Lehighton Area School District
Curriculum Framework

Course Title:	Chemistry
Content Area:	Science
Grade Level(s):	10th, 11th, 12th
Course Overview:	This course provides a firm foundation in chemical concepts and principles using a strong mathematical approach to the study of chemistry and a high degree of student involvement in the laboratory. Emphasis is placed on utilization of the students' problem-solving and critical thinking skills
PA Core Standards:	K-12 STEELS Standards
Key Course Text and Materials:	Introductory to Chemistry by Nivaldo Tro Pearson Online Course
Key Assessments/Projects:	Daily exit tickets, quizzes, chapter tests

Big Idea/Unit: Chemistry is the study of matter and the changes that it undergoes.
Pacing: 10 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.C.9-12G	Students will identify properties of atoms, elements and molecules. They will be able to describe the differences between the states of matter. They will recognize that when a chemical change takes place, the atoms of the original substances are regrouped to form different molecules.	Matter Energy Physical Property Chemical Property Physical Change Chemical Change Element Compound Heterogeneous Mixture Homogeneous Mixture Element Compound Solid Liquid Gas	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 1 Quiz 1 Chapter 1 Unit Assessment

Big Idea/Unit: Laboratory Technique and Safety
Pacing: 3 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.5.9-12.A	Student will be able to properly identify glassware that will be used throughout the course while completing basic laboratory experiments. They will understand the uses of the equipment as well. They will also apply scientific reasoning jto demonstrate why the evidence is adequate for a conclusion in a lab setting.	Beaker Erlenmeyer flask Graduated cylinder Scoop Tweezers Striker Stirring rod Clay triangle Hot plate Electronic balance Safety glasses Ring stand Ring support Thermometer Funnel	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Laboratory Safety Procedures Teacher prepared Google Slides Teacher prepared CANVAS course	Glassware Identification Assessment Lab Exp. 1: Basic Lab Techniques

Big Idea/Unit: Measurements and Conversions
Pacing: 17 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project

3.2.C.A1, T	Students will be able to convert between units of mass, length and volume. Students will then use this mathematical reprsentations to describe and/or support sientific conclusions.	Accuracy Conversion factor Density Derived unit Dimensional analysis Percent Error Precision Qualitative Quantitative SI Significant figures Scientific notation Temperature	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides SI Conversion Sheet Periodic Table Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 2 Quiz Chapter 2 Assessment Lab Exp. 2: Measurement and Conversions

Big Idea/Unit: Atomic Theory is the foundation for the study of chemistry.
Pacing: 13 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.9-12.B & G	Students will recognize that matter is conserved and that energy transfer drives the cycling of matter. Students who demonstrate understanding can construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms. They will learn the placement of electrons within an atom, which drives the reactivity of the atom itself.	Electron Configurations Atomic Mass Molar Mass Isotopes Moles Ions Average Atomic Mass Energy Levels Quantum numbers Atomic orbitals	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 3 Quiz 1 Chapter 3 Test Lab Exp.3: Law of Conservation of Mass Lab Exp 4: Isotopes Element Assessment

Big Idea/Unit: Electrons are located in orbital regions around the nucleus in such a way that it will be a stable arrangement.
Pacing: 10 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project

3.2.9-12.A, T & V	Students will learn the placement of electrons within an atom Students who demonstrate understanding can construct and revise an explanation for the outcome 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.	Aufbau principle Angular momentum quar Electron configuration Electromagnetic radiatior Electromagnetic spectrur Excited state Frequency Ground state Heisenberg uncertainty p Magnetic quantum numb Principal energy level Orbitals Quantum theory Spin quantum number	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 4 & 5 Quiz 1 Chapter 4 & 5 Test

Big Idea/Unit: Chemical formulas have specified nomenclature for both ionic and molecular compounds.
Pacing: 20 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.9-12.C, D, G	Students will learn the name of the inorganic molecules using the IUPAC system. There will be an understanding of basic nomenclature and also the naming of acids.	Acids Ion Ionic compound Molecular compound Molecular formula Polyatomic Ions Structural formula	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Polyatomic Ion Assessment Chapter 7 Quiz Chapter 7 Assessment

Big Idea/Unit: Chemical Reactions are predictable.
Pacing: 17 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project

3.2.9-12. E, F, G	Students will learn the basics of how a molecules bonds are broken and new bonds will be produced within a chemical reaction. Students will understand how to predict the types of molecules that will be formed based on their type of chemical reaction. Students who demonstrate understanding can 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.	Balancing Chemical Equation Combustion Decomposition Double displacement Endothermic Exothermic Product Reactant Synthesis Single displacement	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Polyatomic Ions Sheet Chemical Reaction Flow Chart Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 8 Quiz 1 Chapter 8 Quiz 2 Chapter 8 Test Lab Exp. 5: Chemical Reactions

Big Idea/Unit: There are quantitative relationships between chemical compounds within a chemical reaction.
Pacing: 17 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.9-12. B,C,D, L	Students will be able to determine relationships between molecules within a chemical reaction. Students will then use this stochiometric knowledge to determine the limiting reactants within a chemical reaction and how this will affec the overall percent yeild during a chemical reaction.	Stoichiometry Limiting Reactant Percent Yield Theoretical Yield	Honors: Introduction to Chemistry textbook CP and Modern: Basic Chemistry textbook All levels: Pearson+ Study Prep Guides Periodic Table Limiting Reactant Virtual Lab Online Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 9 Quiz Chapter 9 Assessment Lab Exp. 7: Limiting Reactant Limiting Reactant Virtual Lab

Big Idea/Unit: Chemical Bonding
Pacing: 17 days

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project

3.2.9-12. B,C,D, L	Students will be able to determine the type of bond based on electronegativity values. The bond structure will then give way to the udnerstanding of the properties, both phsically and chemically that the molecule will possess.	Chemical bonding Ionic Bonds Covalent Bonds Polar Bonds Nonpolar Bonds Intermolecular Forces Intramolecular Forces	Textbook – Chapter 6 Teacher generated notes and lessons SI Conversion Sheet Periodic Table Molecular Model Kits Online Tools prepared Google Slides Teacher prepared CANVAS course	Teacher	Daily question and answer Exit Slips Chapter 6 Quiz Chapter 6 Test Drawing of models packet

Big Idea/Unit: Gas Laws / Matter and Energy **Pacing:** 17 days				
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.2.9-12.E,F,G	Students will be able to determine the behavior of gasses based on their phsical and chemical properties and uniques when in comparison to other states of matter.	Gas Laws KMT Model Ideal gas equation Graham's law of effusion	Textbook – Chapter 6 Teacher generated notes and lessons SI Conversion Sheet Periodic Table Molecular Model Kits Online Tools Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 11 Quiz Chapter 11 Assessment Lab Exp. 7: Soda Can Implosion

Big Idea/Unit: Solutions **Pacing:** 10 days				
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**

3.2.9-12.E,F,G	Students will be able to determine what makes a solution. What is meant by the term solubitlity? Students will be able to determine the concentration of solutions and be able to make concentrations in a laboratory setting.	Solute Solvent Homoegenous Mixture Saturated Unsaturated Electrolyte Recrystallization Henry's Law Concentrated Mass Percent Freezing Point Depression Boiling Point Elevation	Textbook – Chapter 11 Teacher generated notes and lessons SI Conversion Sheet Periodic Table Online Tools Teacher prepared Google Slides Teacher prepared CANVAS course	Daily question and answer Exit Slips Chapter 12 Quiz Chapter 12 Assessment Activity: Dilutions and solution in lab