

Chemistry I

Topic	Priority Standard	Learning Targets (LT)	Unit	Term Taught	Term(s) Reinforced
Atomic Structure and Properties	<u>9-12.PS1.A.1</u> Use the organization of the periodic table to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms <u>*Clarification Statement:</u> Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.	LT.1: Students will be able to describe and write out the elemental composition of pure substances and mixtures. LT.2: Students will be able to label and describe the atomic structure of an element and its electron configuration. LT.3: Students will be able to identify and describe the differences between valence electrons and ionic compounds. LT.4: Students will be able to know and be able to identify where periodic trends exist on the periodic table and why.	Unit 1	Term 1	
	Vocab or Pre-requisite skills needed:	LT.5: Students will be able to identify, compare, and contrast the different types of chemical bonds (ionic and covalent). LT.6: Students will be able to label and illustrate the structure of ionic solids. LT.7: Students will be able to draw and interpret Lewis diagrams that represent the valence electrons of atoms.	Unit 2	Term 2	

IMFs and Properties	9-12.PS1.A.3 Plan and conduct an investigation to gather evidence to compare physical and chemical properties of substances such as melting point, boiling point, vapor pressure, surface tension, and chemical reactivity to infer the relative strength of attractive forces between particles <u>Clarification Statement:</u> Emphasis is on understanding the relative strength of forces between particles. Examples of particles could include ions, atoms, molecules, and simple compounds (such as water). Vocab or Pre-requisite	LT.1: Students will be able to understand and describe how intermolecular forces determine the structure and interactions of matter. LT.2: Students will be able to identify the different properties and atomic structures that make up solid forms of matter. LT.3: Students will be able to be able to identify, compare, and contrast the physical properties and characteristics of solids, liquids, and gasses. LT.4: Students will be able to describe and provide examples of the Ideal Gas Law, as it relates to real world problems. LT.5: Students will be able to describe and provide examples of the Kinetic Molecular Theory, as it relates to real world problems. LT.6: Students will be able to identify, differentiate between, and provide examples of both solutions and mixtures. LT.7: Students will be able to apply their knowledge of properties of matter, solutions, and mixtures to separate them into individual components physically or in written expression. LT.8: Students will be able to describe how to adjust the solubility of a solution and how variations of solubility change the solution properties. LT.9: Students will be able to explain spectroscopy phenomenon and label the different	Unit 3	Term 3	
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	skills needed:	parts of the EM spectrum. LT.10: Students will be able to ensure gas properties are explained macroscopically—using the relationships among pressure, volume, temperature, moles, gas constant—and molecularly by the motion of the gas.			
Chemical Reactions	<u>9-12.PS1.A.2</u> Construct and revise an explanation for the products of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. <u>Clarification Statement:</u> Examples of chemical reactions could include the reaction of sodium and chlorine or of oxygen and hydrogen. Students will use the periodic table to	LT.1: Students will be able to understand the basics of chemical reactions. LT.2: Students will be able to identify the different parts of a chemical equation and select reactants, products, coefficients, and states. LT.3: Students will be able to deconstruct an equation and assess the number of atoms (moles) of each element and determine how to balance the equation utilizing lowest integer coefficients. LT.4: Students will be able to deduce a compound's formula from its name, interpret the chemical equation from the provided statement, and calculate the lowest integer coefficient(s) needed to balance the equation LT.5: Students will be able to categorize a chemical equation into one of five categories based on the attributes of the chemical equation. LT.6: Students will be able to predict the product(s) of a chemical equation provided the type of chemical reaction and the reactants.	Unit 4	Term 4	

	create an explanation of how main group elements react, by identifying reactants and products. Students should know that noble gasses do not usually react Vocab or Pre-requisite skills needed:				
Structure & Properties of Matter	9-12.PS1.A.5 Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy <u>Clarification Statement:</u> Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples	LT.1: Students will be able to create a model of an exothermic reaction and an endothermic reaction LT.2: Students will be able to identify an exothermic reaction and an endothermic reaction based on an energy diagram LT.3: Students will be able to explain where the loss or gain of energy comes from in an endothermic or exothermic reaction	Unit 5	Term 5	

	<u>Clarification Statement:</u> Examples of chemical reactions could include the reaction of sodium and chlorine, or of oxygen and hydrogen. Vocab or Pre-requisite skills needed:	an amount of either a product or reactant. LT.5: Students will be able to explain how interactions between intermolecular forces influence the solubility and separation of mixtures. • Calculate the number of solute particles, volume, or molarity of solutions. LT.6: Students will be able to demonstrate how a substance can change into another substance through different processes, and the change itself can be classified by the sort of processes that produced it. • Identify a reaction as acid base, oxidation-reduction, or precipitation. • Identify species as BrønstedLowry acids, bases, and/or conjugate acid-base pairs, based on proton-transfer involving those species.	Unit 7	Term 6	
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