

Unit 1: Properties of Matter				
Essential Questions:				
1. How can properties used to describe matter be classified?				
2. How do physical and chemical properties reflect the nature of the interactions between molecules and atoms?				
Framework Standard	Skills	Resources	Instructional Strategies	Assessments
1.1 Identify and explain physical properties and chemical properties	<ul style="list-style-type: none"> Distinguish between physical and chemical properties concentrating on Density, Melting Pt, Boiling Pt. Classify change as physical or chemical (demonstrate examples) 	<ul style="list-style-type: none"> Prentice Hall Chemistry Text Review Packet Power Point (Prentice Hall Chemistry) 	<ul style="list-style-type: none"> Properties and Classification review packet 	Graded quiz or test on Unit
1.2 Explain the difference between pure substances and mixtures	<ul style="list-style-type: none"> Distinguish among classes of matter: element, compound, mixture (demonstrate common everyday substances) 	<ul style="list-style-type: none"> Prentice Hall Chemistry Text Review Packet 	<ul style="list-style-type: none"> Lab Activity/Demo: Lab safety 	Lab on Safety Graded quiz or test on Unit
1.3 Describe the three common states of matter	<ul style="list-style-type: none"> Explain states of matter (solid, liquid, gas, plasma) in terms of the kinetic molecular model molecule 	<ul style="list-style-type: none"> Prentice Hall Chemistry Text Review Packet 	<ul style="list-style-type: none"> Review 	Graded quiz or test on Unit
Science Inquiry Skills	SIS2. Design and conduct scientific investigations.	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Lab Activity/Demo: Lab safety 	Lab on Safety
Mathematical Skills	Determine the correct number of significant figures.	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Review Activities Dipstick 	Graded quiz or test on Unit
Mathematical Skills	Use scientific notation, where appropriate	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Review Activities 	Graded quiz or test on Unit
Mathematical Skills	Use appropriate metric/standard		<ul style="list-style-type: none"> Review worksheet 	Graded quiz or test on Unit
Reading Standards	RST 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Lab Activity/Demo: Lab safety 	Lab on Safety

		<ul style="list-style-type: none"> • Lab Handouts 		
Reading Standards	RST 5. Analyze how the text structures information or ideas and categories or hierarchies, demonstrating understanding of the information or ideas.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Lab Activity/Demo: Lab safety 	Lab on Safety
Writing Standards	WS 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Lab Activity/Demo: Lab safety 	Lab on Safety

Unit 2: Atomic Structure and Nuclear Chemistry

Essential Questions:

1. How are atomic models used to explain the interactions of elements and compounds?
2. What are the key concepts of nuclear chemistry?
3. What are the main types of nuclear reactions?

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
2.1 Recognize discoveries of Dalton (atomic theory), Thomson (the electron) and Rutherford (nucleus) and understand how these discoveries led to modern theory.	<ul style="list-style-type: none"> • Recognize discoveries of Dalton (atomic theory) , Thomson (the electron) and Rutherford (nucleus) • Understand how these discoveries led to modern theory. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Atomic History 	Unit test
2.2 Describe Rutherford's gold foil experiment that led to the discovery of the nuclear atom .	<ul style="list-style-type: none"> • Calculate the # electrons, # neutrons, # protons given the mass number and atomic number. • Recognize isotopes • Calculate average atomic mass 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Develop a table listing important information about individual atoms • Lab: Size of Molecule optional 	Unit test

			<ul style="list-style-type: none"> Practice problems 	
2.3 Interpret and apply the laws of conservation of mass, constant composition (definite proportions) and multiple proportions	<ul style="list-style-type: none"> Explain Law of Conservation of Mass, 	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Dipsticking Practice problems 	Unit test
2.5 Identify the three main types of radioactive decay (alpha, beta, gamma) and compare their properties (composition, mass, charge, and penetrating power).	<ul style="list-style-type: none"> Write nuclear decay equations for natural decay, and artificial bombardment. Solve half-life problems. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Dipsticking Group practice White board checking Lab or online nuclear self-study 	Unit test Lab report or online nuclear self-study
2.6 Describe the process of nuclear decay by using nuclear equations, and explain the concept of half-life for an isotope (for example, C-14 is a powerful tool in determining the age of objects)	<ul style="list-style-type: none"> Write nuclear decay equations for natural decay, and artificial bombardment. Solve half-life problems. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Dipsticking Group practice White board checking Lab or online nuclear self-study 	Unit test Lab report or online nuclear self-study
2.7 Compare and contrast nuclear fission and fusion	<ul style="list-style-type: none"> Identify fission vs. fusion nuclear equations. 	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Dipsticking Lab or online nuclear self-study 	Unit test Lab report or online nuclear self-study
Science Inquiry Skills	SIS1: Make observations of properties of matter	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Lab or online nuclear self-study 	Lab report or online nuclear self-study
Science Inquiry Skills	SIS2: Design and conduct scientific investigations.	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Lab or online nuclear self-study 	Lab report or online nuclear self-study
Reading Standards	RST 3: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	<ul style="list-style-type: none"> Lab handouts 	<ul style="list-style-type: none"> Lab or online nuclear self-study 	Lab report or online nuclear self-study

Reading Standards	RST 5: Analyze how the text structures information or ideas and categories or hierarchies, demonstrating understanding of the information or ideas.	<ul style="list-style-type: none">• Lab handouts	<ul style="list-style-type: none">• Lab or online nuclear self-study	Lab report or online nuclear self-study
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Unit 3: Periodicity				
Essential Questions:				
1. What are the repeating patterns of physical and chemical properties that occur among the elements of a family/group of the periodic table?				
2. How are these repeating patterns related to the atom's outermost electrons?				
Framework Standard	Skills	Resources	Instructional Strategies	Assessments
3.1 Explain the relationship of an element's position on the periodic table to its atomic number. Identify the families (groups) and periods of the periodic table	<ul style="list-style-type: none"> Locate groups and periods on periodic table Identify the major representative families on periodic table: alkali metals, alkaline earth metals, carbon family, halogens and noble gases. Identify the transition metals along with characteristic properties. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Dynamic Periodic Table (online) 	<ul style="list-style-type: none"> Label blank periodic tables Dipsticking 	Homework Unit Test
3.2 Use the periodic table to identify the three classes of elements: metals, nonmetals and metalloids	<ul style="list-style-type: none"> Identify whether an element is a metal, nonmetal or metalloid. List properties of metals vs. nonmetals. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Dynamic Periodic Table (Online) 	<ul style="list-style-type: none"> Dipsticking Review worksheets 	Homework Unit test
3.3 Relate the position of and element on the periodic table to its electron configuration and compare its reactivity to the reactivity of other elements on the periodic table	<ul style="list-style-type: none"> Write the electron configurations for the elements 1-20 Use the Aufbau Principle/Diagonal Rule to write complete and abbreviated electron configurations. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab Handouts Dynamic Periodic Table (Online) 	<ul style="list-style-type: none"> Group work Class Activity- Writing Electron Configuration Diagonal Rule Aufbau diagram Lab Activity: Flame Tests or other electron relationship lab Worksheets practicing electron configurations 	Unit test Lab report
3.4 Identify trends on the periodic table such atom and ion sizes, and electronegativity	<ul style="list-style-type: none"> Be able to state and explain the atomic radius trend and electronegativity trend. 	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handout 	<ul style="list-style-type: none"> Use a blank periodic table to label the direction of periodic trends Demonstration : 	Unit Test Lab Report

			Light spectrum tubes	
Science Inquiry Skills	SIS4: Use diagrams and charts that represent relationships of variables.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Lab activity 	Lab Report
Reading Standards	RST 2: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	<ul style="list-style-type: none"> • Online articles 	<ul style="list-style-type: none"> • Student found article 	Article Summary
Writing Standards	WS 1: Write arguments focused on discipline-specific content.	<ul style="list-style-type: none"> • Online articles • Lab handouts 	<ul style="list-style-type: none"> • Student found article • Lab activity 	Lab Report Article Summary

Unit 4: Bonding

Essential Questions:

1. How do atoms bond with each other?
2. How do ionic and covalent bonding compare and contrast?

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
4.1: Explain how atoms combine to form compounds through both ionic and covalent bonding.	<ul style="list-style-type: none"> • Compare ionic, covalent, and metallic bonding • Explain ionic bonding. • Explain covalent bonding. • List and compare the distinctive properties of ionic vs. molecular compounds. • State the octet rule 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Overheads or powerpoint or board instruction • Handout 	Unit Test Homework
4.2: Draw Lewis dot structures for molecules and ionic compounds	<ul style="list-style-type: none"> • Use knowledge of valence electrons to draw Lewis structures for singly bonded molecules, given two elements. • Given a molecular formula, draw a Lewis structure. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Worksheets • Model Lab 	Unit Test CFA: Molecular Model Lab
4.3: Use electronegativity to explain the difference between polar and nonpolar covalent bonds.	<ul style="list-style-type: none"> • Identify bonds as nonpolar covalent, polar covalent based on difference in electronegativity values between the bonded elements. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Worksheets • Model Lab 	Unit Test CFA: Molecular Model Lab
4.4: Use valence shell electron pair repulsion theory (VSEPR) to predict electron geometry (linear, trigonal planar, tetrahedral) of simple molecules.	<ul style="list-style-type: none"> • Predict molecular shapes/geometries: linear, trigonal, tetrahedral, trigonal bipyramidal, pyramidal, and bent/angular based on VSEPR model. • Construct basic molecules models to recognize the various geometries. • Define molecule 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Worksheets • Model Lab 	Unit Test CFA: Molecular Model Lab
4.6 Name and write the chemical formulas for simple ionic and molecular compounds, including those that contain the polyatomic ions: ammonium, carbonate, hydroxide, nitrate, phosphate, and sulfate	<ul style="list-style-type: none"> • Use prefixes to name a binary molecular compound from the formula. • Write the formula of a binary molecular compound given its name 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Whiteboards • Worksheets • Model Lab 	Unit Test CFA: Molecular Model Lab

4.5 Identify how hydrogen bonding in water affects a variety of physical, chemical, and biological phenomena.	<ul style="list-style-type: none"> • Compare and describe intermolecular forces namely H- bonding. • Explain what determines polarity. • Draw water molecules and show in detail the interaction 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Whiteboard • Worksheet 	Unit Test
Science Inquiries	SIS4: Use and refine scientific models that stimulate physical processes and phenomena.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab Handouts 	<ul style="list-style-type: none"> • Model lab 	CFA: Molecular Model Lab
Reading Standards	RST 4. Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical concept	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Model Lab 	Unit Test CFA: Molecular Model Lab
Writing Standards	WS 5: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	<ul style="list-style-type: none"> • Lab handouts 	<ul style="list-style-type: none"> • Model lab 	CFA: Molecular Model Lab

Unit 5: Chemical Reactions and Stoichiometry

Essential Questions

1. What is a chemical reaction?
2. What does a reaction equation represent?
3. How is a chemical reaction equation balanced?
4. How are chemical reactions classified?
5. How does the Law of Conservation of Mass allow us to relate amounts of reactants and products? (stoichiometry)

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
5.1 Balance chemical reactions by applying the laws of conservation of mass and constant composition (definite proportions)	<ul style="list-style-type: none"> • Be able to balance equations. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Whiteboards • Worksheets 	Unit Test CFA: Stoichiometry Lab
5.2 Classify chemical reactions as synthesis (combination), decomposition, single replacement, double replacement, and combustion.	<ul style="list-style-type: none"> • Recognize and classify reactions. • Predict whether or not single and double replacement reactions will occur. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Worksheets • Activities on reaction type 	Unit Test
5.3 Use the mole concept to determine the number of particles and the molar mass of elements and compounds.	<ul style="list-style-type: none"> • Define the term MOLE in terms of Avogadro's # and molar mass. • Use dimensional analysis to solve mole conversions relating to mass or particle number and mass to mole 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Worksheets • Group problem solving 	Unit Tests CFA: Stoichiometry Lab
5.5 Calculate the mass-to-mass stoichiometry for a chemical reaction.	<ul style="list-style-type: none"> • Define Stoichiometry • State the importance of the mole ratio • Calculate the mass of reactant or product given the mass of another reactant or product in the chemical equation 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Problem Solving • Stoichiometry Lab 	Unit Tests CFA: Stoichiometry Lab
5.4 Determine percent composition, empirical formulas, and molecular	<ul style="list-style-type: none"> • Determine percent composition from lab analysis data and from chemical formula 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Worksheet percent 	Unit Test

formulas.	<ul style="list-style-type: none"> of a compound Recognize the difference between empirical and molecular formula 	<ul style="list-style-type: none"> Lab handouts 	<ul style="list-style-type: none"> composition Percent composition lab 	CFA: Percent Composition Lab
5.6 Calculate percent yield	<ul style="list-style-type: none"> Given data calculate percent yield 	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Worksheet Stoichiometry lab 	Unit Test CFA: Stoichiometry Lab
Science Inquiry Skills	SIS2: Design and conduct scientific investigation. Write procedures that are clear and replicable.	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Percent composition lab 	CFA: Percent Composition Lab
Science Inquiry Skills	SIS3: Use mathematical operations to analyze and interpret data results.	<ul style="list-style-type: none"> Prentice Hall Chemistry 	<ul style="list-style-type: none"> Worksheets 	Unit Test
Science Inquiry Skills	SIS4: Construct a reasonable argument and respond appropriately to critical comments and questions. (sources of errors)	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Stoichiometry lab Percent composition lab 	CFA: Stoichiometry Lab CFA: Percent Composition Lab
Mathematical Skills	Solve simple algebraic expressions.	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Worksheets Stoichiometry lab Percent composition lab 	Unit Test CFA: Stoichiometry Lab CFA: Percent Composition Lab
Mathematical Skills	Perform statistical procedures to analyze data. (percent yield)	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Worksheets Stoichiometry lab 	Unit Test CFA: Stoichiometry Lab
Mathematical Skills	Determine percent error from experimental and accepted values.	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Worksheets Percent Composition lab 	Unit Test CFA: Percent Composition Lab
Reading Standards	RST 6: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying	<ul style="list-style-type: none"> Prentice Hall Chemistry Lab handouts 	<ul style="list-style-type: none"> Stoichiometry lab 	CFA: Stoichiometry Lab

	important issues that remain unresolved.			
Reading Standards	RST 9: Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Stoichiometry lab • Percent Composition lab 	<p>CFA: Stoichiometry Lab</p> <p>CFA: Percent Composition Lab</p>
Writing Standards	WS 2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Stoichiometry lab • Percent composition lab 	<p>CFA: Stoichiometry Lab</p> <p>CFA: Percent Composition Lab</p>
Writing Standards	WS 7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Stoichiometry lab • Percent composition lab 	<p>CFA: Stoichiometry Lab</p> <p>CFA: Percent Composition Lab</p>

Unit 6: States of Matter

Essential Questions

1. How do gas molecules move and how are they arranged?
2. How is the behavior of a gas modeled by the kinetic molecular theory?
3. How are Boyle's, Charles', Gay-Lussac's Laws used in calculations?
4. How do properties of gases, liquids and solids compare in terms of kinetic molecular theory?
5. What are the driving forces of a chemical reaction?
6. What role does heat play in physical and chemical changes?

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
6.1 Using the kinetic molecular theory, explain the behavior of gases and the relationship between Pressure vs. Volume (Boyles), Volume vs. Temperature (Charles'), Pressure vs. Temperature (Gay-Lussac's), number of particles in a gas sample (Avogadro's).	<ul style="list-style-type: none"> • Describe the importance of the kinetic theory as it applies to gases. • Describe and perform calculations using Charles' Law, Boyles's Law, and Gay-Lussac's law. • Use the combined gas law to solve gas law problems. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Worksheets and practice problems Gas Laws • Gas Law Demos • PowerPoint Gas laws optional • Problem solving gas laws • Molar volume lab 	Unit Test CFA: Molar Volume Lab
6.2 Perform calculations using ideal gas law. Understand the molar volume at 273 K and 1 atm (STP)	<ul style="list-style-type: none"> • Use the ideal gas law to solve gas law problems. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Problem solving worksheet • Molar volume lab 	Unit Test CFA: Molar Volume Lab
6.3 Using the kinetic molecular theory, describe and contrast the properties of gases, liquids, and solids. Explain, at the molecular level, the behavior of matter as it undergoes phase transitions.	<ul style="list-style-type: none"> • Sketch a heat vs. temperature phase change diagram of water showing plateau area for phase change 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Labeling graph activities 	Unit Test
6.4 Describe the law of conservation of energy. Explain the difference between an endothermic process and an exothermic process.	<ul style="list-style-type: none"> • Recognize that melting and boiling is an endothermic phase change. • Recognize that freezing and condensing are exothermic phase changes. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Dipsticking 	Unit Test
6.5 Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness.	<ul style="list-style-type: none"> • Discuss the disorder of life 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Real life examples for conceptual understanding 	Unit Test

Science Inquiry	SIS2: Making and recording measurements at appropriate levels of precision. Collecting data or evidence in an organized way	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Molar volume lab 	CFA: Molar Volume Lab
Mathematical Skills	Measure with accuracy and precision and use the Celsius and Kelvin scales.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Molar volume lab 	CFA: Molar Volume Lab
Reading Standards	RST 8: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Student selected articles 	Article summary
Writing Standards	WS 6: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Online articles 	<ul style="list-style-type: none"> • Student selected articles 	Article summary
Writing Standards	WS 8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	<ul style="list-style-type: none"> • Online articles 	<ul style="list-style-type: none"> • Student selected articles 	Article summary

Unit 7: Solutions, Rates of Reaction and Equilibria

Essential Questions

1. What are the characteristics of a solution?
2. How do the structural formulas and strength of intermolecular forces of solutes and solvents play a pivotal role in whether they will dissolve in each other?
3. How is the concentration of a solution calculated in terms molarity?
4. What factors influence the rate at which a solute dissolved in a solvent?
5. How is the molarity concept used in solution stoichiometry?
6. What is the rule of solubility (“like dissolves like”) and how is it used to predict whether a solution will form?
7. How is Le-Chatelier’s Principle employed to predict and equilibrium shift?
8. What factors influence the rate of a reaction and how are these explained in terms of kinetic theory and/or energy?

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
7.1 Describe the process by which solutes dissolve in solvents	<ul style="list-style-type: none"> • Diagram the dissolving process of ionic or polar solutes in water. • Identify the factors that determine the mass of a solute that will dissolve in a given reaction. • Interpret solubility tables to identify if a solution is saturated, unsaturated or supersaturated. • Contrast the qualitative terms dilute to concentrated. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Worksheets 	<ul style="list-style-type: none"> • Solubility worksheets • Make solutions of various molarities • Demonstration dilute vs. concentrated, polar vs. non-polar and ionic solutes 	Unit Test
7.2 Calculate concentration in terms of molarity. Use molarity to perform solution dilution and solution stoichiometry.	<ul style="list-style-type: none"> • Identify the units used to express the solubility of a solute. • Solve problems involving the molarity of a solution. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Worksheets • Dilution demonstration 	Unit Test
7.3 Identify and explain the factors that affect the rate of dissolving(e.g. temperature, concentrations, surface area, pressure, mixing	<ul style="list-style-type: none"> • Identify the factors that determine the rate at which a solute dissolves. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Worksheets • Demonstration 	Unit Test
Science Inquiry Skills	SIS2: Properly use instruments, equipment, and materials(e.g. scales, and volumetric flasks)	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Make solutions of various molarities 	Unit test
Mathematical Skills	Use ratio and proportion to solve problems.	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Make solutions of various molarities 	Unit Test
Reading Standards	RST2: Determine the central ideas or conclusions	<ul style="list-style-type: none"> • Prentice Hall 	<ul style="list-style-type: none"> • Student found 	Article Summary

	of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	Chemistry <ul style="list-style-type: none"> • Online articles 	article	
Writing Standards	WS 10: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Online articles 	<ul style="list-style-type: none"> • Student found article 	Article Summary

Unit: 8 Acids and Bases and Oxidation-Reduction Reactions

Essential Questions

1. What are the areas of science where acids and bases play an important role?
2. What is an oxidation reduction reaction in terms of electron transfer?

Framework Standard	Skills	Resources	Instructional Strategies	Assessments
8.1 Define Arrhenius Theory of acids and bases in terms of the presence of hydronium ions and hydroxide ions in water. Define Bronsted Acid and Base in terms of proton donor or acceptor	<ul style="list-style-type: none"> • Recognize an Arrhenius Acid by its ability to form hydronium ions in aqueous solution. • Recognize an Arrhenius Base by its ability to form hydroxide ions in aqueous solution. • General properties of acids and bases. 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Worksheets 	Unit Test
8.2 Relate Hydrogen ion concentration to pH Scale and compare strengths of various common acids and bases (eg. vinegar, citrus juice, baking soda, soap etc)	<ul style="list-style-type: none"> • Relate pH number to acidity and alkalinity 	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Teach pH scales • Real life examples • Titration Lab 	Unit Test CFA: Titration Lab
8.3 Explain how a buffer works	<ul style="list-style-type: none"> • Define buffer 	<ul style="list-style-type: none"> • Prentice Hall Chemistry 	<ul style="list-style-type: none"> • Real life example 	Unit Test
Science Inquiry	SIS4: Communicate and apply the results of scientific investigations. Develop descriptions of and explanations for scientific concepts that were a focus of one more investigations.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Titration lab 	CFA: Titration Lab
Mathematical Skills	Solve simple algebraic expressions.	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Titration lab 	Unit Test CFA: Titration Lab
Reading Standards	RST 5: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas sources of information	<ul style="list-style-type: none"> • Prentice Hall Chemistry • Lab handouts 	<ul style="list-style-type: none"> • Titration lab 	CFA: Titration Lab
Writing Standards	WS 9: Draw evidence from informational texts to support analysis, reflection, and research.	<ul style="list-style-type: none"> • Lab handouts 	<ul style="list-style-type: none"> • Titration Lab 	CFA: Titration Lab