

AP Chemistry Summer Assignment 2021

Prerequisites:

AP Chemistry is intended to be a second-year chemistry course. It is assumed that prior to taking AP Chemistry, you have successfully completed a Chemistry I course (with at least a B average). The College Board also recommends that students have successfully completed an Algebra II course (or at the very least be familiar with logarithms). Due to the intense nature of the course curriculum, and the limited amount of time prior to the AP exam for covering the material, it is expected that you have a strong grasp of Chemistry I topics. If you need additional practice with these topics, there are resources at www.khanacademy.org/science/chemistry, www.chemmybear.com, and www.gpb.org/chemistry-physics/students/all (in addition to many others out there on the internet). You may also borrow a copy of an older edition AP chemistry textbook over the summer if you would like.

Due to the limited nature of the NTI format during the majority of the 2020-21 school year, please be aware that if you took Advanced or Honors Chemistry, there are topics that you are expected to know prior to taking the AP class and you will need to do some self-study over the summer to be caught up.

Topics Expected to Have Been Mastered in Chemistry I:

- Chemical Foundations (Scientific Method, Measurement, Lab Equipment, Lab techniques, SI System, Significant Figures, Density, Matter, Calculations)
- Atoms, Molecules, and Ions (Fundamental Chemical laws, Historical - Democritus, Dalton, Lavoisier, Thomson, Rutherford, Bohr, Molecules & Ions)
- Stoichiometry (Atomic masses, mole conversions, percent composition, empirical formula, molecular formula, chemical equations, balancing equations, stoichiometric calculations, limiting reactants, percent yield)
- Types of Chemical Reactions & Solutions Stoichiometry (types of chemical reactions, precipitation reactions, describing reactions in solution, stoichiometry of precipitation reactions, net ionic equations)
- Gases (Pressure, Boyle's Law, Charles' Law, Avogadro's Law, Ideal Gas Law, Gas Stoichiometry, Dalton's Law of Partial Pressures, Kinetic Molecular Theory, Effusion & Diffusion, Real Gases)
- Atomic Structure & Periodicity (Electromagnetic Radiation, Nature of Matter, Atomic Spectrum of Hydrogen, Bohr model, Quantum-Mechanical Model, Electron Configurations & Rules, History of the Periodic Table, Periodic Trends)
- Bonding (Types of Chemical Bonds, Electronegativity, Bond Polarity and Dipole moments, Ions - electron configurations and sizes, binary ionic compounds, covalent bonds, Lewis structures, exceptions to the octet rule, nomenclature)

There will be a chemical nomenclature (names and formulas of chemical compounds) test on the **SECOND** day of class. Keep in mind that in AP Chemistry you need to have the common polyatomic ions and their charges **MEMORIZED** (this is the same list that you were expected to know in MST Chemistry; those who took other courses will need to learn these over the summer) and the periodic table that is allowed to be used only has element symbols and not element names. Since nomenclature is a foundational concept of chemistry, there will be weekly nomenclature quizzes throughout the year as well.

AP Chemistry Preview

The first unit of AP Chemistry will cover solutions chemistry and basic solubility concepts (Chapters 4 & 11 in Zumdahl Chemistry and Chapters 4 & 13 in Brown & LeMay Chemistry: The Central Science). The following topics are expected to be done during the summer (this was covered in MST Chemistry; will most likely be new material for those who took other courses):

- Hydration
- Strong and Weak Electrolytes
- Molarity
- Dilutions
- Precipitation Reactions
- Solubility Rules
- Complete and Net Ionic Equations
- Stoichiometry of Precipitation Reactions
- Acid-Base Neutralization
- Oxidation-Reduction Reactions
- Solution Composition
- Energies of Solution Formation
- Factors Affecting Solubility
- Vapor Pressures of Solutions

There will be a test over these concepts on the fourth class day, so if you haven't studied the material, you will already be behind. Some suggested problems are included with this summer assignment. A solutions manual for the 9th edition Zumdahl can be found in the AP Chemistry notes Dropbox file as well as electronic copies of both the 8th and 9th edition Zumdahl textbooks. I highly recommend getting an AP Chemistry review book as a supplement as well. Just because there isn't a *physical* summer assignment that you have to turn in for a grade, doesn't mean that you shouldn't put in the prep time/work to be successful for the two tests that you will have within the first few days of school.

If you would like to get early access to the AP Chemistry notes Dropbox file, email me and I will add you.

AP Chemistry requires significant preparation and study on the part of the student. Make sure that your work skills are honed for the coming year. Expect to spend time on the class every day.