2025 - 2026 HS Chemistry

STANDARDS	IFD
PLC HUB	OTHER

QUARTER 1

PACING	TN STANDARDS	TEXT/RESOURCES	LEARNING TARGETS	ASSESSMENT/PROJECTS
5 days	Topic 1.1 - Lab Safety & Equipment Laboratory proficiency is embedded within curriculum and required for standards addressed within that curriculum	• Intro to Chemistry & Lab • Lab Safety & Equipment Flinn Scientific Resources and Safety Contract	What are best safety practices while in the laboratory? What are common pieces of chemistry equipment and how are each used?	Safety and equipment quizzes Lab orientation Lab practicals
2 days	Topic 1.2 - Intro to Periodic Table **CHEM1.PS1.12** - “explain organization of the periodic table”	• Intro to Chemistry & Lab • Intro to Periodic Table McGraw- Hill: TN Chemistry	How is the periodic table organized?	Periodic table activity Unit test
4 days	Topic 1.3 - Intro to Chemistry **CHEM1.PS3.3** - “distinguish between endo and exothermic reactions” **CHEMPS1.12** - “predict physical & chemical properties of main group elements” **CHEM1.PS1.7** - “analyze solutions to identify	• Intro to Chemistry & Lab • Intro to Chemistry Chemistry: Matter & Change by McGraw Hill	How are different phases of state classified? How is matter classified? How are physical and chemical properties and physical and chemical changes used to help classify matter? How are endothermic and exothermic reactions categorized?	CO_2 Lab In class practices Unit test

	solutes & solvents”			
1 day	Topic 2.1 - Counting Significant Figures **CHEM.PS1.1** - “use values specific to chemical processes”	• Measurement & Calculation • Counting Significant Figures McGraw- Hill: TN Chemistry	How can we determine the number of significant figures in a number? What rules are used in counting significant figures?	In class practices Unit test
1 day	Topic 2.2 - Scientific Notation & Rounding **CHEM.PS1.1** - “use values specific to chemical processes”	• Measurement & Calculation • Scientific Notation & Rounding McGraw- Hill: TN Chemistry	How are standard numbers written in scientific notation? How are numbers rounded off to a given amount of digits?	In class practices Assignments Unit test
2 days	Topic 2.3 - Calculations with Significant Figures **CHEM.PS1.1** - “use values specific to chemical processes”	• Measurement & Calculation • Calculations with Significant Digits McGraw- Hill: TN Chemistry	How are answers from addition and subtraction problems rounded, according to significant figure rules? How are answers from multiplication and division problems rounded, according to significant figure rules?	In class practice Assignments Unit test
1 day	Topic 2.4 - SI Base Units, SI Prefixes and Derived Units **CHEM.PS1.1** - “use values specific to chemical processes”	• Measurement & Calculation • SI Base Units, SI Prefixes and Derived Units McGraw- Hill: TN Chemistry	What are SI base units and what do they represent? How are prefixes used to change the meaning of measurements? How are units derived from measurements?	In class practice Unit test
3 days	Topic 2.5 - Dimensional Analysis and Unit Conversions **CHEM.PS1.1** - “use values specific to chemical	• Measurement & Calculation • Dimensional Analysis and Unit Conversions McGraw- Hill: TN Chemistry	How is dimensional analysis used to convert between different units of measurement?	In class practices Assignments Unit test

	processes”			
3 days	Topic 2.6 - Accuracy, Precision and Error **CHEM.PS1.1** - “use values specific to chemical processes”	• Measurement & Calculation • Accuracy, Precision and Error McGraw- Hill: TN Chemistry	What is the difference between accuracy and precision? How do we measure and calculate our error in a laboratory?	Accuracy, Precision & Error with Density Lab Unit test
2 days	Topic 3.1 - Dalton’s Atomic Theory and Evolution of the Atomic Model **CHEM.PS1.11** - Develop and compare historical models of the atom and construct arguments to show how scientific knowledge evolves over time, based on experimental evidence, critique, and alternative interpretations.	• Atomic Structure • Dalton’s Atomic Theory and Evolution of the Atomic Model McGraw- Hill: TN Chemistry	What are the tenets of Dalton’s atomic theory and how have they changed over time? How has the atomic model of the atom evolved over time?	In class discussions Unit test
2 days	Topic 3.2 - Mass Number, Atomic Number and Isotopes **CHEM.PS1.12** - “predict number of subatomic particles & ion charge”	• Atomic Structure • Mass Number, Atomic Number and Isotopes McGraw- Hill: TN Chemistry	How can the count of subatomic particles be found from hyphen and nuclear symbol notation? How is isotopic information written? What are atomic mass units and how are they used? How is average atomic mass calculated for an element?	In class practice Isotopes lab Assignment Unit test

2 days	Topic 3.3 - Conversions with Moles **CHEM1.PS1.3** - “perform mole-mole, mass-mole, mole-particle & mass-particle conversions”	• Atomic Structure • Conversions with Moles McGraw- Hill: TN Chemistry	How is Avagadro’s number used in making conversions with moles? How is molar mass used in making conversions with moles?	In class practice Assignment Unit test

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QUARTER 2

PACING	TN STANDARDS	TEXT/RESOURCES	LEARNING TARGETS	ASSESSMENT/PROJECTS
2 days	Topic 4.1 - Waves and the Electromagnetic Spectrum **CHEM1.PS1.1** - “use values specific to chemical processes”	• The Planetary Model of the Atom • Waves and the Electromagnetic Spectrum McGraw- Hill: TN Chemistry	What is the electromagnetic spectrum and how do we distinguish between its different forms? How are calculations involving wavelength, frequency and the speed of light carried out?	In class practice Assignment Unit test
2 days	Topic 4.2 - Max Planck, Quanta, and Einstein **CHEM1.PS1.1** - “use values specific to chemical processes”	• The Planetary Model of the Atom • Max Planck, Quanta, and Einstein McGraw- Hill: TN Chemistry	What contributions did Max Plack and Albert Einstein contribute to the atomic model? What is a quantum and how is it calculated using wavelength/frequency and Planck’s constant? What is the photoelectric effect and how does it relate to a photon/quantum?	In class practice Assignment Unit test

2 days	Topic 4.3 - The Bohr Atomic Model **CHEM.PS1.11** - Develop and compare historical models of the atom and construct arguments to show how scientific knowledge evolves over time, based on experimental evidence, critique, and alternative interpretations. **CHEM1. PS4.1** - Using a model, explain why elements emit and absorb characteristic frequencies of light and how this information is used.	• The Planetary Model of the Atom • The Bohr Atomic Model McGraw- Hill: TN Chemistry	What is the hydrogen line emission spectrum and how does it provide evidence for emission and absorption of specific frequencies of light? How did Neils Bohr use the data from the hydrogen line emission spectrum to form his planetary model of the atom?	Emission spectra lab Unit test
1 day	Topic 5.1 - deBroglie, Heisenberg, and Schrodinger **CHEM.PS1.11** - Develop and compare historical models of the atom and construct arguments to show how scientific knowledge evolves over time, based on experimental evidence, critique, and alternative interpretations.	• The Quantum Model of the Atom • deBroglie, Heisenberg, and Schrodinger McGraw- Hill: TN Chemistry	What contributions did Louis deBroglie, Werner Heisenberg, and Erwin Schrodinger make to the quantum model of the atom?	In class discussion Unit test

2 days	Topic 5.2 - The Quantum Mechanical Model **CHEM.1.PS1.12** - “Construct an argument to describe how the quantum mechanical model of the atom (e.g., patterns of valence and inner electrons) defines periodic properties”	● The Quantum Model of the Atom ● The Quantum Mechanical Model McGraw- Hill: TN Chemistry	What is the quantum mechanical model of the atom and how does it use probability to determine the locations of electrons in the electron cloud? What are energy levels/shells and orbitals/sublevels and how do they fit into the quantum model of the atom? What relationships exist between energy levels, orbitals, and electron counts?	In class practice Unit test
3 days	Topic 5.3 - Electron Configurations **CHEM1.PS1.12** - “Use periodic table to draw Lewis dot structures and show understanding of orbital notations through drawing and interpreting graphical representations (i.e., arrows representing electrons in an orbital)”.	● The Quantum Model of the Atom ● Electron Configurations McGraw- Hill: TN Chemistry	What are the rules governing electron configurations and how are they used? How are orbital notations, electron configurations, noble gas notations, and electron dot diagrams used to represent the distribution of electrons around the atom in the quantum model? What are valence and core electrons and how are they found from configurations? What are exceptional electron configurations and why do they occur?	In class practices Assignment Unit test
1 day	Topic 6.1 - History of the Periodic Table and the Periodic Law **CHEM1.PS1.12** - “Explain the origin and organization of the periodic table”	● The Periodic Law ● History of the Periodic Table and the Periodic Law McGraw- Hill: TN Chemistry	How did Dmitri Mendeleev organize his periodic table and how did he use it to make predictions about undiscovered elements? How did Henry Moseley arrange the periodic table? What is the periodic law?	In class discussion Unit test

2 days	Topic 6.2 - Electron Configuration and the Periodic Law **CHEM1.PS1.12** - “Use periodic table to draw Lewis dot structures and show understanding of orbital notations through drawing and interpreting graphical representations (i.e., arrows representing electrons in an orbital)	• The Periodic Law • Electron Configuration and the Periodic Law McGraw- Hill: TN Chemistry	What relationships can be noticed between electron configurations and the organization of the periodic table? What are the 4 blocks of the periodic table and what do they represent?	In class practice Unit test
	Topic 6.3 - Periodic Trends **CHEM1.PS1.12** - “predict ionization energy, atomic radius & electronegativity based on location on the periodic table”	• The Periodic Law • Periodic Trends McGraw- Hill: TN Chemistry	What is Coulombic force and what variables affect its strength? How does Coulombic force of attraction affect ionization energy, atomic radius and electronegativity? What trends in ionization energy, atomic radius and electronegativity can be predicted down groups and across periods on the periodic table?	Periodic Trends lab In class practice Unit test

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QUARTER 3

PACING	TN STANDARDS	TEXT/RESOURCES	LEARNING TARGETS	ASSESSMENT/PROJECTS
1 days	Topic 7.1 - Introduction to Bonding **CHEM1.PS1.13** - "Use the periodic table to predict types of bonds that are formed between atoms"	• Ionic & Metallic Bonding • Introduction to Bonding McGraw- Hill: TN Chemistry	What types of elements combine to form an ionic bond? A metallic? A covalent? How is the periodic table used to predict bond formation? How are electronegativity values used to predict bond type? What is a polar covalent bond? A nonpolar covalent bond?	In class practice Assignment Unit test
2 days	Topic 7.2 - Ionic Bonding **CHEM1.PS2.1** - "Draw, identify, and contrast graphical representations of chemical bonds based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or sharing electrons"	• Ionic & Metallic Bonding • Ionic Bonding McGraw- Hill: TN Chemistry	How are ionic bonds formed and how can we represent this? What is the difference between a formula unit and a crystal lattice? What properties do ionic compounds have and why? What is lattice energy and how do we use it to compare strengths of ionic bonds?	In class practice Assignment Unit test

	CHEM1.PS3.3 - "recognize when energy is absorbed or given off depending on the bonds formed and broken"			
2 days	Topic 7.3 - Metallic Bonding **CHEM1.PS2.1** - "Draw, identify, and contrast graphical representations of chemical bonds based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or sharing electrons" **CHEM1.PS3.3** - "recognize when energy is absorbed or given off depending on the bonds formed and broken"	● Ionic & Metallic Bonding ● Metallic Bonding McGraw- Hill: TN Chemistry	How are metallic bonds formed and how can we represent this? What is the electron sea and how does it determine the properties of a metal? How is enthalpy of vaporization used to compare the strengths of metallic bonds?	In class practice Assignment Unit test Lab - Flame Tests
1 days	Topic 8.1 - Introduction to Covalent Bonding **CHEM1.PS2.1** - "Draw, identify, and contrast graphical representations of chemical bonds based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or	● Covalent Bonding ● Introduction to Covalent Bonding McGraw- Hill: TN Chemistry	How are covalent bonds formed and how can we represent this? What is a molecule and how does it differ from a formula unit? What properties do covalent compounds have and why? How is bond length and bond energy used to compare the strengths of covalent bonds?	In class practice Assignment Unit test

	sharing electrons" **CHEM1.PS3.3** - "recognize when energy is absorbed or given off depending on the bonds formed and broken"			
2 days	Topic 8.2 - Lewis Structures **CHEM1.PS2.1** - "Draw, identify, and contrast graphical representations of chemical bonds based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or sharing electrons" **CHEM1.PS1.12** - "use the periodic table to draw Lewis dot structures"	• Covalent Bonding • Lewis Structures McGraw- Hill: TN Chemistry	How are Lewis structures used to represent covalent bonding? How are single, double, and triple bonds predicted using Lewis structures? What are the octet and duet rules and how are they used when drawing Lewis structures and determining bonding? How are polyatomic ions drawn using Lewis structures? What are exceptional Lewis structures and how are they drawn?	In class practice Assignment Lab - Molecular Models Unit test
2 days	Topic 8.3 - VSEPR Theory **CHEM1.PS2.1** - "Draw, identify, and contrast graphical representations of chemical bonds based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or sharing electrons" **CHEM1.PS1.12** - "use the	• Covalent Bonding • VSEPR Theory McGraw- Hill: TN Chemistry	What is VSEPR theory and how is it used in covalent bonding? What are the different molecular shapes associated with the VSEPR theory?	In class practice Assignment Lab - Molecular Models Unit test

	periodic table to draw Lewis dot structures”			
2 days	Topic 8.4 - Polarity **CHEM1.PS2.1** - “Use Lewis dot structures and electronegativity differences to predict the polarities of simple molecules (linear, bent, trigonal planar, trigonal pyramidal, tetrahedral). Construct an argument to explain how electronegativity affects the polarity of basic chemical molecules”	● Covalent Bonding ● Polarity McGraw- Hill: TN Chemistry	How can we predict the polarity of a bond using electronegativities? How is the polarity of a molecule predicted using Lewis structures, VSEPR theory, and dipoles?	In class practice Assignment Lab - Molecular Models Unit test
2 days	Topic 8.5 - Intermolecular Forces **CHEM1.PS2.2** - “Understand that intermolecular forces (IMFs) created by the unequal distribution of charge result in varying degrees of attraction between molecules. Compare & contrast the IMFs (hydrogen bonding, dipole-dipole , London dispersion forces) within different types of simple	● Covalent Bonding ● Intermolecular Forces McGraw- Hill: TN Chemistry	How can we predict which type of intermolecular forces exist between molecules using Lewis structures, VSEPR theory, and polarity. How are IMFs used to predict chemical and physical properties?	In class practice Assignment Unit test

	substances and predict & explain their effect on chemical and physical properties”			
2 days	Topic 9.1 - Binary & Ternary Ionic Compounds **CHEM1.PS1.13** - “Use the periodic table…to…write the names of chemical compounds, including polyatomic ions using the IUPAC system”	• Nomenclature • Binary & Ternary Ionic Compounds McGraw- Hill: TN Chemistry	How do we write chemical formulas to represent ionic compounds? How are ionic compounds named? When are Roman numerals used in naming ionic compounds? What are polyatomic ions and how are they used when writing formulas and naming ionic compounds?	In class practice Assignment Unit test
1 day	Topic 9.2 - Molecular Compounds **CHEM1.PS1.13** - “Use the periodic table…to…write the names of chemical compounds, including polyatomic ions using the IUPAC system”	• Nomenclature • Molecular Compounds McGraw- Hill: TN Chemistry	How do we write chemical formulas to represent molecular compounds? How are molecular compounds named? What is the prefix system and what are the rules that govern their use when writing chemical formulas and names?	In class practice Assignment Unit test
1 day	Topic 9.3 - Acids **CHEM1.PS1.13** - “Use the periodic table…to…write the names of chemical compounds, including polyatomic ions using the IUPAC system”	• Nomenclature • Acids McGraw- Hill: TN Chemistry	How do we write chemical formulas to represent acids? How are acids named? What are the rules for naming different types of acids?	In class practice Assignment Unit test

2 days	Topic 9.4 - Percent Composition, Empirical & Molecular Formulas **CHEM1.PS1.1** - "Understand and be prepared to use values specific to chemical processes: the mole, molar mass, molarity, and percent composition"	● Nomenclature ● Percent Composition, Empirical & Molecular Formulas McGraw- Hill: TN Chemistry	How is molar mass used to calculate the percent composition of a substance, including hydrates? How is percent composition and molar mass used to calculate the empirical formula of a substance? How is the molecular formula of a substance determined?	In class practice Assignment Lab - Empirical Formula Determination Unit test
1 day	Topic 10.1 - Introduction to Chemical Reactions **CHEM1.PS1.4** - "Use the reactants in a chemical reaction to predict the products and identify reaction classes"	● Chemical Reactions & Equations ● Introduction to Chemical Reactions McGraw- Hill: TN Chemistry	What symbols are used when writing reactions and what do they represent? Which elements are diatomic in nature and how are they represented in chemical equations? How are word and chemical reactions written?	In class practices Assignments Lab - Five Types of Chemical Reactions Unit test
2 days	Topic 10.2 - Chemical Reactions (Synthesis & Decomposition) **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore mass, are conserved during a chemical reaction by balancing chemical	● Chemical Reactions & Equations ● Chemical Reactions (Synthesis & Decomposition) McGraw- Hill: TN Chemistry	How are synthesis and decomposition reactions identified? How can we predict the products of synthesis and decomposition reactions and represent these in balanced, chemical equations?	In class practices Assignments Lab - Five Types of Chemical Reactions Unit test

	equations." **CHEM1.PS1.4** - "Use the reactants in a chemical reaction to predict the products and identify reaction classes (synthesis, decomposition, combustion, single replacement, double replacement)"			
1 day	Topic 10.3 - Chemical Reactions (Single Replacement Reactions) **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore mass, are conserved during a chemical reaction by balancing chemical equations." **CHEM1.PS1.4** - "Use the reactants in a chemical reaction to predict the products and identify reaction classes (synthesis, decomposition, combustion, single replacement, double replacement)"	• Chemical Reactions & Equations • Chemical Reactions (Single Replacement) McGraw- Hill: TN Chemistry	How are single replacement reactions identified? How can we predict the products of single replacement reactions and represent these in balanced, chemical equations? How are activity series used to aid in the prediction of products for single replacement reactions?	In class practices Assignments Lab - Five Types of Chemical Reactions Unit test

1 day	Topic 10.4 - Chemical Reactions (Double Replacement Reactions) **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore mass, are conserved during a chemical reaction by balancing chemical equations." **CHEM1.PS1.4** - "Use the reactants in a chemical reaction to predict the products and identify reaction classes (synthesis, decomposition, combustion, single replacement, double replacement)"	● Chemical Reactions & Equations ● Chemical Reactions (Double Replacement) McGraw- Hill: TN Chemistry	How are double replacement reactions identified? How can we predict the products of double replacement reactions and represent these in balanced, chemical equations? How are solubility rules used to predict precipitates in double replacement reactions?	In class practices Assignments Lab - Five Types of Chemical Reactions Unit test
1 day	Topic 10.5 - Chemical Reactions (Combustion Reactions) **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore mass, are conserved during a chemical reaction by balancing chemical	● Chemical Reactions & Equations ● Chemical Reactions (Combustion) McGraw- Hill: TN Chemistry	How are combustion reactions identified? How can we predict the products of combustion reactions and represent these in balanced, chemical equations?	In class practices Assignments Lab - Five Types of Chemical Reactions Unit test

	equations." **CHEM1.PS1.4** - "Use the reactants in a chemical reaction to predict the products and identify reaction classes (synthesis, decomposition, combustion, single replacement, double replacement)"			

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QUARTER 4

PACING	TN STANDARDS	TEXT/RESOURCES	LEARNING TARGETS	ASSESSMENT/PROJECTS
1 days	Topic 11.1 - Introduction to Stoichiometry **CHEM1.PS1.3** - "Perform stoichiometric calculations involving the following relationships: mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle. Show a qualitative understanding of the phenomenon of percent yield, limiting and excess reactants in a chemical reaction through pictorial and conceptual examples"	• Reaction Stoichiometry • Introduction to Stoichiometry McGraw- Hill: TN Chemistry	What is stoichiometry? How are the coefficients in a balanced, chemical equation used to form relationships between reactants and products? What is a mole to mole ratio and how is it used in dimensional analysis?	In class practices Assignments Lab - Mass and Mole Relationships Unit test

4 days	Topic 11.2 - Ideal Stoichiometry **CHEM1.PS1.3** - “Perform stoichiometric calculations involving the following relationships: mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle. Show a qualitative understanding of the phenomenon of percent yield, limiting and excess reactants in a chemical reaction through pictorial and conceptual examples”	• Reaction Stoichiometry • Ideal Stoichiometry McGraw- Hill: TN Chemistry	How is dimensional analysis used to perform ideal stoichiometric calculations of mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle?	In class practices Assignments Lab - Mass and Mole Relationships Unit test
2 days	Topic 11.3 - Limiting Reactant Stoichiometry **CHEM1.PS1.3** - “Perform stoichiometric calculations involving the following relationships: mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle. Show a qualitative understanding of the phenomenon of percent yield, limiting and excess reactants in a chemical reaction through pictorial and conceptual examples”	• Reaction Stoichiometry • Limiting Reactant Stoichiometry McGraw- Hill: TN Chemistry	How is dimensional analysis used to perform limiting reactant stoichiometric calculations involving mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle? How is a limiting and excess reactant identified? How can limiting and excess reactants be described using pictorial examples and diagrams?	In class practices Assignments Lab - Mass and Mole Relationships Unit test

1 day	Topic 11.4 - Theoretical and Percent Yields **CHEM1.PS1.3** - “Perform stoichiometric calculations involving the following relationships: mole-mole, mass-mass, mole-mass, mass-mole, mole-particle, and mass-particle. Show a qualitative understanding of the phenomenon of percent yield, limiting and excess reactants in a chemical reaction through pictorial and conceptual examples”	• Reaction Stoichiometry • Theoretical and Percent Yields McGraw- Hill: TN Chemistry	What is a theoretical yield and how is it calculated using dimensional analysis? What is a percent yield and how is it calculated using a theoretical yield? How can percent yield be described using pictorial examples and diagrams?	In class practices Assignments Lab - Mass and Mole Relationships Unit test
1 day	Topic 12.1 - The Kinetic Molecular Theory **CHEM1.PS1.5** - “Conduct investigations to explore and characterize the behavior of gases (pressure, volume, temperature), develop models to represent this behavior and construct arguments to explain this behavior. Evaluate the relationships (qualitatively and quantitatively) at STP between pressure and volume (Boyle’s law), temperature and volume (Charles’s law), temperature and pressure (Gay-Lussac’s law), and moles and volume	• Gas Laws • The Kinetic Molecular Theory McGraw- Hill: TN Chemistry	What are the tenets of the kinetic molecular theory and how is it used to explain gas behavior? What is an ideal gas and how does it differ from a real gas?	In class practices Assignments Labs - various to encompass all variables of a gas Unit test

	(Avogadro's law) and evaluate and explain these relationships with respect to kinetic molecular theory. Be able to understand, establish, and predict the relationships between volume, temperature, and pressure using combined gas law both qualitatively and quantitatively."			
2 days	Topic 12.2 - Pressure, Boyle's Law and Charles's Law **CHEM1.PS1.5** - "Conduct investigations to explore and characterize the behavior of gases (pressure, volume, temperature), develop models to represent this behavior and construct arguments to explain this behavior. Evaluate the relationships (qualitatively and quantitatively) at STP between pressure and volume (Boyle's law), temperature and volume (Charles's law), temperature and pressure (Gay-Lussac's law), and moles and volume (Avogadro's law) and evaluate and explain these relationships with respect to kinetic molecular theory. Be able to understand,	• Gas Laws • Pressure, Boyle's Law and Charles's Law McGraw- Hill: TN Chemistry	What is pressure and how is it measured? What are some common units of pressure and how can we convert between these units using dimensional analysis? What is standard temperature and pressure and why are they significant when describing gas relationships? What is the relationship between pressure and volume and volume and temperature, how can we model these relationships, and how can we predict and calculate changes in these relationships?	In class practices Assignments Labs - various to encompass all variables of a gas Unit test

	establish, and predict the relationships between volume, temperature, and pressure using combined gas law both qualitatively and quantitatively."			
2 days	Topic 12.3 - Gay-Lussac's Law, Avogadro's Law and the Combined Gas Law **CHEM1.PS1.5** - "Conduct investigations to explore and characterize the behavior of gases (pressure, volume, temperature), develop models to represent this behavior and construct arguments to explain this behavior. Evaluate the relationships (qualitatively and quantitatively) at STP between pressure and volume (Boyle's law), temperature and volume (Charles's law), temperature and pressure (Gay-Lussac's law), and moles and volume (Avogadro's law) and evaluate and explain these relationships with respect to kinetic molecular theory. Be able to understand, establish, and predict the relationships between volume, temperature, and pressure using combined	• Gas Laws • Gay-Lussac's Law, Avogadro's Law and the Combined Gas Law McGraw- Hill: TN Chemistry	What is the relationship between pressure and temperature and volume and moles, how can we model these relationships, and how can we predict and calculate changes in these relationships? What is the standard molar volume of a gas?	In class practices Assignments Labs - various to encompass all variables of a gas Unit test

	gas law both qualitatively and quantitatively.”			
2 days	Topic 12.4 - Dalton’s Law of Partial Pressures and The Ideal Gas Law **CHEM1.PS1.6** - “Use the Ideal Gas law, PV=nRT, to algebraically evaluate the relationship among the number of moles, volume, pressure, and temperature for ideal gases.”	• Gas Laws • Dalton’s Law of Partial Pressures and The IdealGas Law McGraw- Hill: TN Chemistry	What is Dalton’s Law of Partial Pressure and how is it used, along with water displacement, to determine the pressure of a mixture of gases? How can the Ideal Gas law be used to solve for the variables of moles, volume, pressure, and temperature of a gas?	In class practices Assignments Labs - various to encompass all variables of a gas Unit test
3 days	Topic 13.1 - Changes in States of Matter, Heating Curves and Phase Diagrams **CHEM1.PS3.2** - “Draw and interpret heating and cooling curves and phase diagrams. Analyze the energy changes involved in calorimetry by using the law of conservation of energy quantitatively (use of q=mcΔT) and qualitatively.”	• Changes in States of Matter, Heating Curves & Phase Diagrams, and Solution Chemistry • Changes in States of Matter, Heating Curves and Phase Diagrams McGraw- Hill: TN Chemistry	What is meant by endothermic and exothermic changes? How do substances change state and how can this be represented graphically on heating/cooling curves and phase diagrams? What is the molar enthalpy of fusion and the molar enthalpy of vaporization? How can energy (heat) be calculated using q=mcΔT?	In class practices Assignments Unit test
5 days	Topic 13.2 - Solution Chemistry Including Acids & Bases **CHEM1.PS1.7** -	• Changes in States of Matter, Heating Curves & Phase Diagrams, and Solution Chemistry • Solution Chemistry	What is a solution and how do the terms solvent and solute describe a solution? How can we draw models to represent the solution process?	In class practices Assignments Labs - various to

	“quantitatively analyze concentrations, and perform separation methods such as evaporation, distillation, and/or chromatography and show conceptual understanding of distillation. Construct an argument to justify the use of certain separation methods under different conditions.” **CHEM1.PS1.5** - “Investigate, describe, and mathematically determine the effect of solute concentration on vapor pressure using the solute’s van’t Hoff factor on freezing point depression and boiling point elevation.” **CHEM1.PS2.3** - “Construct a model to explain the process by which solutes dissolve in solvents and develop an argument to describe how intermolecular forces affect the solubility of different chemical compounds.” **CHEM1.PS2.4** - “Conduct an investigation to determine how temperature, surface area,	Including Acids & Bases	How do intermolecular forces affect the solubility of different compounds according to their polarity? How does temperature, surface area, and stirring affect the rate of solubility according to the collision theory? How do we distinguish between an unsaturated solution, a saturated solution, and a supersaturated solution? How does solute concentration affect vapor pressure? How can we decide which separation methods to use with various mixtures? What defines a solution as being acidic, basic, or neutral? How do we test solutions for acidity and basicity?	encompass separation techniques, rates of solubility, concentration/vapor pressure, and acidity/basicity Unit test

	and stirring affect the rate of solubility. Construct an argument to explain the relationships observed in experimental data using collision theory." **CHEM1.PS1.8** - "Identify acids and bases as a special class of compounds with a specific set of properties."			
1 day	Topic 14.1 - Mass Defect and Nuclear Binding Energy **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore, mass are conserved during a chemical [nuclear] reaction"	• Nuclear Chemistry • Mass Defect and Nuclear Binding Energy McGraw- Hill: TN Chemistry	What is the mass defect, why does it occur, and how is it calculated? How is the nuclear binding energy calculated and how is it used to compare the stability of isotopes?	In class practices Assignments Unit test
3 days	Topic 14.2 - Nuclear Stability, Radioactive Decay and Radiation **CHEM1.PS1.2** - "Demonstrate that atoms, and therefore, mass are conserved during a chemical [nuclear] reaction by balancing chemical [nuclear] equations." **CHEM1.PS1.10** - "Compare alpha, beta, and	• Nuclear Chemistry • Nuclear Stability, Radioactive Decay and Radiation McGraw- Hill: TN Chemistry	How do we use the band of stability and neutron to proton ratios to predict the relative stability of individual isotopes? How do unstable radioisotopes undergo radioactive decay? How do we write balanced, nuclear equations to show different types of I radioactive decay, the emission of radiation, and transmutations? What are the different types of radiation, how do their masses and charges	In class practices Assignments Unit test

	gamma radiation in terms of mass, charge, and penetrating power. Identify examples of applications of different radiation types in everyday life (such as its applications in cancer treatment).” **CHEM1.PS1.9** - “Draw models (qualitative models such as pictures or diagrams) to demonstrate understanding of radioactive stability and decay.”		compare, and how much penetrating power do they possess? What common materials are used for shielding different types of radiation? How is radiation measured and detected? How is radiation used in everyday life?	
2 days	Topic 14.3 - Half-Life and Artificial Transmutations **CHEM1.PS1.9** - “Use models (graphs or tables) to explain the concept of halflife and its use in determining the age of materials (such as radiometric dating).”	● Nuclear Chemistry ● Half-Life and Artificial Transmutations McGraw- Hill: TN Chemistry	What is a half-life and how is it used in radioactive dating? How do we calculate half-life related problems? How is half-life used to compare isotopic stability? How do we read and interpret a decay series? What are artificial transmutations and how are they made?	In class practices Assignments Lab - Half-Life of a M&M Unit test
2 days	Topic 14.4 - Nuclear Fission & Fusion **CHEM1.PS1.9** - “Understand and differentiate between	● Nuclear Chemistry ● Nuclear Fission & Fusion McGraw- Hill: TN Chemistry	What is fission? What is fusion and how does it differ and compare to fission? How is fission used in everyday life?	In class practices Assignments Unit test

	fission and fusion reactions.”		What are the components, and their functions, of a nuclear reactor. How is nuclear waste disposed of?	
1 day	Topic 15.1 - Intro to Thermochemistry **CHEM1.PS3.1** - “Contrast the concepts of temperature and heat flow in macroscopic and microscopic terms. Understand that thermal energy is a form of energy and temperature is a measure of average kinetic energy of a molecule.”	• Thermochemistry • Intro to Thermochemistry McGraw- Hill: TN Chemistry	How are temperature and heat related? What is the difference between temperature and heat? How do we convert between different units of temperature?	In class practices In class discussion Unit test
3 days	Topic 15.2 - Endothermic and Exothermic Reactions **CHEM1.PS3.3** - “Distinguish between endothermic and exothermic reactions by constructing potential energy diagrams and explaining the differences between the two using chemical terms. Recognize when energy is absorbed or given off depending on the bonds formed and bonds broken.” **CHEM1.P3.4** - “Analyze	• Thermochemistry • Endothermic and Exothermic Reactions McGraw- Hill: TN Chemistry	How can we distinguish between an endothermic reaction and an exothermic reaction? How are energy diagrams used to show endothermic vs exothermic reactions? How can we construct an energy diagram? Using differences in the energy needed to form and break bonds, how can we determine whether a reaction is endothermic or exothermic?	In class practices Assignments Unit test

	energy changes to explain and defend the law of conservation of energy.”			