



AP Chemistry
High School

1.0 Understands and applies the skills of scientific inquiry.

- 1.1 Uses scientific inquiry to design, conduct, and analyze scientific investigations.
- 1.2 Identifies questions and concepts that guide scientific investigations.
- 1.3 Understands that different kinds of questions suggest different kinds of investigations.
- 1.4 Uses appropriate models when necessary.
- 1.5 Develops hypothesis.
- 1.6 Identifies controls and variables.
- 1.7 Designs and executes scientific investigations.
- 1.8 Selects and uses appropriate tools, technology and techniques to gather data.
- 1.9 Makes appropriate qualitative and quantitative observations.
- 1.10 Recognizes the importance of multiple trials with reproducible results.
- 1.11 Organizes data and observations efficiently, including creating appropriate tables and graphs.
- 1.12 Analyzes and evaluates the data and observations.
- 1.13 Integrates data and observations to draw appropriate conclusions.
- 1.14 Accounts for errors in investigations.
- 1.15 Uses evidence to infer possible applications or extensions for further inquiry.
- 1.16 Uses various methods to communicate experimental methods, observations, results, and interpretations.
- 1.17 Uses appropriate safety procedures when conducting investigations.
- 1.18 Recognizes that safety concerns change with different procedures.
- 1.19 Knows locations and appropriate uses of the safety equipment in the classroom.

4.0 Understands and applies concepts and theories pertaining to matter, its composition and the forces that govern it.

- 4.1 Understands and applies knowledge of the structure of atoms.
 - Analyzes the structure of matter at the atomic level.
 - Examines the types of chemical bonds and the nature of each type.
 - Analyzes the relationships in the periodic table: horizontal, vertical, and diagonal examples from alkaline metals, alkaline earth metals,

halogens, and the first series of transition elements.

Analyzes conceptual models of bonding and molecular shape and the relation to chemical and physical properties of matter.

Describes organic chemistry nomenclature.

Uses isotope stability to predict nuclear reactions.

4.2 Understands and applies knowledge of the structure and properties of matter.

Examines the relationships between pressure, volume and temperature of ideal gases.

Analyzes kinetic-molecular theory.

Assesses the nature of liquids and solids.

Examines the nature of solutions.

4.3 Understands and applies knowledge of chemical reactions.

Analyzes the various types of common chemical reactions.

Examines chemical reactivity and predict the products of chemical reactions.

Applies the principles of stoichiometry to chemical reactions.

Analyzes systems in dynamic equilibrium.

4.4 Understands and applies knowledge of types of energy and conservation of energy.

Analyzes chemical kinetics.

Analyzes chemical thermodynamics.

5.0 Understands the nature of science.

5.1 Understands how science develops and changes over time.

5.2 Explains that all scientific ideas are tentative and subject to change and improvement with data to support this.

5.3 Explains that most core scientific theories have large quantities of experimental and observational evidence.

5.4 Understands that scientific innovators have had difficulty breaking through the accepted ideas of their time to reach new conclusions that are considered to be common knowledge.

5.5 Understands that people continue inventing new ways of doing things, solving problems, and getting work done.

5.6 Understands the dynamic relationship between science and society.

5.7 Knows that human behavior can affect earth processes and systems.