Chemistry

Text:	Glencoe ***Chemistry Matter and Change*** 2002

Supplemental Materials:	Lab and reference materials from various sources. Lab materials compiled into a yearly lab instructional book.

Course Description:	The chemistry courses at SCPS are designed to help students build understanding of chemical principles and develop study and computational skills necessary to apply these concepts. While the principles are extensive in scope, the presentation is sequential in nature so that students are able to see the interconnectedness of the concepts. Experimentation and investigation reinforce concepts and are used to give experience with careful observation and measurement, working on a team, collecting and analyzing data, observing trends, and using data to draw conclusions. Students in this course must be involved during class time, and study outside of class on a regular basis. Because concepts build on one another, failure to grasp one leads to difficulty later in the course. Tests, labs, and other activities are designed to assess the students' mastery of the course content.

Methods of Evaluation:	Students can be evaluated through tests, laboratory reports, quizzes, classwork, homework, projects, semester exams and/or any other form of evaluation instrument the instructor finds applicable to the course.

Pace of Instruction:	Matter and Properties Mathematics in Science Atomic Structure Periodicity The Mole Concept Ionic Bonding Covalent Bonding Organic Fundamentals Chemical Reactions Stoichiometry Gas Laws and Reactions Chemical Solutions Acids, Bases and Salts

Course Objectives:	Upon completion of this course of study, the student will be able to: 1. Use science process skills in laboratory investigations, including observing, classification, communication, metric measurement, prediction, inference, collecting and analyzing data. 2. Use traditional and technological reference materials to explore background and historical information regarding scientific concepts 3. Learn and use on a regular basis standard safety practices for laboratory.

	4.Describe the fundamental parts of the atom, using the periodic table to identify atomic number and mass and relating structure to periodic trends found from relative position of elements on the periodic table. 5.Identify by name and formula, common elements, ions and compounds. 6.Describe electron orbital configuration of common elements, illustrating the patterns of filling s, p, d and f orbitals and its relation to quantum number and drawing electron dot structures to represent valence electron arrangements of atoms and molecules. 7.Describe ionic and covalent bonds and describe conditions under which each would occur; use electron configuration to predict bonding, use polarity and shape to explain properties of molecules. Write formulas for and name a variety of compounds. Students will also be able to describe the impact of intermolecular forces on compound characteristics and behaviors in reactions. 8.Use the structure of methane as a model structure to draw configurations of and name representative classes of organic compounds by functional group. Discuss common occurrence, function and solubility of organic compounds. 9.Provide evidence from experimental tests that a chemical reaction has occurred, identify four or more types of chemical reactions, balance equations for reactions, and predict products for those types of reactions. Define oxidation and reduction and identify oxidizing and reducing agents in such reactions. 10. Relate stoichiometry calculations to the Law of Conservation of matter, solving mass to mass and volume as well as demonstrate the conceptual principle of limiting reactants and reaction yields through discussion and calculation. 11. Identify factors that affect solubility of a substance and theories that explain the formation of solutions, calculate appropriate amounts of substances and prepare solutions that have differing concentration. 12. Operationally define acids, bases and salts and compare the descriptions of acid/bases including Arrhenius, Bronstead-Lowery and Lewis, writing formulas for and name a variety of acids, bases and salts as part of neutralization reactions found in a variety of familiar situations. 13. Determine pH to calculate hydrogen ion concentrations in solutions and explain the role of indicators in determining relative pH of a substance. 14. Apply kinetic theory to phases of matter in terms of collision and physical properties. 15. Use gas laws to calculate and explain the relationship of temperature and pressure on the volume of a gas and apply molar volume in calculations of gaseous products of a chemical reaction.