

**Inquiry Investigations™**  
**Chemistry - A Closer Look at Matter MODULE - 1287240**  
**Grades: 7-10**

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**California Content Standards**  
**Science**  
**Grade 7**

<b>CONTENT STANDARD</b>	<b>CA.1.</b>	<b>Life Science: Cell Biology: All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>1.d.</b>	<p>Students know that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.7.</b>	<b>Life Science: Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:</b>
<b>PERFORMANCE STANDARD</b>	<b>7.a.</b>	<p>Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<p><b>PERFORMANCE STANDARD</b></p>	<p>7.c.</p>	<p>Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A</li> </ul>

		<p>Closer Look at the Periodic Table</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<p><b>PERFORMANCE STANDARD</b></p>	<p>7.d.</p>	<p>Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> </ul>
<p><b>PERFORMANCE</b></p>	<p>7.e.</p>	<p>Communicate the steps and results from an investigation in written reports</p>

STANDARD	and oral presentations.
	<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown</li> </ul>

		Concentration
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**California Content Standards  
Science  
Grade 8**

CONTENT STANDARD	CA.3.	Physical Science: Structure of Matter: Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
PERFORMANCE STANDARD	3.a.	<p>Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.b.	<p>Students know that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.c.	<p>Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> </ul>

		<ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.d.	<p>Students know the states of matter (solid, liquid, gas) depend on molecular motion.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.e.	<p>Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.f.	<p>Students know how to use the periodic table to identify elements in simple compounds.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.5.	<p>Physical Science: Reactions: Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	5.a.	<p>Students know reactant atoms and molecules interact to form products with different chemical properties.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3:</li> </ul>

		<p>Production of a Salt - Neutralization Reaction</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.b.	<p>Students know the idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total mass stays the same.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	5.d.	<p>Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	5.e.	<p>Students know how to determine whether a solution is acidic, basic, or neutral.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1:</li> </ul>

		<p>The Traffic Light Reaction</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.6.</b>	<b>Physical Science: Chemistry of Living Systems (Life Science): Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>6.a.</b>	<p>Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>6.b.</b>	<p>Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>6.c.</b>	<p>Students know that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.7.</b>	<b>Physical Science: Periodic Table: The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>7.a.</b>	<p>Students know how to identify regions corresponding to metals, nonmetals, and inert gases.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Teacher Resource CD: Matter - Physical Properties and</li> </ul>



		Changes
PERFORMANCE STANDARD	7.b.	<p>Students know each element has a specific number of protons in the nucleus (the atomic number) and each isotope of the element has a different but specific number of neutrons in the nucleus.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	7.c.	<p>Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1:</li> </ul>

		<p>Testing Properties of Acids, Bases, and Salts</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.8.</b>	<b>Physical Science: Density and Buoyancy: All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>8.a.</b>	<p>Students know density is mass per unit volume.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>8.b.</b>	<p>Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.9.</b>	<b>Physical Science: Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:</b>
<b>PERFORMANCE STANDARD</b>	<b>9.a.</b>	<p>Plan and conduct a scientific investigation to test a hypothesis.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3:</li> </ul>

		<p>Forming Ionic Bonds</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<p><b>PERFORMANCE STANDARD</b></p>	<p>9.d.</p>	<p>Recognize the slope of the linear graph as the constant in the relationship <math>y = kx</math> and apply this principle in interpreting graphs constructed from data.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1:</li> </ul>

		Demonstrating Boyle's Gas Law
PERFORMANCE STANDARD	9.e.	Construct appropriate graphs from data and develop quantitative statements about the relationships between variables. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> </ul>
PERFORMANCE STANDARD	9.f.	Apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height). <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	9.g.	Distinguish between linear and nonlinear relationships on a graph of data. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> </ul>

**California Content Standards  
Science  
Grade 9**

CONTENT STANDARD	CA.2.	Physics: Conservation of Energy and Momentum: The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects. As a basis for understanding this concept:
PERFORMANCE STANDARD	2.a.	Students know how to calculate kinetic energy by using the formula: energy equals one half mass times velocity squared. <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.3.	Physics: Heat and Thermodynamics: Energy cannot be created or destroyed, although in many processes energy is transferred to the environment as heat. As a basis for understanding this concept:
PERFORMANCE STANDARD	3.c.	Students know the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. The greater the temperature of the object, the greater the energy of motion of the atoms and molecules that make up the object. <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT	CA.5.	Physics: Electric and Magnetic Phenomena: Electric and magnetic

<b>STANDARD</b>		phenomena are related and have many practical applications. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	5.i.	Students know plasmas, the fourth state of matter, contain ions or free electrons or both and conduct electricity. <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	CA.1.	Chemistry: Atomic and Molecular Structure: The periodic table displays the elements in increasing atomic number and shows how periodicity of the physical and chemical properties of the elements relates to atomic structure. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	1.a.	Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	1.b.	Students know how to use the periodic table to identify metals, semimetals, non-metals, and halogens. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	1.c.	Students know how to use the periodic table to identify alkali metals, alkaline earth metals and transition metals, trends in ionization energy, electronegativity, and the relative sizes of ions and atoms. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> </ul>
<b>PERFORMANCE STANDARD</b>	1.d.	Students know how to use the periodic table to determine the number of electrons available for bonding. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3:</li> </ul>

		<p>Forming Organic Compounds</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.e.	<p>Students know the nucleus of the atom is much smaller than the atom yet contains most of its mass.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.g.	<p>Students know how to relate the position of an element in the periodic table to its quantum electron configuration and to its reactivity with other elements in the table.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.h.	<p>Students know the experimental basis for Thomson's discovery of the electron, Rutherford's nuclear atom, Millikan's oil drop experiment, and Einstein's explanation of the photoelectric effect.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.2.	<p>Chemistry: Chemical Bonds: Biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	2.a.	<p>Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.b.	<p>Students know chemical bonds between atoms in molecules such as H<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>CCH<sub>2</sub>, N<sub>2</sub>, Cl<sub>2</sub>, and many large biological molecules are covalent.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.c.	<p>Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.d.	<p>Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.g.	<p>Students know how electronegativity and ionization energy relate to bond formation.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> </ul>

PERFORMANCE STANDARD	2.h.	<p>Students know how to identify solids and liquids held together by Van der Waals forces or hydrogen bonding and relate these forces to volatility and boiling/melting point temperatures.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.3.	<p>Chemistry: Conservation of Matter and Stoichiometry: The conservation of atoms in chemical reactions leads to the principle of conservation of matter and the ability to calculate the mass of products and reactants. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	3.a.	<p>Students know how to describe chemical reactions by writing balanced equations.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.b.	<p>Students know the quantity one mole is set by defining one mole of carbon 12 atoms to have a mass of exactly 12 grams.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.c.	<p>Students know one mole equals <math>6.02 \times 10^{23}</math> particles (atoms or molecules).</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.d.	<p>Students know how to determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and</li> </ul>



		Changes
PERFORMANCE STANDARD	3.e.	Students know how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses. <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.g.	Students know how to identify reactions that involve oxidation and reduction and how to balance oxidation-reduction reactions. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.4.	Chemistry: Gases and Their Properties: The kinetic molecular theory describes the motion of atoms and molecules and explains the properties of gases. As a basis for understanding this concept:
PERFORMANCE STANDARD	4.a.	Students know the random motion of molecules and their collisions with a surface create the observable pressure on that surface. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.b.	Students know the random motion of molecules explains the diffusion of gases. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.c.	Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.d.	Students know the values and meanings of standard temperature and

		<p>pressure (STP).</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.f.	<p>Students know there is no temperature lower than 0 Kelvin.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.g.	<p>Students know the kinetic theory of gases relates the absolute temperature of a gas to the average kinetic energy of its molecules or atoms.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.h.	<p>Students know how to solve problems by using the ideal gas law in the form <math>PV = nRT</math>.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.5.	<p>Chemistry: Acids and Bases: Acids, bases, and salts are three classes of compounds that form ions in water solutions. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	5.a.	<p>Students know the observable properties of acids, bases, and salt solutions.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.b.	<p>Students know acids are hydrogen-ion-donating and bases are hydrogen-ion-accepting substances.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.c.	<p>Students know strong acids and bases fully dissociate and weak acids and bases partially dissociate.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown</li> </ul>

		Concentration
PERFORMANCE STANDARD	5.d.	<p>Students know how to use the pH scale to characterize acid and base solutions.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.g.	<p>Students know buffers stabilize pH in acid-base reactions.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> </ul>
CONTENT STANDARD	CA.6.	Chemistry: Solutions: Solutions are homogenous mixtures of two or more substances. As a basis for understanding this concept:
PERFORMANCE STANDARD	6.a.	<p>Students know the definitions of solute and solvent.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	6.b.	<p>Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	6.c.	<p>Students know temperature, pressure, and surface area affect the dissolving process.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1:</li> </ul>

		<p>The Traffic Light Reaction</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.8.</b>	<b>Chemistry: Reaction Rates: Chemical reaction rates depend on factors that influence the frequency of collision of reactant molecules. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>8.a.</b>	<p>Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>8.b.</b>	<p>Students know how reaction rates depend on such factors as concentration, temperature, and pressure.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>8.c.</b>	<p>Students know the role a catalyst plays in increasing the reaction rate.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>8.d.</b>	<p>Students know the definition and role of activation energy in a chemical reaction.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.10.</b>	<b>Chemistry: Organic Chemistry and Biochemistry: The bonding characteristics of carbon allow the formation of many different organic molecules of varied sizes, shapes, and chemical properties and provide the biochemical basis of life. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>10.b.</b>	<p>Students know the bonding characteristics of carbon that result in the formation of a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>10.d.</b>	<p>Students know the system for naming the ten simplest linear hydrocarbons and isomers that contain single bonds, simple hydrocarbons with double</p>

		<p>and triple bonds, and simple molecules that contain a benzene ring.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.1.</b>	<b>Biology/Life Sciences: Cell Biology: The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>1.f.</b>	<p>Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>1.g.</b>	<p>Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.6.</b>	<b>Biology/Life Sciences: Ecology: Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>6.b.</b>	<p>Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>6.c.</b>	<p>Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.4.</b>	<b>Earth Sciences: Energy in the Earth System: Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>4.b.</b>	<p>Students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.5.</b>	<b>Earth Sciences: Energy in the Earth System: Heating of Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. As a basis for understanding this concept:</b>

<p>PERFORMANCE STANDARD</p>	<p>5.d.</p>	<p>Students know properties of ocean water, such as temperature and salinity, can be used to explain the layered structure of the oceans, the generation of horizontal and vertical ocean currents, and the geographic distribution of marine organisms.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
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<b>CONTENT STANDARD</b>	<b>CA.9.</b>	<b>Earth Sciences: California Geology: The geology of California underlies the state's wealth of natural resources as well as its natural hazards. As a basis for understanding this concept:</b>
<b>PERFORMANCE STANDARD</b>	<b>9.a.</b>	<p>Students know the resources of major economic importance in California and their relation to California's geology.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>9.c.</b>	<p>Students know the importance of water to society, the origins of California's fresh water, and the relationship between supply and need.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
<b>CONTENT STANDARD</b>	<b>CA.1.</b>	<b>Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:</b>
<b>PERFORMANCE STANDARD</b>	<b>1.a.</b>	<p>Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2:</li> </ul>



		<p>Writing a Description of a Chemical Reaction</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<p>PERFORMANCE STANDARD</p>	<p>1.d.</p>	<p>Formulate explanations by using logic and evidence.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	1.e.	<p>Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
PERFORMANCE STANDARD	1.g.	<p>Recognize the usefulness and limitations of models and theories as scientific representations of reality.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> </ul>

		<ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> </ul>
PERFORMANCE STANDARD	1.1.	<p>Analyze situations and solve problems that require combining and applying concepts from more than one area of science.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>

**California Content Standards  
Science  
Grade 10**

CONTENT STANDARD	CA.2.	Physics: Conservation of Energy and Momentum: The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects. As a basis for understanding this concept:
PERFORMANCE STANDARD	2.a.	<p>Students know how to calculate kinetic energy by using the formula: energy equals one half mass times velocity squared.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.3.	Physics: Heat and Thermodynamics: Energy cannot be created or destroyed, although in many processes energy is transferred to the environment as heat. As a basis for understanding this concept:
PERFORMANCE STANDARD	3.c.	<p>Students know the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. The greater the temperature of the object, the greater the energy of motion of the atoms and molecules that make up the object.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.5.	Physics: Electric and Magnetic Phenomena: Electric and magnetic phenomena are related and have many practical applications. As a basis for understanding this concept:
PERFORMANCE STANDARD	5.i.	<p>Students know plasmas, the fourth state of matter, contain ions or free electrons or both and conduct electricity.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.1.	Chemistry: Atomic and Molecular Structure: The periodic table displays the elements in increasing atomic number and shows how periodicity of the physical and chemical properties of the elements relates to atomic structure. As a basis for understanding this concept:
PERFORMANCE STANDARD	1.a.	<p>Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> </ul>

		<ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.b.	<p>Students know how to use the periodic table to identify metals, semimetals, non-metals, and halogens.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.c.	<p>Students know how to use the periodic table to identify alkali metals, alkaline earth metals and transition metals, trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> </ul>
PERFORMANCE STANDARD	1.d.	<p>Students know how to use the periodic table to determine the number of electrons available for bonding.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.e.	<p>Students know the nucleus of the atom is much smaller than the atom yet contains most of its mass.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Teacher Resource CD: Matter - Physical Properties and</li> </ul>

		Changes
PERFORMANCE STANDARD	1.g.	<p>Students know how to relate the position of an element in the periodic table to its quantum electron configuration and to its reactivity with other elements in the table.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	1.h.	<p>Students know the experimental basis for Thomson's discovery of the electron, Rutherford's nuclear atom, Millikan's oil drop experiment, and Einstein's explanation of the photoelectric effect.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.2.	Chemistry: Chemical Bonds: Biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules. As a basis for understanding this concept:
PERFORMANCE STANDARD	2.a.	<p>Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.b.	<p>Students know chemical bonds between atoms in molecules such as H<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>CCH<sub>2</sub>, N<sub>2</sub>, Cl<sub>2</sub>, and many large biological molecules are covalent.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3:</li> </ul>

		<p>Forming Organic Compounds</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.c.	<p>Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.d.	<p>Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	2.g.	<p>Students know how electronegativity and ionization energy relate to bond formation.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> </ul>
PERFORMANCE STANDARD	2.h.	<p>Students know how to identify solids and liquids held together by Van der Waals forces or hydrogen bonding and relate these forces to volatility and boiling/melting point temperatures.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.3.	<p>Chemistry: Conservation of Matter and Stoichiometry: The conservation of atoms in chemical reactions leads to the principle of conservation of matter and the ability to calculate the mass of products and reactants. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	3.a.	<p>Students know how to describe chemical reactions by writing balanced equations.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.b.	<p>Students know the quantity one mole is set by defining one mole of carbon 12 atoms to have a mass of exactly 12 grams.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.c.	<p>Students know one mole equals <math>6.02 \times 10^{23}</math> particles (atoms or molecules).</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.d.	<p>Students know how to determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.e.	<p>Students know how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	3.g.	<p>Students know how to identify reactions that involve oxidation and reduction and how to balance oxidation-reduction reactions.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Teacher Resource CD: Matter - Chemical Properties and</li> </ul>

		Changes
<b>CONTENT STANDARD</b>	CA.4.	Chemistry: Gases and Their Properties: The kinetic molecular theory describes the motion of atoms and molecules and explains the properties of gases. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	4.a.	Students know the random motion of molecules and their collisions with a surface create the observable pressure on that surface. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	4.b.	Students know the random motion of molecules explains the diffusion of gases. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	4.c.	Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	4.d.	Students know the values and meanings of standard temperature and pressure (STP). <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
<b>PERFORMANCE STANDARD</b>	4.f.	Students know there is no temperature lower than 0 Kelvin. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1:</li> </ul>



		<p>Observing Temperature Change in a Chemical Reaction</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.g.	<p>Students know the kinetic theory of gases relates the absolute temperature of a gas to the average kinetic energy of its molecules or atoms.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	4.h.	<p>Students know how to solve problems by using the ideal gas law in the form <math>PV = nRT</math>.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.5.	<p>Chemistry: Acids and Bases: Acids, bases, and salts are three classes of compounds that form ions in water solutions. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	5.a.	<p>Students know the observable properties of acids, bases, and salt solutions.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE	5.b.	<p>Students know acids are hydrogen-ion-donating and bases are hydrogen-</p>

STANDARD		<p>ion-accepting substances.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.c.	<p>Students know strong acids and bases fully dissociate and weak acids and bases partially dissociate.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.d.	<p>Students know how to use the pH scale to characterize acid and base solutions.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown</li> </ul>

		Concentration
PERFORMANCE STANDARD	5.f.	<p>Students know how to calculate pH from the hydrogen-ion concentration.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> <li>Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	5.g.	<p>Students know buffers stabilize pH in acid-base reactions.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> </ul>
CONTENT STANDARD	CA.6.	Chemistry: Solutions: Solutions are homogenous mixtures of two or more substances. As a basis for understanding this concept:
PERFORMANCE STANDARD	6.a.	<p>Students know the definitions of solute and solvent.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	6.b.	<p>Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	6.c.	<p>Students know temperature, pressure, and surface area affect the dissolving process.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.8.	Chemistry: Reaction Rates: Chemical reaction rates depend on factors that influence the frequency of collision of reactant molecules. As a basis for understanding this concept:

PERFORMANCE STANDARD	8.a.	<p>Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	8.b.	<p>Students know how reaction rates depend on such factors as concentration, temperature, and pressure.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	8.c.	<p>Students know the role a catalyst plays in increasing the reaction rate.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	8.d.	<p>Students know the definition and role of activation energy in a chemical reaction.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
CONTENT STANDARD	CA.10.	<p>Chemistry: Organic Chemistry and Biochemistry: The bonding characteristics of carbon allow the formation of many different organic molecules of varied sizes, shapes, and chemical properties and provide the biochemical basis of life. As a basis for understanding this concept:</p>
PERFORMANCE STANDARD	10.b.	<p>Students know the bonding characteristics of carbon that result in the formation of a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Teacher Resource CD: Matter - Physical Properties and Changes</li> </ul>
PERFORMANCE STANDARD	10.d.	<p>Students know the system for naming the ten simplest linear hydrocarbons and isomers that contain single bonds, simple hydrocarbons with double and triple bonds, and simple molecules that contain a benzene ring.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Teacher Resource CD: Matter - Physical Properties and</li> </ul>

		Changes
<b>CONTENT STANDARD</b>	CA.1.	Biology/Life Sciences: Cell Biology: The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	1.f.	Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>PERFORMANCE STANDARD</b>	1.g.	Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	CA.6.	Biology/Life Sciences: Ecology: Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	6.b.	Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
<b>PERFORMANCE STANDARD</b>	6.c.	Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death. <ul style="list-style-type: none"> <li>Teacher Resource CD: Matter - Chemical Properties and Changes</li> </ul>
<b>CONTENT STANDARD</b>	CA.4.	Earth Sciences: Energy in the Earth System: Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	4.b.	Students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> </ul>
<b>CONTENT STANDARD</b>	CA.5.	Earth Sciences: Energy in the Earth System: Heating of Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. As a basis for understanding this concept:
<b>PERFORMANCE STANDARD</b>	5.d.	Students know properties of ocean water, such as temperature and salinity, can be used to explain the layered structure of the oceans, the generation of horizontal and vertical ocean currents, and the geographic distribution of marine organisms. <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
CONTENT STANDARD	CA.9.	Earth Sciences: California Geology: The geology of California underlies the state's wealth of natural resources as well as its natural hazards. As

		a basis for understanding this concept:
PERFORMANCE STANDARD	9.a.	<p>Students know the resources of major economic importance in California and their relation to California's geology.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
PERFORMANCE STANDARD	9.c.	<p>Students know the importance of water to society, the origins of California's fresh water, and the relationship between supply and need.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
CONTENT STANDARD	CA.1.	Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:
PERFORMANCE STANDARD	1.a.	<p>Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.</p> <ul style="list-style-type: none"> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> </ul>

		<ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
<b>PERFORMANCE STANDARD</b>	<b>1.d.</b>	<p>Formulate explanations by using logic and evidence.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1:</li> </ul>



		<p>Testing Properties of Acids, Bases, and Salts</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li> <li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li> </ul>
PERFORMANCE STANDARD	1.e.	<p>Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li> </ul>
PERFORMANCE STANDARD	1.g.	<p>Recognize the usefulness and limitations of models and theories as scientific representations of reality.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> </ul>
PERFORMANCE STANDARD	1.i.	<p>Analyze situations and solve problems that require combining and</p>

applying concepts from more than one area of science.

- Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions
- Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds
- Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds
- Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases
- Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt
- Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds
- Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents
- Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter
- Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter
- Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements
- Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table
- Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures
- Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water
- Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction
- Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law
- Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts
- Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal
- Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction
- Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2: An Endothermic Reaction
- Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification
- Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass
- Virtual Laboratory: Titrating an Acid of Unknown

		Concentration
PERFORMANCE STANDARD	1.m.	<p>Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.</p> <ul style="list-style-type: none"> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 1: Modeling Atoms and Ions</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 2: Forming Covalent Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 1 Activity 3: Forming Ionic Bonds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 1: Molecular Structure of Acids and Bases</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 2: Crystal Structure of Common Salt</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 3: Forming Organic Compounds</li> <li>• Chemistry - A Closer Look at Matter: Unit 1 Lab 2 Activity 4: Chemical Structure of Soaps and Detergents</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 1: Classifying Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 3 Activity 2: Exploring Changes in Matter</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 1: Examining Elements</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 4 Activity 2: A Closer Look at the Periodic Table</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 5 Activity 1: Investigating Mixtures</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 1: Separating the Compound Water</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 6 Activity 2: Writing a Description of a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 2 Lab 7 Activity 1: Demonstrating Boyle's Gas Law</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 1: Testing Properties of Acids, Bases, and Salts</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 2: Chemical Reactions of Acids with a Metal</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 10 Activity 3: Production of a Salt - Neutralization Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 11 Activity 1: The Traffic Light Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 1: Observing Temperature Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 2: Observing Color Change in a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 3: Observing Gas Production During a Chemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 8 Activity 4: Observing a Biochemical Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 1: An Exothermic Reaction</li> <li>• Chemistry - A Closer Look at Matter: Unit 3 Lab 9 Activity 2:</li> </ul>

		<p>An Endothermic Reaction</p> <ul style="list-style-type: none"><li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 1: Water Purification</li><li>• Chemistry - A Closer Look at Matter: Unit 4 Lab 12 Activity 2: Demonstrating Conservation of Mass</li><li>• Virtual Laboratory: Titrating an Acid of Unknown Concentration</li></ul>
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