Targets for the first exam (Ch1-3) in IB/AP chemistry 2008-2009

Chapter 1
ALL students should;

- Recall a definition of chemistry
- Understand the process and stages of scientific (logical) problem solving
- Understand and recall definitions for physical and chemical change
- Know the difference between elements, mixtures and compounds including the difference between heterogeneous and homogeneous mixtures
- Understand and be able to use scientific notation (standard form)
- Recall and use SI units and prefixes
- Be able to convert between units using dimensional analysis
- Understand the concept of derived units and use relationships relating to density
- Recall the meaning of uncertainty and understand and be able to use the rules for determining significant figures and rounding off
- Understand the differences between, and be able to apply, the concepts of accuracy and precision
- Learn, and be able to use, formulae for the conversion of the three different temperature units studied in chapter 1

Chapter 2
ALL students should;

- Recall a very brief history of Atomic Theory
- Know and understand the five main aspects of Dalton's Atomic Theory
- Recall some of the experiments that led to the identification of sub-atomic particles such as the gold foil and the cathode ray tube experiments
- Know the three particles that make up the atom and their relative charges, masses and positions in the atom
- Be able to use the Atomic # and Mass # of an isotope to calculate the numbers of protons, neutrons and electrons present
- Know what the term isotope means and be able to perform simple calculations relating to isotopic data
- Know the approximate locations of metals, non-metals and metalloids on the periodic table
- Understand the meaning of the terms Molecule and Ion
- Learn the lists of common anions and cations (including polyatomic ions) studied in chapter 2
- Know how to combine those anions and cations in the correct proportions to form ionic compounds with no net charge
- Be able to name binary ionic compounds of a metal and a non-metal
- Be able to name binary molecular compounds of two non-metals
- Be able to name simple binary acids
- Be able to name ionic compounds containing polyatomic anions
- Be able to name oxoacids and compounds containing oxoanions such as sulfuric acid, H_2SO_4
- Be able to name hydrated salts

Chapter 3
ALL students should;

- Be able to write chemical equations in words
- Be able to write chemical equations using chemical formulae and chemical symbols (this requires knowledge, and correct use of, chemical nomenclature)
- Understand, and be able to use, state symbols as part of chemical equation writing
- Be able to balance chemical equations
- Understand why balancing chemical equations is important
- Understand the concept of percentage by mass
- Be able to calculate empirical formulae from percentage by mass data
- Be able to convert empirical formulae to molecular formulae by using Molar Mass data
- Understand and be able to apply the concept of the mole in chemical calculations (including the application of Avogadro's number)
- Be able to use combustion data to calculate empirical formulae of compounds
- Understand the importance of, and be able to apply, the concept of stoichiometric coefficients relating to reacting ratios
- Know how to calculate the number of moles of a solid substance present in a reaction from data
- Be able to calculate the formulae of hydrated salts from experimental data
- Understand, and be able to apply, the concept of a limiting reactant
- Understand, and be able to apply, the concept of percentage yield