Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
Matter		
	Changes in Matter	
		Differentiate between physical properties and chemical properties of matter.
		Differentiate between extensive and intensive properties of matter, and give examples of each.
		Differentiate between physical changes and chemical changes of matter.
		Science Practice: Identify substances based on their chemical and physical properties.
	Lab: Physical and Chemical Changes	
		Distinguish between chemical changes and physical changes.
		Describe indicators of chemical change.
		Conduct systematic observations during an experiment.
		Science Practice: Write a clear, coherent laboratory report that describes methods used and conclusions made.
	Elements, Compounds, and Mixtures	
		Describe elements as pure substances.
		Describe compounds as pure substances.
		Describe mixtures.
		Science Practice: Classify matter as pure substances or mixtures by studying their properties.
	Mixtures and Solutions	
		Describe heterogeneous mixtures, including suspensions and colloids.
		Describe homogeneous mixtures, such as solutions.
		Identify the components of a solution.
		Identify nonaqueous solutions.

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Science Practice: Build vocabulary by properly using the terms mixture, solution, solute, and solvent.
	Solutions and Solubility	
		Describe the dissolving process on the molecular level.
		Identify factors affecting the rate at which a substance dissolves.
		Define solubility and differentiate between saturated, supersaturated, and unsaturated solutions.
		Investigate factors that influence solubility.
		Science Practice: Interpret, analyze, and make inferences from solubility graphs.
	Lab: Solubility	
		Formulate an investigative question to scientifically investigate how temperature affects solubility.
		Investigate how the temperature of a solvent affects the solubility of a solid.
		Accurately read the temperature in °C to know how temperature affects saturation.
		Science Practice: Plan and carry out an investigation to test factors affecting solubility.
	Unit Test	
Atoms and the Periodic Table		
	The Structure of the Atom	
		Describe the structure of atoms, and discriminate between the relative sizes and electrical charges of protons, neutrons, and electrons.
		Explain that protons and neutrons have substructures and consist of particles called quarks.
		Identify an element based on the number of protons in an atom.
		Explain the relationship between the number of neutrons in an atom of an element, its mass number, and its isotopes.
		Science Practice: Use math to calculate the average atomic mass of an element from its isotopic composition.
	The Historical Development of Atomic Theory	

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Describe early atomic models including Dalton's postulates.
		Describe how Thomson's and Millikan's research led to the understanding of the electron in the early atomic model.
		Describe how Rutherford's gold foil experiment led to Rutherford's nuclear model of the atom.
		Science Practice: Describe, in writing, how a scientist's creativity resulted in changes in atomic theory.
	The Modern Atomic Theory	
		Describe the experimental basis for Einstein's explanation of the photoelectric effect.
		Explain Bohr's model of the atom and how it accounts for the existence of spectral lines.
		Describe the modern (electron cloud) model of the atom.
		Science Practice: Compare Dalton's atomic model with the current quantum model of the atom.
	Atomic Numbers and Electron Configurations	
		Identify electron configurations as a scientific model, and explain its usefulness and limitations.
		Express the arrangement of electrons of atoms using electron configurations.
		Use atomic orbitals to write quantum numbers for electrons.
		Science Practice: Use specific symbols to represent the arrangement of electrons in atoms.
	The History and Arrangement of the Periodic Table	
		Outline the historical development of the periodic table.
		Describe the arrangement of the periodic table and relate the properties of atoms to their position in the periodic table.
		Use the periodic table to classify elements.
		Science Practice: Predict the properties of elements based on their position on the periodic table.
	Electrons and the Periodic Table	
		Relate the position of an element in the periodic table to its electron configuration.

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Use the periodic table to determine the number of valence electrons available for bonding.
		Science Practice: Analyze the relationship between electron configurations and the structure of the periodic table.
	Unit Test	
Chemical Bonding		
	Types of Chemical Bonds	
		Compare and contrast ionic, metallic, and covalent bonds.
		Relate electronegativity and ionization energy to bond formation.
		Science Practice: Create a chart to compare and contrast ionic, metallic, and covalent bonds.
	Ionic Bonding	
		Explain how ionic bonds form.
		Explain that ionic compounds form crystal lattices.
		Describe how polyatomic ions form ionic bonds with other ions.
		Explain how ionic bonds affect the properties of ionic compounds.
		Science Practice: Explain the process by which ionic bonds form.
	Nomenclature of Ionic Compounds	
		Predict formulas of stable ionic compounds by balancing charges.
		Name ionic compounds using the International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules.
		Write chemical formulas of ionic compounds and common polyatomic ions.
		Science Practice: Develop vocabulary by using IUPAC rules for naming ionic compounds.
	Metallic Bonding	
		Describe how metallic bonds form.
		Describe the properties of metals including thermal conductivity, electrical conductivity, malleability, and ductility.

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Science Practice: Apply the theory of metallic bonding to explain metallic properties.
	Covalent Bonding	
		Use the periodic table to determine the number of electrons available for bonding.
		Use the octet rule to predict covalent compounds.
		Construct electron-dot structures (i.e., Lewis structures) to illustrate the arrangement of electrons in covalent structures.
		Explain how covalent bonds affect the properties of covalent compounds.
		Science Practice: Develop and use electron-dot models, and explain their usefulness and limitations.
	Nomenclature of Covalent Compounds	
		Use the International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules to write the names of covalent compounds.
		Write formulas for covalent compounds and interpret those formulas in terms of composition and structure.
		Use IUPAC nomenclature rules to name and write the chemical formulas of acids and bases.
		Science Practice: Develop vocabulary by using IUPAC rules for naming covalent compounds.
	Lab: Ionic and Covalent Bonds	
		Design and conduct an experiment to test the properties of substances.
		Draw conclusions about the type of bond in a substance based on the tested properties of that substance.
		Science Practice: Compare your conclusions about the identity of the bonds in substances to published information about those substances.
	Intermolecular Forces	
		Describe hydrogen bonding.
		Describe van der Waals forces, including dipole-dipole forces and London dispersion forces.
		Describe how hydrogen bonding and van der Waals forces affect the volatility, boiling points, and melting points of liquids and solids.

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Science Practice: Give examples of intermolecular forces occurring in nature.
	Unit Test	
Chemical Reactions		
	Evidence of Chemical Reactions	
		Explain what happens during a chemical reaction.
		Identify indicators of a chemical reaction.
		Science Practice: Compare scenarios to determine whether a chemical reaction has occurred.
	Writing and Balancing Chemical Equations	
		Describe chemical reactions by writing word equations and formula equations.
		Use the law of conservation of mass to balance chemical equations.
		Science Practice: Identify and use special symbols properly in chemical equations.
	Types of Reactions	
		Identify and characterize the types of reactions, including synthesis, decomposition, combustion, single replacement, and double replacement.
		Classify a reaction as synthesis, decomposition, single replacement, double replacement, or combustion.
		Use the activity series to determine whether a single replacement reaction will occur.
		Science Practice: Predict the products of a reaction using the activity series.
	Lab: Types of Reactions	
		Identify the reactants and products of a reaction performed in alaboratory setting.
		Write balanced equations for a reaction performed in a laboratory setting.
		Science Practice: Use experimental data to classify a reaction.
	Unit Test	

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
Stoichiometry		
	Scientific Notation and Significant Figures	
		Write measurements in scientific notation.
		Use appropriate numbers of significant figures for calculated data.
		Science Practice: Solve science-related math problems using scientific notation with the correct number of significant figures.
	Dimensional Analysis	
		Explain how dimensional analysis works.
		Solve scientific problems using dimensional analysis.
		Science Practice: Convert between units using dimensional analysis.
	Molar Masses	
		Define a mole and explain its role in the measurement of matter.
		Explain the relationship between the mole and Avogadro’s number.
		Determine the molar mass of a molecule from its chemical formula.
		Science Practice: Perform math calculations to determine the number of particles in a given sample of a substance.
	Introduction to Stoichiometry	
		Use a balanced equation to write mole ratios correctly to use in stoichiometry problems.
		Perform stoichiometric calculations to determine the mole-to-mole relationships between reactants and products of a reaction.
		Science Practice: Use mathematical procedures, including dimensional analysis and significant figures, when solving mole-to-mole stoichiometry problems.
	Stoichiometric Calculations	
		Use molar mass to write conversion factors that convert between mass and moles.

Options EHS Chemistry A		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Identify and solve stoichiometric problems that relate mass to moles and mass to mass.
		Perform stoichiometric calculations to determine mass relationships between reactants and products of a reaction.
		Science Practice: Use mathematical procedures, including dimensional analysis and significant figures, when solving mole-to-mass, mass-to-mole, and mass-to-mass stoichiometric problems.
	Limiting Reactant and Percent Yield	
		Identify the limiting and excess reactants for a given reaction.
		Use the limiting reactant to predict the theoretical yield of a reaction.
		Calculate the percent yield of a reaction.
		Science Practice: Use mathematical procedures, including dimensional analysis and significant figures, when solving limiting reactant and percent yield stoichiometry problems.
	Measures of Concentration: Molarity	
		Define concentration.
		Calculate the concentration of solutions in units of molarity.
		Solve stoichiometry problems involving molarity.
		Use molarity to calculate dilutions of solutions.
		Science Practice: Use mathematics and computational thinking to solve problems involving molarity.
	Unit Test	
Cumulative Exam		
	Cumulative Exam Review	
	Cumulative Exam	