Chemistry- Part A

COURSE DESCRIPTION: This course surveys all key areas of chemistry, including atomic structure, chemical bonding and reactions, solutions, stoichiometry, thermochemistry, organic chemistry, and nuclear chemistry. The course includes direct online instruction, virtual laboratories, and related assessments, used with a problem-solving book.

PREREQUISITES: Middle school Physical Science or Physical Science and satisfactory grasp of algebra basics, evidenced by success in Algebra I, or equivalents

COURSE LENGTH: One Semester

REQUIRED TEXT: Chemistry: Problems and Solutions

MATERIALS LIST: No required materials for this course

COURSE OUTLINE:

Unit 1: The Study of Chemistry

- Semester Introduction
- Chemistry and Society
- Matter and Energy
- Review: Matter
- Pure Substances
- Mixtures
- Review: Substances
- Laboratory: Paper Chromatography 1
- Laboratory: Paper Chromatography 2
- Properties of Substances
- Problem Solving in Chemistry
- Review: Properties and Problems
- Metric System: Base Units
- Metric System: Derived Units
- Review: Metric System

- Graphing
- Scientific Method and Chemistry
- Review: Graphing and Scientific Method

Unit 2: Atomic Structure

- Early Theories of the Atom
- The Nuclear Atom
- Atomic Number and Mass Number
- Review: The Atom
- Laboratory: Properties of Substances 1
- Laboratory: Properties of Substances 2
- Ions
- Isotopes and Atomic Mass
- Review: Aspects of the Atom
- The Bohr Atom

Unit 3: The Periodic Table

- Atomic Number and the Periodic Law
- The Periodic Table
- Trends within the Periodic Table
- Review: Periodic Table
- Metals
- Nonmetals
- Review: Metals and Nonmetals
- Laboratory: Reaction of Metals 1
- Laboratory: Reaction of Metals 2
- Metalloids
- Inner Transition Metals
- Review: Metalloids and Transition Metals

Unit 4: Chemical Bonding

- Monatomic Ions
- Polyatomic Ions
- Review: Ions

- The Ionic Bond and Salts
- Properties of Ionic Compounds
- Review: Ionic Compounds
- Laboratory: Salts: Precipitation Reactions 1
- Laboratory: Salts: Precipitation Reactions 2
- The Covalent Bond and Molecules
- Lewis Structures
- Van der Waals Forces
- Review: Atomic Bonding

Unit 5: Chemical Reactions

- The Conservation of Mass
- Balancing Chemical Equations
- Review: Chemical Equations
- Types of Reactions 1
- Types of Reactions 2
- Review: Chemical Reactions
- Laboratory: Chemical Reactions 1
- Laboratory: Chemical Reactions 2

Unit 6: Stoichiometry

- Stoichiometry and Its Uses
- Mole-Number Relationships
- Review: Stoichiometry
- Mole-Mass Relationships
- Mole-Volume Relationships
- Review: Moles
- Moles and Chemical Equations
- Calculating Yields of Reactions
- Laboratory: Stoichiometry of Chemical Reactions 1
- Laboratory: Stoichiometry of Chemical Reactions 2

Unit 7: Semester Review and Test

- Semester Review

- Semester Test