Cornwall-Lebanon School District Curriculum Overview

Chemistry 2 Honors – Grades 11 and 12

length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards (PA Core if applicable)
Unit 1 — 2	<u>Stoichiometry and Limiting Reactants</u> Students will use mole ratios in chemical calculations. Students will identify the limiting reactant in a stoichiometry problem. Students will determine theoretical yield based on the limiting reactant.	➢ Chem 1 Review Assignments ➢ Limiting Reactants Lab ➢ Unit Test	3.2.C.A3 3.2.C.A4 3.2.10.A5
Unit 2 — 2	<u>Thermochemistry</u> Students will differentiate between exothermic and endothermic reactions. Students will write and manipulate thermochemical equations. Students will determine the heat of reaction using Hess's Law or other equations.	➢ Thermochemistry Lab ➢ Unit Test	3.2.10.A4 3.2.10.B3 3.2.C.B3
Unit 3 — 3	<u>Chemical Bonding and VSEPR</u> Students will differentiate between different types of bonds. Students will use electron dot diagrams and Lewis formulas to represent valence electrons and bonding within elements, ions, and compounds. Students will predict and draw the shapes of ions and compounds	➢ Spectrophotometer Lab ➢ Bonding Chapter Test ➢ VSEPR Chapter Test	3.2.10.A1 3.2.C.A1 3.2.C.A2 3.2.12.A5
Unit 4 — 3	<u>Kinetics and Rate of Reaction</u> Students will identify factors that affect the rate of chemical reactions. Students determine how concentration affects the rate of reaction using rate law. Students will determine the energy requirements in a reaction using a potential energy diagram.	➢ Rate Lab ➢ Unit Test	3.2.10.A4

Unit 5 — 4	**Chemical Equilibrium** Students will describe a chemical reaction in terms of equilibrium. Students will calculate quantities of reactants and products at equilibrium using the equilibrium constant, K_c.	➢ K_c Lab ➢ Disturbing Equilibrium Lab ➢ K_c Quiz ➢ Unit Test	3.2.C.A4 3.2.12.A5
Unit 6 — 3	**Acids and Bases** Students will describe and write equations for acids and bases using the Arrhenius and Bronsted-Lowry concepts. Students will calculate the concentrations of reactants and products in solutions of strong acids and strong bases. Students will describe the acidity or alkalinity of a solution using pH calculations.	➢ Acid/Base Titration 1 ➢ Unit Test	3.2.12.A1 3.2.C.A4 3.2.12.A4 3.2.12.A5
Unit 7 — 3	**Acid and Base Equilibrium** Students will calculate the concentrations of reactants and products for weak acids using the equilibrium constants K_a and K_b. Students will describe and calculate the concentrations of reactants and products in common ion and buffer solutions.	➢ Acid/Base Titration 2 ➢ K_a/K_b Chapter Test ➢ Common Ion, Buffer, Titration Test	3.2.12.A1 3.2.C.A4 3.2.12.A4 3.2.12.A5
Unit 8 — 2	**Solubility and K_{sp}** Students will identify and write equations for soluble and insoluble compounds. Students will calculate concentrations of reactants and products for insoluble salts using eh equilibrium constant K_{sp}.	➢ Solubility Quiz ➢ K_{sp} Lab ➢ Unit Test	3.2.12.A1 3.2.12.A5
Unit 9 — 2	**Spontaneity and Thermodynamics** Students will describe factors (such as entropy and enthalpy) that determine the spontaneity of a chemical reaction. Students will us the Gibbs Free Energy equation to determine the spontaneity of a reaction.	➢ Entropy Lab ➢ Unit Test	3.2.C.B2
Unit 10 — 1	**Reduction and Oxidation** Students will identify the oxidation number of atoms within elements, compounds, and ions. Students will differentiate between oxidation and reduction reactions. Students will balance reduction and oxidation (RedOx) reactions.	➢ Oxidation Lab ➢ RedOx Quiz	3.2.12.A4

Unit 11 2	<u>Organic Chemistry</u> Students will identify and draw basic organic hydrocarbons and their isomers. Students will name simple alkanes. Students will identify organic functional groups.	➢ Organic Quiz 1 ➢ Organic Quiz 2	3.2.12.A5 3.2.10.A4
Unit 12 5	<u>Unknowns Lab</u> Students will describe chemical reactions in terms of net-ionic equations. Students will use physical and chemical properties of inorganic compounds. Students will use simple confirming tests to identify organic compounds.	➢ Equation Writing ➢ Lab Quiz 1 and 2 ➢ Unknown Lab Reports (4)	3.2.C.A2 3.2.C.A4