

AP Chemistry Syllabus 2017 – 2018 School Year

Parents and Students,

Welcome to Shaw High School and AP Chemistry. Please feel free to contact me at 569-3638 if you have any questions, but email is the best way to reach me.

You may also contact me by email if you have any questions or would like an update on your student.

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The school's website is <https://sites.muscogee.k12.ga.us/shaw/>

Course Description:

The purpose of Advanced Placement Chemistry is to provide a college level course in chemistry and to prepare the student to seek credit and/or appropriate placement in college chemistry courses. The course will include lecture and problem solving sessions and a lab that relates directly to the objective being taught. The course provides lab experience and an emphasis is put on the safety of the student. Students are engaged in hands-on laboratory work, integrated throughout the course that accounts for more than 25% of the class time. [CR5a] Emphasis is placed on depth of understanding of a topic, rather than breadth of topics.

Objectives:

Students will:

1. Learn the inquiry process through numerous laboratory investigations.
2. Gain an understanding of the six big ideas as articulated in the AP Chemistry Curriculum Framework.
3. Apply mathematical and scientific knowledge and skills to solve quantitative, qualitative, spatial, and analytic problems.
4. Apply basic arithmetic, algebraic, and geometric concepts.
5. Formulate strategies for the development and testing of hypotheses.
6. Use basic statistical concepts to draw both inferences and conclusions from data.
7. Identify implications and consequences of drawn conclusions.
8. Use manipulative and technological tools including the Texas Instruments, Vernier Lab Quests and Vernier Probes.
9. Measure, compare, order, scale, locate, and code accurately.
10. Do scientific research and report and display the results of this research.
11. Learn to think critically in order to solve problems.

Materials:

- 1 or 1 ½ inch 3-ring binder for science class only
- **Scientific** calculator. (Graphing calculator is preferred.)
- **Book Cover.** ONLY paper book covers allowed. NO cloth or adhesive.
- **Textbook:** Zumdahl...cost \$122.67

Grading Policy:

- Your grade will be determined using the following formula.
 - **Assignment Folder containing classwork/homework for the unit**
 - **Quizzes**
 - **Tests**
 - **Labs**
 - **Projects**

Absences:

- If present the day work is assigned but absent the day it is due, the work **MUST** be turned in the first day student returns to school.
- Excused absences: students have 3 days to make up work missed.
- Missed labs will have to be made up after school.
- Unexcused absences result in zeros for missed work.
- Tests are announced in advance. If the student misses the day before the test, they **WILL** take the test with the rest of the class.

Behavior Expectations:

1. Be in your assigned seat and ready for class when the bell rings.
2. Bring your book, notebook, paper, pencil and homework to class **every day**.
3. Show respect for your teacher and your peers.
4. Pay attention to and follow the instructions given by the instructor and participate in class activities.
5. Follow instructions and safety rules in the lab.
6. Follow the policies set forth in the Code of Conduct handbook established by MCSD and Shaw High School.
7. No food, candy or drinks in class at any time.
8. **VERY IMPORTANT:** Absolutely no spraying of perfume or body spray or application of any lotion or hand sanitizer. The chemicals in class may interact with these and cause irritation or other problems.

Detention:

Detention will be assigned for inappropriate behavior. (3:30 – 4:00) When students are assigned detention, they are expected to make arrangements to stay the following day. **Think about the difficulty this may cause and try to avoid behaviors that would cause you to receive detention. Missed detention results in two days, if those are missed, a referral will be sent to the office.**

Laboratory Work:

All of the laboratory experiments in this course are hands-on. Students work individually or in a group of two depending upon the lab. They collect, process, manipulate, and graph data from both qualitative and quantitative observations. Inquiry is emphasized in many of the experiments that students complete. The laboratory work requires students to design, carry out, and analyze data using guided inquiry principles. For all labs, students are required to report the purpose, procedure, all data, data analysis, error analysis, results, and conclusions in a lab report that is submitted for grading.

Assignments:

Unit 1 Review of Concepts (15 days)

Chapter 1: Chemical Foundations (5 days)

Read: Pages 1-30
Labs: Safety/Lab Skills/Lab Preparation
Principles of Chromatography

Chapter 2: Atoms, Molecules, and Ions (4 days)

Read: Pages 39-69

Chapter 3: Stoichiometry (5 days)

Read: Pages 77-115
Labs: *Guided Inquiry:* Determination of the Formula of a Compound, Silver
Guided Inquiry: Stoichiometry of Chemical Reactions

Unit 2 Types of Reactions & Solution Stoichiometry (15 days)

Chapter 4: Types of Chemical Reactions and Solution Stoichiometry (5 days)

Read: Pages 127-170
Labs: Vitamin C on Fruit Juices by Redox Titration
Guided Inquiry: Gravimetric Analysis of a Carbonate

Chapter 11: Properties of Solutions (4 days)

Read: Pages 485-518

Unit 3 Electrochemistry (10 days)

Chapter 17: Electrochemistry (8 days)

Read: Pages 791-829
Problems: Chapter 17
Labs: Electrochemical Cells

Unit 4 Thermodynamics (15 days)

Chapter 6: Thermochemistry (10 days)

Read: Pages 229-265

Labs: Fundamentals of Calorimetry

Chapter 16: Spontaneity, Entropy, and Free Energy (5 days)

Read: Pages 749-782

Unit 5 Chemical Kinetics (15 days)

Chapter 12: Chemical Kinetics (6 days)

Read: Pages 527-566

Labs: Factors that affect reaction rates

Unit 6 Equilibrium (25 days)

Chapter 13: Chemical Equilibrium (5 days)

Read: Pages 578-612

Lab: La Chatelier's Principle and Equilibrium Shift

Chapter 14: Acids and Bases (5 days)

Read: Pages 623-672

Labs: *Guided Inquiry:* Concentration of Acetic Acid in Household Vinegar

Chapter 15: Applications of Aqueous Equilibria (8 days)

Read: Pages 681-739

Labs: *Guided Inquiry:* Evaluating Lemonade as a Buffer

Unit 7 Atomic Structure & Periodicity (15 days)

Chapter 7: Atomic Structure and Periodicity (5 days)

Read: Pages 275-320

Labs: Beers Law Lab

Chapter 18: The Representative Elements: Groups 1A Through 4A (Chapter 18 & 19 are tested together-4 days)

Read: Pages 875-895

Lab: Chemical and Physical Changes

Chapter 19: The Representative Elements: Groups 5A through 8A

Read: Pages 901-935

Unit 8 Bonding & Molecular Structure (15 days)

Chapter 8: Bonding: General Concepts (4 days)

Read: Pages 329-381

Lab: *Guided Inquiry:* Types of Chemical Bonds

Chapter 9: Covalent Bonding: Orbitals (4 days)

Read: Pages 391-417

Unit 9 Kinetic Molecular Theory & Gases (10 days)

Chapter 5: Gases (2 days)

Read: Pages 179-216

Labs: *Guided Inquiry:* Molar Volume of a Gas

Unit 10 Liquids & Solids - Intermolecular Forces (5 days)

Chapter 10: Liquids and Solids (4 days)

Read: Pages 425-474

Problems: Chapter 10

AP Exam Review:

The final ten full class days before the AP Chemistry Exam are used for exam review and practice tests using old AP Chemistry exam materials. Students work in cooperative groups to solve a packet of free response problems from previous exams. Students practice net ionic equations and are quizzed on their progress. Several practice AP Exams are administered as part of the 10 day review prior to the AP Chemistry Exam.

The Laboratory Notebook

A record of lab work is an important document, which will show the quality of the lab work that you have done. It may be necessary to show your lab book to a university for credit in a chemistry lab course, so keep your book neat and organized since it may be looked at in the future and might be of some great use.

Getting Started:

1. Use a quadrille-lined book with pages numbered and with carbon copy capability.
2. Write your name and class on the front cover in case book gets misplaced.
3. Always, Always, Always use black or blue ink! Pencil is not accepted.
4. Fill in the table of contents provided in the book. This should be kept current as you proceed during the year. In the table of contents, place the title and the page number where the lab report begins for each lab.
5. If you make a mistake DO NOT ERASE! Just draw ONE LINE through the error and continue. Do not scribble out the error or use white-out. It is expected that some errors will occur. You cannot produce an error free notebook. If you mess up an entire page DO NOT rip it out of the book. Simply draw a line through the page corner to corner and go to the next page.
6. You will keep the original copy of the lab in the book and turn in the carbon copy. If your instructor cannot read carbon copies of the lab easily, the student will receive an automatic 50% for a grade.

The 10 Parts of a Laboratory Report A specific format will be given to you for each lab. You must follow that format and label all sections very clearly. Chem AP lab reports are much longer and more in depth than the ones completed in PreAP chemistry. Therefore, it is important that you don't procrastinate when doing your prelab and postlab work. I will NOT answer last minute questions on the days the pre labs and post labs are due. GET HELP EARLY!! **LATE LABS WILL NOT BE ACCEPTED!!!! Labs not completed in class must be done so after school!!!!**

Pre-Lab Work

1. *Title* The title should be descriptive. —Experiment 5, for instance, is not a descriptive title.
2. *Date* This is the date you performed the experiment.
3. *Purpose* A statement summarizing the —point of the lab. What are you trying to do?
4. *Procedure Outline* You will need to write an outline of the procedure. This is BRIEF! Use bulleted statements or outline format to make it easy for me to read. I just want to make sure you know what's going on in lab.
5. *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 you give. You MUST use completed sentences. You will not get credit for sentence fragments. 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. I am very serious about this! It is important to produce a good record of your lab work.
6. *Data Tables* You will need to create any data tables or charts necessary for data collection in the lab.

During the Lab

7. *Data* Record all your data **directly** in your book. You are NOT to be recording data on your lab sheet. Label all data clearly and always include proper units of measurement. Underline, use capital letters, or use any device you choose to help organize this section well. Space things out neatly and clearly.

Post-Lab Work

8. *Cals and Graphs* You should show how calculations are carried out. Your instructor needs to be able to follow your calculations and read your graphs easily. Graphs need to be titled, axis need to be labeled, and units need to be shown on axis. **To receive credit for any graphs they must be at least ½ page in size.**
9. *Conclusions* This will vary from lab to lab. You will usually be given direction as to what to write but I expect all conclusions to be well thought out and well written. Again, I expect neat penmanship and complete sentences.
10. *Questions* Follow the same procedure as for Pre-Lab Questions