

GRADE LEVEL: 10

SUBJECT: CHEMISTRY

DATE: 2016-2017

MONTH/GRADING PERIOD: QUARTER 1

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CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"><li>• Pure Substances</li><li>• Mixtures</li><li>• Physical Properties</li><li>• Chemical Properties</li></ul>	<b>C.1.1</b> Differentiate between pure substances and mixtures based on physical and chemical properties.	<ul style="list-style-type: none"><li>• Differentiate between pure substances and mixtures.</li><li>• Distinguish between physical and chemical properties.</li></ul>	<ul style="list-style-type: none"><li>• Matter and Change Test</li><li>• Daily Bell ringer Questions</li><li>• Class Discussions</li><li>• Drops of Water on a Penny Lab Handout</li><li>• Milk, Soap, and Food Coloring Lab Handout</li></ul>	<ul style="list-style-type: none"><li>• Pure Substance</li><li>• Mixture</li><li>• Physical Properties</li><li>• Chemical Properties</li></ul>	CRITICAL
<ul style="list-style-type: none"><li>• Substance identification</li><li>-chemical properties</li><li>-extensive and intensive physical properties</li></ul>	<b>C.1.2</b> Use chemical properties, extensive, and intensive physical properties to identify substances.	<ul style="list-style-type: none"><li>• Distinguish between intensive and extensive properties.</li><li>• Measure and Observe properties of substances to classify and identify the substances.</li></ul>	<ul style="list-style-type: none"><li>• Matter and Change Test</li><li>• Density Lab Handout</li><li>• Daily Bell ringer Questions</li></ul>	<ul style="list-style-type: none"><li>• Chemical Properties</li><li>• Physical Properties</li><li>• Intensive Properties</li><li>• Extensive Properties</li></ul>	CRITICAL

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Indicators of Chemical Change</li> </ul>	<p><b>C.1.3</b> Recognize observable macroscopic indicators of chemical changes.</p>	<ul style="list-style-type: none"> <li>Describe a change as physical or chemical based on whether one of the indicators of chemical change has been observed.</li> </ul>	<ul style="list-style-type: none"> <li>Matter and Change Test</li> <li>Daily Bell ringer Questions</li> </ul>		CRITICAL
<ul style="list-style-type: none"> <li>Physical Changes</li> <li>Chemical Changes</li> </ul>	<p><b>C.1.4</b> Describe physical and chemical changes at the particle level.</p>	<ul style="list-style-type: none"> <li>Describe physical and chemical changes at the particle level.</li> </ul>	<ul style="list-style-type: none"> <li>Daily Bell ringer Questions</li> </ul>		ADDITIONAL
<ul style="list-style-type: none"> <li>Solids</li> <li>Liquids</li> <li>Gases</li> <li>Phase Changes</li> </ul>	<p><b>C.1.5</b> Describe the characteristics of solids, liquids, and gases and changes in state at the macroscopic and microscopic levels.</p>	<ul style="list-style-type: none"> <li>Describe the differences between solids, liquids and gases at the microscopic and macroscopic level.</li> <li>Categorize a state of matter based off the spacing between particles and arrangement of particles.</li> </ul>	<ul style="list-style-type: none"> <li>Matter and Change Test</li> <li>Daily Bell ringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Melting</li> <li>Freezing</li> <li>Vaporization</li> <li>Condensation</li> <li>Sublimation</li> <li>Deposition</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>Conservation of Mass</li> </ul>	<p><b>C.1.6</b> Demonstrate an understanding of the law of conservation of mass through the use of particle diagrams and mathematical models.</p>	<ul style="list-style-type: none"> <li>Show by calculation that mass is conserved in ordinary chemical reactions (even if it seems like it isn't i.e. gas formation).</li> </ul>	<ul style="list-style-type: none"> <li>Vinegar and Baking Soda Conservation of Mass Lab Handout</li> <li>Daily Bell ringer Questions</li> </ul>		CRITICAL

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Material identification using density</li> </ul>	<p><b>C.1.7</b> Perform calculations involving density and distinguish among materials based on densities.</p>	<ul style="list-style-type: none"> <li>Calculate densities of objects given their mass and volume.</li> <li>Reference density charts to identify substances for which densities are calculated.</li> </ul>	<ul style="list-style-type: none"> <li>Daily Bell ringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Density</li> </ul>	<p>IMPORTANT</p>
<ul style="list-style-type: none"> <li>Models of atomic structure               <ul style="list-style-type: none"> <li>-Plum Pudding Model</li> <li>-Bohr's Model of the Hydrogen Atom</li> <li>-Quantum Mechanical Model</li> <li>-Cathode Ray Experiments</li> <li>-Oil Drop Experiment</li> <li>-Gold-Foil Experiment</li> </ul> </li> </ul>	<p><b>C.2.1</b> Using available experimental data, explain how and why models of atomic structure have changed over time.</p>	<ul style="list-style-type: none"> <li>Explain the differences between atomic models.</li> <li>Explain the development of atomic models (i.e. how the electron was discovered).</li> <li>Diagram the location of protons, neutrons, and electrons in the atom.</li> <li>Articulate the relative charge and relative masses of the subatomic particles.</li> </ul>	<ul style="list-style-type: none"> <li>Atomic Structure Test</li> <li>Daily Bell ringer Questions</li> <li>Class Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Proton</li> <li>Neutron</li> <li>Electron</li> <li>Nucleus</li> </ul>	<p>IMPORTANT</p>

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Isotopes</li> <li>• Mass Number</li> <li>• Atomic Number</li> <li>• Percent Abundance</li> </ul>	<p><b>C.2.2</b> Determine the number of protons, neutrons, and electrons in isotopes and calculate the average atomic mass from isotopic abundance data.</p>	<ul style="list-style-type: none"> <li>• Calculate the number of neutrons in an isotope when given the mass number and atomic number.</li> <li>• Articulate protons, neutron, and electron interactions.</li> <li>• Calculate weighted average atomic mass given isotope abundance data.</li> </ul>	<ul style="list-style-type: none"> <li>• Atomic Structure Test</li> <li>• Daily Bell ringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Isotope</li> <li>• Mass Number</li> <li>• Atomic Number</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>• Electron Configurations</li> <li>• Valence Electrons and element position on the periodic table</li> <li>• Orbital Diagrams</li> </ul>	<p><b>C.2.3</b> Write the full and noble gas electron configuration of an element, determine its valence electrons, and relate this to its position on the periodic table.</p>	<ul style="list-style-type: none"> <li>• Connect the location of an element on the periodic table to its valence electrons and electron configuration.</li> <li>• Construct electron configurations and orbital diagrams for the ground state of an atom.</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic Structure of the Atom Test</li> <li>• Daily Bell ringer Questions</li> <li>• Class Discussions</li> <li>• Flame Test Lab Handout</li> </ul>	<ul style="list-style-type: none"> <li>• Valence Electron</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>• Nuclear Reaction</li> <li>• Alpha</li> <li>• Beta</li> <li>• Gamma</li> </ul>	<p><b>C.2.5</b> Compare and contrast nuclear reactions with chemical reactions.</p>	<ul style="list-style-type: none"> <li>• Compare and contrast nuclear reactions and ordinary chemical reactions.</li> <li>• Rank the strengths of alpha, beta, and gamma radiation.</li> <li>• Compare the masses and charges of the 3 types of radiation.</li> </ul>	<ul style="list-style-type: none"> <li>• Atomic Structure Test</li> <li>• Daily Bell ringer Questions</li> <li>• Class Discussions</li> <li>• Radioactivity Lab Handout</li> </ul>		IMPORTANT

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Nuclear changes in matter</li> <li>• Fission</li> <li>• Fusion</li> <li>• Transmutation</li> <li>• Radioactive Decay</li> </ul>	<p><b>C.2.6</b> Describe nuclear changes in matter, including fission, fusion, transmutations, and decays.</p>	<ul style="list-style-type: none"> <li>• Compare and contrast fission and fusion.</li> <li>• Examine and interpret decay chains for radioactive isotopes.</li> </ul>	<ul style="list-style-type: none"> <li>• Daily Bell ringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Fission</li> <li>• Fusion</li> <li>• Transmutation</li> <li>• Radioactive Decay</li> </ul>	<p>ADDITIONAL</p>
<ul style="list-style-type: none"> <li>• Half-Life</li> </ul>	<p><b>C.2.7</b> Perform half-life calculations when given the appropriate information about the isotope.</p>	<ul style="list-style-type: none"> <li>• Calculate half-life information (i.e. half-life, radioactive substance remaining, etc).</li> </ul>	<ul style="list-style-type: none"> <li>• Daily Bell ringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Half-life</li> </ul>	<p>ADDITIONAL</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.1.1</b> Differentiate between pure substances and mixtures based on physical and chemical properties.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p>
<p><b>C.1.2</b> Use chemical properties, extensive, and intensive physical properties to identify substances.</p>	<p><b>SEPS.4</b> Analyzing and interpreting data</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p> <p><b>SEPS.7</b> Engaging in argument from evidence</p> <p><b>SEPS.8</b> Obtaining, evaluating, and communicating information <b>SEPS.8</b> Obtaining, evaluating, and communicating information evidence</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>
<p><b>C.1.3</b> Recognize observable macroscopic indicators of chemical changes.</p>	<p><b>SEPS.3</b> Constructing and performing investigations</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.1.4</b> Describe physical and chemical changes at the particle level.</p>	<p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p>
<p><b>C.1.5</b> Describe the characteristics of solids, liquids, and gases and changes in state at the macroscopic and microscopic levels.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>
<p><b>C.1.6</b> Demonstrate an understanding of the law of conservation of mass through the use of particle diagrams and mathematical models.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.1.7</b> Perform calculations involving density and distinguish among materials based on densities.</p>	<p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.7.1:</b> Conduct short as well as more sustained research assignments and tasks to answer a question (including a self-generated question), test a hypothesis, or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.2.1</b> Using available experimental data, explain how and why models of atomic structure have changed over time.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p> <p><b>11-12.LST.4.2:</b> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>
<p><b>C.2.2</b> Determine the number of protons, neutrons, and electrons in isotopes and calculate the average atomic mass from isotopic abundance data.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.2.3</b> Write the full and noble gas electron configuration of an element, determine its valence electrons, and relate this to its position on the periodic table.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>
<p><b>C.2.5</b> Compare and contrast nuclear reactions with chemical reactions.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.2.1:</b> Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.2.6</b> Describe nuclear changes in matter, including fission, fusion, transmutations, and decays.</p>	<p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
<p><b>C.2.7</b> Perform half-life calculations when given the appropriate information about the isotope.</p>	<p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Relative properties of elements</li> <li>Pattern of valence electrons</li> <li>Periodic trends</li> </ul>	<b>C.2.4</b> Use the periodic table as a model to predict the relative properties of elements based on the pattern of valence electrons and periodic trends.	<ul style="list-style-type: none"> <li>Rank atoms/ions in the same group or period from least to greatest radius, electronegativity, and ionization energy.</li> </ul>	<ul style="list-style-type: none"> <li>Periodic Trends Quiz</li> </ul>	<ul style="list-style-type: none"> <li>Atomic Radius</li> <li>Ionic Radius</li> <li>Electronegativity</li> <li>Ionization Energy</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>Characteristics of elements and compounds.               <ul style="list-style-type: none"> <li>-ionic</li> <li>-covalent</li> </ul> </li> </ul>	<b>C.3.1</b> Investigate the observable characteristics of elements, ionic, and covalent compounds.	<ul style="list-style-type: none"> <li>Distinguish between ionic and covalent compounds based on their physical properties (i.e. melting point and boiling point).</li> <li>Distinguish between elements and compounds based on their chemical formulas.</li> </ul>	<ul style="list-style-type: none"> <li>Ionic and Covalent Bonding Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Ionic Compounds</li> <li>Covalent Compounds</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>Formation of ionic and covalent compounds.</li> </ul>	<b>C.3.2</b> Compare and contrast how ionic and covalent compounds form.	<ul style="list-style-type: none"> <li>Compare and contrast how ionic and covalent compounds form.</li> </ul>	<ul style="list-style-type: none"> <li>Ionic and Covalent Bonding Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Ionic Bonding</li> <li>Covalent Bonding</li> <li>Valence Electrons</li> </ul>	IMPORTANT

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Structural formulas for simple molecules</li> <li>• Molecular shape</li> </ul>	<p><b>C.3.3</b> Draw structural formulas for simple molecules and determine their molecular shape.</p>	<ul style="list-style-type: none"> <li>• Draw Lewis Symbols that describe how ionic bonding forms.</li> <li>• Draw structural formulas for simple molecules.</li> </ul>	<ul style="list-style-type: none"> <li>• Ionic and Covalent Bonding Test</li> <li>• Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Valence Electrons</li> <li>• Octet Rule</li> <li>• Single Bond</li> <li>• Double Bond</li> <li>• Triple Bond</li> <li>• Resonance</li> </ul>	<p>IMPORTANT</p>
<ul style="list-style-type: none"> <li>• Chemical Formulas</li> <li>• Chemical Names</li> </ul>	<p><b>C.3.4</b> Write chemical formulas for ionic compounds and covalent compounds given their names and vice versa.</p>	<ul style="list-style-type: none"> <li>• Write the chemical formula given the chemical name.</li> <li>• Write the chemical name given the chemical formula.</li> </ul>	<ul style="list-style-type: none"> <li>• Ionic and Covalent Bonding Test</li> <li>• Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical Formula</li> <li>• Chemical Name</li> </ul>	<p>CRITICAL</p>
<ul style="list-style-type: none"> <li>• Types of bonding: <ul style="list-style-type: none"> <li>-Ionic</li> <li>-Polar Covalent</li> <li>-Nonpolar Covalent</li> <li>-Network</li> <li>-Metallic</li> </ul> </li> </ul>	<p><b>C.3.5</b> Use laboratory observations and data to compare and contrast ionic, covalent, network, metallic, polar, and non-polar substances with respect to constituent particles, strength of bonds, melting, and boiling points and conductivity; provide examples of each type.</p>	<ul style="list-style-type: none"> <li>• Identify substances as ionic or covalent based off their: melting points, boiling points, and electrical conductivity.</li> <li>• Distinguish between polar and nonpolar substances based off their properties and electronegativity differences.</li> <li>• Produce examples of ionic, polar covalent, and nonpolar covalent compounds.</li> </ul>	<ul style="list-style-type: none"> <li>• Ionic and Covalent Bonding Test</li> <li>• Daily Bellringer Questions</li> <li>• Ionic and Covalent Bonding Lab Handout</li> </ul>	<ul style="list-style-type: none"> <li>• Ionic Bonding</li> <li>• Polar Covalent Bonding</li> <li>• Nonpolar Covalent Bonding</li> <li>• Network Solids</li> <li>• Metallic Bonding</li> </ul>	<p>IMPORTANT</p>

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Structural formulas of hydrocarbons</li> </ul>	<p><b>C.3.6</b> Use structural formulas of hydrocarbons to illustrate carbon's ability to form single and multiple bonds within a molecule.</p>	<ul style="list-style-type: none"> <li>Draw appropriate Lewis Structures of hydrocarbons with carbon forming 4 bonds (and therefore obeying the octet rule).</li> </ul>	<ul style="list-style-type: none"> <li>Ionic and Covalent Bonding Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Hydrocarbon</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>Types of Reactions: <ul style="list-style-type: none"> <li>-Synthesis</li> <li>-Decomposition</li> <li>-Single Displacement</li> <li>-Double Displacement</li> <li>-Combustion</li> <li>-Acid/Base</li> </ul> </li> </ul>	<p><b>C.4.1</b> Describe, classify, and give examples of various kinds of reactions: synthesis (i.e., combination), decomposition, single displacement, double displacement, acid/base, and combustion.</p>	<ul style="list-style-type: none"> <li>Describe various kinds of reactions.</li> <li>Classify various kinds of reactions.</li> <li>Provide examples of various kinds of reactions.</li> </ul>	<ul style="list-style-type: none"> <li>Types of Reactions Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Synthesis</li> <li>Decomposition</li> <li>Single Displacement</li> <li>Double Displacement</li> <li>Combustion</li> <li>Acid/Base</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>Products of simple reactions</li> </ul>	<p><b>C.4.2</b> Predict products of simple reactions as listed in C.4.1.</p>	<ul style="list-style-type: none"> <li>Predict the products of a reaction given the reactants.</li> </ul>	<ul style="list-style-type: none"> <li>Types of Reactions Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Products</li> <li>Reactants</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>Balancing Chemical Equations</li> </ul>	<p><b>C.4.3</b> Balance chemical equations and use the law of conservation of mass to explain why this must be true.</p>	<ul style="list-style-type: none"> <li>Write balanced chemical equations for a reaction given the chemical names of the reactants.</li> </ul>	<ul style="list-style-type: none"> <li>Types of Reactions Test</li> <li>Daily Bellringer Questions</li> </ul>		CRITICAL
<ul style="list-style-type: none"> <li>Conversions between moles, grams, molecules, atoms, and liters of gas</li> </ul>	<p><b>C.4.4</b> Apply the mole concept to determine the mass, moles, number of particles, or volume of a gas at STP, in any given sample, for an element or compound.</p>	<ul style="list-style-type: none"> <li>Convert between moles, grams, molecules, atoms, and liters of gas.</li> </ul>	<ul style="list-style-type: none"> <li>Chemical Quantities Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Moles</li> <li>Atoms</li> <li>Molecules</li> <li>Formula Units</li> <li>Ions</li> </ul>	CRITICAL

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Calculations to determine the composition of a compound or mixture</li> </ul>	<p><b>C.4.6</b> Perform calculations to determine the composition of a compound or mixture when given the necessary information.</p>	<ul style="list-style-type: none"> <li>• Calculate percent composition.</li> <li>• Calculate empirical and molecular formulas.</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical Quantities Test</li> <li>• Daily Bellringer Questions</li> <li>• Popcorn Percent Composition Lab</li> </ul>	<ul style="list-style-type: none"> <li>• Percent Composition</li> <li>• Empirical Formula</li> <li>• Molecular Formula</li> </ul>	<p>IMPORTANT</p>
<ul style="list-style-type: none"> <li>• Empirical and molecular formula of a compound.</li> </ul>	<p><b>C.4.7</b> Apply lab data to determine the empirical and molecular formula of a compound.</p>	<ul style="list-style-type: none"> <li>• Determine empirical formula after collecting lab data.</li> </ul>	<ul style="list-style-type: none"> <li>• Determination of empirical formula of magnesium oxide lab</li> </ul>		<p>IMPORTANT</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.2.4</b> Use the periodic table as a model to predict the relative properties of elements based on the pattern of valence electrons and periodic trends.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.3.1</b> Investigate the observable characteristics of elements, ionic, and covalent compounds.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.2</b> Developing and using models and tools</p> <p><b>SEPS.3</b> Constructing and performing investigations</p> <p><b>SEPS.7</b> Engaging in argument from evidence</p> <p><b>SEPS.8</b> Obtaining, evaluating, and communicating information</p>	<p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.4.2:</b> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>
<p><b>C.3.2</b> Compare and contrast how ionic and covalent compounds form.</p>	<p><b>SEPS.2</b> Developing and using models and tools</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.3.3</b> Draw structural formulas for simple molecules and determine their molecular shape.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>
<p><b>C.3.4</b> Write chemical formulas for ionic compounds and covalent compounds given their names and vice versa.</p>	<p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.3.5</b> Use laboratory observations and data to compare and contrast ionic, covalent, network, metallic, polar, and non-polar substances with respect to constituent particles, strength of bonds, melting, and boiling points and conductivity; provide examples of each type.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.1:</b> Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p> <p><b>11-12.LST.4.2:</b> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p><b>11-12.LST.7.1:</b> Conduct short as well as more sustained research assignments and tasks to answer a question (including a self-generated question), test a hypothesis, or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>
<p><b>C.3.6</b> Use structural formulas of hydrocarbons to illustrate carbon's ability to form single and multiple bonds within a molecule.</p>	<p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.4.1</b> Describe, classify, and give examples of various kinds of reactions: synthesis (i.e., combination), decomposition, single displacement, double displacement, acid/base, and combustion.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>
<p><b>C.4.2</b> Predict products of simple reactions as listed in C.4.1.</p>	<p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>
<p><b>C.4.3</b> Balance chemical equations and use the law of conservation of mass to explain why this must be true.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p>
<p><b>C.4.4</b> Apply the mole concept to determine the mass, moles, number of particles, or volume of a gas at STP, in any given sample, for an element or compound.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.4.6</b> Perform calculations to determine the composition of a compound or mixture when given the necessary information.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
<p><b>C.4.7</b> Apply lab data to determine the empirical and molecular formula of a compound.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>11-12.LST.5.2:</b> Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p> <p><b>11-12.LST.6.2:</b> Use technology to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p>

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Stoichiometry</li> <li>Limiting Reactant Problems</li> <li>Percent Yield</li> <li>Amount of Excess Reactant Remaining</li> </ul>	<p><b>C.4.5</b> Use a balanced chemical equation to calculate the quantities of reactants needed and products made in a chemical reaction that goes to completion.</p>	<ul style="list-style-type: none"> <li>Calculate theoretical yields of products, given reactant amounts (or calculate how much reactant is needed to produce a certain amount of product).</li> <li>Compare actual yield to the theoretical yield to determine a percent yield.</li> <li>Calculate the amount of excess reactant remaining.</li> </ul>	<ul style="list-style-type: none"> <li>Stoichiometry Test</li> <li>Daily Bellringer Questions</li> <li>Vinegar and Baking Soda Stoichiometry Lab</li> </ul>	<ul style="list-style-type: none"> <li>Limiting Reactant</li> <li>Excess Reactant</li> <li>Theoretical Yield</li> <li>Actual Yield</li> <li>Percent Yield</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>Kinetic Molecular Theory</li> <li>Combined Gas Law</li> <li>Ideal Gas Law</li> </ul>	<p><b>C.5.1</b> Use the kinetic molecular theory with the combined and ideal gas laws to explain changes in volume, pressure, moles, and temperature of a gas.</p>	<ul style="list-style-type: none"> <li>Describe what causes gas pressure.</li> <li>Describe general relationships between temperature, pressure, volume, and amount of gas (i.e. with more moles of gas comes higher pressure).</li> </ul>	<ul style="list-style-type: none"> <li>Gas Laws Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Compressibility</li> <li>Diffusion</li> <li>Effusion</li> </ul>	IMPORTANT

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Calculations involving ideal gas law and combined gas law</li> </ul>	<p><b>C.5.2</b> Apply the ideal gas equation (<math>PV = nRT</math>) to calculate the change in one variable when another variable is changed and the others are held constant.</p>	<ul style="list-style-type: none"> <li>Calculate changes in temperature, pressure, and volume using combined gas law.</li> <li>Calculate temperature, pressure, volume, or number of moles given the other 3 variables and determine how changes in one variable affect the others.</li> </ul>	<ul style="list-style-type: none"> <li>Gas Laws Test</li> <li>Daily Bellringer Questions</li> </ul>		IMPORTANT
<ul style="list-style-type: none"> <li>Lab data and balanced chemical equations related to ideal gas law</li> </ul>	<p><b>C.5.3</b> Use lab data and a balanced chemical equation to calculate volume of a gas at STP and non STP conditions, assuming that the reaction goes to completion and the ideal gas law holds.</p>	<ul style="list-style-type: none"> <li>Calculate amount of gas produced using stoichiometry and the ideal gas law.</li> </ul>	<ul style="list-style-type: none"> <li>Gas Laws Test</li> <li>Daily Bellringer Questions</li> <li>Production of hydrogen gas lab</li> </ul>	<ul style="list-style-type: none"> <li>STP (Standard Temperature and Pressure)</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>Relationship between kinetic energy, temperature, and the motion of particles</li> </ul>	<p><b>C.6.1</b> Explain that atoms and molecules are in constant motion and that this motion increases as thermal energy increases.</p>	<ul style="list-style-type: none"> <li>Qualitatively predict the changes in particle motion, gas pressure, etc. involved with changing temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Gas Laws Test</li> <li>Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Kinetic Energy</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>Composition and properties of solutions</li> </ul>	<p><b>C.7.1</b> Describe the composition and properties of solutions.</p>	<ul style="list-style-type: none"> <li>Identify the solute, solvent in a solution.</li> <li>Distinguish between solutions, colloids, and suspensions.</li> </ul>	<ul style="list-style-type: none"> <li>Solutions Test</li> <li>Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>Solute</li> <li>Solvent</li> <li>Solution</li> <li>Colloid</li> <li>Suspension</li> </ul>	IMPORTANT

CONTENT (THE WHAT)	STANDARD INDICATORS	SKILLS (WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO)	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Effects of temperature, pressure, and polarity of solvent on solubility of solute</li> </ul>	<p><b>C.7.2</b> Explain how temperature, pressure, and polarity of the solvent affect the solubility of a solute.</p>	<ul style="list-style-type: none"> <li>• Predict whether solutes will dissolve in different solvents based off polarity.</li> <li>• Predict the effect of temperature and pressure changes on the solubility of a solute.</li> </ul>	<ul style="list-style-type: none"> <li>• Solutions Test</li> <li>• Daily Bellringer Questions</li> </ul>		IMPORTANT
<ul style="list-style-type: none"> <li>• Molarity Calculations</li> </ul>	<p><b>C.7.3</b> Describe the concentration of solutes in a solution in terms of molarity. Perform calculations using molarity, mass, and volume. Prepare a sample of given molarity provided a known solute.</p>	<ul style="list-style-type: none"> <li>• Perform molarity calculations provided solute mass and solution volume.</li> <li>• Make solutions of desired concentrations in a lab-based setting.</li> </ul>	<ul style="list-style-type: none"> <li>• Solutions Test</li> <li>• Daily Bellringer Questions</li> <li>• Kool-aid Lab</li> </ul>	<ul style="list-style-type: none"> <li>• Molarity</li> </ul>	IMPORTANT

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.4.5</b> Use a balanced chemical equation to calculate the quantities of reactants needed and products made in a chemical reaction that goes to completion.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p><b>11-12.LST.7.1:</b> Conduct short as well as more sustained research assignments and tasks to answer a question (including a self-generated question), test a hypothesis, or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.5.1</b> Use the kinetic molecular theory with the combined and ideal gas laws to explain changes in volume, pressure, moles, and temperature of a gas.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p>
<p><b>C.5.2</b> Apply the ideal gas equation (<math>PV = nRT</math>) to calculate the change in one variable when another variable is changed and the others are held constant.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p>	<p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.5.3</b> Use lab data and a balanced chemical equation to calculate volume of a gas at STP and non STP conditions, assuming that the reaction goes to completion and the ideal gas law holds.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p>
<p><b>C.6.1</b> Explain that atoms and molecules are in constant motion and that this motion increases as thermal energy increases.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.7.1</b> Describe the composition and properties of solutions.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p>	<p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
<p><b>C.7.2</b> Explain how temperature, pressure, and polarity of the solvent affect the solubility of a solute.</p>	<p><b>SEPS.1 Posing questions (for science) and defining problems (for engineering)</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>
<p><b>C.7.3</b> Describe the concentration of solutes in a solution in terms of molarity. Perform calculations using molarity, mass, and volume. Prepare a sample of given molarity provided a known solute.</p>	<p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p>

GRADE LEVEL: 10

SUBJECT: CHEMISTRY

DATE: 2016-2017

MONTH/GRADING PERIOD: QUARTER 4

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CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>• Temperature</li> <li>• Heat Flow</li> </ul>	<b>C.6.2</b> Distinguish between the concepts of temperature and heat flow in macroscopic and microscopic terms.	<ul style="list-style-type: none"> <li>• Distinguish between temperature and heat flow.</li> <li>• Describe heat flow on a micro and macro scale.</li> </ul>	<ul style="list-style-type: none"> <li>• Thermochemistry Test</li> <li>• Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature</li> <li>• Heat</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>• Reactions and Phase Changes</li> <li>-Endothermic</li> <li>-Exothermic</li> <li>• Energy Curves</li> </ul>	<b>C.6.3</b> Classify chemical reactions and phase changes as exothermic or endothermic based on enthalpy values. Use a graphical representation to illustrate the energy changes involved.	<ul style="list-style-type: none"> <li>• Classify reactions and phase changes as endothermic or exothermic.</li> <li>• Draw energy curves for endothermic and exothermic reactions.</li> </ul>	<ul style="list-style-type: none"> <li>• Thermochemistry Test</li> <li>• Daily Bellringer Questions</li> </ul>	<ul style="list-style-type: none"> <li>• Endothermic</li> <li>• Exothermic</li> </ul>	IMPORTANT
<ul style="list-style-type: none"> <li>• Specific Heat</li> <li>• Calorimetry</li> <li>• Heat Transfer Calculations</li> <li>• Molar Heats of Fusion and Vaporization</li> </ul>	<b>C.6.4</b> Perform calculations involving heat flow, temperature changes, and phase changes by using known values of specific heat, phase change constants, or both.	<ul style="list-style-type: none"> <li>• Perform calculations using <math>q=mc\Delta T</math>.</li> <li>• Perform calorimetry calculations with two substances (i.e. hot metal places into water).</li> <li>• Perform calculations involving molar heat of fusion and molar heat of vaporization.</li> </ul>	<ul style="list-style-type: none"> <li>• Thermochemistry Test</li> <li>• Daily Bellringer Questions</li> <li>• Calorimetry Lab</li> </ul>	<ul style="list-style-type: none"> <li>• Specific Heat</li> <li>• Heat Capacity</li> <li>• Molar Heat of Fusion</li> <li>• Molar Heat of Vaporization</li> </ul>	CRITICAL
<ul style="list-style-type: none"> <li>• Properties of Acids and Bases</li> </ul>	<b>C.8.1</b> Classify solutions as acids or bases and describe their characteristic properties.	<ul style="list-style-type: none"> <li>• Classify solutions as acidic or basic based on their properties.</li> </ul>	<ul style="list-style-type: none"> <li>• Acids and Bases Test</li> <li>• Daily Bellringer Questions</li> <li>• Household Acids and Bases Lab</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Acid</li> <li>• Base</li> </ul>	IMPORTANT

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCAB	PRIORITY
<ul style="list-style-type: none"> <li>Strengths of Acids and Bases</li> </ul>	<p><b>C.8.2</b> Compare and contrast the strength of acids and bases in solutions.</p>	<ul style="list-style-type: none"> <li>Distinguish between the strength of an acid and the concentration of an acid.</li> <li>Describe the degree of ionization of strong acids and bases versus weak acids and bases.</li> </ul>	<ul style="list-style-type: none"> <li>Acids and Bases Test</li> <li>Daily Bellringer Questions</li> <li>Household Acids and Bases Lab</li> </ul>		IMPORTANT
<ul style="list-style-type: none"> <li>pH and pOH scales</li> </ul>	<p><b>C.8.3</b> Given the hydronium ion and/or the hydroxide ion concentration, calculate the pH and/or the pOH of a solution. Explain the meanings of these values.</p>	<ul style="list-style-type: none"> <li>Perform calculations between <math>[H_3O^+]</math>, <math>[OH^-]</math>, pH, and pOH.</li> <li>State which substance is "more acidic" or "more basic" based off <math>[H_3O^+]</math>, <math>[OH^-]</math>, pH, or pOH.</li> </ul>	<ul style="list-style-type: none"> <li>Acids and Bases Test</li> <li>Daily Bellringer Questions</li> <li>Strong Acid- Strong Base Titration Lab</li> </ul>	<ul style="list-style-type: none"> <li>Hydronium ion</li> <li>Hydroxide ion</li> <li>pH</li> <li>pOH</li> <li>Acid-Base Titration</li> </ul>	CRITICAL

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.6.2</b> Distinguish between the concepts of temperature and heat flow in macroscopic and microscopic terms.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.1.2:</b> Write routinely over a variety of time frames for a range of discipline-specific tasks, purposes, and audiences.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.6.3</b> Classify chemical reactions and phase changes as exothermic or endothermic based on enthalpy values. Use a graphical representation to illustrate the energy changes involved.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p> <p><b>SEPS.7</b> Engaging in argument from evidence</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

STANDARD INDICATORS	SCIENCE AND ENGINEERING	LITERACY IN SCIENCE
<p><b>C.6.4</b> Perform calculations involving heat flow, temperature changes, and phase changes by using known values of specific heat, phase change constants, or both.</p>	<p><b>SEPS.2 Developing and using models and tools</b></p> <p><b>SEPS.3 Constructing and performing investigations</b></p> <p><b>SEPS.4 Analyzing and interpreting data</b></p> <p><b>SEPS.5 Using mathematics and computational thinking</b></p> <p><b>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</b></p> <p><b>SEPS.7 Engaging in argument from evidence</b></p> <p><b>SEPS.8 Obtaining, evaluating, and communicating information</b></p>	<p><b>11-12.LST.2.1:</b> Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.1:</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.</p> <p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p><b>11-12.LST.4.2:</b> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p> <p><b>11-12.LST.5.2:</b> Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

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<p><b>C.8.1</b> Classify solutions as acids or bases and describe their characteristic properties.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p> <p><b>SEPS.8</b> Obtaining, evaluating, and communicating information</p>	<p><b>11-12.LST.1.1:</b> Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.4.1:</b> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., <i>quantitative data, video, multimedia</i>) in order to address a question or solve a problem.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>
<p><b>C.8.2</b> Compare and contrast the strength of acids and bases in solutions.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.3</b> Constructing and performing investigations</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p> <p><b>SEPS.7</b> Engaging in argument from evidence</p> <p><b>SEPS.8</b> Obtaining, evaluating, and communicating information</p>	<p><b>11-12.LST.2.2:</b> Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p> <p><b>11-12.LST.7.3:</b> Draw evidence from informational texts to support analysis, reflection, and research.</p>

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<p><b>C.8.3</b> Given the hydronium ion and/or the hydroxide ion concentration, calculate the pH and/or the pOH of a solution. Explain the meanings of these values.</p>	<p><b>SEPS.1</b> Posing questions (for science) and defining problems (for engineering)</p> <p><b>SEPS.2</b> Developing and using models and tools</p> <p><b>SEPS.3</b> Constructing and performing investigations</p> <p><b>SEPS.4</b> Analyzing and interpreting data</p> <p><b>SEPS.5</b> Using mathematics and computational thinking</p> <p><b>SEPS.6</b> Constructing explanations (for science) and designing solutions (for engineering)</p> <p><b>SEPS.8</b> Obtaining, evaluating, and communicating information</p>	<p><b>11-12.LST.2.3:</b> Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>11-12.LST.3.2:</b> Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>11-12.LST.3.3:</b> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p><b>11-12.LST.4.2:</b> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p><b>11-12.LST.4.3:</b> Synthesize information from a range of sources (e.g., <i>texts, experiments, simulations</i>) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>11-12.LST.5.1:</b> Write arguments focused on discipline-specific content.</p> <p><b>11-12.LST.5.2:</b> Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p> <p><b>11-12.LST.6.2:</b> Use technology to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p>