

Conceptual Chemistry

Instructor:

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This half-year course is designed to serve as an alternate or introductory course to full-year chemistry. It aims to introduce the student to the content and applications of chemistry, to increase the student's confidence in science, and to prepare the student for further study in this field. It will address the Learning Results content standards in the area of chemistry, including the study of matter, energy and change. Topics may include properties of matter, behavior of gases, atomic structure, nuclear changes, chemical bonding, chemical reactions, and solution chemistry. Laboratory activities will be a major part of this course. Juniors who successfully complete this course will be prepared for more intensive study of chemistry in their senior year. Please note that to receive a full year credit in science, this course must be taken in combination with **Conceptual Physics** in the second semester. Students who have successfully completed full-year Chemistry are not eligible for this course.

Graduation Standards (the number of the standard is referenced in the performance indicators listed in each unit):

PHYSICAL SCIENCES STANDARD:**1: STRUCTURE, PROPERTIES AND INTERACTIONS OF MATTER****Unit 1 Introduction to Chemistry**

- Summary
- Chemistry relation to everyday life.
 - Scientists methods for learning about the world.
 - Density importance to real life examples

Performance Indicators Assessed in Unit 1A. Understand various patterns of the periodic table and use knowledge of these patterns to predict chemical and physical properties.

Unit 2 Matter and Energy

- Summary
- The Kinetic Theory and how it relates.
 - The relation between matter and changes in temperature, pressure and volume.

Performance Indicators Assessed in Unit 1E. Demonstrate that the kinetic molecular theory describes the motion of atoms and molecules, and explains the properties of gases.

Unit 3 Matter and Energy

- Summary
- Contrast between an atom and a molecule.
 - Define the word "pure" in chemistry.
 - Understand the process to separate mixtures.

Performance Indicators Assessed in Unit	1I. Understand solutions are homogeneous mixtures of two or more substances and categorize acids, bases, and salts as three classes of compounds that form ions in water solutions.
Unit 4 Atoms and Nuclear energy	
Summary	<ul style="list-style-type: none"> • The components making an atom. • Scientist's development/learning of the atom. • Nuclear chemistry and its process.
Performance Indicators Assessed in Unit	1H. Model nuclear processes in which an atomic nucleus changes, including radioactive decay of naturally occurring and human-made isotopes, nuclear fission, and nuclear fusion.
Unit 5 Atoms and Periodic Table	
Summary	<ul style="list-style-type: none"> • The relation between periodic table location and atomic structure and property. • Connection between element and light.
Performance Indicators Assessed in Unit	1A. Understand various patterns of the periodic table and use knowledge of these patterns to predict chemical and physical properties.
Unit 6 Atoms and the Periodic Table	
Summary	<ul style="list-style-type: none"> • The similarities and differences between three chemical bonds. • Connection between bonds and compound properties. • Connection between molecules and compound properties.
Performance Indicators Assessed in Unit	1 B. Understand that chemical and physical properties of matter result from the ability of atoms to form bonds due to electrostatic forces between electrons and protons and intermolecular forces between molecules.
Unit 7 Chemical Reactions	
Summary	<ul style="list-style-type: none"> • Understand the law of conservation of mass. • Atomic change during chemical reactions.

- Purpose of balancing chemical equations.

Performance Indicators Assessed in Unit 1G. Demonstrate chemical reaction rates depend on factors that influence the frequency of collisions between reactant molecules.