**Online Courses for High School Students**
1-888-972-6237

# Chemistry

## Semester A

Chemistry A introduces students to the science of chemistry beginning with exploring why scientists are interested in studying matter at a submicroscopic level. Students will continue to learn how scientific methods are used to understand the natural world and will continue to develop their skills in this area. Chemistry A covers topics in the characteristics of matter, atomic structure, chemical periodicity, chemical bonds and compounds, and chemical formula writing and naming. An algebra background is recommended because of the amount and type of math involved.

**Prerequisite:** Algebra 1
**Labs:** All labs must be provided and administered by the home district.
**Course Length:** Two Semesters
**Materials:** https://ideal.accelerate-ed.com/materials/233760332/course

### Module 1: Chemistry Basics

- Chemistry and Society
- The Scientific Method of Investigation
- Matter and Measurement
- Uncertainty in Measurement
- Dimensional Analysis

### Module 2: Basics of Matter

- States of Matter
- Pure Substances
- Mixtures
- Physical and Chemical Properties and Changes

### Module 3: The Atom

- Atomic Theory
- Atomic Structure
- Isotopes and Atomic Mass
- Nuclear Chemistry

### Module 4: Electronic Structure and Periodicity

- The Periodic Table
- The Atomic Model
- Electron Configuration
- The Nature of Light
- Periodic Trends

### Module 5: Ionic Compounds

- Ions
- Ionic Bonding
- Metallic Bonds and Properties
- Binary Ionic Compounds
- Ternary Ionic Compounds

### Module 6: Covalent Compounds

- Covalent Bonding
- Molecular Compounds
- Molecular Shape and Polarity
- Forces of Attraction
- Water and Its Properties

## Semester B

Chemistry B builds on the concepts and skills learned in the first semester as students continue to explore the properties of matter and the changes it undergoes. Chemistry B covers topics in chemical reactions and stoichiometry, gases, thermochemistry, kinetics, equilibrium, acids and bases, organic chemistry, and biochemistry. An algebra background is recommended because of the amount and type of math involved.

### Module 7: Chemical Reactions

- Balancing Chemical Equations
- Types of Chemical Reactions
- Reactions in Aqueous Solutions
- Solubility
- Oxidation Reduction Reactions
- Electron Transfer in Redox Reactions

### Module 8: Chemical Stoichiometry

- Chemical Quantities and the Mole
- Empirical and Molecular Formulas
- Concentrations of Solutions
- Stoichiometric Calculations
- Limiting Reactant and Percent Yield

### Module 9: Gases

- Properties of Gases
- The Gas Laws
- The Ideal Gas Law
- Gas Stoichiometry

### Module 10: Thermochemistry, Kinetics and Equilibrium

- Energy and Chemical Change
- Calorimetry and Heat Capacity
- Reaction Rates
- Chemical Equilibrium

## Module 11: Acids and Bases

- Acids and Bases
- Calculating pH
- Neutralization Reactions
- Acid-Base Titration

## Module 12: Organic and Biological Chemistry

- Simple Hydrocarbons
- Branched-Chain Hydrocarbons
- Functional Groups
- Proteins and Carbohydrates
- Lipids and Nucleic Acids