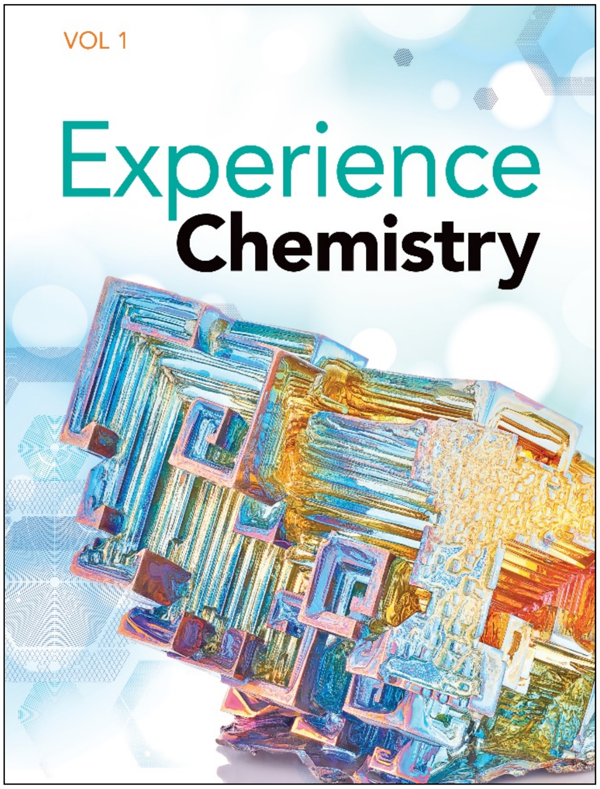
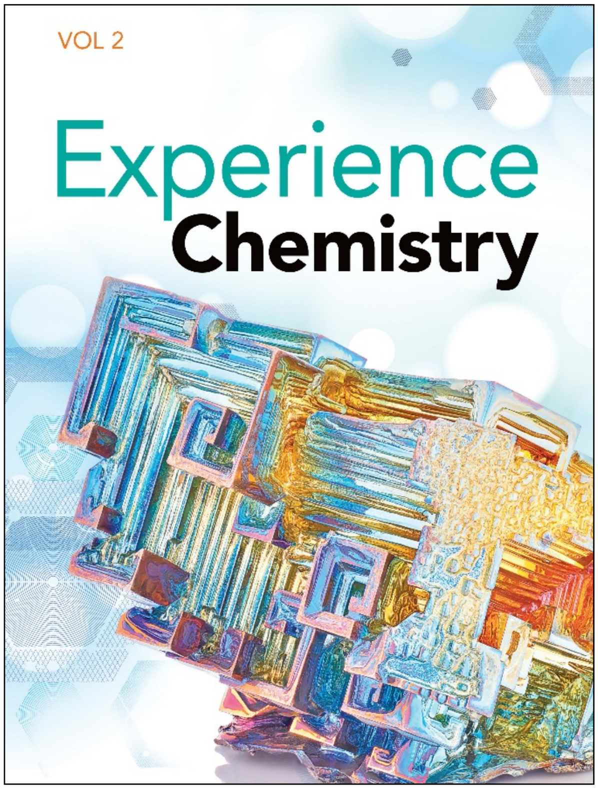
SAVVAS
LEARNING COMPANY

A Correlation of





To the

Arizona Science Standards 2018
High School Chemistry

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

A Correlation of Experience Chemistry, ©2021 to the
Arizona Science Standards 2018
High School Chemistry

Introduction

This document demonstrates how **Experience Chemistry ©2021** supports the Arizona Science Standards 2018 for High School Chemistry Correlation references include the Experience Notebook (Volumes 1 & 2), Teacher Guide, and online digital assets.

Savvas Learning Company is excited to introduce **Experience Chemistry!** From climate change, water quality, and the newest energy sources, to the foods we grow and eat, your students will experience chemistry like never before. The program uses cool, weird, and amazing phenomena to engage students in 3-D science. Give students an up-close, first-hand experience they'll never forget.

Be the first to *Experience It!*

Storylines are organized around a real-world Anchoring Phenomena that sparks student curiosity, gives a purpose to learning and connects chemistry concepts through a unifying unique occurrence. Students encounter everyday phenomena through Claims-Evidence Reasoning Exercises, Authentic Readings, STEM Projects, and Engineering Performance Tasks.

Explore Phenomena with Flinn Scientific!

Experience Chemistry and Flinn Scientific partner to deliver high-quality inquiry opportunities to chemistry classrooms. Lab Experiments, Engineering Challenges, Performance Tasks, Virtual Reality Simulations, and Lab Videos by Flinn Scientific immerse students in hands-on chemistry.

Hands-On Labs

• Assign student-friendly labs focused on real-world phenomena in every learning experience.
• Customize your lessons with four versions of every lab including Open-Ended, Guided, Shortened, and Advanced.

Lab Videos

• Background videos, demo videos and summary videos engage and connect students to the phenomena, prepare students and instructors for set-up and revisit concepts before assessments.

Design Challenges and Performance Tasks

• Students mimic the real-world activities of engineers as they define and solve problems and design, test and evaluate solutions.
• Students demonstrate mastery of three-dimensional learning at the end of every Investigation with a Performance-Based assessment.

Lab Kits

• Simplify lab set-up and solution preparation with time-saving lab kits.

Virtual Reality

• Immerse your students in 360º simulations that bring chemistry to life.

A Correlation of Experience Chemistry, ©2021 to the
Arizona Science Standards 2018
High School Chemistry

Table of Contents

A Correlation of Experience Chemistry, ©2021 to the
Arizona Science Standards 2018
High School Chemistry

Arizona Science Standards 2018 High School Chemistry	**Experience Chemistry ©2021**
(HS.P1) All matter in the Universe is made of very small particles.	
Structures and Properties of Matter	
(Essential HS.P1U1.1) Develop and use models to explain the relationship of the structure of atoms to patterns and properties observed in the Periodic Table and describe how these models are revised with new evidence.	**Experience Notebook, Vol. 1:** Visualizing the Atom, 12 Atomic Number, 13 Revisit Investigative Phenomenon, 21 The Quantum Mechanical Model, 28 The Shell Model Explained, 28 Patterns in Electron Configurations, 36-38 Valence Electrons, 39 Revisit Investigative Phenomenon, 40 The Modern Periodic Table, 46-48 Revisit Investigative Phenomenon, 49 The Periodic Table as a Predictive Model, 50-51 **Teacher Guide:** **Inquiry Labs:** Develop a Periodic Table, Periodic Trends and Properties; Elemental Metals, Nonmetals, and Metalloids; Evaluate the Bohr Model of the Atom **Digital Activities:** Periodic Properties; Predict Reactivity Using Periodic Trends **Performance Based Assessments:** Evaluate Atomic Structure with Flame Tests; Gravimetric Analysis of Periodic Trends
(Plus HS+C.P1U1.1) Develop and use models to demonstrate how changes in the number of subatomic particles (protons, neutrons, electrons) affect the identity, stability, and properties of the element.	**Experience Notebook, Vol 1:** Atoms and Molecules, 6 Electron Configurations, 33 Patterns in Electron Configurations, 36-38 Valence Electrons, 39 The Modern Periodic Table, 46-48 Properties of Metals, 78-79 Delocalized Electrons, 141 Electrons in Metal, 141 **Teacher Guide:** **Inquiry Labs:** Periodic Trends and Properties; Elemental Metals, Nonmetals, and Metalloids **Digital Activities:** Periodic Properties; Predict Reactivity Using Periodic Trends; Electron Configuration and Element Properties

A Correlation of Experience Chemistry, ©2021 to the Arizona Science Standards 2018 High School Chemistry

Arizona Science Standards 2018 High School Chemistry	Experience Chemistry ©2021
(Plus HS+C.P1U1.2) Obtain, evaluate, and communicate the qualitative evidence supporting claims about how atoms absorb and emit energy in the form of electromagnetic radiation.	**Experience Notebook, Vol 1:** Atomic Emission Spectra, 22-23 The Bohr Model, 24-25 Revisit Investigative Phenomenon, 27, 40 Assessment, 41 **Experience Notebook, Vol 2:** Radiation: Absorption and Reradiation, 102 Carbon Dioxide and Methane, 104 Incoming and Outgoing Radiation, 105-106 **Teacher Guide:** **Inquiry Labs:** Evaluate Atomic Spectra **Digital Activities:** Emission Spectra of Elements **Engineering Design Challenge:** Design a Spectroscope from Household Materials
(Plus HS+C.P1U1.3) Analyze and interpret data to develop and support an explanation for the relationships between kinetic molecular theory and gas laws.	**Experience Notebook, Vol 1:** Kinetic Theory and a Model for Gases, 112 Common Gases, 113 **Experience Notebook, Vol 2:** Compressibility, 6 Gas Pressure and Amount of Gas, 7 Boyle's Law, 11 Sample Problem: Using Boyle's Law, 12 Charles's Law, 13 Sample Problem: Using Charles's Law, 14 Gay-Lussac's Law, 17-18 Combined Gas Law, 19 Ideal Gas Law, 23-25 Isobaric, Isovolumetric, and Isothermal Processes, 26 Real Gases, 27-28 **Teacher Guide:** **Inquiry Labs:** Relationships Between Gas Variables; The Ideal Gas Law **Digital Activities:** Explain Changes in Tire Pressure; Gas Volume and Temperature; Relate Gas Pressure and Temperature; Model the Combined Gas Laws

A Correlation of Experience Chemistry, ©2021 to the
Arizona Science Standards 2018
High School Chemistry

Arizona Science Standards 2018 **High School Chemistry**	**Experience Chemistry** **©2021**
Chemical Reactions	
(Essential HS.P1U1.2) Develop and use models for the transfer or sharing of electrons to predict the formation of ions, molecules, and compounds in both natural and synthetic processes.	**Experience Notebook, Vol. 1:** Coulomb's Law, 52 Ionic Compounds, 72-73 Properties of Ionic Compounds, 74-75 Revisit Investigative Phenomenon, 76 Revisit Investigative Phenomenon, 80 Properties of Metals, 78-79 Types of Covalent Bonds, 84-85 Electronegativity and Bonding, 86-87 Van der Waals Forces, 91-92 Hydrogen Bonds, 93 Properties of Molecular Substances, 94-95 Liquids and Intermolecular Forces, 118-119 Solids and Attractive Force, 120-121 Properties of Ionic and Molecular Compounds,138 Electrons in Metal, 141 Conductivity and Luster, 143 Surface Tension, 149-150 Electrolytes and Nonelectrolytes, 156 **Inquiry Labs:** Characteristics of Ionic Bonds; Investigate Metallic Bonds; Investigate Covalent Bonds, Intermolecular Forces; Correlate Material Properties and Bond Type; Melt Ionic and Covalent Compounds; Modeling Metals, Ceramics, and Polymers; Investigate Surface Tension **Digital Activities:** Intermolecular Forces in Liquids **Performance-Based Assessments:** Qualitative Analysis and Chemical Bonding
(Essential HS.P1U1.3) Ask questions, plan, and carry out investigations to explore the cause and effect relationship between reaction rate factors.	**Experience Notebook, Vol. 2:** Calculating Reaction Rates, 161 Effect of Concentration on Reaction Rates, 164 Effect of Temperature on Reaction Rate, 165 Effect of Particle Size on Reaction Rates, 166 Reaction Rate vs. Favorability, 182 Assessment, 191 **Teacher Guide:** **Inquiry Lab:** Reaction Rates: Iodine Clock **Digital Activity:** Factors that Affect Reaction Rate; Glow Sticks and Reaction Rate Reaction Rates and Activation Energy; Reaction Rate and Molecular Collisions **Performance Based Assessment**: Reaction Rates and Equilibrium

A Correlation of Experience Chemistry, ©2021 to the
Arizona Science Standards 2018
High School Chemistry

Arizona Science Standards 2018 High School Chemistry	Experience Chemistry ©2021
(Plus HS+C.P1U1.4) Develop and use models to predict and explain forces within and between molecules.	**Experience Notebook, Vol. 1:** Coulomb's Law, 52 Atomic Radius, 56-57 Ionic Bonds, 70-71 Ionic Compounds, 72-73 Revisit Investigative Phenomenon, 76 Properties of Metals, 78-79 Electronegativity and Bonding, 86-87 Geometry and Polar Molecules, 88-90 Van der Waals Forces, 91-92 Hydrogen Bonds, 93 Water and Hydrogen Bonding, 148-149 **Experience Notebook, Vol. 2:** Strong and Weak Nuclear Forces, 361-362 **Teacher Guide:** **Inquiry Labs:** Characteristics of Ionic Bonds; Investigate Covalent Bonds **Digital Activities:** Ions and Electroplating
(Plus HS+C.P1U1.5) Plan and carry out investigations to test predictions of the outcomes of various reactions, based on patterns of physical and chemical properties.	**Experience Notebook, Vol. 1:** Types of Reactions, 227 Combination Reactions, 228 Decomposition Reactions, 229 Sample Problem: Writing Chemical Equations for Combination and Decomposition Reactions, 230 Sample Problem: Writing Chemical Equations for Single-Replacement Reactions, 233 Double-Replacement Reactions, 234 Sample Problem: Writing Chemical Equations for Double-Replacement Reactions, 235 Combustion Reactions, 236 Predicting the Products of Reactions, 238-239 Revisit Investigative Phenomenon, 240 **Teacher Guide:** **Inquiry Labs:** Evaluate Chemical Reactions; Predict Chemical Reactions; Explore Iron Corrosion **Digital Activities:** Classify Reactions and Predict Their Products; Reactivity of Metals; Reaction Reasoning

Arizona Science Standards 2018 High School Chemistry	Experience Chemistry ©2021
(Plus HS+C.P1U1.6) Construct an explanation, design a solution, or refine the design of a chemical system in equilibrium to maximize production.	**Experience Notebook, Vol. 1:** Formation of a Precipitate, 245 Predicting the Formation of a Precipitate, 246 Redox vs. Non-redox Reactions, 284 **Inquiry Labs:** Determination of Reaction Output: Evaluate Chemical Reactions **Digital Activities:** Classify Reactions and Predict Their Products; Predict Whether a Precipitate Will Form **Performance Based Assessments:** Identify Evidence of Chemical Reactions; Battery Challenge **Engineering Design Challenges:** Use Equilibrium for a Commercial Application
(Plus HS+C.P1U1.7) Use mathematics and computational thinking to determine stoichiometric relationships between reactants and products in chemical reactions.	**Experience Notebook, Vol. 1:** SEP Use Mathematics, 193 SEP Use Mathematics, 195 CCC Structure and Function, 198 SEP Use Mathematics, 199 SEP Use Mathematics, 201 SEP Carrying out Investigations, 204 SEP Use Mathematics, 205 SEP Interpret Data, 208 SEP Develop a Model, 259 SEP Apply Mathematical Concepts, 261 SEP Interpret Data, 270 SEP Apply Mathematical Concepts, 272 SEP Construct an Explanation, 275 SEP Apply Mathematical Concepts, 276 **Teacher Guide:** **Inquiry Labs:** Determine an Empirical Formula; Preparation of Solutions; Identify Unknowns Through Stoichiometry; Determination of Reaction Output **Digital Activities:** Introduction to STP; PhET Simulation: Balancing Chemical Equations; Virtual Reality Experience: Stoichiometry; Animation: Stoichiometry Calculations **Engineering Design Challenge:** An Empirical Formula Challenge **Performance Based Assessments:** Analysis of Basic Copper Carbonate

Arizona Science Standards 2018 High School Chemistry	Experience Chemistry ©2021
Nuclear Processes and Applications of Chemistry	
(Essential HS.P1U3.4) Obtain, evaluate, and communicate information about how the use of chemistry related technologies have had positive and negative ethical, social, economic, and/or political implications.	**Experience Notebook, Vol. 2:** Human Impacts on the Earth System, 53-54 Climate and Humans, 93-95 Sources of Anthropogenic Carbon, 120-121 Impact on the Biosphere, 138-139 Solving Global Warming, 144-145 Sustainability, 151-152 The Chemical Industry, 405-406 Challenges for Chemical Production, 407 Supply: Finite Resources, 408-409 Demand: Human Population and Consumerism, 410 Environmental Impacts of Chemical Industries, 412 Chemical Disasters, 414 A Greener Vision for Chemistry, 415 **Teacher Guide:** **Inquiry Labs:** Toxicity of Road Deicers, How to Recycle Polylactic Acid Plastics **Engineering Design Challenges:** Evaluate Metals for a Commercial Application, Building a Better Bike, Water Purification, Design a Model of Ocean Acidification, Plastic from Biowaste **Performance-Based Assessment:** Prepare and Characterize Biodiesel **Problem-Based Learning:** The Chemistry of Cooking, Water as a Greenhouse Gas, Reducing Carbon Footprints, Sustainable Off-Grid Energy

Arizona Science Standards 2018 High School Chemistry	Experience Chemistry ©2021
(Plus HS+C.P1U3.8) Engage in argument from evidence regarding the ethical, social, economic, and/or political benefits and liabilities of fission, fusion, and radioactive decay.	**Experience Notebook, Vol. 2:** Strong and Weak Nuclear Forces, 361-364 Radioactive Decay Chains, 367 Nuclear Fission, 379 Radiation Penetration, 387 Radiation Hazards and Units, 388 Nuclear Fission Power, 392-393 Nuclear Accidents and Radioactive Waste, 394 Nuclear Fusion Power, 395 Radiation and Medicine, 396-397 Radiation and Living Tissue, 398 Radiation and Gene Mutation, 399 SEP Engage in Argument, 400 **Teacher Guide:** **Inquiry Labs:** Radioactive Decay; Nuclear Energy **Digital Activities:** What Happens When an Atom Decays? Energy From Nuclear Processes