



Ephrata High School
Course Syllabus

Principles of Chemistry
4040



I. Course Description

Principles of Chemistry

1 Credit

Grades 11, 12

Course Level: Level 1

Corequisite: Algebra 2

Principles of Chemistry is an academic-level, laboratory-oriented course designed for average and above-average ability students. The central theme of this course is that properties of matter are a natural consequence of its structure. By combining the basic theories and concepts of chemistry with relevant descriptive chemistry, supporting practical applications, and varied laboratory demonstrations and experiments, the Principles of Chemistry course provides the student with a comprehensive exposure to the science of chemistry. Mathematical relationships are emphasized, and students are expected to be proficient in algebraic concepts.

This course is written to expose you to some basic chemistry concepts, and to prepare you for the Science PSSA and upcoming Keystone exams. This course moves quickly and deals with a reasonable amount of mathematical conversions and equations.

II. Materials & Equipment

Texts: Cobb, C. & M. L. Fetterolf. *The Joy of Chemistry: The Amazing Science of Familiar Things*. Prometheus Books. New York, 2005.

Schwarz, J. *The Genie in the Bottle*. ECW Press. New York, 2001.

* Various supplemental books, journals & magazines as needed

Materials: A scientific calculator with logarithmic functions and scientific notation capabilities (TI- 83 or higher is recommended, but not required), three-ring binder, lab equipment and chemicals.

III. Course Goals & Objectives

- Students will acquire basic laboratory skills in the area of measurement and data collecting.
- Students will develop a general understanding of chemical principles and will be able to predict reaction outcomes.
- Students will gain experience working in small laboratory group situations.

- Students will become familiar with and understand the measurements, calculations, and symbols used by chemists.
- Students will understand the classification of matter and the changes it undergoes.
- Students will gain an understanding of mole concepts and their applications in quantitative chemical relationships.
- Students will gain knowledge and understanding of the evolution of modern atomic structure theories and the periodic properties of elements.
- Students will gain an understanding of the relationship between chemical bonds, molecular structure, and chemical properties.
- Students will gain an understanding of the Kinetic Molecular Theory and its relationship to the states of matter.
- Students will gain an understanding of energy and its transfer in chemical reactions.
- Students will become familiar with the preparation and properties of solutions.
- Students will be made aware of their responsibilities as users of chemicals and their impact on the environment.

IV. Course Topics (Summary Outline)

- *Measurement, Conversions & Safety*
safety equipment, safety practices, metric conversions, factor-label method, significant figures, density, percent error
- *Matter & Energy*
classification of matter, properties of matter, changes in properties, energy transfer in systems, calorimetry
- *Atomic Structure*
atomic theory, structure of atoms, atomic number & atomic mass, elements, ions, average atomic mass & weighted averages
- *Electronic Structure*
quantum numbers, writing electron configurations, drawing Lewis dot diagrams, electromagnetic spectrum
- *Periodic Table*
history of the Periodic Table, sections of the Periodic Table, periodic trends
- *States of Matter*
states of matter, changes in state, graphical representations of state changes, solubility
- *Chemical Formulas*
covalent & ionic compounds, writing chemical formulas, chemical nomenclature

- *Molecular Structure*
bond types, bond polarity, molecular geometry, molecular polarity
- *Chemical Equations*
Law of Conservation of Mass, balancing equations, writing equations, identifying reaction types, predicting products of reactions
- *Moles & Mole Conversions*
mole, mole conversions using factor-label method, calculating formula mass, percent composition, empirical formulas
- *Gases & Gas Laws*
properties of gases, Boyle's law, Charles's law, ideal gas law, combined gas law
- *Stoichiometry*
stoichiometry conversions, limiting reactants, percent yield

V. Assignments & Grading

The marking period and course grade will be weighted based on tests and quizzes, final exam, homework and classwork, lab sheets, and a lab report. These grades are weighted according to the table below.

<u>Marking Period Grade</u>		<u>Final Grade</u>	
Homework, Classwork, Labs & Activities	50%	Marking Period Grades	20% each
Test & Quizzes	50%	Final Exam Grade	20%

All tests, quizzes and exams are meant to be taken during one class period – extra time will not be given. Unit tests and final exam are all common to the course. The Ephrata standard grading scale is used.

Any coursework assigned during an excused absence can be made up within a week of its original assignment. This means that labs and other assignments will NOT be made available after a week. It is the student's responsibility to make an appointment to make up this work outside of class. In cases of lengthy absences, exceptions will be made at the discretion of the teacher, but students must request an extension. Any assignments assigned when the student was in attendance, but not turned in because of an excused absence **MUST** be turned in the day of the student's return to class. ***It is the student's responsibility to ask for and make up any missed work – the instructor will not "chase you down" to complete missed work!***

Laboratory experiences are an important part of any chemistry course; however, horseplay will NOT be tolerated. Any student who chooses to exhibit any type of unauthorized behavior will be asked to leave the lab and will be given a zero for the lab grade. The students would not be allowed to make up the lab for credit. In extreme circumstances, dependent upon the nature of the disruption (at the discretion of the teacher and administration), the course grade could also be forfeit.

