



INSPIRE CALIFORNIA SCIENCE

HIGH SCHOOL – CHEMISTRY
CURRICULUM PACING GUIDE

Getting Started

- Students will need the McGraw- Hill Chemistry Textbook, a copy of the Science Notebook (available to complete online in each lesson, fillable pdf or printable pdf), a Science Journal (which is a composition or notebook to keep notes in) and a student login for online materials such as Labs and Assessments. Website <https://my.mheducation.com/login> Username: Student first name and ID number (i.e. Stella95834) Password: Sutterpeak1
- Module Assessments can be printed or assigned to take online. Please discuss with your teacher if you would like the assessments assigned to take online or emailed to you as a pdf to print.
- Students have the option of completing the course by using “Learnsmart/Smartbook” (your teacher can assign it to you per module) where you have access to all of the textbook material online and/or can answer all questions online (from the Science Notebook) as well as assessments, with immediate feedback.
- The textbook or pacing guide will indicate when you should access online materials (videos, CER charts, additional activities). You can access them by logging in, click on Lessons, click on the three lines in the top left-hand corner of your course, select the module and lesson and then scroll down to the appropriate section (Engage, Explore and Explain, Elaborate or Evaluate) which you can find at the bottom of the page in your textbook.
- You have two options to complete the lab requirement for this class:
 - **Option 1:** Complete labs in this course. There are several labs available in each module. You will need to **complete a minimum of 1 lab per module** and turn in the lab sheets to your teacher. A material list for all of the labs can be obtained from your teacher. Your teacher will need to assign the labs to your student online account and it is suggested to look through the available labs for each module (online) ahead of time, choose which lab(s) you would like to complete, and obtain the materials you need. You can be reimbursed from your student budget for materials and borrow from the Lending Library when materials are available (i.e. microscope, etc.).
 - **Option 2:** Take a corresponding lab class through a community partner for the year. Please talk to your teacher and/or the school counselor for available options.
- The course pacing is designed to allow for an additional day in each module to complete a lab. So if the module says it takes 7 days, you can take 8 days to include a lab day if needed.

Module One: The Central Science			
6 Days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: The Study of Life	<input type="checkbox"/> Textbook: Pages 3 <input type="checkbox"/> Science Notebook: Page 1	<input type="checkbox"/> Lab: How can you form layers of liquids?	Students will define chemistry as a discipline. Students will learn about the base units for scientific measurements, as well as some basic operations with these measurements. Students will learn about accuracy and precision and how significant figures reflect the precision of a measurement. Students will analyze graphs.
Day 2 Lesson One: What is Chemistry?	<input type="checkbox"/> Textbook: Pages 4-10 <input type="checkbox"/> Science Notebook: Pages 2-6	<input type="checkbox"/> Lab: Laboratory Techniques and Safety	
Day 3 Lesson Two: Measurement	<input type="checkbox"/> Textbook: Pages 11- 26 <input type="checkbox"/> Science Notebook: Page 7-13	<input type="checkbox"/> Lab: Determine Density	
Day 4 Lesson Three: The Uncertainty in Data	<input type="checkbox"/> Textbook: Pages 27- 35 <input type="checkbox"/> Science Notebook: Page 14-17	<input type="checkbox"/> Lab: Use Density to date a Coin	
Day 5 Lesson Four: Representing Data	<input type="checkbox"/> Textbook: Pages 36- 41 <input type="checkbox"/> Science Notebook: Pages 18-22	<input type="checkbox"/> Lab: Making a Graph	
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 42- 43 <input type="checkbox"/> Module Assessment		
Unit 1: Structure and Properties of Matter			
Module Two: Matter- Properties and Changes			
9 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Page 45 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: Battery Chemistry	<input type="checkbox"/> Lab: How can you observe chemical change?	Students explore the basic properties of matter, including physical and chemical properties. Students extend their understanding of the properties in matter to an understanding of the different changes matter undergoes,
Day 2 Module Opener: Matter-Properties and Changes	<input type="checkbox"/> Textbook: Pages 47 <input type="checkbox"/> Science Notebook: Page 23	<input type="checkbox"/> Lab: The Density of Wood <input type="checkbox"/> Lab: Properties of Water	
Day 3 Lesson One: Properties of Matter	<input type="checkbox"/> Textbook: Pages 48- 54 <input type="checkbox"/> Science Notebook: Pages 24-27		

	<input type="checkbox"/> Online: PhET Video: States of Matter	<input type="checkbox"/> ChemLab: Identify the Products of a Chemical Reaction	including physical and chemical changes. Students are introduced to elements and how they can combine to form compounds. Students are introduced to homogeneous and heterogeneous mixtures and how they can be separated.
Day 4 Lesson Two: Changes in Matter	<input type="checkbox"/> Textbook: Pages 55-59 <input type="checkbox"/> Science Notebook: Pages 28-31	<input type="checkbox"/> Lab: Observe Dye Separation	
Day 5-6 Lesson Three: Elements and Compounds	<input type="checkbox"/> Textbook: Pages 60-67 <input type="checkbox"/> Science Notebook: Pages 32-36	<input type="checkbox"/> Lab: Separation of Aspirin	
Day 7-8 Lesson Four: Mixtures of Matter	<input type="checkbox"/> Textbook: Pages 68-73 <input type="checkbox"/> Science Notebook: Pages 37-40 <input type="checkbox"/>	<input type="checkbox"/> Forensics Lab: The Counterfeit Coin Caper	
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 74-75 <input type="checkbox"/> Module Assessment		

Module Three: The Structure of the Atom
7 Days

Days	Assignments	Labs	Focus
Day 1 Module Opener: The Structure of the Atom	<input type="checkbox"/> Textbook: Page 77 <input type="checkbox"/> Science Notebook: Page 41	<input type="checkbox"/> Lab: How can the effects of electric charges be observed?	Students will explore a summary of early theories about the nature of matter which builds to the introduction of modern atomic theory and its relationship to conservation of mass. Students see the atom defined, from the discovery of the electron through the modern electron cloud model. Students enhance their understanding of the composition of matter as they study atomic
Day 2 Lesson One: Early Ideas About Matter	<input type="checkbox"/> Textbook: Pages 78-81 <input type="checkbox"/> Science Notebook: Pages 42-45	<input type="checkbox"/> Lab: Simulation of Rutherford's Gold Foil Experiment	
Day 3-4 Lesson Two: Defining the Atom	<input type="checkbox"/> Textbook: Pages 82-90 <input type="checkbox"/> Science Notebook: Pages 46-50 <input type="checkbox"/> Online Simulation: PhET Rutherford's Experiment	<input type="checkbox"/> Lab: Model Isotopes <input type="checkbox"/> Lab: Half-Life of Barium-137m	
Day 5 Lesson Three: How Atoms Differ	<input type="checkbox"/> Textbook: Pages 91-97 <input type="checkbox"/> Science Notebook: Pages 51-55 <input type="checkbox"/> Online Simulation: PhET: Isotopes and Atomic Mass		

Day 6 Lesson Four: Unstable Nuclei and Radioactive Decay	<input type="checkbox"/> Textbook: Pages 98-101 <input type="checkbox"/> Science Notebook: Pages 56-58		<p>number, mass number, and isotopes.</p> <p>Students are introduced to the basic types of radiation, furthering their understanding of matter and how it can change.</p>
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 102-103 <input type="checkbox"/> Module Assessment		

Module Four: Electrons in Atoms
7 Days

Days	Assignments	Labs	Focus
Day 1 Module Opener: Electrons in Atoms	<input type="checkbox"/> Textbook: Page 105 <input type="checkbox"/> Science Notebook: Page 59	<input type="checkbox"/> Lab: How do you know what is inside an atom?	<p>Students study the dual nature of light, leading to atomic emission spectra, the foundation for analyzing the light from stars.</p> <p>Students apply the idea of quantized energy to the atom, helping them understand how different colors of light can signal different elements in stars.</p> <p>Students learn to model the arrangements of electrons in atoms.</p>
Day 2-3 Lesson One: Light and Quantized Energy	<input type="checkbox"/> Textbook: Pages 106-115 <input type="checkbox"/> Science Notebook: Pages 60-65	<input type="checkbox"/> Lab: Identify Compounds	
Day 4-5 Lesson Two: Quantum Theory and the Atom	<input type="checkbox"/> Textbook: Pages 116-125 <input type="checkbox"/> Science Notebook: Pages 66-70 <input type="checkbox"/>	<input type="checkbox"/> ChemLab: Analyze Line Spectra <input type="checkbox"/> Lab: The Photoelectric Effect	
Day 6 Lesson Three: Electron Configuration	<input type="checkbox"/> Textbook: Pages 126-133 <input type="checkbox"/> Science Notebook: Pages 71-74	<input type="checkbox"/> Lab: Electron Charge-to-Mass Ratio	
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 134-135 <input type="checkbox"/> Module Assessment		

Module Five: The Periodic Table and Periodic Law
7 days

Days	Assignments	Labs	Focus
Day 1 Module Opener: The Periodic Table and Periodic Law	<input type="checkbox"/> Textbook: Pages 137 <input type="checkbox"/> Science Notebook: Page 75	<input type="checkbox"/> Lab: How can you recognize trends?	<p>Students will have a brief introduction to the history of the periodic table to help students understand why elements are so</p>
Day 2 Lesson One:	<input type="checkbox"/> Textbook: Pages 138-145	<input type="checkbox"/> ChemLab: Investigate	

Development of the Modern Periodic Table	<input type="checkbox"/> Science Notebook: Pages 76-80	Descriptive Chemistry <input type="checkbox"/> Lab: Properties of Transition Metals <input type="checkbox"/> Lab: Organize Elements <input type="checkbox"/> Lab: Periodic Trends	arranged and how to begin extracting information from the table. Students connect the organization of the periodic table to the organization of electrons in atoms. Students study the basic trends on the periodic table and the reasons for these trends.
Day 3 Lesson Two: Classification of the Elements	<input type="checkbox"/> Textbook: Pages 146-151 <input type="checkbox"/> Science Notebook: Pages 81-84		
Day 4-5 Lesson Three: Periodic Trends	<input type="checkbox"/> Textbook: Pages 152-161 <input type="checkbox"/> Science Notebook: Pages 85-88		
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 162-163 <input type="checkbox"/> Module Assessment		
Day 7 STEM Unit Project	<input type="checkbox"/> Complete and present STEM unit project: Battery Chemistry		

Unit 2: Chemical Bonding and Reactions

Module Six: Ionic Compounds and Metals
8 days

Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Page 165 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: Therapeutic Putty	<input type="checkbox"/> Lab: What compounds conduct electricity in solution?	Students study the formation of ions, the foundation for the crystalline structures of ionic compounds. Students build on their study of ions by learning how ionic bonds form and the properties, including crystal structure, that emerge from those bonds. Students learn how to name ionic compounds
Day 2 Module Opener: Ionic Compounds and Metals	<input type="checkbox"/> Textbook: Pages 167 <input type="checkbox"/> Science Notebook: Page 89	<input type="checkbox"/> ChemLab: Synthesize an Ionic Compound	
Day 3 Lesson One: Ion Formation	<input type="checkbox"/> Textbook: Pages 168-172 <input type="checkbox"/> Science Notebook: Pages 90-93	<input type="checkbox"/> Lab: Observe Properties	
Day 4-5 Lesson Two:	<input type="checkbox"/> Textbook: Pages 173-186		

Ionic Bonds and Ionic Compounds	<input type="checkbox"/> Science Notebook: Pages 94-98		and how to write their formulas.
Day 6 Lesson Three: Names and Formulas for Ionic Compounds	<input type="checkbox"/> Textbook: Pages 187-191 <input type="checkbox"/> Science Notebook: Pages 99-102		Students learn about bonding in metals and how that bonding affects the properties of metals.
Day 7 Lesson Four: Metallic Bonds and Properties of Metals	<input type="checkbox"/> Textbook: Pages 192-193 <input type="checkbox"/> Science Notebook: Pages 103-106 <input type="checkbox"/>		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 159-160 <input type="checkbox"/> Module Assessment		
Module Seven: Covalent Bonding 9 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Covalent Bonding	<input type="checkbox"/> Textbook: Pages 195 <input type="checkbox"/> Science Notebook: Page 107 <input type="checkbox"/>	<input type="checkbox"/> Lab: What type of compound is used to make a super ball?	Students explore how atoms can gain stability from sharing electrons, foundational to understanding the bonding in water.
Day 2-3 Lesson One: The Covalent Bond	<input type="checkbox"/> Textbook: Pages 196-204 <input type="checkbox"/> Science Notebook: Pages 108-111	<input type="checkbox"/> Lab: Compare Melting Points <input type="checkbox"/> Lab: Modeling Molecular Shapes	Students study the formal system for naming molecules, as well as how to write formulas from the formal names.
Day 4 Lesson Two: Naming Molecules	<input type="checkbox"/> Textbook: Pages 205-210 <input type="checkbox"/> Science Notebook: Pages 112-115	<input type="checkbox"/> ChemLab: Model Molecular Shapes	
Day 5-6 Lesson Three: Molecular Structures	<input type="checkbox"/> Textbook: Pages 211-219 <input type="checkbox"/> Science Notebook: Pages 116-120	<input type="checkbox"/> Lab: Covalent Compounds	Students write structural formulas for molecules, including molecules that are exceptions to the octet rule.
Day 7 Lesson Four: Molecular Shapes	<input type="checkbox"/> Textbook: Pages 220-224 <input type="checkbox"/> Science Notebook: Pages 121-124 <input type="checkbox"/> Online: PhET Simulation: Molecular Shapes		Students move from molecular structures to molecular shapes, including the shapes of
Day 8 Lesson Five:	<input type="checkbox"/> Textbook: Pages 225-232		

Electronegativity and Polarity	<input type="checkbox"/> Science Notebook: Pages 125-130 <input type="checkbox"/> Online: PhET Simulation: Molecular Polarity		<p>molecules such as water that have lone pairs of electrons.</p> <p>Students study bond character and how bond character affects the properties of compounds.</p>
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 233-234 <input type="checkbox"/> Module Assessment		

Module Eight: Chemical Reactions
7 days

Days	Assignments	Labs	Focus
Day 1 Module Opener: Chemical Reactions	<input type="checkbox"/> Textbook: Pages 236 <input type="checkbox"/> Science Notebook: Page 131	<input type="checkbox"/> Lab: How do you know when a chemical change has occurred?	<p>Students learn to describe chemical reactions with balanced chemical equations.</p> <p>Students learn to classify chemical reactions and how those classifications can help them predict the outcomes of chemical reactions.</p> <p>Students learn about reactions between substances dissolved in water and learn to write ionic equations, as well as combine two reactions into an overall equation.</p>
Day 2 Lesson One: Reactions and Equations	<input type="checkbox"/> Textbook: Pages 237-244 <input type="checkbox"/> Science Notebook: Pages 132-135 <input type="checkbox"/> Online: PhET simulation: Balancing Chemical Equations	<input type="checkbox"/> ChemLab: Develop an Activity Series <input type="checkbox"/> Lab: Double-Replacement Reactions	
Day 3-4 Lesson Two: Classifying Chemical Reactions	<input type="checkbox"/> Textbook: Pages 245-254 <input type="checkbox"/> Science Notebook: Pages 136-139	<input type="checkbox"/> Lab: Relate Photosynthesis to Cellular Respiration	
Day 5-6 Lesson Three: Reactions in Aqueous Solutions	<input type="checkbox"/> Textbook: Pages 255-266 <input type="checkbox"/> Science Notebook: Pages 140-144 <input type="checkbox"/> Online: PhET simulation: Salts & Solubility	<input type="checkbox"/>	
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 267-268 <input type="checkbox"/> Module Assessment		

Module Nine: The Mole
10 days

Days	Assignments	Labs	Focus
Day 1	<input type="checkbox"/> Textbook: Pages 270		

Module Opener: The Mole	<input type="checkbox"/> Science Notebook: Page 145	<input type="checkbox"/> Lab: How much is a mole?	<p>Students will learn about the mole and how to convert between moles and particles.</p> <p>Students will convert between the mass of a substance and the moles of representative particles.</p> <p>Students apply their understandings of the mole to compounds, determining the molar mass and converting between moles of a compound and mass.</p> <p>Students apply mass and the mole to determine empirical and molecular formulas from percent composition.</p> <p>Students analyze hydrates to determine the moles of water associated with each mole of the compound.</p>
Day 2 Lesson One: Measuring Matter	<input type="checkbox"/> Textbook: Pages 271-276 <input type="checkbox"/> Science Notebook: Pages 146-149	<input type="checkbox"/> Lab: Determining Avogadro's Number	
Day 3-4 Lesson Two: Mass and the Mole	<input type="checkbox"/> Textbook: Pages 277-284 <input type="checkbox"/> Science Notebook: Pages 150-153	<input type="checkbox"/> Lab: Estimating the Size of a Mole <input type="checkbox"/> Lab: Analyze Chewing Gum	
Day 5-6 Lesson Three: Moles of Compounds	<input type="checkbox"/> Textbook: Pages 285-293 <input type="checkbox"/> Science Notebook: Pages 154-157	<input type="checkbox"/> Lab: Mole Ratios	
Day 7-8 Lesson Four: Empirical and Molecular Formulas	<input type="checkbox"/> Textbook: Pages 294-303 <input type="checkbox"/> Science Notebook: Pages 158-162	<input type="checkbox"/> ChemLab: Determine the Formula of a Hydrate	
Days 9 Lesson Five: Formulas of Hydrates	<input type="checkbox"/> Textbook: Pages 304-309 <input type="checkbox"/> Science Notebook: Pages 163-166		
Day 10 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 310-311 <input type="checkbox"/> Module Assessment		
Module Ten: Stoichiometry 8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Stoichiometry	<input type="checkbox"/> Textbook: Pages 313 <input type="checkbox"/> Science Notebook: Page 167	<input type="checkbox"/> Lab: What evidence can you observe that a reaction is taking place?	<p>Students define the relationships in a balanced chemical equation and write mole ratios given the balance equation.</p> <p>Students apply molar mass and mole ratios to convert between masses of reactants and products.</p>
Day 2 Lesson One: Defining Stoichiometry	<input type="checkbox"/> Textbook: Pages 314-319 <input type="checkbox"/> Science Notebook: Pages 168-171	<input type="checkbox"/> Lab: Apply Stoichiometry	
Day 3-4 Lesson Two: Stoichiometric Calculations	<input type="checkbox"/> Textbook: Pages 320-325 <input type="checkbox"/> Science Notebook: Pages 172-177	<input type="checkbox"/> ChemLab: Determine the Mole Ratio	
Day 5 Lesson Three:	<input type="checkbox"/> Textbook: Pages 326-331		

Limiting Reactants	<input type="checkbox"/> Science Notebook: Pages 178-181 <input type="checkbox"/> Online: PhET simulation: Reactions, Products, and Leftovers	<input type="checkbox"/> Lab: Observing a Limiting Reactant <input type="checkbox"/> Lab: Stoichiometry of a Chemical Reaction	Students continue to develop their understandings of stoichiometry by identifying limiting reactants and determining the masses of products formed and excess reactant remaining.
Day 6 Lesson Four: Percent Yield	<input type="checkbox"/> Textbook: Pages 332-336 <input type="checkbox"/> Science Notebook: Pages 182-184		
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 337-338 <input type="checkbox"/> Module Assessment		
Day 8 STEM Unit Project	<input type="checkbox"/> Complete and present STEM unit project: Therapeutic Putty		

Unit 3: Matter, Energy, and Equilibrium

Module Eleven: States of Matter
9 days

Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 341 <input type="checkbox"/> Online: Project Planner: STEM Unit Project- Ocean Acidification Prevention	<input type="checkbox"/> Lab: How do different liquids affect the speed of a sinking ball? <input type="checkbox"/> Lab: Forensics: How is DNA extracted?	Students develop the kinetic molecular theory to explain the behavior of gases. Students develop a deeper understanding of intermolecular forces.
Day 2 Module Opener: States of Matter	<input type="checkbox"/> Textbook: Pages 343 <input type="checkbox"/> Science Notebook: Page 185	<input type="checkbox"/> Lab: Model DNA Replication	Students examine how the properties of liquids and solids relate to the arrangements and interactions of the particles that compose them. Students study phase changes that require energy and phases
Days 3-4 Lesson One: Gases	<input type="checkbox"/> Textbook: Pages 344-353 <input type="checkbox"/> Science Notebook: Pages 186-189	<input type="checkbox"/> Lab: Model Crystal Unit Cells <input type="checkbox"/> ChemLab: Compare Rates of Evaporation	
Day 5 Lesson Two: Forces of Attraction	<input type="checkbox"/> Textbook: Pages 354-358 <input type="checkbox"/> Science Notebook: Pages 190-192		
Day 6-7 Lesson Three: Liquids and Solids	<input type="checkbox"/> Textbook: Pages 359-369		

	<input type="checkbox"/> Science Notebook: Pages 193-198		changes that release energy.
Days 8 Lesson Four: Phase Changes	<input type="checkbox"/> Textbook: Pages 370-377 <input type="checkbox"/> Science Notebook: Pages 199-204		
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 378-379 <input type="checkbox"/> Module Assessment		
Module Twelve: Gases 7 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Gases	<input type="checkbox"/> Textbook: Pages 381 <input type="checkbox"/> Science Notebook: Page 205	<input type="checkbox"/> Lab: How does temperature affect the volume of a gas?	Students learn the laws that can be used to predict the behavior of a sample of gas when pressure, temperature, and volume change.
Day 2-3 Lesson One: The Gas Law	<input type="checkbox"/> Textbook: Pages 382-391 <input type="checkbox"/> Science Notebook: Pages 206-212 <input type="checkbox"/> Online: PhET Simulation: Gas Properties	<input type="checkbox"/> Lab: Boyle's <input type="checkbox"/> Lab: Charles's Law	
Day 4-5 Lesson Two: The Ideal Gas Law	<input type="checkbox"/> Textbook: Pages 392-399 <input type="checkbox"/> Science Notebook: Pages 213-217	<input type="checkbox"/> Lab: Model a Fire Extinguisher <input type="checkbox"/> ChemLab: Determine Pressure in Popcorn	Students learn how the ideal gas law can account for changes in amount of gas, in addition to changes in pressure, temperature, and volume, and reexamine ideal v. nonideal behavior.
Day 6 Lesson Three: Gas Stoichiometry	<input type="checkbox"/> Textbook: Pages 400-405 <input type="checkbox"/> Science Notebook: Pages 218-220		Students learn that Avogadro's principle means that the molar relationships between gases in balanced chemical equations also represent volume relationships.
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 406-407 <input type="checkbox"/> Module Assessment		
Module Thirteen: Mixtures and Solutions 8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Mixtures and Solutions	<input type="checkbox"/> Textbook: Page 409 <input type="checkbox"/> Science Notebook: Page 221	<input type="checkbox"/> Lab: How does energy change when solutions form?	Students revisit heterogeneous and homogenous mixtures, expanding their

Day 2-3 Lesson One: Types of Mixtures	<input type="checkbox"/> Textbook: Pages 410-414 <input type="checkbox"/> Science Notebook: Pages 222-225	<input type="checkbox"/> ChemLab: Factors Affecting Solubility <input type="checkbox"/> Lab: Making a Solubility Curve <input type="checkbox"/> Lab: Examine Freezing Point Depression	<p>understandings of these classifications.</p> <p>Students describe and quantify the concentrations of solutions.</p> <p>Students study the solvation process, including factors such as agitation, surface area, and temperature that affect solvation.</p> <p>Students study the properties of solutions that depend on the concentration of solute particles, such as boiling point elevation and freezing point depression.</p>
Day 4 Lesson Two: Solution Concentration	<input type="checkbox"/> Textbook: Pages 415-425 <input type="checkbox"/> Science Notebook: Pages 226-230 <input type="checkbox"/> Online: PhET simulation: Concentration		
Day 5 Lesson Three: Factors Affecting Solvation	<input type="checkbox"/> Textbook: Pages 426-435 <input type="checkbox"/> Science Notebook: Pages 231-235 <input type="checkbox"/> Online: PhET simulation: Molarity		
Day 6-7 Lesson Four: Colligative Properties of Solutions	<input type="checkbox"/> Textbook: Pages 436-443 <input type="checkbox"/> Science Notebook: Pages 236-240		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 444-445 <input type="checkbox"/> Module Assessment		
Module Fourteen: Energy and Chemical Change			
9 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Energy and Chemical Change	<input type="checkbox"/> Textbook: Pages 447 <input type="checkbox"/> Science Notebook: Page 241	<input type="checkbox"/> Lab: How can you make a cold pack? <input type="checkbox"/> Lab: Determine Specific Heat	<p>Students examine the nature of energy in chemical reactions, establishing the foundation for analyzing heat released by a reaction.</p> <p>Students learn about heat in chemical processes and how thermochemistry defines heat changes in terms of system and surroundings.</p>
Day 2 Lesson One: Energy	<input type="checkbox"/> Textbook: Pages 448-455 <input type="checkbox"/> Science Notebook: Pages 242-245	<input type="checkbox"/> ChemLab: Measure Calories	
Day 3-4 Lesson Two: Heat	<input type="checkbox"/> Textbook: Pages 456-462 <input type="checkbox"/> Science Notebook: Pages 246-249	<input type="checkbox"/> Lab: Heats of Solution and Reaction	

Days 5 Lesson Three: Thermochemical Equations	<input type="checkbox"/> Textbook: Pages 463-467 <input type="checkbox"/> Science Notebook: Pages 250-253	<input type="checkbox"/> Lab: Heat of Combustion of Candle Wax	<p>Students learn to write thermochemical equations and to use them to calculate energy released in a chemical reaction.</p> <p>Students apply Hess's law and the summation equation to determine enthalpy changes in chemical processes.</p> <p>Students learn about entropy and how to use enthalpy and entropy to determine Gibbs' free energy to assess the spontaneity of a reaction.</p>
Day 6-7 Lesson Four: Calculating Enthalpy Change	<input type="checkbox"/> Textbook: Pages 468-476 <input type="checkbox"/> Science Notebook: Pages 254-258	<input type="checkbox"/> Lab: Energy Changes in Chemical and Physical Processes	
Day 8 Lesson Five: Reaction Spontaneity	<input type="checkbox"/> Textbook: Pages 477-486 <input type="checkbox"/> Science Notebook: Pages 259-262 <input type="checkbox"/>		
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 487-488 <input type="checkbox"/> Module Assessment		
Module Fifteen: Reaction Rates			
8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Reaction Rates	<input type="checkbox"/> Textbook: Pages 490 <input type="checkbox"/> Science Notebook: Page 263	<input type="checkbox"/> Lab: How can you accelerate a reaction?	<p>Students learn to calculate an average reaction rate and use collision theory to explain how substances react.</p> <p>Students apply activation energy and collision theory to explain factors that affect reaction rates, including the nature of the reactants, concentration, surface area, temperature, and catalysts and inhibitors.</p> <p>Students write rate laws for reactions and</p>
Day 2-3 Lesson One: A Model for Reaction Rates	<input type="checkbox"/> Textbook: Pages 491-499 <input type="checkbox"/> Science Notebook: Pages 264-268 <input type="checkbox"/> Online: PhET simulation: Reactions & Rates	<input type="checkbox"/> Lab: Examine Reaction Rate and Temperature	
Day 4-5 Lesson Two: Factors Affecting Reactions Rates	<input type="checkbox"/> Textbook: Pages 500-506 <input type="checkbox"/> Science Notebook: Pages 269-271	<input type="checkbox"/> ChemLab: Observe How Concentration Affects Reaction Rate	
Day 6 Lesson Three: Reaction Rate Laws	<input type="checkbox"/> Textbook: Pages 507-511 <input type="checkbox"/> Science Notebook: Pages 272-276	<input type="checkbox"/> Lab: Determining Reaction Orders	
Day 7 Lesson Four:	<input type="checkbox"/> Textbook: Pages 512-517		

Instantaneous Reaction Rates and Reaction Mechanisms	<input type="checkbox"/> Science Notebook: Pages 277-280		determine reaction order.	
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 518-519 <input type="checkbox"/> Module Assessment		Students calculate instantaneous reaction rates and study reaction mechanisms for complex reactions.	
Module Sixteen: Chemical Equilibrium 7 days				
Days	Assignments	Labs	Focus	
Day 1 Module Opener: Chemical Equilibrium	<input type="checkbox"/> Textbook: Pages 521 <input type="checkbox"/> Science Notebook: Page 281	<input type="checkbox"/> Lab: What is equal about equilibrium?	Students will be introduced to reversible reactions and the concept of dynamic equilibrium and will write equilibrium constants. Students will apply Le Chatelier's principle to analyze factors that affect equilibrium, including concentration, temperature, and volume and pressure. Students will use equilibrium constants, including the solubility product constant, to calculate concentrations and predict precipitates.	
Day 2 Lesson One: A State of Dynamic Balance	<input type="checkbox"/> Textbook: Pages 522-533 <input type="checkbox"/> Science Notebook: Pages 282-286 <input type="checkbox"/> Online: PhET simulation: Reversible Reactions	<input type="checkbox"/> Lab: Observe Shifts in Equilibrium <input type="checkbox"/> Lab: Reversible Reactions		
Day 3-4 Lesson Two: Factors Affecting Chemical Equilibrium	<input type="checkbox"/> Textbook: Pages 534-541 <input type="checkbox"/> Science Notebook: Pages 287-289	<input type="checkbox"/> ChemLab: Compare Two Solubility Product Constants <input type="checkbox"/> Lab: Exploring Chemical Equilibrium		
Days 5-6 Lesson Three: Using Equilibrium Constants	<input type="checkbox"/> Textbook: Pages 542-533 <input type="checkbox"/> Science Notebook: Pages 290-294			
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 534-535 <input type="checkbox"/> Module Assessment			
Module Seventeen: Acids and Bases 9 days				
Days	Assignments	Labs		Focus
Day 1 Module Opener: Acids and Bases	<input type="checkbox"/> Textbook: Pages 557 <input type="checkbox"/> Science Notebook: Page 233	<input type="checkbox"/> Lab: What is in your cupboards?	Students will be introduced to the basic acid-base definitions.	
Days 2-3 Lesson One:	<input type="checkbox"/> Textbook: Pages 558-567	<input type="checkbox"/> Lab: Compare Acid Strengths		

Introduction to Acids and Bases	<input type="checkbox"/> Science Notebook: Pages 234-237	<input type="checkbox"/> Lab: Comparing the Strengths of Acids	<p>Students will compare strong and weak acids and bases in terms of ionization and be introduced to ionization constants. Students will apply the ion product for water and the formulas for pH and pOH to calculate the pH and pOH of solutions. Students will also calculate ion concentrations and the value of ionization constant when given pH.</p> <p>Students will learn that neutralization reactions produce salt and water and will calculate molarity from titration data. Students will also be introduced to salt hydrolysis and buffered solutions.</p>
Days 4 Lesson Two: Strengths of Acids and Bases	<input type="checkbox"/> Textbook: Pages 568-574 <input type="checkbox"/> Science Notebook: Pages 238-242 <input type="checkbox"/> Online: PhET simulation: Acids and Bases	<input type="checkbox"/> ChemLab: Standardize a Base <input type="checkbox"/> Lab: Acids, Bases, and Neutralization	
Days 5 Lesson Three: Hydrogen Ions and pH	<input type="checkbox"/> Textbook: Pages 575-582 <input type="checkbox"/> Science Notebook: Pages 238-242 <input type="checkbox"/> Online: PhET simulation: The pH Scale		
Days 6-7 Lesson Four: Neutralization	<input type="checkbox"/> Textbook: Pages 583-593 <input type="checkbox"/> Science Notebook: Pages 238-242 <input type="checkbox"/>		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 594-595 <input type="checkbox"/> Module Assessment		
Day 9 STEM Unit Project	<input type="checkbox"/> Complete and present STEM Unit Project- Ocean Acidification Prevention		
Unit 4: Oxidation and Reduction Reactions			
Module Eighteen: Redox Reactions 7 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 597 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: Non-Destructive Testing	<input type="checkbox"/> Lab: What happens when iron and copper(II) sulfate react?	Students will define oxidation-reduction reactions and learn to assign oxidation numbers.
Day 2 Module Opener: Redox Reactions	<input type="checkbox"/> Textbook: Pages 599 <input type="checkbox"/> Science Notebook: Page 315	<input type="checkbox"/> Lab: Observe a Redox Reaction	Students will use the oxidation number

Day 3-4 Lesson One: Oxidation and Reduction	<input type="checkbox"/> Textbook: Pages 600-608 <input type="checkbox"/> Science Notebook: Pages 316-319	<input type="checkbox"/> Lab: Reduction of Manganese <input type="checkbox"/> ChemLab: Identify the Damaging Dumper <input type="checkbox"/> Lab: Determining Oxidation Numbers	method and half reactions to balance the equations for redox reactions.
Day 5-6 Lesson Two: Balancing Redox Equations	<input type="checkbox"/> Textbook: Pages 609-617 <input type="checkbox"/> Science Notebook: Pages 320-328		
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 618-619 <input type="checkbox"/> Module Assessment		
Module Nineteen: Electrochemistry			
7 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Electrochemistry	<input type="checkbox"/> Textbook: Pages 621 <input type="checkbox"/> Science Notebook: Page 329	<input type="checkbox"/> Lab: How can you make a battery from a lemon?	Students will describe the functioning of voltaic cells and calculate electrochemical cell potentials.
Day 2-3 Lesson One: Voltaic Cells	<input type="checkbox"/> Textbook: Pages 622-632 <input type="checkbox"/> Science Notebook: Pages 330-335	<input type="checkbox"/> Lab: Observe Corrosion	
Day 4 Lesson Two: Batteries	<input type="checkbox"/> Textbook: Pages 633-643 <input type="checkbox"/> Science Notebook: Pages 336-341	<input type="checkbox"/> ChemLab: Voltaic Cell Potentials <input type="checkbox"/> Lab: Electrolysis of Water	Students will learn about the basic types of batteries, including those used in cameras. Students will also describe corrosion and methods to prevent corrosion.
Day 5 Lesson Three: Electrolysis	<input type="checkbox"/> Textbook: Pages 644-650 <input type="checkbox"/> Science Notebook: Pages 342-344	<input type="checkbox"/> Lab: Electroplating	
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 651-652 <input type="checkbox"/> Module Assessment		
Day 7 STEM Unit Project	<input type="checkbox"/> Complete and present STEM Unit Project: Non-Destructive Testing		Students will describe electrolytic cells and some applications of electrolysis.

Unit 5: Organic and Nuclear Chemistry

Module Twenty: Hydrocarbons

9 days

Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 655 <input type="checkbox"/> Online: Project Planner: STEM Unit project- Energy Audit	<input type="checkbox"/> Lab: How can you model simple hydrocarbons?	<p>Students will be introduced to bonding in hydrocarbons and, briefly, refining hydrocarbons.</p> <p>Students will be introduced to the properties of alkanes and will name straight-chain alkanes, branched chain alkanes, and cycloalkanes.</p> <p>Students will be introduced to the properties of alkenes and alkynes and will name alkenes and alkynes.</p> <p>Students will recognize isomers, including structural isomers, stereoisomers, and optical isomers.</p> <p>Students will recognize the benzene ring and will name hydrocarbons that contain benzene rings in their structures.</p>
Day 2 Module Opener: Hydrocarbons	<input type="checkbox"/> Textbook: Pages 657 <input type="checkbox"/> Science Notebook: Page 345	<input type="checkbox"/> ChemLab: Analyze Hydrocarbon Burner Gases	
Day 3 Lesson One: Introduction to Hydrocarbons	<input type="checkbox"/> Textbook: Pages 658-664 <input type="checkbox"/> Science Notebook: Pages 346-350	<input type="checkbox"/> Lab: Synthesize and Observe Ethyne	
Day 4 Lesson Two: Alkanes	<input type="checkbox"/> Textbook: Pages 665-674 <input type="checkbox"/> Science Notebook: Pages 351-355	<input type="checkbox"/> Lab: The Ripening of Fruit with Ethene <input type="checkbox"/> Lab: Isomerism	
Day 5-6 Lesson Three: Alkanes and Alkynes	<input type="checkbox"/> Textbook: Pages 675-680 <input type="checkbox"/> Science Notebook: Pages 356-359		
Day 7 Lesson Four: Hydrocarbon Isomers	<input type="checkbox"/> Textbook: Pages 681-685 <input type="checkbox"/> Science Notebook: Pages 360-363		
Day 8 Lesson Five: Aromatic Hydrocarbons	<input type="checkbox"/> Textbook: Pages 686-692 <input type="checkbox"/> Science Notebook: Pages 364-366		
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 693-694 <input type="checkbox"/> Module Assessment		

Module Twenty-One: Substituted Hydrocarbons and Their Reactions

9 days

Days	Assignments	Labs	Focus
Day 1 Module Opener: Substituted Hydrocarbons and Their Reactions	<input type="checkbox"/> Textbook: Pages 696 <input type="checkbox"/> Science Notebook: Page 367	<input type="checkbox"/> Lab: How do you make slime? <input type="checkbox"/> ChemLab: Observe Properties of Alcohols	Students will be introduced to functional groups and will name halocarbons.
Day 2 Lesson One: Alkyl Halides and Aryl Halides	<input type="checkbox"/> Textbook: Pages 697-702 <input type="checkbox"/> Science Notebook: Pages 368-372	<input type="checkbox"/> Lab: Make an Ester	Students will identify and name alcohols, ethers, and amines and will be introduced to substitution reactions.
Day 3 Lesson Two: Alcohols, Ethers, and Amines	<input type="checkbox"/> Textbook: Pages 703-709 <input type="checkbox"/> Science Notebook: Pages 373-377	<input type="checkbox"/> Lab: The Characterization of Carbohydrates	Students will identify and name carbonyl compounds and will be introduced to condensation reactions.
Day 4-5 Lesson Three: Carbonyl Compounds	<input type="checkbox"/> Textbook: Pages 710-717 <input type="checkbox"/> Science Notebook: Pages 378-382	<input type="checkbox"/> Lab: Polymerization Reactions	Students will classify reactions as elimination reactions, addition reactions, and oxidation-reduction reactions, as well as predict the product of organic reactions.
Day 6-7 Lesson Four: Other Reactions of Organic Compounds	<input type="checkbox"/> Textbook: Pages 718-724 <input type="checkbox"/> Science Notebook: Pages 383-386		Students will identify monomer units and recognize addition polymerization and condensation polymerization.
Day 8 Lesson Five: Polymers	<input type="checkbox"/> Textbook: Pages 725-732 <input type="checkbox"/> Science Notebook: Pages 387-392		
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 733-734 <input type="checkbox"/> Module Assessment		

Module Twenty-Two: The Chemistry of Life

8 days

Days	Assignments	Labs	Focus
Day 1 Module Opener: The Chemistry of Life	<input type="checkbox"/> Textbook: Pages 736 <input type="checkbox"/> Science Notebook: Page 393	<input type="checkbox"/> Lab: How do you test for simple sugars?	Students will identify parts of amino acids and describe how they combine to form proteins. Students will describe the basic biological functions of proteins.
Day 2 Lesson One: Proteins	<input type="checkbox"/> Textbook: Pages 737-742 <input type="checkbox"/> Science Notebook: Pages 394-399 <input type="checkbox"/>	<input type="checkbox"/> ChemLab: Observe Temperature and Enzyme Action	

Day 3 Lesson Two: Carbohydrates	<input type="checkbox"/> Textbook: Pages 743-745 <input type="checkbox"/> Science Notebook: Pages 400-402	<input type="checkbox"/> Lab: Denaturation <input type="checkbox"/> Lab: Observe a Saponification Reaction <input type="checkbox"/> Lab: Saturated and Unsaturated Fats <input type="checkbox"/> Lab: Plants Produce Oxygen	<p>Students will define monosaccharides, disaccharides, and polysaccharides and will describe the basic biological functions of carbohydrates.</p> <p>Students will identify fatty acids, triglycerides, and the steroid ring structure. Students will describe the basic biological functions of lipids.</p> <p>Students will identify the structural components of DNA and RNA and will describe the basic biological functions of nucleic acids.</p> <p>Students will identify anabolism and catabolism and describe the role of ATP as an energy storage molecule.</p>
Day 4-5 Lesson Three: Lipids	<input type="checkbox"/> Textbook: Pages 746-750 <input type="checkbox"/> Science Notebook: Pages 403-407		
Day 6 Lesson Four: Nucleic Acids	<input type="checkbox"/> Textbook: Pages 751-754 <input type="checkbox"/> Science Notebook: Pages 408-411		
Day 7 Lesson Five: Metabolism	<input type="checkbox"/> Textbook: Pages 755-760 <input type="checkbox"/> Science Notebook: Pages 412-418		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 761-762 <input type="checkbox"/> Module Assessment		
Module Twenty-Three: Nuclear Chemistry			
9 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Nuclear Chemistry	<input type="checkbox"/> Textbook: Pages 764 <input type="checkbox"/> Science Notebook: Page 419	<input type="checkbox"/> Lab: How do chain reactions occur?	Students will identify and describe the basic types of radiation: alpha, beta, and gamma.
Day 2 Lesson One: Nuclear Radiation	<input type="checkbox"/> Textbook: Pages 765-770 <input type="checkbox"/> Science Notebook: Pages 420-423	<input type="checkbox"/> Lab: Modeling Radioactive Decay	
Day 3-4 Lesson Two: Radioactive Decay	<input type="checkbox"/> Textbook: Pages 771-781 <input type="checkbox"/> Science Notebook: Pages 424-432 <input type="checkbox"/> Online: PhET simulation: Radioactive Dating Game	<input type="checkbox"/> Lab: Modeling Isotopes <input type="checkbox"/> ChemLab: Investigate Radiation Dosage	Students will describe the importance of the neutron-to-proton ratio write balanced nuclear reactions for the basic types of decay and calculate the remaining amount of

Day 5-6 Lesson Three: Nuclear Reactions	<input type="checkbox"/> Textbook: Pages 782-792 <input type="checkbox"/> Science Notebook: Pages 433-438		<p>an isotope after a given time interval.</p> <p>Students will write balanced equations for transmutations, calculate the energy equivalent of mass, and describe fission and fusion.</p> <p>Students will describe some uses of radiation, as well as the biological effects of exposure to radiation.</p>
Day 7 Lesson Four: Applications and Effects of Nuclear Reactions	<input type="checkbox"/> Textbook: Pages 793-799 <input type="checkbox"/> Science Notebook: Pages 439-442		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 800-801 <input type="checkbox"/> Module Assessment		
Day 9 STEM Unit Project	<input type="checkbox"/> Complete and Present STEM Unit project- Energy Audit		