Week	Standards	Student Learning Objective	Key Vocabulary	Instructional Resources
Unit 1: Introduction to Chemistry				
1-2	PA STEELS Standard: 3.2.10.A2 3.2.10.A4 3.2.10.A5 PA Chemistry Standard: 3.2.C.A6 3.2.C.A4	Differentiate between science and technology. Define chemistry and identify its major areas of study. Describe the characteristics of matter. Classify changes in matter as physical or chemical. Identify the reactants and products of chemical reactions. Use the scientific method to develop and test hypotheses.	Atoms/Elements Periodic Table Molecules/Compounds Physical property Chemical property Density Isotopes Polarity Intermolecular Forces Solubility Mixture (colloid,suspension) Surface Tension	ChemCom Textbook (Unit: Supplying Our Water Needs) NearPod Activities American Association of Chemistry Teachers (AACT) ChemMatters
Unit 2: Measurements and Calculations				
3-5	**PA STEELS Standard**: 3.1.10.A5 3.1.10.B4 **PA Chemistry Standard**: 3.2.C.A5 3.4.10.A	Distinguish between precision and accuracy. Apply the rules for significant figures and scientific notation. Perform metric conversions using dimensional analysis. Solve problems related to density. Use calorimetry to calculate specific heat and energy transfer.	Precision Accuracy Significant Figures Scientific Notation and Metric System Density Calculations and Unit Conversions Specific Heat and Calorimetry	Density Determination Lab American Association of Teachers Simulation: Specific Heat

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Unit 3: Atomic Structure and the Periodic Table				
6-9	**PA STEELS Standard**: 3.2.10.A2 3.2.10.A5 **PA Chemistry Standard**: 3.2.C.A1 3.2.C.A5	Apply the law of conservation of mass to chemical reactions Analyze Rutherford's and Bohr's atomic models. Distinguish between isotopes. Use the periodic table to explain periodic trends. Write and interpret electron configurations.	Law of Conservation of Mass Atomic Models: Rutherford and Bohr Subatomic Particles and Isotopes Atomic Mass and Periodicity Electron Configuration and Periodic Trends	Lab: Flame Test for Elements American Association of Chemistry Teachers - Bohr vs Quantum Model POGILs: Isotopes, Average Mass, Electron Configurations, Periodic Trends
Unit 4: Electromagnetic Radiation and the Quantum Model				
10-12	**PA STEELS Standard**: 3.2.10.A4 **PA Chemistry Standard**: 3.2.C.A1 3.2.C.A3	Describe the relationship between wavelength and energy. Explain the Bohr model of the atom. Use quantum numbers to describe electron behavior.	Electromagnetic Spectrum Quantum Numbers and Energy Levels Electron Configurations Atomic Radii and Ionization Energy Trends	Advancing Science - Spectrum Analysis of Elements using Spectroscopy
Unit 5: Chemical Bonding				
13-16	**PA STEELS Standard**: 3.2.10.A3 **PA Chemistry Standard**: 3.2.C.A1 3.2.C.A2	Compare and contrast ionic, covalent, and metallic bonding. Draw Lewis dot structures for atoms and ions. Use VSEPR theory to predict molecular geometries. Apply Coulomb's Law to explain bond strength.	Ionic and Covalent Bonds Lewis Dot Diagrams and Molecular Geometry (VSEPR Theory) Polarity and Intermolecular Forces Ionic Compounds vs. Molecular Compounds	Molecular Models and Bonding Simulation

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Unit 6: Chemical Reactions				
17-20	**PA STEELS Standard**: 3.2.10.A5 **PA Chemistry Standard**: 3.2.C.A1 3.2.C.A4	Balance chemical equations. Use stoichiometry to predict amounts of products/reactants. Differentiate between precipitation and neutralization reactions. Explain how reactivity affects reaction types.	Types of Chemical Reactions (Synthesis, Decomposition, Combustion, etc.) Balancing Chemical Equations Reaction Rates and Energy Changes Precipitation and Neutralization Reactions	Reaction Types Lab (Flinn Kit)
Unit 7: Stoichiometry				
21-24	**PA STEELS Standard**: 3.2.10.A5 **PA Chemistry Standard**: 3.2.C.A3 3.2.C.A5	Calculate molar masses from chemical formulas. Perform stoichiometric calculations for reactions. Analyze the theoretical yield and calculate percent yield.	Mole Concept Molar Mass Calculations Stoichiometric Calculations in Reactions Percent Yield and Limiting Reactants	Stoichiometry of a Reaction Lab: Determine how to produce 2 g of product (Flinn Kit)
Unit 8: States of Matter and Gas Laws				
25-28	**PA STEELS Standard**: 3.2.10.A5 **PA Chemistry Standard**: 3.2.C.A3	Apply the kinetic molecular theory to explain gas behavior. Solve problems using the ideal gas law and other gas laws. Explain phase changes using energy calculations.	Kinetic Molecular Theory Gas Laws (Boyle's, Charles', and Ideal Gas Law) Phase Changes and Energy Calculations Intermolecular Forces	Boyle's Law and Gas Pressure Lab using syringes and books to apply pressure.

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Unit 9: Solutions and Acids & Bases				
29-31	**PA STEELS Standard**: 3.4.10.A 3.4.10.C 3.4.10.D **PA Chemistry Standards**: CHEM.1.2.1.A CHEM.2.3.1.B CHEM.1.2.4.A CHEM.2.1.3.A CHEM.1.2.4.B CHEM.1.3.2.B	Calculate concentration of solutions using molarity. Classify substances as acids or bases using the pH scale. Explain titration and use data to determine concentrations.	Properties of Acids and Bases pH Scale and Neutralization Reactions	Titration Lab
Unit 10: Thermochemistry and Chemical Kinetics				
32-34	**PA STEELS Standards**: 3.4.10.B 3.4.10.D **PA Chemistry Standards**: CHEM.1.2.3.A CHEM.2.2.3.A CHEM.1.2.3.B CHEM.1.2.4.A:	Calculate enthalpy changes in chemical reactions. Explain collision theory and describe factors affecting rates.	Heat Transfer and Calorimetry Enthalpy Changes in Reactions Collision Theory and Reaction Rates	
Unit 11: Organic Chemistry				
35-36	**PA STEELS Standards:** 3.4.10.A 3.4.10.C **PA Chemistry Standards:** CHEM.2.1.3.B: CHEM.2.1.4.A CHEM.2.1.4.B	Name and draw structures Write reactions for esterification	Hydrocarbons Alkanes Alkenes Alkynes Substituted hydrocarbons Alcohols, Ethers Esters Carboxylic Acids Halides Amines Ketones Esterification	Produce Common Esters Lab (Flinn Kit)