

2011 AP Chemistry Summer Assignment

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This packet of information includes the course description for AP chemistry and the outline for the first unit. For each topic of the outline, there is information you will need to complete 5 assignments over the summer. Notice that each assignment has a deadline that must be met. Complete each assignment and either drop it off at school or mail it on or before the due date. If you drop it off at school, make sure to enclose it in an envelope and clearly write my name on the envelope. Failure to complete the assignments will result in a schedule change when school begins in August.

Mailing Address for Assignments:

Port Charlotte High School
ATTN: Ms. Dunham-Derheimer
18200 Cochran Blvd.
Port Charlotte, FL 33948

Due Dates for Assignments:

Topic 1 Assignment: Thursday June 9, 2011
Topic 2 Assignment: Monday June 20, 2011
Topic 3 Assignment: Thursday June 30, 2011
Topic 4 Assignment: Thursday July 14, 2011
Topic 5 Assignment: Monday July 25, 2011

The following chart will give you an idea of the pace of the course.

day	activities planned
1	go over questions about the course description review lab rules review highlights of the topic 1 assignment pre-lab: Fractional Distillation
2-3	lab: Fractional Distillation HW: Chemical Equation Handbook pages 1-8
4	review highlights of the topic 2 assignment
5	review highlights of the topic 3 assignment pre-lab: Determining the Quantity of Iron (II) in an Iron Tablet HW: Chemical Equation Handbook pages 9-10
6	lab: Determining the Quantity of Iron (II) in an Iron Tablet
7-8	review highlights of the topic 4 assignment HW: Periodic Trends Chart
9-12	review highlights of the topic 5 assignment discuss the format for the test review for the test HW: Chemical Equation Handbook pages 11-17
13	Unit One Test

AP Chemistry Course Description

Ms. Dunham-Derheimer

Welcome to AP chemistry! In this course, we will review the fundamentals concepts from honors chemistry, solve more advanced problems, and explore several new topics. Since this is a college level course, the work load can be demanding at times. If you have ANY problems, please talk to me IMMEDIATELY. I am available after school for extra help or to discuss any concerns you may have. This is a challenging course, but I have complete faith in your ability to be successful!

General Expectations:

- be familiar with all school policies, including the academic integrity policies
- accept responsibility for your own learning
- take the AP exam in May

Required Materials:

- a calculator that can perform log functions
- a notebook for your class notes, assignments, etc.
- a binder to keep your lab work
- a binder for all test items from previous AP exams

Grading Policy: Your grade will be based on a weighted average of your grades in each of the three following categories. Your grade in each category will be based on total points possible in that category.

- unit test 50%
- lab notebook 25%
- classwork/homework 25%

There are two types of homework assignments:

- “Practice” problems will be assigned to individual students to review each topic. When assigned a practice problem, you will be expected to prepare a brief presentation of the solution to the problem. Full credit will be earned if you explain the problem, have the solution/answer on a transparency, and explain how you solved it. The answer does NOT have to be correct to earn full credit.
- “Homework” problems are collected at the end of each topic. TO receive full credit, these problems must be turned in on time, ALL work must be shown in an organized manner (including significant digits and units), and the answer/explanation must be correct.

Late Assignments:

- If you are absent, you have two days for each day absent to complete what was missed in class. Please see the “current assignments” link on my web page which can be accessed from www.portcharlottehigh.net/
- If you are absent the day an assignment is due, it is due the day you return to school since the due dates are always posted well in advance.

- Late work will be accepted, however a late penalty will be assessed of one letter grade per day. After five days, you will only receive half credit if the assignment is complete.
- If you are absent the day of a test, make sure to make up the test as soon as possible. Again, you have two days to get caught up for every day you are absent.
- Tests and labs can be made up before school, after school, or during school at your convenience.

Extra Help:

- Monday-Thursday **after** school--please be aware that I am very busy before school and will send you away... don't be offended... don't procrastinate...

Overview of the Topics:

- Unit 1: Chemical Foundations
 - Topic 1: Measuring and Classifying Matter
 - Topic 2: Evidence of Atomic Structure
 - Topic 3: Patterns in Formulas and Reactivity
 - Topic 4: Electronic Structure of Atoms
 - Topic 5: Periodic Trends
- Unit 2: Stoichiometry and Reaction Types
 - Topic 6: Stoichiometry
 - Topic 7: Reactions in Solutions
 - Topic 8: Solution Stoichiometry
- Unit 3: Thermochemistry
 - Topic 9: Calculating Changes in Energy State
 - Topic 10: Calculating Changes in Entropy
 - Topic 11: Free Energy and Spontaneity
- Unit 4: Chemical Bonding
 - Topic 12: Bonding Basics
 - Topic 13: The Localized Electron Model of Covalent Bonding
- Unit 5: Gases
 - Topic 14: Gas Laws and Gas Stoichiometry
 - Topic 15: Kinetic-Molecular Theory
- Unit 6: Solids, Liquids, and Solutions
 - Topic 16: Phases of Matter
 - Topic 17: Phase Changes
 - Topic 18: Solutions
- Unit 7: Kinetics
 - Topic 19: What is Kinetics?
 - Topic 20: Reaction Mechanisms and Integrated Rate Laws
- Unit 8: Equilibrium
 - Topic 21: What is equilibrium?
 - Topic 22: Solving Equilibrium Problems
 - Topic 23: Equilibrium, Free Energy, and Nonstandard Conditions
- Unit 9: Applications of Aqueous Equilibria
 - Topic 24: Acid-Base Equilibria
 - Topic 25: Buffers and Titrations
 - Topic 26: Solubility and Complex Ion Equilibria
- Unit 10: Topic 27: Electrochemistry Basics

Unit One: Chemical Foundations

(13 school days)

Topic 1: Measuring and Classifying Matter

Read pages 1-29

Vocabulary to review: physical properties, chemical properties, precision, accuracy, significant digits, dimensional analysis

Make sure that you can:

- state the correct units for base units (see page 14)
- apply the prefixes mega-, kilo-, deci-, centi-, milli-, micro-, and nano- to base units (see page 14)
- identify the correct number of significant digits to keep after performing various calculations
- solve problems using dimensional analysis

ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 32-34 #25-26, 41, 42, 46, 70, 77

Topic 2: Evidence for Atomic Structure

Read pages 37-54

Vocabulary to review: atom, radioactivity, proton, neutron, electron, atomic mass unit, atomic number, mass number, isotope, atomic weight, molecular formula, empirical formula, structural formula

Make sure that you can:

- describe how Dalton's atomic theory explains the laws of conservation of mass, constant composition, and multiple proportions
- write and interpret nuclear symbols for isotopes
- solve problems involving average atomic masses for the isotopes of any element
- identify metals, nonmetals, metalloids, and noble gases from the periodic table
- identify empirical and molecular formulas from a description of from a structural formula

ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 71-73 #8, 10, 18, 20, 24, 29, 30, 36, 42

Topic 3: Patterns in Formulas and Reactivity

Read pages 55-67, 79-90

Vocabulary to review: ion, cation, anion, ionic compound, oxyanions, hydrocarbons, alkanes, alcohols, reactants, products, combination reactions, decomposition reactions, combustion reactions

Make sure that you can:

- write and interpret nuclear symbols for ions
- write names and formulas for ionic compounds, acids, and simple organic compounds
- balance chemical equations

ASSIGNMENT:

pages 73-74 #48, 60, 62, 64, 66
page 111 #12 (parts a-g)

Topic 4: Electronic Structure of Atoms

Read pages 217-228, 231-243, 246-249

Vocabulary to review: electromagnetic radiation, wavelength, frequency, quantum, photoelectric effect, continuous spectrum, line spectrum, wave functions, orbitals, quantum numbers, electron configurations

Make sure that you can:

- perform calculations involving wavelength and energy, and the energy needed to remove an electron from its ground state
- calculate the energy of electrons at different energy levels and the energy changes when electrons move between ground and excited states
- interpret values for quantum numbers
- apply Pauli's Exclusion Principle, the Aufbau Principle, and Hund's Rule to writing electron configurations and orbital notations

ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 253-255 #15, 22, 26, 36, 50, 52-54, 64, 68 (a-e only)

Topic 5: Periodic Trends

Read pages 261-290

Vocabulary to review: effective nuclear charge, atomic radius, ionic radius, isoelectric series, ionization energy, electron affinity, alkaline metals, alkaline earth metals, halogens, noble gases

Make sure that you can:

- a. explain the periodic trends in effective nuclear charge, atomic radii, ionic radii, ionization energies, electron affinities, metallic character
- b. describe the properties of metals, nonmetals, metalloids, alkali metals, alkaline earth metals, hydrogen, the oxygen group, the halogens, and the noble gases
- c. write equations for various chemical reactions

ASSIGNMENT: *Make sure to explain your answers to questions thoroughly.*

pages 292-295 #9, 14, 24, 33, 42, 49, 54, 57, 59, 65, 73