|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weeks | TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **1-3** | **Unit 1 Inquiry, Technology, Engineering & Mathematics** | | | |  |
|  | 3221.2.1 Investigate the characteristic properties of matter.  3221.2.2 Explore the interactions between matter and energy.  3221.3.4 Explain the law of conservation of mass/energy. | 3221.Inq.1 Recognize  that science is a progressive endeavor that reevaluates and extends what is already accepted.  3221.Inq.4 Apply qualitative and quantitative measures to analyze data and draw conclusions that are free of bias.  3221.TE.2 Differentiate among elements of the engineering design cycle.  3221.TE.4 Describe the dynamic interplay among science, technology, and engineering within living, earth-space, and physical systems.  3221.Math.1 Understand the mathematical principles associated with the science of chemistry.  3221.Math.2 utilize appropriate mathematical principles associated with the science of chemistry. | SPI.3221.Inq.1 Select a description or scenario that reevaluates and/or extends a scientific finding.  SPI 3221.Inq.2 Analyze  the components of a properly designed scientific investigation.  SPI 3221.Inq.3 Determine the appropriate tools to gather precise and accurate data.  SPI 3221.Inq.4 Evaluate the accuracy and precision of data.  SPI 3221.TE.1 Distinguish among tools and procedures best suited to conduct a specified scientific inquiry.  SPI.3221.TE.2 Evaluate a protocol to determine the degree to which an engineering design process was successfully applied. | Holt *Modern Chemistry* Chapters 1-2  Lab: Observing a Chemical Reaction  Lab: Density Determination  Problem Solving Workbook: Conversions; Significant Figures; Scientific Notation; Solving Quantitative Problems  Lab Safety Rules  Laboratory Equipment  Safety Contract | *USA TestPrep Chemistry EOC*: Standard Inquiry, and Technology & Engineering  *Compass Learning:* Chapters 11, 12, 13  *ACT Science Reasoning* workbook  Lab: Laboratory Procedures  Lab: Accuracy and Precision  Lab: Conservation of Mass |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Weeks | TN Standards | Embedded Standards | | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **4-9** | **Unit 2 Atomic Structure** | | | | |  |
|  | 3221.1.1 Compare and contrast historical models of the atom.  3221.1.2 Analyze the organization of the modern periodic table.  3221.1.3 Describe an atom in terms of its composition and electron characteristics. | 3221.Math.2 Utilize appropriate mathematical equations and processes to solve chemistry problems. | | SPI.3221.1.1 Compare and contrast the major models of the atom (Bohr and the quantum mechanical model).  SPI.3221.1.2 Interpret the periodic table to describe an element’s atomic makeup.  SPI.3221.1.3 Describe the trends found in the periodic table with respect to atomic size, ionization energy, or electronegativity.  SPI.3221.1.4 Determine the Lewis electron-dot structure or number of valence electrons for an atom of any main-group elements from its atomic number or position in the periodic table.  SPI.3221.1.5 Represent an electron’s location in the quantum mechanical model of an atom in terms of the shape of electron clouds, relative energies of orbitals, and the number of electrons possible in the periodic table. | Holt *Modern Chemistry* Chapters 3-5  Lab: Isotopes and Atomic Mass  Lab: Flame Tests  Lab: Periodic Properties  Problem-Solving Workbook: The Mole Concept | *USA TestPrep Chemistry EOC*: Standard Atomic Structure  *Compass Learning*: Chapters 21, 22, 23, 24, 25  *ACT Science Reasoning* workbook  Lab: Weighing as a Means of Counting  Lab: The Quantum Model of the Atom  Lab: The Wave Nature of Light, Interference  Lab: Designing Your Own Periodic Table  Lab: The Mendeleev Lab of 1869 |
| Weeks | TN Standards | | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **10-18** | **Unit 3 Interactions of Matter: Chemical Bonding, Formulas, and Equations** | | | | |  |
|  | 3221.3.1 Investigate chemical bonding.  3221.3.2 Analyze chemical reactions.  3221.3.3 Explore the mathematics of chemical formulas and equations. | | 3221.Math.1 Understand the mathematical principles associated with the science of chemistry.  3221.Math.2 Utilize appropriate mathematical equations and processes to solve chemistry problems. | SPI.3221.3.1 Analyze ionic and covalent compounds in terms of how they form names, chemical formulas, percent composition, and molar masses.  SPI.3221.3.2 Identify the reactants, products, and types of different chemical reactions.  SPI.3221.3.3 Predict the products of a chemical reaction.  SPI.3221.3.4 Balance a chemical equation to determine molar ratios.  SPI.3221.2.4 Classify a property of change in matter as physical or chemical.  SPI.3221.3.5 Convert among mass, number of moles, number of particles, molar volume at STP.  SPI.3221.3.6 Identify and solve stoichiometry problems. | Holt *Modern Chemistry* Chapters 6-9  Lab: Chemical Names & Formulas  Lab: Types of Chemical Reactions  Lab: Balancing Chemical Equations  Lab: Quantitative Analysis  Problem-Solving Workbook: The Mole Concept;  Percentage Composition; Empirical Formulas; Stoichiometry; Limiting Reactants; Percentage Yield | *USA TestPrep Chemistry EOC*: Standard Interactions of Matter  *Compass Learning*: Chapters 26, 31, 32, 33, 34  *ACT Science Reasoning* workbook  Lab: Chemical Bonds  Lab: Types of Bonding in Solids  Lab: Percentage Composition  Lab: Determination of an Empirical Formula  Lab: Blueprint Paper  Lab: Evidence for Chemical Change  Lab: Gravimetric Analysis  Lab: Limiting Reactants in a Recipe |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weeks | TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **19-27** | **Unit 4 Matter and Energy: Phases of Matter** | | | |  |
|  | 3221.2.3 Apply the kinetic molecular theory to describe solids, liquids, and gases.  3221.2.4 Investigate characteristics associated with the gaseous state.  3221.2.5 Discuss phase diagrams of one-component systems. | 3221.Math.2 Utilize appropriate mathematical equations and processes to solve chemistry problems. | SPI.3221.2.1 Distinguish among elements, compounds, solutions, colloids, and suspensions.  SPI.3221.2.2 Identify properties of a solution: solute and solvent; procedures to make or determine concentration of a solution in units of ppm, ppb, molarity, percent composition, and factors that affect the rate of solution.  SPI.3221.2.3 Classify a solution as saturated, unsaturated, or supersaturated based on its composition and temperature and a solubility graph.  SPI.3221.2.6 Investigate similarities and differences among solids, liquids and gases in terms of energy and particle spacing.  SPI.3221.2.7 Predict how changes in volume, temperature, and pressure affect the behavior of a gas. | Holt *Modern Chemistry* Chapters 10-13  (No SPIs on EOC in Chapter 13)  Lab: Constructing a Heating/Cooling Curve  Lab: Boyle’s Law  Lab: Paper Chromatography  Lab: Solution Concentration  Problem-Solving Workbook: Gas Laws; Stoichiometry of Gases;  The Ideal Gas Law; Concentration of Solutions; Dilutions  \*Colligative Properties (not on EOC) | *USA TestPrep Chemistry EOC*: Standard Matter and Energy  *Compass Learning*: Chapters 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55  *ACT Science Reasoning* workbook  Lab: Charles’s Law  Lab: Test for Dissolved Oxygen  Lab: Generating and Collecting Oxygen  (or Hydrogen)  Lab: Molar Volume of a Gas  Lab: Diffusion  Lab: Production of an Alloy  Lab: Testing Water  Lab: Precipitation Reactions |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weeks | TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **28-33** | **Unit 5 Interactions of Matter: Acids & Bases, Reaction Energy, Nuclear Chemistry** | | | |  |
|  | 3221.3.2 Analyze chemical and nuclear reactions.  3221.2.2 Explore the interactions between matter and energy. | 3221.Inq.4 Apply qualitative and quantitative measures to analyze data and draw conclusions that are free of bias.  3221.Math.2 Utilize appropriate mathematical equations and processes to solve chemistry problems. | SPI.3221.3.7 Classify substances as acids or bases based on their formulas and how they react with various indicators.  SPI.3221.2.5 Compare and contrast heat and temperature changes in chemical or physical processes.  SPI.3221.3.10 Relate the laws of conservation of mass/energy to thermal changes that occur during physical, chemical or nuclear processes.  SPI.3221.3.8 Describe radioactivity through a balanced nuclear equation and through an analysis of the half-life concept. | Holt *Modern Chemistry* Chapters 14-15, 16, 21  (\*Chapter 17 in Honors)  Lab: Properties of Acids and Bases  Lab: Acid-Base Titration  Lab: Specific Heat of a Metal  Lab: Half-life  Problem-Solving Workbook: pH; Titrations; Thermochemistry | *USA TestPrep Chemistry EOC*: Standard Interactions of Matter  *Compass Learning*: Chapters 56, 57, 61, 81, 82, 83  *ACT Science Reasoning* workbook  Lab: Household Indicators  Lab: Hydronium Ion Concentration and pH  Lab: Testing the pH of Rainwater  Lab: Percentage of Acetic Acid in Vinegar  Lab: Hess’s Law  Lab: Counting Calories  Lab: Radioactivity |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weeks | TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **Post EOC** | **Unit 6 Interactions of Matter: Redox, Electrochemistry, Organic and Biochemistry** | | | |  |
|  | 3221.3.1 Investigate chemical bonding.  3221.3.2 Analyze chemical and nuclear reactions. | 3221.Math.2 Utilize appropriate mathematical equations and processes to solve chemistry problems. | SPI.3224.3.3 Identify the oxidation states of ions in an oxidation-reduction reaction.  SPI.3224.3.4 Balance an oxidation-reduction reaction.  SPI.3224.3.5 Use reduction potentials to determine the anode and cathode reactions in an electrochemical cell, and calculate its standard reduction potential.  \*Describe the bonding found in carbon compounds, and the formulas, structures and properties of hydrocarbons.  \*Identify functional groups found in organic compounds and describe types of organic reactions.  \*Describe the composition, properties and functions of carbohydrates, lipids, and proteins. | Holt *Modern Chemistry* Chapters 19-20, 22-23 (\*Chapter 18 in Honors)  Lab: Electrolysis of Water | *ACT Science Reasoning* workbook  Lab: Activity Series of Metals (Redox Reactions)  Lab: Electroplating  Lab: Polymerization (Slime)  Lab: Chemicals of Life |