids/bases(PAP)	
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