

Course: Chemistry 1 Honor

Course Code: 2003350

Quarter: 4 Unit 10

Resources	Common Core	Pacing Guide
---------------------------	-----------------------------	------------------------------

<p>Topic of Study: Solutions and Mixtures</p> <p>Standards: P8 - Matter</p> <p>Concepts: Mixtures, Solutions, Solubility, Concentration</p> <p>Essential Question: How are the characteristics of a solution related to its components?</p> <p>Key Learning: A solution is a stable homogeneous mixture.</p> <p style="text-align: right;">Unit 10: 14 days (7 blocks)</p>

NGSSS	Content	Target
<p>SC.912.P.8.2 Differentiate between physical and chemical properties and physical and chemical changes of matter. Cognitive Complexity: Moderate</p> <p>SC.912.P.8.6 Distinguish between other attractive forces, including hydrogen bonding and van der Waals forces. Cognitive Complexity: Moderate</p> <p>SC.912.P.8.10 Describe oxidation-reduction reactions in living and non-living systems. Cognitive Complexity: Moderate</p>	<p>I What is a mixture?</p> <p>A. Heterogeneous mixtures</p> <ol style="list-style-type: none"> 1. properties and examples 2. colloids 3. suspensions <p>B. Homogeneous mixtures</p> <ol style="list-style-type: none"> 1. properties and examples 2. solutions 3. alloys <p>II How do solutes and solvents interact to form solutions?</p> <p>A. types of solutions</p> <ol style="list-style-type: none"> 1. solute phase vs. solvent phase <ol style="list-style-type: none"> a. same phase b. different phases (gas vs. liquid) B. polar and nonpolar solutions C. Solutes <ol style="list-style-type: none"> 1. saturation types <ol style="list-style-type: none"> a. saturated b. supersaturated c. unsaturated 2. Electrolytes and nonelectrolytes 	<p>Identify types of mixtures.</p> <p>Determine if mixtures are homogeneous or heterogeneous.</p> <p>Describe Brownian movement.</p> <p>Identify the components of a solution (solute, solvent, solution).</p> <p>Differentiate between unsaturated, supersaturated, and saturated.</p> <p>Distinguish types of solutes as electrolytic or nonelectrolytes.</p> <p>Explain how intermolecular forces, such as Hydrogen bonding, affect dissolving.</p>
<p>Vocabulary: mixture, miscible, immiscible, suspension, colloid, alloy, solute, solvent, Brownian movement, saturated, supersaturated, unsaturated, electrolyte, nonelectrolyte oxidation, reduction</p>		
<p>SC.912.P.8.9 Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions. Concept Complexity: High</p>	<p>III What is a solutions concentration?</p> <p>A. percent concentration</p> <p>B. molarity</p>	<p>Express solution concentration in terms of molarity.</p> <p>Determine molarity of unknown solutions by experimental data.</p>
<p>Vocabulary: molarity, moles, percent concentration, titration</p> <p style="text-align: right;">Unit 10 – 14 days 7 block periods</p>		

St. Lucie County Public Schools Chemistry Scope and Sequence 2012-2013

Suggest Laboratories for Unit 10	Title	Lab Type	Resources: P -Pearson Textbook G -Glencoe Textbook H -Holt Textbook Reference pages
SC.912.P.8.2 Classification of Matter	<u>Separating Mixtures</u>	Quick Lab	P – page 39
	<u>Chemical Changes & Energy</u>	Start Up	H – page 37
	<u>Observing Chemical Changes</u>	Discovery	G – page 55
SC.912.P.8.9 Concentration	<u>Drip-Drop Acid/Base Experiment</u>	Skills	H – page 804
	<u>Acid-Bases Titration of an Eggshell</u>	Skills	H – page 808
	<u>Standardizing a Basic Solution</u>	ChemLab	G – page 626

Course: Chemistry 1 Honors

Course Code: 2003350

Quarter: 4 Unit 11

Topic of Study: Acids and Bases

Standards: P8 – Matter

Concepts: Acid and Base, Acid and Base Equations, Concentration, pH

Essential Question: How do the properties of acids and bases relate to their impact on the environment?

Key Learning: Solutions can be classified as acidic, basic and neutral.

Unit 11: 16 days (8 blocks)

NGSSS	Content	Target
<p>SC.912.P.8.8 Characterize types of chemical reactions, for example: acid-base. Cognitive Complexity: Moderate</p> <p>SC.912.P.8.11 Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH. Cognitive Complexity: Moderate</p>	<p>I Where are acids and bases found? A. models 1. Arrhenius a. ionization into H⁺ and (OH)⁻ 2. Brønsted-Lowry a. acid-base pair reactions 3. Lewis a. electron donor and acceptor B. nomenclature a. binary acids } review/ b. oxyacids } re-teach c. bases d. salts e. conjugate acids and bases C. applications in nature 1. beneficial and harmful effects a. acid rain b. ground water contamination c. nutrients in soils d. antibacterial/fungal properties.</p> <p>II What similarities and differences exist between acids and bases? A. physical properties B. chemical properties C. tests used for identification a. color changes b. litmus</p> <p>III How do we use pH to indicate the strength of an acid or base? A. ionization of water 1. equilibrium constant of water 2. hydronium, (H₃O)⁺ vs. H⁺ 3. hydroxide, (OH)⁻ B. pH scale 1. equilibrium constant of water. K_w C. pH and pOH 1. logarithmic function the ions D. pH values of acids and bases</p>	<p>Compare the Arrhenius and Brønsted-Lowry models of acids and bases.</p> <p>Differentiate the Lewis model of acids from both Arrhenius and Brønsted-Lowry.</p> <p>Compare and contrast the properties and models of acids and bases.</p> <p>Write Brønsted-Lowry equations and identify acid, base and their conjugates.</p> <p>Write neutralization reactions and identify salts formed.</p> <p>Explain the meaning of pH and pOH</p> <p>Relate pH and pOH to the ion product constant for water</p> <p>Relate the strength of an acid or base to its degree of ionization</p> <p>Calculate the pH and pOH of aqueous solutions</p> <p>Solve pH problems with concentration data.</p>
<p>Vocabulary: ionization, hydronium, hydroxide, ion product constant, equilibrium, acid, base, salt, pH, neutral, indicators Unit 11 – 16 days 8 block periods</p>		

St. Lucie County Public Schools Chemistry Scope and Sequence 2012-2013

Suggest Laboratories for Unit 11	Title	Lab Type	Resources: P -Pearson Textbook G -Glencoe Textbook H -Holt Textbook Reference pages
SC.912.P.8.11 pH	<u>Indicators from Natural Sources</u>	Quick Lab	P – page 662
	<u>How does your blood maintain it's pH?</u>	Problem S	G – page 624
	<u>Investigating what's in your Cupboards</u>	Discovery	G – page 595
SC.912.P.8.8 Acid/Base Reactions	<u>What Does an Antacid Do?</u>	Start Up	H – page 529
	<u>Acids & Bases in the Home</u>	Quick Lab	H – page 535
	<u>Standardizing a Base Solution</u>	ChemLab	G – page 626

Course: Chemistry 1 Honors

Course Code: 2003350

Quarter: 4 Unit 12

Topic of Study: Oxidation – Reduction Reactions

Standards: P8 – Matter

Concepts: Oxidation numbers, Oxidation and Reduction, Oxidizing and Reducing Agents

Essential Question: How do electron transfers occur in nature?

Key Learning: Electron loss or gain occur together in nature.

Unit 12: 12 days (6 blocks)

NGSSS	Content	Target
<p>SC.912.P.8.8 Characterize types of chemical reactions, for example: redox. Cognitive Complexity: Moderate</p> <p>SC.912.P.8.10 Describe oxidation-reduction reactions in living and non-living systems. Cognitive Complexity: Moderate</p>	<p>I How to determine oxidation numbers?</p> <p>A. Compounds</p> <ol style="list-style-type: none"> Rules for hydrogen and oxygen in compounds. neutrality in formula unit or molecule <ol style="list-style-type: none"> positive and negative charges add to zero. <p>B. Polyatomic ions</p> <ol style="list-style-type: none"> positive and negative charges add to the charge found on the ion. <p>C. Elements</p> <ol style="list-style-type: none"> proton and electrons numbers diatomic molecule's neutrality <p>II What is oxidized and reduced in an equation?</p> <p>A. Oxidation</p> <ol style="list-style-type: none"> OILRIG electron loss oxidation number more positive <p>B. Reduction</p> <ol style="list-style-type: none"> OILRIG electron gain oxidation number more negative <p>C. Oxidizing and Reducing Agents</p>	<p>Assign oxidation numbers of all elements or ions in a reaction.</p> <p>Determine which reactant is oxidized and which is reduced.</p> <p>Distinguish the oxidizing agent from the reducing agent.</p> <p>Calculate the number of electrons gained by the oxidizing agent.</p> <p>Calculate the number of electrons lost by the reducing agent</p> <p>Analyze oxidation/reduction reactions with regard to the transfer of electrons</p>

Vocabulary: oxidation number, oxidation, reduction, redox, oxidizing agent, reducing agent

Unit 12 – 12 days
6 block periods

Suggest Laboratories for Unit 12	Title	Lab Type	Resources: P-Pearson Textbook G-Glencoe Textbook H-Holt Textbook Reference pages
SC.912.P.8.8/P.8.10 Redox E-cells	<u>Half-Reactions</u>	Small Scale	P – page 717
	<u>A Lemon Battery</u>	Chem & You	P – page 747
	<u>Electrochemical Analysis of Metals</u>	Quick Lab	P – page 750
	<u>Lights On</u>	Start Up	H – page 603
	<u>Listen Up</u>	Quick Lab	H – page 618
	<u>Observing a Redox Reaction</u>	Discovery	G – page 635
	<u>Cleaning by Redox</u>	Mini Lab	G – page 638
	<u>Redox Reactions</u>	ChemLab	G – page 654