WHEATON, AP CHEMISTRY
CLASS EXPECTATIONS AND PROCEDURES

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Textbook
Brown, LeMay, Bursten, Chemistry, The Central Science, 14th edition.

Materials

- Internet access
- A computer or chromebook (phones are not ideal)
- A place to keep any notes you take (either digital or a physical notebook)
- A calculator with scientific functions (or https://www.desmos.com/calculator)

Expectations
An AP chemistry class takes a lot of time and effort on your part. A lot will be asked of you, but you will also be granted a large degree of independence to learn. However, independence and responsibility go hand in hand. Therefore, you will be expected to behave in a polite, respectful, and responsible manner.

Grading and Reporting:

- Work for practice/preparation will account for 10% of the grade. Assignments in this category will start with the prefix PA.
- All other assignments ("all tasks/assessments") will account for 90% of the course grade, and will be assessed and given feedback based on accuracy and/or adherence to the rubric for the assignment (as appropriate). Assignments in this category will start with the prefix FA or SUM, depending on if it's a formative or summative assessment.

No grade lower than a 50% will be assigned to a **completed** task/assessment. If a teacher determines the student did not attempt to meet the basic requirements of the task/assessment, or if the student did not adhere to the academic honesty policy, the teacher may assign a zero.

Assignment names will also reflect if something can be revised or redone by having the suffix "R". Being able to redo an assignment will generally require some form of reteaching or remediation prior to being able to resubmit or retake the assignment. The reassessment grade replaces the original grade, if higher than the grade previously earned.

A Z in the Gradebook may be used to denote that the student did not turn in an assignment by the due date but may still turn it in. A "Z" will calculate as a zero in the Gradebook. Work turned in late will be lowered by one letter grade or 10 percent of the grade. If the student does not turn in the assignment after support and intervention, the teacher should change the Z to a zero.

Zoom Live Sessions:

The expectation is that students attend live classes and turn their cameras on for the entirety of class. The live lessons will be recorded and posted on MyMCPS Classroom. Access to the video will be limited to students in the class with MCPS email accounts. The video will not be downloadable. Recordings will be available for 72 hours and will automatically delete after that time. Parents/guardians can OPT OUT of recording by completing MCPS Form 281-13. Students may not record, download, or screenshot any part of the lesson. Unauthorized sharing will result in disciplinary action.

Asynchronous Video Lessons and Discussion Boards:

Zoom Live Sessions will be used for modeling examples and providing support for practice problems. They may also be used for virtual laboratory assignments, free response and multiple choice question practice, and formative and summative assessment. In order to meet the needs of the College Board curriculum and still be prepared for the exam in May, students will be expected to watch asynchronous video lessons in order to take lecture notes and complete discussion boards with their peers. College Board is providing Daily Topic Videos on AP Classroom that are about 8 minutes long. These are an example of an asynchronous video lesson students may be required to watch. These videos are skill-based and focus on the application of the content. Mrs. Paul and Mr. Dorsch both have recorded their own asynchronous lessons for AP Chemistry as well. These videos are approximately 20 minutes long and go further in depth with respect to the content.

Attendance:

Attendance will be taken in these ways:

- Logging into the live zoom session
- Engaging in a discussion thread or attendance check on MyMCPS Classroom
- Completing daily classwork.

If a student misses class, the video recording may be watched within the 72 hour period. Complete the school google form on the Wheaton High School website to have the absence entered as “Present - other.”

We will be using breakout rooms throughout this semester. Here are the ground rules for break out rooms.

Break Out Sessions—Ground Rules

- No break out sessions will be recorded unless there is a legitimate educational reason for doing so, and if so, students and parents will be notified.
- All provisions of the Student Code of Conduct apply in break out rooms will be enforced
- Students acting out during break out sessions will, at a minimum, not be able to engage in break out sessions and will be given alternate assignments

Chemistry Problems

I emphasize both the PROCESS and the FINAL ANSWER when you solve chemistry problems. You will be required to show the formula, plug in the numbers and units, and express your final answer with correct significant figures as well as the final units. Full credit will not be awarded if only the final answer is provided. Make sure that you are able to take a problem and identify the "approach" you are going to use to solve it. The ability to classify the chemistry problems is a very important aspect to this class - analyze, evaluate, classify!

AP Exam

You will be expected to register and sit for the AP chemistry exam in May. It is not an easy test, but with some good effort and hard work in this class you will be VERY WELL prepared for it. With dedication from BOTH of us, we will not only make this a good experience for everyone, but also prepare you well for whatever ETS will throw your way!

LET'S ENJOY THIS TIME TOGETHER!

AP Chemistry Syllabus

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Course Description

This AP Chemistry course is designed to be the equivalent of the general chemistry course usually taken during the first year of college. For most students, the course enables them to undertake, as freshmen, second-year work in the chemistry sequence at their institution or to register in courses in other fields where general chemistry is a prerequisite. This course is structured around the four big ideas articulated in the AP Chemistry curriculum framework provided by the College Board. A special emphasis will be placed on the six science practices, which capture important aspects of the work that scientists engage in, with learning objectives that combine content with inquiry and reasoning skills. AP Chemistry is open to all students that have completed a year of chemistry who wish to take part in a rigorous and academically challenging course.

Big Idea 1: SCALE, PROPORTION, AND QUANTITY (SPQ)
Big Idea 2: STRUCTURE AND PROPERTIES (SAP)
Big Idea 3: TRANSFORMATIONS (TRA)
Big Idea 4: ENERGY (ENE)

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Required Materials:

Notebook to hold all handouts, labs, and returned papers
Section in notebook or spiral for note taking
Black and White composition book for lab reports
Scientific Calculator (a graphing calculator is recommended)
Black or blue pens (for the lab notebook)

Advanced Placement Chemistry-The Laboratory Notebook

A record of lab work is an important document, which will show the quality of the lab work that you have performed. The labs require following or developing processes and procedures, taking observations, and data manipulation. You will communicate and collaborate in lab groups; however, each of you will write a laboratory report in a lab notebook for every lab you perform.

The 14 Parts of a Laboratory Report

A specific format will be followed for each lab. You will label all sections very clearly. AP Chemistry lab reports are much longer and more in depth than the ones completed in the first year chemistry course. Therefore, it is important that you don't procrastinate when doing pre-lab and post-lab work. Late labs will not
be accepted. Labs not completed in class must be done at lunch or after school by appointment.

Pre-Lab Work

Pre-lab work is to be completed and turned in on the day the lab is performed.

1. Title

The title should be descriptive. For example, “pH Titration Lab" is a descriptive title and "Experiment 5"is not a descriptive title.

2. Date

This is the date you performed the experiment.

3. Objective

A purpose is a statement summarizing the "point" of the lab.

4. Hypothesis

An educated guess of what you think the result will be.

5. Materials

Any equipment or chemical used to complete the lab.

6. Preparation of Solutions

Show how to make the correct concentration needed of the solution from the stock.

7. Pre-Lab Questions

You will be given some questions to answer before the lab is done. You will need to either rewrite the question or incorporate the question in the answer. The idea here is that when someone (like a college professor) looks at your lab notebook, they should be able to tell what the question was by merely looking at your lab report. It is important to produce a good record of lab work.

8. Procedure Outline

You need to write an outline of the procedure. You should use bulleted statements or outline format to make it easy to read. If you are doing a guided inquiry lab, you will be required to write a full procedure that you develop.

9. Data Tables

You will need to create data tables or charts necessary for data collection in the lab.

During the Lab

10. Data

You need to record all your data directly in your lab notebook. You are not to be recording data on a separate lab sheet. You need to label all data clearly and always include proper units of measurement. You should underline, use capital letters, or use any device you choose to help organize this section well. You should space things out neatly and clearly.

Post-Lab Work

11. Calculations and Graphs

You should show how calculations are carried out. Graphs need to be titled, axes need to be labeled, and units need to be shown on the axis. To receive credit for any graphs, it must be at least half a page in size.

12. Conclusions

This will vary from lab to lab. It is expected that all conclusions will be well thought out and well written.

13. Discussion of Theory

What theory was demonstrated in this experiment? What do the calculations show? How was the purpose of the experiment fulfilled?

14. Experimental Sources of Error

What would you do differently if you were to repeat the experiment?

AP CHEMISTRY COURSE CONTENT

Units	Exam Weighting
Unit 1: Atomic Structure and Properties	7–9%
Unit 2: Molecular and Ionic Compound Structure and Properties	7–9%
Unit 3: Intermolecular Forces and Properties	18–22%
Unit 4: Chemical Reactions	7–9%
Unit 5: Kinetics	7–9%
Unit 6: Thermodynamics	7–9%
Unit 7: Equilibrium	7–9%
Unit 8: Acids and Bases	11–15%
Unit 9: Applications of Thermodynamics	7–9%

Unit 1: Atomic Structure and Properties

Topics

1.1 Moles and Molar Mass	1.5 Atomic Structure and Electron Configuration
1.2 Mass Spectroscopy of Elements	1.6 Photoelectron Spectroscopy
1.3 Elemental Composition of Pure Substances	1.7 Periodic Trends
1.4 Composition of Mixtures	1.8 Valence Electrons and Ionic Compounds

Labs:

- *Synthesis of Alum Lab
- What Makes Hard Water Hard?

Unit 2: Molecular and Ionic Compound Structure and Properties

Topics

2.1 Types of Chemical Bonds	2.5 Lewis Diagrams
2.2 Intramolecular Force and Potential Energy	2.6 Resonance and Formal Charge
2.3 Structure of Ionic Solids	2.7 VSEPR and Bond Hybridization
2.4 Structure of Metals and Alloys	

Labs:

- *Bonding Dry Lab
- What's in That Bottle?
- Sticky Question: How Do You Separate Molecules That Are Attracted to One Another?

Unit 3: Intermolecular Forces and Properties

Topics

3.1 Intermolecular Forces	3.8 Representations of Solutions
3.2 Properties of Solids	3.9 Separation of Solutions and Mixtures Chromatography
3.3 Solids, Liquids, and Gases	3.10 Solubility
3.4 Ideal Gas Law	3.11 Spectroscopy and the Electromagnetic Spectrum
3.5 Kinetic Molecular Theory	3.12 Photoelectric Effect
3.6 Deviation from Ideal Gas Law	3.13 Beer-Lambert Law
3.7 Solutions and Mixtures	

Labs:

- *Determination of Molar Volume of a Gas
- Using the Principle That Each Substance Has Unique Properties to Purify a Mixture: An Experiment Applying Green Chemistry to Purification
- What Is the Relationship Between the Concentration of a Solution and the Amount of Transmitted Light Through the Solution?

Unit 4: Chemical Reactions

Topics

4.1 Introduction for Reactions	4.6 Introduction to Titration
4.2 Net Ionic Equations	4.7 Types of Chemical Reactions
4.3 Representations of Reactions	4.8 Introduction to Acid-Base Reactions
4.4 Physical and Chemical Changes	4.9 Oxidation-Reduction (Redox) Reactions
4.5 Stoichiometry	

Labs:

- How Can We Experimentally Determine the Mole to Mole Ratio of a Chemical Reaction?
- *Determination of the Percent Water in a Compound and its Empirical Formula

Unit 5: Kinetics

Topics

5.1 Reaction Rates	5.7 Introduction to Reaction Mechanisms
5.2 Introduction to Rate Law	5.8 Reaction Mechanism and Rate Law
5.3 Concentration Changes Over Time	5.9 Steady-State Approximation
5.4 Elementary Reactions	5.10 Multistep Reaction Energy Profile
5.5 Collision Model	5.11 Catalysis
5.6 Reaction Energy Profile	

Labs:

- *Determination of the Rate of a Reaction, Its Order, and Its Activation Energy
- How Long Will That Marble Statue Last?
- What Is the Rate Law of the Fading of Crystal Violet Using Beer's Law?

Unit 6: Thermodynamics

Topics

6.1 Endothermic and Exothermic Processes	6.6 Introduction to Enthalpy of Reaction
6.2 Energy Diagrams	6.7 Bond Enthalpies
6.3 Heat Transfer and Thermal Equilibrium	6.8 Enthalpy of Formation
6.4 Heat Capacity and Calorimetry	6.9 Hess's Law
6.5 Energy of Phase Changes	

Labs:
The Hand Warmer Design Challenge: Where Does the Heat Come From?

Unit 7: Equilibrium

Topics

7.1 Introduction to Equilibrium	7.8 Representations of Equilibrium
7.2 Direction of Reversible Reactions	7.9 Introduction to Le Châtelier's Principle
7.3 Reaction Quotient and Equilibrium Constant	7.10 Reaction Quotient and Le Châtelier's Principle
7.4 Calculating the Equilibrium Constant	7.11 Introduction to Solubility Equilibria
7.5 Magnitude of the Equilibrium Constant	7.12 Common-Ion Effect
7.6 Properties of the Equilibrium Constant	7.13 pH and Solubility
7.7 Calculating Equilibrium Concentrations	7.14 Free Energy of Dissolution

Labs:

- *Determination of the Equilibrium Constant for a Chemical Reaction
- Can We Make the Colors of the Rainbow? An Application of Le Châtelier's Principle

Unit 8: Acids and Bases

Topics

8.1 Introduction to Acids and Bases	8.6 Molecular Structure of Acids and Bases
8.2 pH and pOH of Strong Acids and Bases	8.7 pH and pKa
8.3 Weak Acid and Base Equilibria	8.8 Properties of Buffers
8.4 Acid-Base Reactions and Buffers	8.9 HendersonHasselbalch Equation
8.5 Acid-Base Titrations	8.10 Buffer Capacity

Labs:

- *Standardization of NaOH
- *Determination of Concentration by Acid-Base Titration

Unit 9: Applications of Thermodynamics

Topics

9.1 Introduction to Entropy	9.6 Coupled Reactions
9.2 Absolute Entropy and Entropy Change	9.7 Galvanic (Voltaic) and Electrolytic Cells
9.3 Gibbs Free Energy and Thermodynamic Favorability	9.8 Cell Potential and Free Energy
9.4 Thermodynamic and Kinetic Control	9.9 Cell Potential Under Nonstandard Conditions
9.5 Free Energy and Equilibrium	9.10 Electrolysis and Faraday's Law

Labs:

- *Determination of an Electrochemical Series
- How Can We Determine the Enthalpy of Neutralization for Phosphoric Acid?

AP Review

4 AP Style Review Exams

Mock AP

Labs/Final Project