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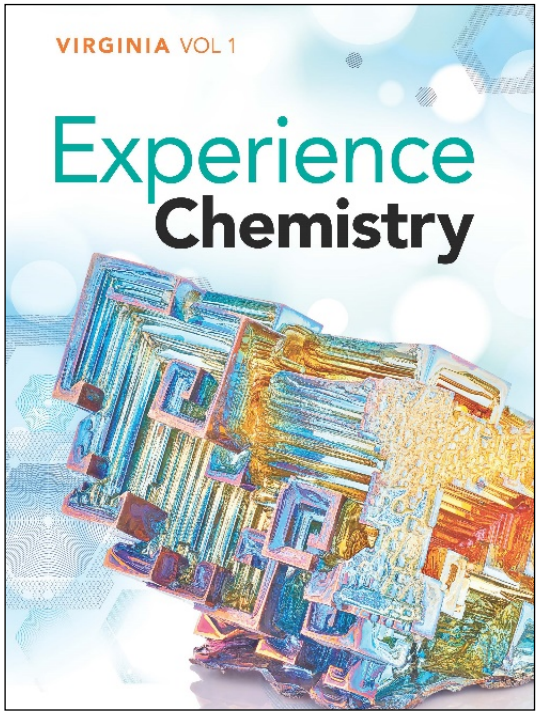

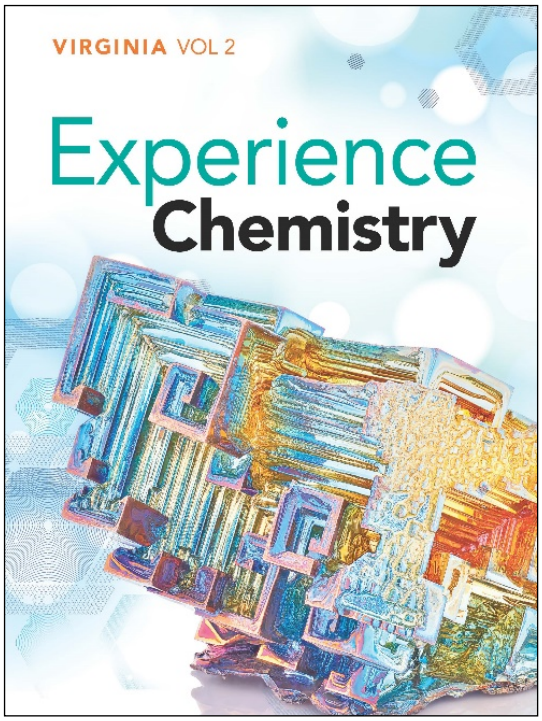

To the

Virginia Standards of Learning for Science 2010 High School Chemistry

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

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To the
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Introduction

This document demonstrates how the ***Experience Chemistry ©2021*** program supports the Virginia Standards of Learning for Science 2010: High School Chemistry. Correlation page references are to the Student and Teacher's Editions and cited at the page level.

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.

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(CH.1) The student will investigate and understand that experiments in which variables are measured, analyzed, and evaluated produce observations and verifiable data.	
(CH.1.a) designated laboratory techniques;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Teacher Guide:** Lab Techniques, T32 **Realize™ Digital Resources:** **Inquiry Labs:** Characteristics of Ionic Bonds; Investigate Covalent Bonds; Intermolecular Forces; Measure the Energy of a Phase Change; Investigate Surface Tension; The Thermodynamics of Hand Warmers; Human Activity and Carbon Emissions; Titrations – The Study of Acid-Base Chemistry **Performance-Based Assessments:** Measure Energy in Combustion Reactions; Calcium Carbonate and Shell Production
(CH.1.b) safe use of chemicals and equipment;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Measure Energy Flow in Chemical Reactions; Evaluate the Thermal Equilibrium of Metals; Types of Chemical Reactions; Energy in the Atmosphere; Explore Chemical Equilibrium **Performance-Based Assessments:** Evaluate Atomic Structure with Flame Tests; Qualitative Analysis and Chemical Bonding; Reaction Rates and Dissolution; Quantitative Analysis of Acid Rain; Calcium Carbonate and Shell Production
(CH.1.c) proper response to emergency situations;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Teacher Guide:** Management, T32 **Realize™ Digital Resources:** **Inquiry Labs:** Measure Acid Strength; Analysis of Buffer Solutions and Ranges

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(CH.1.d) manipulation of multiple variables, using repeated trials;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Energy Densities of Organic Fuels; Investigate Metallic Bonds; Intermolecular Forces; Relationships Between Gas Variables; Carbon Dioxide and Its Role in Climate; Reaction Rates: Iodine Clock; Collision Theory; Carbon Dioxide Levels in Water; The Fate of Carbonate in Acidifying Oceans **Performance-Based Assessments:** Measure Energy in Combustion Reactions; Gravimetric Analysis of Periodic Trends; Road Deicers; Reaction Rates and Dissolution
(CH.1.e) accurate recording, organization, and analysis of data through repeated trials;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** The Ideal Gas Law; Identify Unknowns Through Stoichiometry; Hess's Law and the Combustion of a Metal; The Heat of Melting Ice; Reaction Rates: Iodine Clock; Collision Theory; Titrations – The Study of Acid-Base Chemistry; The Fate of Carbonate in Acidifying Oceans **Performance-Based Assessments:** Measure Energy in Combustion Reactions; Gravimetric Analysis of Periodic Trends; Identify Evidence of Chemical Reactions; Reaction Rates and Dissolution
(CH.1.f) mathematical and procedural error analysis;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Energy Densities of Organic Fuels; Relationships Between Gas Variables; Identify Unknowns Through Stoichiometry; Determination of Reaction Output; Titrations – The Study of Acid-Base Chemistry **Performance-Based Assessments:** Measure Energy in Combustion Reactions

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(CH.1.g) mathematical manipulations including SI units, scientific notation, linear equations, graphing, ratio and proportion, significant digits, and dimensional analysis;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Relationships Between Gas Variables; Determine an Empirical Formula; Identify Unknowns Through Stoichiometry; Determination of Reaction Output; Hess's Law and the Combustion of a Metal; Titrations – The Study of Acid-Base Chemistry **Performance-Based Assessments:** Gravimetric Analysis of Periodic Trends; Analysis of Basic Copper Carbonate
(CH.1.h) use of appropriate technology including computers, graphing calculators, and probeware, for gathering data, communicating results, and using simulations to model concepts;	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Thermal Energy and Heat Transfer; Evaluate Atomic Spectra; Elemental Metals, Nonmetals, and Metalloids; Hess's Law and the Combustion of a Metal **Performance-Based Assessments:** Quantitative Analysis of Acid Rain
(CH.1.i) construction and defense of a scientific viewpoint; and	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Characteristics of Ionic Bonds; Investigate Covalent Bonds; The pH of Seawater **Performance-Based Assessments:** Climate Change and the Carbon Cycle
(CH.1.j) the use of current applications to reinforce chemistry concepts.	This objective is met throughout *Virginia Experience Chemistry.* For examples, please see: **Realize™ Digital Resources:** **Inquiry Labs:** Climate Change and Keeping Cool; Solar Cell Technology; The pH of Seawater; The Fate of Carbonate in Acidifying Oceans **Performance-Based Assessments:** Electricity and Wind Energy; Road Deicers; Climate Change and the Carbon Cycle; Calcium Carbonate and Shell Production **Digital Activities:** Virtual Lab: The Effect of Ocean Acidification on Shells

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(CH.2) The student will investigate and understand that the placement of elements on the periodic table is a function of their atomic structure. The periodic table is a tool used for the investigations of	
(CH.2.a) average atomic mass, mass number, and atomic number;	**Experience Notebook, Vol. 1:** Types of Atoms, 101-102 Mass Number, 103 SEP Use Mathematics, 103 Atomic Mass, 105-109 Compare and Contrast, 109 Atomic Numbers, 134 **Realize™ Digital Resources:** **Inquiry Labs:** Bean Bag Isotopes **Digital Activities:** Explore Atomic Particles
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(CH.2.e) periods;	**Experience Notebook, Vol. 1:** The Modern Periodic Table, 134-136 **Realize™ Digital Resources:** **Digital Activities:** Animation: The Design of the Periodic Table

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(CH.2.f) trends including atomic radii, electronegativity, shielding effect, and ionization energy;	**Experience Notebook, Vol. 1:** The Shielding Effect and Effective Nuclear Charge, 141-142 SEP Develop Models, 143 Atomic Radius, 144-146 SEP Develop Models, 145 Ionization Energy, 147 CCC Patterns, 147 Successive Ionization Energies, 148 Electron Affinity, 149 SEP Develop and Use Models, 149 Connecting the Trends, 151 CCC Patterns, 151 Electronegativity and the Periodic Table, 174 CCC Patterns, 174 **Realize™ Digital Resources:** **Inquiry Labs:** Periodic Trends and Properties **Performance-Based Assessments:** Gravimetric Analysis of Periodic Trends **Digital Activities:** Writing About Science: Properties of Atoms: Size vs. Mass; Size Trends and Shielding Effect; Predict Reactivity Using Periodic Trends; Effective Nuclear Charge and Electron Shielding
(CH.2.g) electron configurations, valence electrons, and oxidation numbers;	**Experience Notebook, Vol. 1:** Electron Configurations, 121 Energy and Stability in Electron Configurations, 122-123 Patterns in Electron Configurations, 124-126 Valence Electrons, 127 CCC Patterns, 127 Revisit Investigative Phenomenon, 128 **Realize™ Digital Resources:** **Inquiry Labs:** Model Electron Configuration **Digital Activities:** Patterns in Electron Configurations; Model Electron Configurations

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(CH.2.h) chemical and physical properties; and	**Experience Notebook, Vol. 1:** The Modern Periodic Table, 134-136 The Periodic Table as a Predictive Model, 138-139 Coulomb's Law, 140 **Realize™ Digital Resources:** **Inquiry Labs:** Elemental Metals, Nonmetals, and Metalloids; Periodic Trends and Properties **Digital Activities:** Periodic Properties; Electron Configuration and Element Properties
(CH.2.i) historical and quantum models.	**Experience Notebook, Vol. 1:** The Bohr Model, 112-113 The Bohr Model Representations of Atoms, 114 Revisiting the Atomic Model, 116-117 Revisit Investigative Phenomenon, 120 **Realize™ Digital Resources:** **Inquiry Labs:** Evaluate the Bohr Model of the Atom **Digital Activities:** Explore Bohr Model Patterns; The Quantum Mechanical Model and Atomic Orbitals; Evaluate Atomic Models; The History of Atomic Models
(CH.3) The student will investigate and understand how conservation of energy and matter is expressed in chemical formulas and balanced equations.	
(CH.3.a) nomenclature;	**Experience Notebook, Vol. 1:** Naming Ions, 185-186 Names of Ionic Compounds, 187 Compounds with Polyatomic Ions, 189 Sample Problem: Identifying Ionic Compounds, 190 Names of Molecular Compounds, 191 SEP Use Models, 191 Sample Problem: Identifying Molecular Compounds, 193 Revisit Investigative Phenomenon, 194 **Realize™ Digital Resources:** **Inquiry Labs:** Chemical Names and Formulas **Digital Activities:** Infer Rules for Naming Compounds; Comparing Compound Nomenclatures; Infer Rules for Naming Acids

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(CH.3.b) balancing chemical equations;	**Experience Notebook, Vol. 1:** Chemical Equations, 305-306 Balancing Equations, 308-309 Sample Problem: Balancing a Chemical Equation, 310 Sample Problem: Writing Chemical Equations for Combination and Decomposition Reactions, 318 Sample Problem: Writing Chemical Equations for Single-Replacement Reactions, 321 Sample Problem: Writing Chemical Equations for Double-Replacement Reactions, 323 Sample Problem: Writing Chemical Equations for Combustion Reactions, 325 Sample Problem: Writing and Balancing Net Ionic Equations, 331 Sample Problem: Writing and Balancing Net Ionic Equations, 335 **Realize™ Digital Resources:** **Inquiry Labs:** Evaluate Chemical Reactions **Performance-Based Assessments:** Identify Evidence of Chemical Reactions **Digital Activities:** Modeling Chemical Reactions; Balance Combustion Equations
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(CH.3.d) bonding types;	**Experience Notebook, Vol. 1:** Ionic Bonds, 158 CCC Cause and Effect, 159 Ionic Compounds, 160-161 CCC Matter and Energy, 161 Sea of Electrons Model, 165 SEP Compare Models, 165 Molecular Compounds, 169 Types of Covalent Bonds, 172 Revisit Investigative Phenomenon, 178 **Realize™ Digital Resources:** **Inquiry Labs:** Characteristics of Ionic Bonds; Investigative Metallic Bonds; Characteristics of Covalent Bonds **Performance-Based Assessments:** Qualitative Analysis and Chemical Bonding **Digital Activities:** Formation of Ionic Compounds; Formation of Covalent Bonds
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(CH.4) The student will investigate and understand that chemical quantities are based on molar relationships.	
(CH.4.a) Avogadro's principle and molar volume;	**Experience Notebook, Vol. 1:** Avogadro's Hypothesis, 275 The Mole-Volume Relationship, 276 Sample Problem: Calculating Gas Quantities at STP, 277 **Realize™ Digital Resources:** **Digital Activities:** Mole Road Map; Model Molar Mass and Molar Volume; Introduction to STP
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(CH.5) The student will investigate and understand that the phases of matter are explained by kinetic theory and forces of attraction between particles.	
(CH.5.a) pressure, temperature, and volume;	**Experience Notebook, Vol. 1:** Temperature, 12-13 Kinetic Theory and a Model for Gases, 200 Common Gases, 201 Gas Pressure, 202-203 Kinetic Energy and Particle Motion in Solids, Liquids, and Gases, 205 **Realize™ Digital Resources:** **Inquiry Labs:** Relationships Between Gas Variables; The Ideal Gas Law
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(CH.5.e) molar heats of fusion and vaporization;	**Experience Notebook, Vol. 1:** Enthalpy of Fusion and Solidification, 388 Sample Problem: Using the Heat of Fusion in Phase-Change Calculations, 389 Enthalpy of Vaporization and Condensation, 390 Sample Problem: Using the Heat of Vaporization in Phase-Change Calculations, 391 **Realize™ Digital Resources:** **Inquiry Labs:** The Heat of Melting Ice **Digital Activities:** Heat of Fusion
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(CH.6) The student will investigate and understand how basic chemical properties relate to organic chemistry and biochemistry.	
(CH.6.a) unique properties of carbon that allow multi-carbon compounds; and	**Experience Notebook, Vol. 1:** Molecular Compounds, 169 Covalent Network Solids, 227 SEP Evaluate Information, 228 **Realize™ Digital Resources:** **Inquiry Labs:** Periodic Trends and Properties
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