

# Curriculum Mapping and Pacing Guide

**Grade/Course**

**Chemistry**

**Grading Period: 2009-2010**

Time Frame	Unit/SOL	SOL #	Strand	Resources	Assessments	Notes
September 10 blocks	<ul style="list-style-type: none"> <li>Students will solve dimensional analysis problems using metric and British units</li> <li>Students will convert temperature reading from Celsius, Fahrenheit and Kelvin scales</li> <li>Students will complete density calculations</li> <li>Students will complete a laboratory exercise were they determine the density of an unknown metal</li> <li>Students will record all calculations using the correct number of significant figures as well as placing numbers in scientific notation</li> </ul>	1	a-g	Chapter 2: Measurements & Calculations	Quiz Lab Safety Quiz Colligative Properties Practical Quiz: Lighting a BB Quiz Scientific Notation/Significant Figures	<p><i>Modern Chemistry</i>, Holt, Rinehart &amp; Winston, 2002</p> <p><i>NOTE: This SOL is incorporated into almost every unit that is taught</i></p> <ul style="list-style-type: none"> <li>Lab Safety Video</li> <li>Set up Lab Notebook</li> <li>Introduction to Bunsen Burner</li> <li>Lab Activity: Colligative Properties</li> </ul>

<p>September-October 8 blocks</p>	<ul style="list-style-type: none"> <li>Students will begin to identify elements on the periodic table based on their symbols</li> <li>Students will discuss the differences between chemical v. physical properties and extensive v. intensive properties</li> <li>Students will verify the law of conservation of mass through a laboratory exercise</li> <li>Students will label matter as either a pure substance or mixture (and mixtures as homo- v. heterogeneous)</li> </ul>	<p>2</p>	<p>4</p>	<p>Chapter 1: Matter &amp; Change</p>	<p>First Unit Test Quiz Elements Quiz Matter</p>	<ul style="list-style-type: none"> <li>Lab Activity: Separation of a Heterogeneous Mixture</li> <li>Lab Activity: Candy Chromatography</li> <li>Lab Activity: Element of the Week: Cu</li> <li>Lab Activity: Conservation of Matter</li> <li>Lab Activity: Conservation of Mass</li> </ul>
<p>October 10 blocks</p>	<ul style="list-style-type: none"> <li>Students will discuss early atomic theory (Dalton, Thompson, Rutherford, Millikan)</li> <li>Students will identify the subatomic particles (including charge when necessary) in particular atoms as well as discuss the role of isotopes</li> <li>Students will calculate average atomic mass through practice problems as well as through laboratory exercise</li> <li>Students will complete simple stoichiometric calculations using mole-</li> </ul>	<p>2 4</p>	<p>a-c,i a-b</p>	<p>Chapter 3: Atoms: The Building Blocks of Matter</p>	<p>Second Unit Test Quiz Atomic Structure Quiz Mole Quiz Determining Atomic Mass</p>	<ul style="list-style-type: none"> <li>Prepare for MOLE DAY</li> <li>Lab Activity: Measuring the Impossible (Moles of Al in a piece of Foil)</li> <li>Lab Activity: Average Age (Isotopes)</li> <li>Lab Activity: Density of Pennies</li> <li>Lab Activity: Bean Bag Isotopes</li> </ul>

	gram-atom conversions (being introduced to the concept of molar mass and Avogadro's number)					
	Nine Week Assessment			Nine Week Assessment		Nine Week Assessment
October- November 8 blocks	<ul style="list-style-type: none"> <li>Students will discuss modern atomic theory (Planck, DeBroglie, Quantum theory, Heisenberg, Aufbau)</li> <li>Students will assign quantum numbers for electrons in atoms</li> <li>Students will assign electron configurations for electrons in neutral and charged atoms</li> </ul>	2	g, i	Chapter 4: Arrangement of Electrons in Atoms	Test Electron Configuration Quiz Atomic Theory Development	<ul style="list-style-type: none"> <li>Lab Activity: Flame Test</li> </ul>
November 10 blocks	<ul style="list-style-type: none"> <li>Students will discuss Mendeleev's &amp; the modern Periodic table</li> <li>Students will discuss element placement on the periodic table (including groups, families and periods and their properties)</li> <li>Students will discuss periodicity</li> </ul>	2	d-f	Chapter 5: The Periodic Law	Test Periodic Table	<ul style="list-style-type: none"> <li>Lab Activity: Periodic Table Activity</li> <li>Lab Activity: "It's in the Cards"</li> </ul>
November- December 12 blocks	<ul style="list-style-type: none"> <li>Students will classify compounds as either ionic or covalent (polar and nonpolar)</li> <li>Students will discuss metallic bonding</li> <li>Students will illustrate the octet rule using Lewis Dot structures</li> </ul>	3	C,d	Chapter 6: Chemical Bonding	Test Bonding Quiz Lewis Structures Quiz Structural Formulas	<ul style="list-style-type: none"> <li>Lab Activity: Bonding</li> </ul>

	<ul style="list-style-type: none"> <li>Students will determine the shapes of molecules using VSEPR theory</li> </ul>					
January 10 blocks	<ul style="list-style-type: none"> <li>Students will name and give formulas for ionic and covalent compounds</li> <li>Students will name and give formulas for acids</li> <li>Students will calculate the percent composition of compounds using molar mass</li> <li>Students will complete calculations to determine empirical and molecular formulas of compounds</li> </ul>	3	A,c,d	Chapter 7: Chemical Formulas and Chemical Compounds	Lab Practical: Identify 8 Unknowns Quiz Binary Compound Nomenclature Quiz Polyatomic Ions Quiz Ternary Compound Nomenclature Quiz Empirical Formulas	Lab Activity: Mystery Anion Lab
	<b>End of Semester ONE</b>					<b>Semester Examination/ Benchmark Assessment</b>
January-February 12 blocks	<ul style="list-style-type: none"> <li>Students will verify the law of conservation of mass by balancing chemical equations</li> <li>Students will review nomenclature (chapter 7) by writing balanced equations from word equations</li> <li>Students will classify reactions</li> </ul>	3	A,b, e	Chapter 8: Chemical Equations and Reactions	Lab Practical Examination: Chemical Reactions: Observation and Classification TEST: Bell Ringer Test  Test Writing Balanced Chemical Equations	<ul style="list-style-type: none"> <li>Lab Activity: Classifying Chemical Reactions</li> <li>Lab Activity: A Four-Reaction Copper Cycle (Copper and its Compounds)</li> <li>Lab Activity: Chemical Reactions and Qualitative Analysis</li> </ul>

February-March 8 blocks	<ul style="list-style-type: none"> <li>Students will discuss thermodynamic units of energy</li> <li>Students will discuss spontaneity of reactions using Gibbs Free energy</li> <li>Students will determine the heat of reaction using Hess's law</li> <li>Students will discuss the use of catalysts in reactions</li> <li>Students will be able to read an energy diagram for a reaction and determine whether the reaction is endo- or exothermic</li> <li>Students will extrapolate data from a phase diagram</li> <li>Students will complete specific heat calculations</li> </ul>	5	C,d,e	Chapter 17: Reaction Energy and REaction Kinetics	Test Energy/Thermodynamics	<ul style="list-style-type: none"> <li>Lab Activity: Energy Content of a Peanut</li> <li>Lab Activity: Measuring Energy Changes: Heat of Fusion</li> </ul>
March-April 12 blocks	<ul style="list-style-type: none"> <li>Students will complete stoichiometric calculations involving energy, molar conversions, gram conversions, conversions involving Avogadro's number, limiting reactant, density conversions, and percent yield</li> </ul>	14	G b	Chapter 9: Stoichiometry	Test Stoichiometry	<ul style="list-style-type: none"> <li>Lab Activity: Magnesium Oxide</li> <li>Lab Activity: Decomposition of Sodium Chlorate</li> <li>Lab Activity: Mole Ratios</li> <li>Lab Activity: Mole Rockets</li> <li>Lab Activity: Moles of Copper</li> <li>Lab Activity: Limiting Reactants</li> </ul>
	Nine Week Assessment					Nine Week Assessment
April 3 blocks	<ul style="list-style-type: none"> <li>Students will discuss Kinetic Molecular Theory</li> <li>Students will understand and complete calculations</li> </ul>	4 5	A,c,d a	<ul style="list-style-type: none"> <li>Chapter 10: Physical Characteristics of Gases</li> </ul>	Test Gas Laws	<ul style="list-style-type: none"> <li>Lab Activity: Boyles and Charles Laws</li> <li>Lab Activity: Preparing and Testing Hydrogen Gas</li> </ul>

	<p>using Charles' law, Boyle's law, Avogadro's principle, Pressure-Temperature relationship, Combined gas law, Ideal gas law, Graham's law of effusion, and Dalton's law of partial pressure</p> <ul style="list-style-type: none"> <li>• Students will convert pressure into different units (kilopascals, mmHg, torr, and atmospheres)</li> </ul> <p>Students will understand the difference between gas effusion and diffusion</p>			<ul style="list-style-type: none"> <li>• Chapter 11: Molecular Composition of Gases</li> </ul>		
April 3 blocks	<ul style="list-style-type: none"> <li>• Students will discuss the properties of liquids and solids focusing on changes in state</li> <li>• Students will discuss the unique properties of water</li> </ul>	2 5	H d	Chapter 12: Liquids & Solids		Lab Activity: It's Just a Phase
April 3 blocks	<ul style="list-style-type: none"> <li>• Students will determine solubility and extract information from a solubility curve</li> <li>• Students will calculate solution concentration using molarity, molality and normality</li> <li>• Students will become familiar with ionic compound solubility and precipitation reactions</li> </ul>	4 5	E g	Chapter 13: Solutions		<ul style="list-style-type: none"> <li>• Lab Activity: Preparing and Diluting Solutions</li> <li>• Lab Activity: Solubility and Temperature</li> <li>• Lab Activity: It's In Their Nature</li> <li>• Lab Activity: Intermolecular Forces</li> </ul>
April 3 blocks	<ul style="list-style-type: none"> <li>• Students will discuss the properties of ions in solution</li> </ul>	3 5	E G,h	Chapter 14: Ions in Aqueous Solutions & Colligative Properties	Test Liquids, Solids, Solutions	Lab Activity: Freezing Point Depression

	<ul style="list-style-type: none"> <li>Students will write balanced net ionic equations</li> <li>Students will discuss colligative properties of solutions</li> </ul>					
April 3 blocks	<ul style="list-style-type: none"> <li>Students will classify acids (Arrhenius and Bronsted-Lowry) and bases</li> <li>Students will determine conjugate acid-base pairs</li> <li>Students will determine acid/base strength by <math>K_a/K_b</math> values</li> <li>Students will recognize neutralization reactions and predict products</li> <li>Students will complete pH and pOH calculations</li> <li>Students will complete titration calculations using data provided and data collected during laboratory exercises</li> <li>Students will become familiar with indicators used in titration reactions</li> </ul>	3 4	E g	<ul style="list-style-type: none"> <li>Chapter 15: Acids &amp; Bases</li> <li>Chapter 16: Acid-Base Titration and pH</li> </ul>		<ul style="list-style-type: none"> <li>Lab Activity: Classic Titration</li> <li>Lab Activity: Natural Indicators</li> </ul>
April 3 blocks	<ul style="list-style-type: none"> <li>Students will discuss the nature of chemical equilibrium using LeChatlier's principle</li> <li>Students will discuss different stresses on equilibrium and how they effect shift of the equilibrium/reaction</li> </ul>	4	f	Chapter 18: Chemical Equilibrium		Lab Activity: Exploring Equilibrium

May 3 blocks	<ul style="list-style-type: none"> <li>Students will understand the basic principles of oxidation and reduction</li> <li>Students will identify oxidizing and reducing agents in reactions</li> <li>Students will balance redox reactions</li> <li>Students will discuss basic principles of electrochemistry</li> </ul>	3	e	Chapter 19: Oxidation-Reduction Reactions		Lab Activity: Metal Activity and Reactivity
May 3-6 blocks	<b>SOL REVIEW</b>			<b>SOL REVIEW</b>		<b>SOL REVIEW</b>