**AP Chemistry Student Syllabus (2019-2020)**

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Textbook: Zumdahl, Steven S., Susan A. Zumdahl, and Donald J. DeCoste. *Chemistry* (AP Edition). 10th edition. National Geographic Learning/Cengage Learning.

**Course Overview:** AP Chemistry is one year class equivalent to that of a freshman-level college chemistry course. It will be extremely rigorous, requiring background in Pre-AP Chemistry, plus a high level of confidence and skills in mathematics. AP Chemistry involves applying logic and critical thinking to show a depth of understanding. The goal of AP Chemistry is to provide the student a foundation in which to understand the structure and properties of chemical substances and to make predictions in regards to energy movement in a system. By nature, this course is lab-based with special emphasis on quantitative and qualitative methods of analysis. You are expected to complete all of your assigned readings and homework prior to coming to class, so you are prepared to participate in class discussions and problem solving activities. This is a very easy course to fall behind in quickly if you are not prepared and do not keep up with the pace of the course.

**Topics**

Unit 1. Foundational Topics-Names & Formulas, Types of Reactions & Equations, Stoichiometry

 (Chp1, Ch 2, Ch 3)

Unit 2. Reactions & Solutions (Chp4)

Unit 3. Gases (Chp5)

Unit 4. Thermochemistry -Enthalpy, Calorimetry, Hess’s Law (Chp6)

Unit 5. Atomic Structure & Periodicity (Chp7)

Unit 6. Bonding- Types of Bonds, Models, Lewis Structures, VSEPR, Resonance (Chp8&9)

Unit 7. States of Matter & IMF-Intermolecular Forces, Liquids & Solids, Metallic bonds, state

changes (chp10)

Unit 8. Kinetics (Chp12)

Unit 9. Equilibrium 1-Keq, Kp, Ksp, Le Chatelier's principle (Chp13&16)

Unit 10. Equilibrium 2-Ka, Kb, Kw & buffers (Chp14&15)

Unit 11. Thermodynamics-Spontaneity, entropy & free energy (Ch17)

Unit 12. Electrochemistry (Chp18)

**AP Chemistry Test Date: TBA**

**STRUCTURE OF THE COURSE:**

AP Chemistry is built around six big ideas and seven science practices. The big ideas are:

**Big Idea 1**: The chemical elements are fundamental building materials of matter, and all

matter can be understood in terms of arrangements of atoms. These atoms retain their

identity in chemical reactions.

**Big Idea 2**: Chemical and physical properties of materials can be explained by the

structure and the arrangement of atoms, ions, or molecules and the forces between them.

**Big Idea 3**: Changes in matter involve the rearrangement and/or reorganization of atoms

and/or the transfer of electrons.

**Big Idea 4**: Rates of chemical reactions are determined by details of the molecular

collisions.

**Big Idea 5**: The laws of thermodynamics describe the essential role of energy and explain

and predict the direction of changes in matter.

**Big Idea 6**: Any bond or intermolecular attraction that can be formed can be broken.

These two processes are in a dynamic competition, sensitive to initial conditions and

external perturbations.

The **science practices for AP Chemistry** are designed to get the students to think and act

like scientists. The science practices are:

**Science Practice 1**: The student can use representations and models to communicate

scientific phenomena and solve scientific problems.

**Science Practice 2:** The student can use mathematics appropriately.

**Science Practice 3:** The student can engage in scientific questioning to extend thinking

or to guide investigations within the context of the AP course.

**Science Practice 4**: The student can plan and implement data collection strategies in

relation to a particular scientific question.

**Science Practice 5**: The student can perform data analysis and evaluation of evidence.

**Science Practice 6**: The student can work with scientific explanations and theories.

**Science Practice 7**: The student is able to connect and relate knowledge across various

scales, concepts, and representations in and across domains.

**Grading**: Grades will be determined using a straight percentage of points earned over points possible, including tests, quizzes, labs, projects and homework.

The grading scale used at Central High School is:

A 92-100

B 84-91

C 74-83

D 64-73

Many of the tests and quizzes will be similar in style to the AP Chemistry test. This practice will ensure that students are familiar with the wording, format and rigor of the AP test.

**What is needed**:

Homework notebook, bond lab notebook, scientific calculator, positive attitude, willingness to take risks, open-mind to new ways of learning and thinking!

**Labs**

A minimum of 25% of student contact time will be spent doing hands-on laboratory activities. **[CR5a]**

See hand AP Chemistry Lab hand out for lab report format

**The exam**

**Multiple Choice:** 60 questions in 90 minutes. No penalty for incorrect answers. Calculators not permitted

**Free Response**: 3 long and 4 short questions in 90 minutes. Calculators permitted for entire section.

* To receive a **FIVE** on the AP Chemistry exam: You need about **63% correct** on the exam.
* To receive a **Three** on the AP Chemistry exam: about **50% correct** on the exam