AP Chemistry
Year at a Glance (YAG)
2023-2024

First Semester		Second Semester	
1st Nine Weeks		**3rd Nine Weeks**	
AP Topic Chemical Foundations (10 days) Atoms, Ions, and Molecules (18 days) Stoichiometry (12 days)	Students will express measurements in chemistry utilizing rules for significant figures, scientific notation, and dimensional analysis. Students will organize matter based on class, phase, and chemical properties. Students will apply fundamental chemical laws to identify quantitative composition of compounds. Students explain how experimentation led to the development of atomic models and periodic trends. Students will write chemical formulas and name chemical compounds that are ionic and covalent. Students will perform calculations related to average atomic mass, molar mass, moles, percent composition and empirical formulas. Student will complete calculations related to stoichiometric quantities for a balanced chemical reaction.	AP Topic Equilibrium (10 days) Acid-Base (20 days) Solubility (5 days) Thermochem-istry (10 days)	Students will explain the occurrence of a reversible reaction to establish equilibrium. Students will represent and calculate the equilibrium constant and the reaction quotient for a chemical reaction. Students will show how the size of an equilibrium constant determines reaction relative concentrations. Students will apply Le Chatelier's Principle to a reaction stress. Students will calculate pH and pOH bases on Kw values, ion concentrations, Ka and Kb values for given solutions. Students will graph titration reactions and use the Henderson-Hasselbalch Equation to identify the pH and properties of a buffer. Students will calculate the solubility of a salt based on a Ksp value, use the common ion effect to determine ion concentration. Students will represent a chemical reaction as endothermic or exothermic, calculate the q from a calorimetry experiment, and explain changes in q. Students will calculate the enthalpy change of a reaction using Hess's Law and standard enthalpy of formation values.
2nd Nine Weeks		**4th Nine Weeks**	
Types of Reactions (12 days) Gases (8 days) Solutions (8 days) Kinetics (15 days)	Students will identify 5 types of reactions based on reactants used and products formed. Students will write formula and net ionic equations for precipitation, acid-base, and redox reactions. Student will apply stoichiometric calculations to reaction with solution molarity as a variable. Students will state the tenets of the kinetic molecular theory. Students will explain the properties of a gas sample identified in the Ideal Gas Law and Dalton's Law of PP, and calculate the values for a gas sample. Students will calculate concentration values given solution components. Students will identify factors that affect solubility and explain how a colligative property impacts a physical property of a solution. Students will explain the relationship between reaction rate and experimental parameters. Students will write a differential and integrated rate law given data and calculate appropriate values for that data.	Thermodyn-amics (18 days) Electrochem-istry (18 days) Periodicity and Bonding (9 days)	Students will identify the sign and magnitude of entropy for a reaction and calculate the entropy change. Students will designate a reaction's thermodynamic favorability based on a Gibbs free energy value, and the use of K, G, and T for a given process. Students will relate external sources of energy or coupled reactions to their ability to drive an unfavorable reaction. Students will explain the relationship between physical components of a cell and overall operation principles. Students will diagram components of voltaic cells and electrolytic cells. Students will calculate cell potentials from half-reactions within a cell. Students will calculate charge flow based on Faraday's Law. Students will determine periodic trends such as ionization energy, atomic radii and bond strength based on attractions, repulsions, and shielding. Students will diagram a Lewis structure for a molecule based on comparisons of formal charges.

	Students will create models to explain elementary steps, reaction mechanisms, rate determining step, activation energy, and catalysts.		Students will show resonance structures given a molecular compound. Students will predict molecular structures based on VSEPR theory and hybridization.

Resources

1st Nine Weeks	2nd Nine Weeks	3rd Nine Weeks	4th Nine Weeks
-Zumdahl 9ed Chem text with Powerpoints -AP Chem Course and Exam Description -AP Chem Guided Inquiry lab manual -Vernier LabQuest2 experiments -AP Central Released FRQs -Bozeman AP Chem Videos -NMSI Chapter notes -Fast Track to a Five Study Guide	-Zumdahl 9ed Chem text with Powerpoints -AP Chem Course and Exam Description -AP Chem Guided Inquiry lab manual -Vernier LabQuest2 experiments -AP Central Released FRQs -Bozeman AP Chem Videos -NMSI Chapter notes -Fast Track to a Five Study Guide	-Zumdahl 9ed Chem text with Powerpoints -AP Chem Course and Exam Description -AP Chem Guided Inquiry lab manual -Vernier LabQuest2 experiments -AP Central Released FRQs -Bozeman AP Chem Videos -NMSI Chapter notes -Fast Track to a Five Study Guide	-Zumdahl 9ed Chem text with Powerpoints -AP Chem Course and Exam Description -AP Chem Guided Inquiry lab manual -Vernier LabQuest2 experiments -AP Central Released FRQs -Bozeman AP Chem Videos -NMSI Chapter notes -Fast Track to a Five Study Guide