

Course Outline
AP Chemistry
Citrus Valley High School

Instructor: Dr. Stover

Email: michelle_stover@redlands.k12.ca.us

Classroom: E144

Ext#: 35544

Letter to Parent(s)/Guardian:

Welcome to AP Chemistry. My name is Dr. Stover and I will be your son's/daughter's teacher this year. I am delighted to have your student in my class. I plan to help all my students acquire a deep and rich understanding of chemistry and of its real-life application around them. I want to teach them the knowledge and skills they need to gradually transition from school work to real world work in order to become responsible young adults. I am looking forward to working with you to make this school year an excellent learning experience for your student.

This course is not a college preparatory course. This is the college course. It is equivalent of the general chemistry course taken during the first year of college year. **Review of Chemistry I** is necessary, but there will be a lot of new information learned that are important for succeeding in both the course and in the AP test. Due to the fast pace of the course, **students are expected to do a lot of independent studies** that will better prepare them for the day to day lessons. **Getting behind is not an option.** Everyone taking the course will have the **opportunity** to take the AP test in May.

Goals of the Course

- Students are challenged to have critical and logical minds that will better prepare them for college.
- Students will learn to work through challenging situations and to find the solution to accomplish their goals.
- Students will finish this program with confidence that they will achieve an acceptable score on the AP examination.

Requirements

Students should have taken General Chemistry with a grade of C or better.

All experiments will require students' understanding of lab safety procedures. AP Chemistry Labs are comparable to college-level chemistry laboratories.

Lab Student Manual:

- CollegeBoard, AP Chemistry Guided-Inquiry Experiments: Applying the Science Practices, 2019

Textbooks

- Steven S. Zumdahl and Susan A. Zumdahl, Zumdahl Chemistry, 10th edition
- **Supplementary Text**
- Crashing the Board by A. Dingle
- John T. Moore, 5 steps to a 5 on the AP: Chemistry or any AP Chemistry review book

Online Resources:

- Clever
- docstover.org (class website)
- AP Classroom
- PhET
- Google classroom

Activity Resource:

- ChEsRm (Chemistry Escape Room)
- ChemQuest

Materials

Please bring the following to class daily:

- Technology (chromebooks)
- Binder -1 ½ inch (2 – 1 for each semester) or ½ inch per unit
- Blue/black pen, #2 pencil
- Highlighter (optional)
- Red pens
- Scientific calculator
- Loose Leaf Paper

Absences

Daily attendance is essential because each lesson is important in understanding succeeding lessons. For excused absences, students will be given **one day** to complete work missed. After that day, **late work gets half a credit. After the first week, late work will not be accepted and will get a grade of zero.** Weekly calendar will be provided on the class website and in class so that students don't fall behind. Everyone is expected to come prepared for the class.

Homework – Unit Topic

Lecture Notes are the Topic homework. The answer keys to 'You Do' are posted on website under **Homework** navigation bar. They are there for your use, but 'You Do' means you have to do the work first and then use the key to correct your work and learn from your mistakes.

Work with annotations will be stamped on due dates. NO late work.

Test/Quizzes

Unit tests and quizzes are given within the unit. Students who missed these are given a week to make up for it. Check calendar on the website.

After a week that a test is not made up, a grade of zero will be given.

Test/Quiz Analysis

Students have opportunities to improve their scores through analysis or test corrections. This helps them learn from their mistakes and get better at test-taking. They must follow the format and the deadline stated to get credit.

Late test correction is not accepted.

Laboratory Experiment

Students spend 100 minutes a week on virtual labs. Pre-lab work is given so students can prepare for the lab. Labs are due at the end of each lab, or when specified. Make up for a lab is assigned the week that the lab is missed.

After a week that lab is not made up, a grade of zero is given.

Interactive Binder

Two 1 ½” binders are required, one per semester. Student work are organized into this binder. Please follow format, pages and bring this always with you. Binder grading happens at the end of each unit. These are work collected overtime and will reflect a big chunk of your grade.

Lab Report

Students must follow a lab report format that states the verbal, written and graphic communication skills through use of literature or scientific investigations, and oral, written, and graphic representations.

The components of the lab are:

- | | |
|--|------------------------------------|
| 1. Objective (the purpose) | 5. Data Tables/Result |
| 2. Abstract (what is the experiment about/ concepts being studied) | 6. Graphs (if any) |
| 3. Pre-lab (answer all questions) | 7. Calculations (if any) |
| 4. Procedures (flow chart) | 8. Post Lab (answer all questions) |
| | 9. Discussion of Errors |
| | 10. Conclusion |

Grading

Grades are calculated as an average of total points earned over points possible as follows:

Assessments (unit or chapter tests) = 50% Homework = 20% Class work (quizzes, laboratory, class work, class participation and projects) = 20% Final Exam = 10%

An overall grade from:

100%-98% is an A+; 97%-94% is an A; 93%-90% is an A-;

89%-87% is a B+; 86%-84% is a B; 83%-80% is a B-;

79%-77% is a C+; 76%-74% is a C; 73%-70% is a C-; 69%

and below is a non-proficient grade.

Schedule

This is the planned schedule for the year. It may or may not work depending on school activities that day. Otherwise, the test dates are set for your planning purposes. Use the resources available to you.

First Semester

Unit	Topics	Resources to Use
1	Atomic Structure and Properties <ul style="list-style-type: none">• 1.1 Moles and Molar Mass• 1.2 Mass Spectroscopy of Elements• 1.3 Elemental Composition of Pure Substances• 1.4 Composition of Mixtures• 1.5 Atomic Structure and Electron Configuration• 1.6 Photoelectron Spectroscopy• 1.7 Periodic Trends• 1.8 Valence Electrons and Ionic Compounds Lab: Guided Inquiry: Spectroscopy	Zumdahl Chapters: 2,3,4 ,5 and 7 Summer Review Packet ChemQuest POGIL Activity Class Review Book Guided-Inquiry Lab Manual
2	Molecular and Ionic Compound Structure and Properties <ul style="list-style-type: none">• 2.1 Types of Chemical Bonds• 2.2 Intramolecular Force and Potential Energy• 2.3 Structure of Ionic Solids• 2.4 Structure of Metals and Alloys• 2.5 Lewis Diagrams• 2.6 Resonance and Formal Charge• 2.7 VSEPR and Bond Hybridization Lab: Guided Inquiry Lab: Chromatography Bonding in Solids Molecular Models	Zumdahl Chapters: 8 10, and 21, ChemQuest POGIL Activity Class Review Book Guided-Inquiry Lab Manual

<p>3</p>	<p>Intermolecular Forces and Properties</p> <ul style="list-style-type: none"> • 3.1 Intermolecular Forces • 3.2 Properties of Solids • 3.3. Solids, Liquids, and Gases • 3.4 Ideal Gas Law • 3.5 Kinetic Molecular Theory • 3.6 Deviation from Ideal Gas Law • 3.7 Solutions and Mixtures • 3.8 Reperesentations of Solutions • 3.9 Separation of Solutions and Mixtures Chromatography • 3.10 Solubility • 3.11 Spectroscopy and Electromagnetic Spectrum • 3.12 Photoelectric Effect • 3.13. Beer-Lambert Law <p>Lab: Chromatography Lab Gas Law Smorgasbord</p>	<p>Zumdahl Chapter: 1, 3, 4, 5, 10, 11 ChemQuest POGIL Activity Unit 3 Module Bozeman Videos Class review Book Guided Inquiry Lab Manual</p>
<p>4</p>	<p>Chemical Reactions</p> <ul style="list-style-type: none"> • 4.1 Introduction for Reactions • 4.2 Net Ionic Equations • 4.3 Representation of Reactions • 4.4 Physical and Chemical Chages • 4.5 Stoichiometry • 4.6 Introduction to Titration • 4.7 Types of Chemical Reactions • 4.8 Introduction to Acids-Base Reactions • 4.9 Oxidation Reduction (Redox) Reactions <p>Lab: Precipitate Lab</p>	<p>Zumdahl Chapters: 3 and 4 ChemQuest POGIL Activity Unit 4 Module Bozeman Videos Class Review Book Guided-Inquiry Lab Manual</p>

5	<p>Kinetics</p> <ul style="list-style-type: none"> • 5.1 Reaction Rate • 5.2 Introduction to Rate Law • 5.3 Concentration Changes Over Time • 5.4 Elementary Reactions • 5.5 Collision Model • 5.6 Reaction Energy Profile • 5.7 Introduction to Reaction Mechanisms • 5.8 Reaction Mechanism and Rate Law • 5.9 Steady State Approximation • 5.10 Multistep Reaction Energy Profile • 5.11 Catalysis <p>Lab: Determination of the Rate and Order For the Decomposition of Hydrogen Peroxide</p>	<p>Zumdahl Chapter 12 ChemQuest POGIL Activity Unit 4 Module Bozeman Videos Class Review Book Guided-Inquiry Lab Manual</p>
Final's Review	Units 1-5	
Final Exams		

Second Semester

6	Thermodynamics <ul style="list-style-type: none">• 6.1 Endothermic and Exothermic Processes• 6.2 Energy Diagram• 6.3 Heat Transfer and Thermal Equilibrium• 6.4 Heat capacity and Calorimetry• 6.5 Introduction to Entahlpy pf Reaction• 6.7 Bond Enthalpies• 6.8 Enthalpy of Formation• 6.9 Hess's Law Lab: Calorimetry	Zumdahl Chapter 6 and 16 ChemQuest POGIL Activity Unit 5 Module Bozeman Videos Class Review Book
---	--	---

7	<p>Equilibrium</p> <ul style="list-style-type: none"> • 7.1 Introduction to Equilibrium • 7.2 Direction of Reversible Reactions • 7.3 Reaction Quotient and Equilibrium Constant • 7.4 Calculating Equilibrium Constant • 7.5 Magnitude of the Equilibrium Constant • 7.6 Properties of the Equilibrium Constant • 7.7 Calculating Equilibrium Concentrations • 7.8 Representations of Equilibrium • 7.9 Introduction to Le Chatelier's Principle • 7.10 Reaction Quotient and Le Chatelier's principle • 7.11 Introduction to Solubility Equilibria • 7.12 Common Ion Effect • 7.13 pH and Solubility 	<p>Zumdahl Chapter 13, 14, 15 and 16 ChemQuest POGIL Activity Unit 6 Module Bozeman Videos</p>
	<ul style="list-style-type: none"> • 7.14 Free Energy and Dissolution <p>Lab: Equilibrium Lab: Can We make the Colors of the Rainbow Le Chatelier's Station Lab</p>	

8	<p>Acids and Bases</p> <ul style="list-style-type: none"> • 8.1 Introduction to Acids and Bases • 8.2 pH and pOH of Strong Acids and Bases • 8.3 Weak Acid and Base Equilibria • 8.4 Acid-Base Reactions and Buffers • 8.5 Acid-Base Titrations • 8.6 Molecular Structure of Acids and Bases • 8.7 pH and pKa • 8.8 Properties and Buffers • 8.9 Henderson-Hasselbalch Equation • 8.10 Buffer Capacity <p>Lab: Titration Alka Seltzer Lab</p>	<p>Zumdahl Chapter 12</p> <p>ChemQuest</p> <p>POGIL Activity</p> <p>Unit 4 Module</p> <p>Bozeman Videos</p> <p>Class Review Book</p> <p>Guided-Inquiry Lab Manual</p>
9	<p>Applications of Thermodynamics</p> <ul style="list-style-type: none"> • 9.1 Introduction to Entropy • 9.2 Absolute Entropy and Entropy Change • 9.3 Gibbs Free Energy and Thermodynamic Favorability • 9.4 Thermodynamic and Kinetic Control • 9.5 Free Energy and Equilibrium • 9.6 Coupled Reactions • 9.7 Galvanic (Voltaic) Cells and Electrolytic Cells • 9.8 Cell Potential and Free Energy • 9.9 Cell Potential Under Non-Standard Conditions • 9.10 Electrolysis and Faraday's Law <p>Lab: Calorimetry Potato lab Electrolysis Lab</p>	<p>Zumdahl Chapter 6 and 16</p> <p>ChemQuest</p> <p>POGIL Activity</p> <p>Unit 5 Module</p> <p>Bozeman Videos</p> <p>Class Review Book</p>

AP Review	ALL Units (1-9) 2 Full length practice tests (3 hours) outside of class time Final Exams (3 hours) on all units, outside of class time)	3 weeks before the test in May
--------------	--	--------------------------------

Sign Sheet Section to be turned in

Please fill in the following information and provide phone number(s) where I can contact you or leave a message concerning your student. Please include email if available because I find this a very useful tool of communication also.

Student's name: _____

Father's name: _____

Contact Number: _____

Email: _____

Mother's name: _____

Contact Number: _____

Email: _____

Please list any information that I should be aware of that may limit participation in certain class or laboratory activities. Thank you.

Chemistry

“My son/daughter and I have read the student behavior contract and agree to abide by these rules, or as a parent, help my student to keep these rules by: providing a quiet place for them to work, encouraging them to do their best, complimenting them when they do well, seeing that they get enough sleep at night, and get a nutritious breakfast in the morning.”

Student Name: _____

Period: _____

Student Signature: _____

Parent/Guardian Signature: _____

Date: _____