

# Cornwall-Lebanon School District Curriculum Overview

## AP Chemistry (Grade 11 & 12)

36	length of time in weeks	Concepts & Competencies	Common Assessments	AP Chemistry Standards
Unit 1	4	<p><u>Chemistry Fundamentals</u></p> <p>Student will identify chemical and physical properties and changes.</p> <p>Student will determine the atomic structure of a species.</p> <p>Student will analyze gravimetric data to determine percent, moles and formulas in a sample. Student will identify limiting reactant, excess reactant, and percent yield in a chemical reaction.</p>	<ul style="list-style-type: none"> <li>➤ Atomic Structure Packet (Chapter 1-4)</li> <li>➤ Gases Packet (Chapter 5)</li> <li>➤ Polyatomic Ion Quiz</li> <li>➤ % Copper in a Compound Lab</li> <li>➤ Limiting Reactants Lab</li> <li>➤ Activity Series Lab</li> <li>➤ Chemistry Fundamentals Test (Chapter 1-5)</li> </ul>	1.A, 1.B, 1.D, 1.E, 2.A, 2.B, 2.C, 2.D, 3.A, 3.B, 3.C, 5.D, 6.C
Unit 2	2	<p><u>Thermochemistry</u></p> <p>Student will analyze and interpret thermal energy transfers between system and surroundings. Student will interpret and calculate results of a calorimetry experiment based on specific heat and enthalpy.</p>	<ul style="list-style-type: none"> <li>➤ Chapter 6 HW</li> <li>➤ Hess's Law Lab</li> <li>➤ Thermochemistry Test (Chapter 6)</li> </ul>	3.C, 5.A, 5.B, 5.C, 5.E
Unit 3	3	<p><u>Periodicity, Bonding &amp; Geometry</u></p> <p>Student will predict atomic structure based on spectroscopy data. Student will analyze properties based on coulombic attraction. Student will predict Lewis Structure, Geometry and properties based on VSEPR theory.</p>	<ul style="list-style-type: none"> <li>➤ Chemical Bonding Packet (Chapter 7-10)</li> <li>➤ Beer's Law Lab</li> <li>➤ Chemical Bonding Test (Chapter 7-10)</li> </ul>	1.B, 1.C, 1.D, 2.C, 2.D, 5.C, 5.E
Unit 4	3	<p><u>Chemical Kinetics</u></p> <p>Student will evaluate properties of zeroth, first, and second order reactions. Student will describe and calculate rate law and constants. Student will evaluate rate laws and experimental data, and rate, using mechanisms.</p>	<ul style="list-style-type: none"> <li>➤ Chemical Kinetics Packet (Chapter 14 HW)</li> <li>➤ Rates of Reaction Lab</li> <li>➤ Chemical Kinetics Test (Chapter 14)</li> </ul>	4.A, 4.B, 4.C, 4.D
Unit 5	3	<p><u>Chemical Equilibria</u></p> <p>Student will evaluate equilibrium conditions in a chemical reaction. Student will set-up and calculate equilibrium</p>	<ul style="list-style-type: none"> <li>➤ Equilibrium Packet (Chapter 15 HW)</li> <li>➤ Kc Lab</li> <li>➤ Le Chatelier's lab</li> </ul>	6.A, 6.B

		constants and concentrations using ICE charts. Student will predict direction of shift caused by stresses on a system using Le Chatelier's Principle.	➤ Equilibrium Test (Chapter 15)	
Unit 6	2	<u>Acids &amp; Bases</u> Student will determine and evaluate acid and base strength. Student will determine and identify the type of Acid or Base and its properties. Student will calculate and interpret pH and acid/base concentrations.	➤ Chapter 16 HW ➤ pH Indicators Lab ➤ Acids & Bases Test (Chapter 16)	3.B, 6.A, 6.C
Unit 7	3	<u>Acid &amp; Base Equilibrium</u> Student will draw, describe, and calculate weak acid and base equilibrium constants and concentrations using ICE charts. Student will analyze acidic, basic, and neutral salts. Student will design and calculate the pH of a buffer and its properties. Student will analyze, interpret, and calculate 3 major titration curves.	➤ Chapter 17 HW #1 ➤ Acids & Bases Packet ➤ Quantitative Titration Lab ➤ Titration Curves Lab ➤ Acid & Base Equilibrium Test (Chapter 17)	1.E, 3.A, 6.A, 6.C
Unit 8	2	<u>Intermolecular Forces</u> Student will analyze and interpret intermolecular forces based on structure. Student will determine properties based on intermolecular forces. Student will classify solids and determine their properties based on structure.	➤ Intermolecular Forces Packet (Chapter 11 & 12 HW) ➤ Chromatography Lab ➤ Intermolecular Forces Test (Chapter 11 & 12)	1.C, 2.A, 2.B, 2.C, 2.D, 5.B, 5.D, 6.A, 6.C
Unit 9	2	<u>Solubility &amp; Complex Ion Equilibrium</u> Student will identify salts of high solubility versus salts of low-solubility (precipitates). Student will evaluate and solve solubility product constants calculations, including equilibrium concentrations using ICE charts.	➤ Solutions Packet (Chapter 18 HW) ➤ K <sub>sp</sub> of Calcium Hydroxide Lab ➤ Solubility Equilibrium Test (Chapter 18)	1.E, 3.A, 6.A, 6.C
Unit 10	2	<u>Thermodynamics</u> Student will describe and calculate various forms of entropy. Student will determine and calculate in the Gibbs' Free Energy equation nonspontaneous versus spontaneous reactions. Student will determine and calculate relationships between spontaneity, entropy, enthalpy, and equilibrium constant.	➤ Thermodynamics Packet (Chapter 19 HW) ➤ Entropy Lab ➤ Thermodynamics Test (Chapter 19)	2.B, 5.A, 5.C, 6.D
Unit 11	3	<u>Electrochemistry</u> Student will analyze and interpret properties of a galvanic or voltaic cell. Student will evaluate and calculate cell potential	➤ Electrochemistry Packet (Chapter 20 HW) ➤ Electrochemistry Test (Chapter 20)	3.A, 3.B, 3.C, 5.E, 6.A

		and relate to Gibb's Free Energy and Equilibrium constant. Student will predict cell potential caused by stresses on the cell using Le Chatelier's Principle or the Nernst Equation. Student will evaluate, predict and calculate products of electrolysis.		
Unit 12	2	<u>AP Chemistry Exam Review</u> Student will be assessed on multiple-choice questions (90 seconds per question). Student will be assessed on 3 long and 4 short free response questions. Student will then perform test corrections to increase retention of concepts missed.	➤ AP Chemistry Simulation	All AP Chemistry Standards
Unit 13	5	<u>Unknowns Lab Practicum</u> Student will perform cation tests used to identify cations. Student will perform anions tests used to identify anions. Student will be given 3 sample unknown compounds to identify using tests of cations and anions.	<ul style="list-style-type: none"> <li>➤ Cations lab results and equations</li> <li>➤ Anions lab results and equations</li> <li>➤ Lab reports of 3 unknown compounds</li> </ul>	All AP Chemistry Standards