

Cornwall-Lebanon School District Curriculum Overview

CCHS_Chemistry (Chemistry in the Community)

36 length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards (PA Core if applicable)
Unit 1 9	<p style="text-align: center;"><u>Water – Exploring Solutions</u></p> <p>Students will predict how combinations of substances can result in physical and/or chemical changes. Students will describe the three normal states of matter in terms of energy, particle motion, and phase transitions. Students will use electro-negativity to explain the difference between polar and nonpolar covalent bonds. Students will differentiate between pure substances and mixtures; differentiate between heterogeneous and homogeneous mixtures. Students will differentiate between physical properties and chemical properties. Students will explore the natural tendency for systems to move in a direction of disorder or randomness (entropy). Students will describe the law of conservation of energy.</p>	<ul style="list-style-type: none"> ➤ Candle lab or other introduction to chemistry lab ➤ Measuring Lab ➤ Foul Water Lab ➤ Quiz A - Water's supply, use, and purification/treatment ➤ Water tension Lab ➤ Density Lab ➤ Mixture Lab ➤ Water Testing Lab ➤ Quiz B – Properties of water, ions in water ➤ Solubility Lab ➤ Acid/Base Lab ➤ Solvents Lab ➤ Hard Water Lab ➤ Quiz C – Solutions ➤ Unit/Marking Period Test 	<p>3.2.C.A1</p> <p>3.2.C.A3</p> <p>3.2.C.A4</p> <p>3.2.C.B2</p> <p>3.2.C.B3</p>
Unit 2 9	<p style="text-align: center;"><u>Materials – Structure and Uses</u></p> <p>Students will differentiate between physical properties and chemical properties. Students will predict chemical formulas based on the number of valence electrons. Students will determine percent compositions, empirical formulas, and molecular formulas. Students will predict how combinations of substances can result in physical and/or chemical changes.</p>	<ul style="list-style-type: none"> ➤ Properties of Matter Lab ➤ Metal/Nonmetal Lab ➤ Quiz A – Properties of matter, classification of matter, and the periodic table ➤ Converting Copper Lab ➤ Metal Reactivity Lab ➤ Quiz B - Earth's mineral resources ➤ Chemical Reaction Lab ➤ Percent Composition Lab ➤ Retrieving Copper Lab ➤ Using Up a Metal Lab 	<p>3.2.C.A1</p> <p>3.2.C.A2</p> <p>3.2.C.A4</p> <p>3.2.C.B3</p>

	<p>Students will interpret and apply the laws of conservation of mass, constant composition (definite proportions), and multiple proportions.</p> <p>Students will balance chemical equations by applying the laws of conservation of mass.</p> <p>Students will classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion.</p> <p>Students will describe the law of conservation of energy.</p> <p>Students will use the mole concept to determine number of particles and molar mass for elements and compounds.</p> <p>Students will explain the relationship of an element's position on the periodic table to its atomic number, ionization energy, electro-negativity, atomic size, and classification of elements.</p>	<ul style="list-style-type: none"> ➤ Quiz C,D – Properties of Minerals ➤ Unit Test 	
		Midterm Exam	
Unit 3	<div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-bottom: 5px;">8</div> <p style="text-align: center;"><u>Petroleum – Breaking and Making Bonds</u></p> <p>Students will describe how changes in energy affect the rate of chemical reactions.</p> <p>Students will use models to demonstrate patterns in bio macromolecules.</p> <p>Students will differentiate between physical properties and chemical properties.</p> <p>Students will explain how atoms combine to form compounds through both ionic and covalent bonding.</p> <p>Students will predict chemical formulas based on the number of valence electrons.</p> <p>Students will draw Lewis dot structures for simple molecules and ionic compounds.</p> <p>Students will predict the chemical formulas for simple ionic and molecular compounds.</p> <p>Students will describe the law of conservation of energy.</p> <p>Students will explain the difference between an endothermic process and an exothermic process.</p>	<ul style="list-style-type: none"> ➤ Viscosity Lab ➤ Distillation Lab ➤ Molecular Modeling Lab –Alkanes I ➤ Alkane Boiling Points Lab ➤ Molecular Modeling Lab –Alkanes II (isomers) ➤ Quiz A – What is Petroleum? ➤ Combustion Lab ➤ Quiz B – Petroleum as an Energy Source ➤ Molecular Modeling Lab –Alkenes and Alkynes ➤ Molecular Modeling Lab –Functional Groups ➤ Alternative Fuels/Vehicles Research Activity ➤ Quiz C,D – Petroleum and a Building Source ➤ Unit/Marking Period Test 	<p>3.2.C.A1</p> <p>3.1.C.A2</p> <p>3.2.C.B3</p> <p>3.1.C.B5</p>
Unit 4	<div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-bottom: 5px;">2</div> <p style="text-align: center;"><u>Kinetic Molecular Theory and Gas Behavior</u></p> <p>Students will describe the three normal states of matter in terms of energy, particle motion, and phase transitions.</p> <p>Students will identify and explain the relationships between temperature, volume, and pressure of a gas</p>	<ul style="list-style-type: none"> ➤ Soda Can Implosion Lab ➤ Unit Test 	<p>3.2.C.A3</p>

Unit 5

8

Atoms – Nuclear Interaction

Students will recognize discoveries from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus), and Bohr (planetary model of atom), and understand how each discovery leads to modern theory.
Students will describe Rutherford’s “gold foil” experiment that led to the discovery of the nuclear atom. Identify the major components (protons, neutrons, and electrons) of the nuclear atom and explain how they interact.
Students will compare and contrast nuclear fission and nuclear fusion.
Students will identify the three main types of radioactive decay and compare their properties.
Students will describe the process of radioactive decay by using nuclear equations and explain the concept of half-life for an isotope.

- Isotopic Pennies Lab
- Quiz A – The Nature of Atoms
- Quiz B – Nuclear Radiation
- Half Life Lab
- Quiz C – Using Radioactivity
- Unit Test

3.2.C.A3
3.2.C.A5

Final Exam