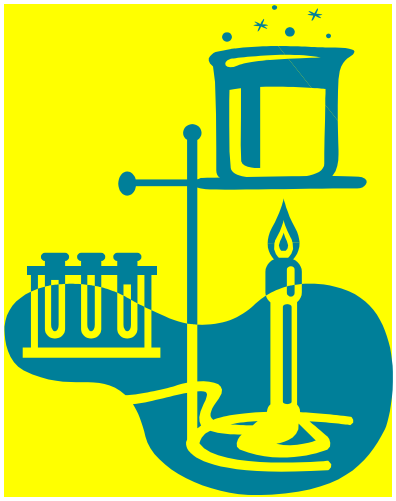
Planned Course of Study

ACCELERATED CHEMISTRY

HIGH SCHOOL



NORTHWESTERN LEHIGH SCHOOL DISTRICT
6493 ROUTE 309
NEW TRIPOLI, PA 18066

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2018

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INTRODUCTION

The Accelerated Chemistry curriculum guide contains planned course formats for the Northwestern Lehigh School District. The content of this document describes the objectives, activities, assessments, content, time frame, and standard alignment that serve as a guide to the specific units of study offered in Accelerated Chemistry.

The Accelerated Chemistry curriculum guide is the product of much diligent work on the part of the following members of the Science Task Force:

Glen Hughes Andrea Meyers

This document reflects their efforts to establish a well-defined and organized approach to teaching Science in the Northwestern Lehigh School District.

Approved by Northwestern Lehigh School District Board of Education
May 2018

Unit 1: Introduction to Chemistry and Laboratory Safety				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Demonstrate correct personal protection measures.	S11.A.2.2 HS-PS1-3	• Demonstrated in laboratory experiments throughout the course. • Safety Video • Safety 1st Guided Notes • Safety 1st Reading and POGIL Activity	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Demonstrate the use of a/an safety shower, eye wash, fire blanket, fire extinguisher, and fume hood.	S11.A.2.2 HS-PS1-3	• Teacher Demo: Proper Use of Laboratory Safety Equipment • Laboratory Safety and Equipment Quiz		1
Demonstrate proper housekeeping, handling, cleaning glassware, waste disposal, handing and observing chemicals, heating substances, and first aid.	S11.A.2.2 HS-PS1-3	• Teacher Demo: Working in the Chemistry Lab • Labs: MSDS and The Scientific Method • Fundamentals of Experimental Design POGIL Activity • Organizing Data POGIL Activity		1
Use and interpret hazard information found on product labels, Diamond symbols, and Material Safety Data Sheets.	S11.A.2.2 HS1-PS1-3	• Class Activity: Information Sources • Chemistry KWL Chart • Formal Lab Report Criteria • Lab Safety and Equipment Quiz • Diagnostic Test • Chapter One Quiz 1		2

Unit 2: Scientific Measurement				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Make accurate and precise measurements of mass, length, volume and temperature using metric units.	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Volume Measurements • Demo: Density Calculations • Demo: The Hydrometer • Class Activity: Measurements Using Laboratory Equipment • What is Fire Made of Reading and Questions? • Lab: Identification of a Pure Substance • Lab: Density of Pennies • Lab Reports • Density Challenge • Chapter 3 Quiz 2 • Chapter 3 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	4
Utilize significant figures to communicate the uncertainty in a quantitative observation.	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Significant Figure Measurement POGIL Activity • Significant Zero POGIL Activity • Lab Significant Figure and Measurement • Lab Report • Chapter 3 Quiz 1 • Chapter 3 Test		

 Please note: The activities, assessments, materials and time frame are meant to be used as a guide for educators, and are not meant to be all-inclusive.

Determine percent error	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Metric Scavenger Hunt • Chapter 3 Quiz 1 • Chapter 3 Test		2
Characterize data in terms of precision and accuracy.	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Chapter 3 Quiz 1 • Chapter 3 Test		
Recall and convert metric system units	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Metric Puzzle Box • Metric Base Unit Quiz • Chapter 3 Quiz 3 • Chapter 3 Test		1
Complete unit conversions using the factor label method.	S11.C.1.1 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Chapter 3 Section 3 Quiz • Chapter 3 Test		1

Unit 3: Matter and Change				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Differentiate between physical properties and chemical properties	3.2.C.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Volume and Mass and States of Chocolate • States of Matter Graphic Organizer • Lab Report • Chapter 2 Quiz 1, Chapter 2 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Classify physical or chemical changes within a system in terms of matter and/or energy	3.2.C.A5 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Teacher Demo: Identifying a Chemical Change • Lab: Study of Chemical Changes • Chapter 2 Quiz 1, Chapter 2 Test		
Differentiate between pure substances and mixtures; differentiate between heterogeneous and homogeneous mixtures	3.2.C.A1 S11.A.2.1 S11.C.1.1.1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Classifying Matter Graphic Organizer and POGIL Activity • Quick Lab: Separation of Mixtures • Lab: Preparation of Sterno • Lab: Chromatography • Teacher Demo: Iron in Cereal • Teacher Demo: Distillation • Where do Elements Come From Reading and Questions • Chapter 2 Quiz 1, Chapter 2 Test		2

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Predict how combinations of substances can result in physical and/or chemical changes	3.2.C.A4 S11.C.1.1.1 HS-PS1-1 HS-PS1-2 HS-PS1-3 HS-PS2-6	• Teacher Demo: Decomposition of Sugar • Lab: Chemical and Physical Changes • Lab Report • Chemical/ Physical Change Webquest • Chapter 2 Quiz 1 • Chapter 2 Test		1
Interpret and apply the laws of conservation of mass, constant composition (definite proportions), and multiple proportions	3.2.C.A4 S11.C.1.1.1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Teacher Demo: Reaction of Zinc and Sulfur • Lab: Conserving Matter • Lab Report • Chapter 2 Test		1
Distinguish between intensive and extensive properties of matter	3.2.C.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Activity: Massing • Teacher Demo: Volume and Mass • Lab: Determining Properties • Chapter 2 Quiz 1 • Chapter 2 Test		1
Explain why compounds are composed of integer ratios of elements	3.2.10.A2 S11.C.1.1.1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Writing Activity • Chapter 2 Test	Textbook Interactive Whiteboard Assessments	1
Explain how the behavior of matter and energy follow predictable patterns that are defined by laws	3.2.10.B6 S11.A.3.1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Lab: Eight Solutions • Lab: Qualitative Analysis of Fourteen Household Chemicals • Lab Reports	Textbook Interactive Whiteboard Laboratory Equipment and Chemicals Assessments	1
Classify observations as qualitative and/or quantitative	3.2.C.A2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Discussion: Qualitative vs. Quantitative Observations • Lab: Volume and Temperature • Lab Report	Laboratory Equipment and Chemicals Assessments	1
Explain the difference between endothermic and exothermic reactions.	3.2.10.A4 HS-PS1-1 HS-PS1-2 HS-PS1-3 HS-PS2-6	• Teacher Demo: Endothermic Reaction • Chapter 2 Test	Textbook Laboratory Equipment and Chemicals Assessments	

Unit 4: Atomic Structure				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Describe the historical development of models of the atom and how each discovery contributed to modern theory	3.2.10.A5 S11.A.1.1 S11.A.3.2 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Atomic Structure Video • Atomic Chemist Resume • Chapter 4 Quiz 1, Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Recognize discoveries from Dalton (atomic theory), Thomson (the electron), and Rutherford (the nucleus)	3.2.C.A5 S11.A.1.1 S11.A.3.2 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Atomic Structure Video • Atomic Chemist Resume • Demo: Observing Cathode Rays • Computer Simulation: Cathode Ray Tube • Chapter 4 Quiz 1, Test		
Describe Rutherford's "gold foil" experiment that led to the discovery of the nuclear atom	3.2.C.A5 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Video: Atomic Structure • Atomic Chemist Resume • Chapter 4 Quiz 1, Test		

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Identify the major components (protons, neutrons, and electrons) of the nuclear atom and explain how they interact	3.2.C.A5 S11.A.3.3 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Video: Atomic Structure • Atomic Chemist Resume • Chapter 4 Quiz 1 • Chapter 4 Test		2
Distinguish among the isotopic forms of elements	3.2.12.A2 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Isotope POGIL Activity • Average Atomic Mass POGIL Activity • M and M Isotope Lab • Atomic Mass Lab • Lab Reports • Chapter 4 Test		
Identify the three main types of radioactive decay and compare their properties	3.2.C.A3 HS-PS1-1 HS-PS1-3 HS-PS1-7 HS-PS1-8 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Chapter 4 Test		2

Unit 5: Electrons in Atoms				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Recognize the discoveries of Thomson (the electron) and Bohr (planetary model of the atom), and how each discovery leads to modern theory	3.2.C.A5 S11.A.1.1 HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-3 HS-PS4-3 HS-PS4-5	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Atomic Timeline Project • Inquiry Activity: Observing Light Emission from Wintergreen Mints • Video • Demo: Energy and Energy Levels • Chapter 5 Quiz 1, Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Describe the historical development of models of the atom and how they contributed to modern atomic theory	3.2.10.A5 S11.A.1.1 S11.A.3.3 HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-3 HS-PS4-3 HS-PS4-5	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: Development of Atomic Models • Video • Atomic Timeline Project • Chapter 5 Quiz 1, Test		
Compare the electron configurations for the elements found on the periodic table	3.2.C.A2 HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-3 HS-PS4-3 HS-PS4-5	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Color Code the Orbitals on the Periodic Table • Electron Configuration POGIL Activity • Class Activity: Determining the Electron Configuration of an Element • Lab: Electron Configurations: Chemistry of Fireworks • Lab Reports • Chapter 5 Quiz 2, Test		2

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Explain how light is absorbed or emitted by electron orbital transitions	3.2.12.A2 S11.A.3.3 HS-PS1-6 HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-3 HS-PS4-3 HS-PS4-5	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Atomic Emission Spectra • Lab: Flame Test • Lab: Finding a Laser Pointer's Wavelength of Light • Lab Reports • Demo: Quantized Energy • Enrichment: The Discovery of Helium • Chapter 5 Test		3

Unit 6: The Periodic Table				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Predict properties of elements using trends of the periodic table	3.2.10.A1 S11.C.1.1.4 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Periodic Table Bingo • Periodic Table Webquest • Color Code the Periodic Table • Cracking the Periodic Table POGIL Activity • Teacher Demo: Alkali Metal • Video: Alkali Metals in Water • Lab: Alkaline Earth Metals • Lab: Periodic Table • Lab Reports • Chapter 6 Quiz 1, Quiz 2 • Chapter 6 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	3
Relate the position of an element on the periodic table to its electron configuration and compare its reactivity to other elements in the table	3.2.C.A2 S11.A.3.3 S11.C.1.1.4 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Periodic Table Bingo • Color Code the Periodic Table • Periodic Table Webquest • Cracking the Periodic Table POGIL Activity • Chapter 6 Quiz 1, Quiz 2 • Chapter 6 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	
Explain the relationship of an element's position on the periodic table to its atomic number, ionization energy, electronegativity, atomic size, and classification of elements	3.2.C.A1 S11.A.3.3 S11.C.1.1.4 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Effective Nuclear Charge	Textbooks Laptops Calculators Interactive Whiteboard	3

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		• Demo: Electron Shielding • Demo: Predicting Reactivity • Demo: Trends in Ionic Size • Periodic Table Bingo • Periodic Trend Graphing Activity • Periodic Trend POGIL Activity • Class Activity: Reactivity of Halogens Simulation • Enrichment: Reconstructing Mendeleev's Periodic Table • Chapter 6 Test	Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	
Compare the properties of metals, nonmetals, metalloids, and noble gases.	3.2.C.A1 S11.C.1.1.4 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Periodic Table Bingo • Periodic Table Webquest • Cracking the Periodic Table POGIL Activity • Color Code the Periodic Table • Lab: Metals, Nonmetals, Metalloids • Chapter 6 Quiz 1 • Chapter 6 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	

Unit 7: Chemical Bonding				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Explain how atoms combine to form compounds through both ionic and covalent bonding	3.2.C.A2 S11.A.1.1 S11.C.1.1.3 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Ionic Compound Webquest • Ion POGIL Activity • Demo: Metals vs. Ionic Compounds • Demo: Types of Alloys • Demo: Making an Alloy • Class Activity: Hardness of Water • Lab: Sugar or Salt: Ionic and Covalent Binding • Lab Report • Online Activity: Crystal Structures • Chapter 7 Test • Chapter 8 Sections 1 and 2 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	3
Compare and contrast different bond types that result in the formation of molecules and compounds	3.2.10.A2 S11.A.1.1 S11.C.1.1.3	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Quick Lab: Strength of Covalent Bonds • Lab Report • Demo: Molecular Structures and Formulas • Enrichment: Strength of Intermolecular Forces • Chapter 8 Sections 1 and 2 Test		

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Compare, using examples, the effect of covalent and ionic bonding on the physical properties of matter	3.2.C.A1 S11.A.1.1 S11.C.1.1.2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Properties of Ionic and Covalent Compounds • Lab Report • Chapter 7 Quiz 1 • Chapter 8 Sections 1 and 2 Test • Chapter 7 Test		2
Explain the unique properties of water (polarity, high boiling point, and hydrogen bonding) that support life on Earth	3.2.C.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Observing Evidence of Polarity • Lab: Chemical Binding: Polarity of Slime and Silly Putty • Lab: Solvent Properties of Water • Lab Reports • Class Activity: Graphing Properties • Chapter 8 Sections 3 and 4 Test		2
Explain the relationship of an element's position on the periodic table to its electronegativity	3.2.C.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: A Magnetic Analogy • Class Activity: Alien Periodic Tables • Chapter 8 Sections 3 and 4 Test		2
Use electronegativity to explain the difference between polar and nonpolar covalent bonds	3.2.C.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: A Magnetic Analogy • Class Activity: Alien Periodic Tables • Chapter 8 Sections 3 and 4 Test	Textbooks Interactive Whiteboard	

Compare and contrast the unique properties of water to other liquids	3.2.12.A1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Video • Demo: Evidence of Hydrogen Bonding	Textbooks Laptops Interactive Whiteboard	1
Draw Lewis dot structures for simple molecules and ionic compounds	3.2.C.A2 S11.A.3.2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: Drawing Lewis Dot Structures for Compounds • Class Activity: Making Molecular Models • Chapter 8 Sections 3 and 4 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Use VSEPR theory to predict the molecular geometry of simple molecules.	3.2.12.A5 S11.A.3.2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Molecular Geometries • Lab: Magnets, Marshmallows, and Covalent Bonds • Lab Reports • Class Activity: Making Molecular Models • Demo: A Resonance Hybrid • Demo: Bond Energies • Molecular Geometry POGIL Activity • Chapter 8 Sections 3 and 4 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables Molecular Model Kits VSEPR Theory Reference Sheet	5
Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.	3.2.A.2.2.1 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Ion POGIL Activity • Ionic Compound Webquest • Class Activity: Hardness of Water • Lab: Paper Chromatography of Food Dyes	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	

		• Quick Lab: Solutions Containing Ions Qualitative Test for Fluoride Ions in Mouth Rinses • Demo: Valence Electrons • Chapter 7 Quiz 1 • Chapter 7 Test		

Unit 8: Chemical Names and Formulas				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Predict chemical formulas based on the number of valence electrons	3.2.C.A2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Colorful Ions • Class Activity: Predicting Formulas of Compounds • Lab: Synthesis of Zinc Iodide • Lab Report • Chapter 9 Reading Quiz • Chapter 9 Quiz 1	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables Student White Boards	2
Predict the chemical formulas for simple molecules and ionic compounds.	3.2.C.A2 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Making and Naming and Ionic Compound • Demo: Making and Naming Lead Carbonate • Naming molecular Formulas POGIL Activity • Lab: Decomposition of Zinc Iodide • Lab: Names and Formulas for Ionic Compounds • Lab Report • Enrichment: Crystalline Structure of Ionic Compounds • Chapter 9 Quiz 2 • Chapter 9 Quiz 3 • Chapter 9 Test		5

Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions	3.2.C.A2 CHEM.A.1.1.5 HS-PS1-1 HS-PS1-3 HS-PS2-6	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Quick Lab: Making Ionic Compounds • Naming Ionic Compounds POGIL Activity • Polyatomic Ion POGIL Activity • Naming Acids POGIL Activity • Lab: Ionic Formula Writing • Lab Report • Chapter 9 Quiz 2 • Chapter 9 Quiz 3 • Chapter 9 Test		5

Unit 9: Chemical Reactions and Equations				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Describe chemical reactions in terms of atomic rearrangement and/or electron transfer	3.2.10.A4 S11.A.1.1 S11.A.3.2 HS-PS1-2 HS-PS1-4 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Removing Silver Tarnish • Demo: An Example of an Chemical Change • Mini Quizzes, Chapter 11 Test 1	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	4
Balance chemical equations by applying the laws of conservation of mass	3.2.C.A4 S11.A.1.1 HS-PS1-2 HS-PS1-4 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Law of Conservation of Mass • Lab: Blueprint Paper • Lab Report • Enrichment: Challenging Chemical Equation Balancing • Mini Quizzes, Chapter 11 Test 1		
Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement (replacement), and composition	3.2.C.A4 S11.A.1.3 HS-PS1-2 HS-PS1-4 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Single Replacement Reactions • Demo: Double Replacement Reactions • Demo: Combustion of Iron • Demo: A Combustion Reaction • Demo: Model a Fire Extinguisher • Lab: Types of Chemical Reactions • Lab Report • Types of Chemical Reaction POGIL Activity • Mini Quizzes, Chapter 11 Test 2		5

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Unit 10: Chemical Quantities and Stoichiometry				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Use the mole concept to determine the number of particles and molar mass for elements and compounds	3.2.C.A2 3.2.10.A5 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Mole and Mass • Demo: Molar Volume • Lab: Moles of a Substance • Lab Report • Chapter 10 Quiz 2, Chapter 10 Test	Textbooks Laptops Calculators Interactive Whiteboard Laboratory Equipment Chemicals Handouts Assessments Periodic Tables	2
Determine percent compositions, empirical formulas, and molecular formulas	3.2.C.A2 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Determining the Empirical Formula for a Compound • Lab: Percent of Water in Popcorn • Lab Report • Chapter 10 Test		3
Predict the amounts of products and reactants in a chemical reaction using mole relationships	3.2.10.A4 S11.A.1.3 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Mole Ratio POGIL Activity • Demo: Interpreting a Chemical Equation • Class Activity: Stoichiometric Flash Cards • Lab: Verifying Stoichiometry I • Lab: Relating Moles to Coefficients • Lab Reports • Mini Quizzes, Chapter 12 Test 1		3

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Use stoichiometry to predict quantitative relationships in a chemical reaction.	3.2.C.A4 S11.A.1.3 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Mole Ratio POGIL Activity • Demo: Interpreting a Chemical Equation • Class Activity: Stoichiometric Flash Cards • Lab: Verifying Stoichiometry II • Lab: Chemical Reactions of Copper • Lab: Mole to Mass Relationships • Lab: Mass to Mass Relationships • Lab: Stoichiometry: Synthesis of Garden Lime • Lab Reports • Mini Quizzes, Chapter 12 Test 1		2
Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions, molecules, and/or formula units)	3.2.C.A2 CHEM.B.1.1.1 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Paper Chromatography • Lab: The Mole: Avogadro's Number • Lab Report • Relative Mass and the Mole POGIL Activity • Chapter 10 Quiz 1, Chapter 10 Test		2
Describe the roles of limiting and excess reactants in chemical reactions.	CHEM.B.2.1.1 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Interpreting a Chemical Equation • Class Activity: Stoichiometric Flash Cards • Demo: Limiting Factor • Demo: Ham and Cheese Sandwich • Lab: Analysis of Baking Soda • Lab: Limiting Reagents • Lab Reports • Mini Quizzes, Chapter 12 Test 2		3

Unit 11: Behavior of Gases				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame (days)**
Predict the behavior of gases through the application of laws (i.e., Boyle's law, Charles' law, or ideal gas law)	3.2.10.A3 S11.A.1.1 S11.C.1.1.5 HS-PS1-4 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Gas Variables POGIL Activity • Demo: Boyle's Law • Lab: Charles' Law • Ideal Gas Law: Finding Percent H_2O_2 with Carrot Juice • Class Activity: Diffusion • Class Activity: Effusion • Mini Quizzes • Chapter 14 Test 1 • Chapter 14 Test 2	Textbooks Laptops Interactive Whiteboard Laboratory Equipment and Chemicals Calculators Handouts Assessments Periodic Tables	5
Relate how volumes of gases react in terms of the kinetic theory of gases.	3.2.10.A3 HS-PS1-4 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Pressure and Particle Size • Lab: CO_2 from Antacid Tablets • Lab Report • Enrichment: Gases Used in Ballooning • Chapter 13 Quiz 1		2
Describe phases of matter according to the kinetic molecular theory	3.2.10.A3 S11.C.1.1.1 S11.A.2.1 HS-PS1-4 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Inquiry Activity: Observing Gas Pressure • Demo: Elastic Collisions • Demo: Air Pressure • Video • Chapter 13 Quiz 1		2

 Please note: The activities, assessments, materials and time frame are meant to be used as a guide for educators, and are not meant to be all-inclusive.

Relate Kelvin-Scale and Celsius-temperature scales	S11.A.2.2.1 HS-PS1-4 HS-PS1-5 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, and Chapter Questions • Section Review Sheets • Mini Quizzes • Chapter 14 Test 1 • Chapter 14 Test 2		1

Unit 12: Solutions				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame**
Identify the factors that determine the rate at which a solute dissolves	3.2.C.A3 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Solubility POGIL Activity • Inquiry Activity: Salt and the Freezing Point of Water • Demo: Solubility of Gases • Lab: Factors Affecting Solubility • Chapter 16 Quiz 1	Laptops Calculators Interactive Whiteboard Textbooks Laboratory Equipment and Chemicals Handouts Assessments Periodic Tables	2
Identify the units usually used to express the solubility of a solute	3.2.C.A2 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Demo: Serial Dilutions • Class Activity: Solution Preparation • Enrichment: Concentration of Everyday Solutions • Mini Quizzes, Chapter 16 Test 1		2
Identify the factors that determine the mass of solute that will dissolve in a given mass of solvent	3.2.C.A2 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Saturated/ Unsaturated Solutions POGIL Activity • Demo: Degrees of Saturation • Lab: Supersaturation • Lab Report • Mini Quizzes, Chapter 16 Test 1		2

 Please note: The activities, assessments, materials and time frame are meant to be used as a guide for educators, and are not meant to be all-inclusive.

Solve problems involving the molarity of a solution	3.2.C.A2 3.2.10.A5 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: Preparing Solutions • Enrichment: Writing Recipes for Solutions • Molarity POGIL Activity • Mini Quizzes • Chapter 16 Test 1		3
Solve problems related to the molality and mole fraction of a solute	3.2.C.A2 3.2.10.A5 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Class Activity: Diagramming Methods of Concentration Calculation • Mini Quizzes • Chapter 16 Test 2		2

Unit 13: Acids, Bases, and Salts				
Objective **The student will be able to:**	**Standard Alignment &/or Anchor**	**Suggested Activity and Assessment**	**Materials**	**Time Frame**
Define the properties of acids and bases	3.2.12.A4 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Acids and Bases POGIL Activity • Demo: Reactive Acids • Inquiry Activity: Effect of Foods on Baking Soda • Lab: Characteristic Properties of Acids and Bases • Lab: Drano vs. Sani Flush • Lab Reports • Mini Quizzes, Chapter 19 Test 1	Laptops Calculators Interactive Whiteboard Textbooks Laboratory Equipment and Chemicals Handouts Assessments Periodic Tables	2
Compare and contrast the theories of Arrhenius, Bronsted-Lowry, and Lewis	3.2.C.A6 3.2.12.A6 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Lewis Acids • Lab Report • Enrichment: Practical Application of Acid-Base Theories • Mini Quizzes, Chapter 19 Test 1		2
Classify solutions as neutral, acidic, or basic given the hydrogen-ion or hydroxide-ion concentration	3.2.12.A4 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Calculating pH POGIL Activity • Demo: Observing pH Change • Class Activity: Comparing pH Indicators and pH Meters • Mini Quizzes, Chapter 19 Test 1		3

 Please note: The activities, assessments, materials and time frame are meant to be used as a guide for educators, and are not meant to be all-inclusive.

Define the products of an acid-base reaction	3.2.12.A4 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	• Class Lecture and Discussion • Guided Notes • Reading Assignments, Problem Sets, and Chapter Questions • Section Review Sheets • Lab: Ionization Constants of Weak Acids • Mini Quizzes, Chapter 19 Test 3		3