Currituck County High School
AP Chemistry
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T h e C o u r s e

The AP Chemistry course is designed to be the equivalent of the general chemistry course usually taken during the first college year. For some students, this course enables them to undertake, in their first year, second- year work in the chemistry sequence at their institution or to register in courses in other fields where general chemistry is a prerequisite. For other students, the AP Chemistry course fulfills the laboratory science requirement and frees time for other courses.

Prerequisites

The AP Chemistry course is designed to be taken only after the successful completion of a first course in high school chemistry. Surveys of students who take the AP Chemistry Exam indicate that the probability of achieving a score of 3 or higher is significantly greater for students who successfully complete a first course in high school chemistry prior to undertaking the AP course. *Thus it is strongly recommended that credit in a first-year high school chemistry course be a prerequisite for enrollment in an AP Chemistry class. In addition, the recommended mathematics prerequisite for an AP Chemistry class is the successful completion of a second- year algebra course.*

The Exam

The AP Chemistry Exam has two main parts, Section I and Section II, that contribute equally (50 percent each) toward the final score. Section I consists of 75 multiple choice questions that cover a broad range of topics. Section II consists of six free response questions: three multipart quantitative questions, one question on writing balanced chemical equations and answering a short question for three different sets of reactants, and two multipart questions that are essentially nonquantitative.
Teachers should not try to prepare students to answer every question in Section I of the exam. To be broad enough in scope to give every student who has covered an adequate amount of material an opportunity to make a good showing, the exam must be so comprehensive that no student should be expected to make a perfect or near perfect score.
A period of 90 minutes is allotted for Section I of the exam. Section II is divided into two parts:
Part A (55 minutes), students are allowed the use of a calculator, but for
Part B (40 minutes), no calculators are permitted.
Every Section II of the exam will contain one quantitative question that is based on chemical equilibrium and one question that is based on laboratory. The laboratory question may appear in Part A and be quantitative, or it may appear in Part B and require little or no calculation.

Calculators

The policy regarding the use of calculators on the AP Chemistry Exam was developed to address the rapid expansion of the capabilities of scientific calculators, which include not only programming and graphing functions but also the availability of stored equations and other data. For the section of the exam in which calculators are permitted, students should be allowed to use the calculators to which they are accustomed, except as noted below.* On the other hand, they should not have access to information in their calculators that is not available to other students, if that information is needed to answer the questions.

Therefore, calculators are not permitted on the multiple-choice section of the AP Chemistry Exam. The purpose of the multiple-choice section is to assess the breadth of students' knowledge and understanding of the basic concepts of chemistry. The multiple-choice questions emphasize conceptual understanding as well as qualitative and simple quantitative applications of principles. Many chemical and physical principles and relationships are quantitative by nature and can be expressed as equations. Knowledge of the underlying basic definitions and principles, expressed as equations, is a part of the content of chemistry that should be learned by chemistry students and will continue to be assessed in the multiple-choice section. However, any numeric calculations that require use of these equations in the multiple-choice section will be limited to simple arithmetic so that they can be done quickly, either mentally or with paper and pencil. Also, in some questions the answer choices differ by several orders of magnitude so that the questions can be answered by estimation. Refer to sample questions on pages 15–17 (#6, 8, 11, 12, 16 and 17), which can be answered using simple arithmetic or by estimation. Students should be encouraged to develop their skills not only in estimating answers but also in recognizing answers that are physically unreasonable or unlikely. Calculators (with the exceptions previously noted) will be allowed only during the first 55 minutes (Part A) of the free-response section of the exam. During this time, students will work on three problems. **Any programmable or graphing calculator may be used, and students will NOT be required to erase their calculator memories before or after the exam.** Students will not be allowed to move on to the last portion of the free-response section until time is called and all calculators are put away. For the last 40 minutes (Part B) of the exam, students will work without calculators on the remaining portion of the free-response section.

Equation Tables
Tables containing equations commonly used in chemistry are printed both in the free-response (Section II) exam booklet and in the inserts provided with each exam for permitted for use with the multiple-choice section. In general, the equations for each year's exam are printed and distributed with the Course Description at least a year in advance so that students can become accustomed to using them throughout the year. However, because the equation tables will be provided with the exam, students will NOT be allowed to bring their own copies to the exam room.

- **Exceptions to calculator use.** Calculators that are not permitted are PowerBooks and portable/handheld computers; electronic writing pads or pen-input/stylus-driven devices (e.g., Palm, PDAs, Casio ClassPad 300); pocket organizers; models with Qwert y (i.e., typewriter) keypads (e.g., TI-92 Plus, Voyage 200); models with paper tapes; models that make noise or "talk"; models that require an electrical outlet; cell phone calculators Students may not share calculators.

AP Exam Scores
The Readers' scores on the free-response questions are combined with the results of the computer-scored multiple-choice questions; the weighted raw scores are summed to give a composite score. The composite score is then converted to a score on AP's 5-point scale. While colleges and universities are responsible for setting their own credit and placement policies, AP scores signify how qualified students are to receive college credit or placement:

AP SCORE QUALIFICATION

5 Extremely well qualified
4 Well qualified
3 Qualified
2 Possibly qualified
1 No recommendation

AP Exam scores of 5 are equivalent to A grades in the corresponding college course. AP Exam scores of 4 are equivalent to grades of A–, B+ and B in college. AP Exam scores of 3 are equivalent to grades of B–, C+ and C in college.

Credit and Placement for AP Scores
Thousands of two- and four-year colleges and universities grant credit, placement or both for qualifying AP Exam scores because these scores represent a level of achievement equivalent to that of students who have taken the comparable college course.

Laboratory Performance Skills

To play a violin, one needs to know how to handle it properly. To do a meaningful experiment, one must mix and measure just as properly.
—Sienko, Plane, and Marcus, 1984

Physical Manipulations

Students must learn the skills necessary to use ordinary equipment such as:

• beakers, flasks, test tubes, crucibles, evaporating dishes, watch glasses, burners, plastic and glass tubing, stoppers, valves, spot plates, funnels, reagent bottles, wash bottles and droppers;
and measuring equipment, including:
• balances (single pan, double pan, triple beam), thermometers (ºC), barometers, graduated cylinders, burets, volumetric pipets, graduated pipets, volumetric flasks, ammeters and voltmeters, pH meters and spectrophotometers.

Processes and Procedures

Familiarity (more than a single day's experience) with such general types of chemical laboratory work as the following is important:
• synthesis of compounds (solid and gas)
• separations (precipitation and filtration, dehydration, centrifugation, distillation, chromatography)
• observing and recording phase changes (solid—liquid—gas)
• titration using indicators and meters
• spectrophotometry/colorimetry
• devising and utilizing a scheme for qualitative analysis of ions in solution
• gravimetric analysis
Some colleges have laboratory practical exams in which students must perform certain operations accurately within time constraints. Even though this is not part of the AP Chemistry Exam, such exercises are useful in providing students with goals for the development and practice of their laboratory skills.

Observations and Data Manipulation

Students must practice the art of making careful observations and of recording accurately what they observe. Too frequently students confuse *what they see* with *what they think they are supposed to see.* They should be encouraged to be accurate reporters even when this seems to conflict with what the textbook or laboratory procedure has led them to expect. Several great discoveries were made this way
(e.g., penicillin and Teflon).

Interpretation of proper observations is also important. Students should be familiar with finding evidence of chemical change (color change, precipitate formation, temperature change, gas evolution, etc.) and its absence (for example, in the identification of spectator ions). Students should know how to make and interpret quantitative measurements correctly. This includes knowing which piece of apparatus is appropriate. For example, a student should be able to select the correct glassware to dispense *about* 50 mL and the best glassware to dispense *precisely* 10.00 mL of a solution. Students need a great deal of practice in recording and reporting both qualitative and quantitative information. They should be encouraged to do this properly and at the time that the information is obtained.

Students must learn how to keep proper records of their experimental work. Even when teams perform experiments, each student should be responsible for making his or her own record of the data obtained. In group work, this ideally leads to double or triple checking of all actions and results, which helps to avoid mistakes and reinforces the idea that the entire team is responsible for the overall experiment. Student laboratory records should form part of the ongoing assessment and evaluation for the course.

If students are required to keep proper records of all experimental work done in the course, they will end the year with a document that is a source of pride and that demonstrates the growth of their skills. *This record is an important document that may be requested by the Chemistry Department at a college or university when a decision is needed regarding credit or placement in more advanced chemistry courses.*
***Students will need to have a spiral notebook for laboratory records**.*

There are 15 TOPICS in the AP Chemistry course. 5 are MAJOR Topics, these are in bold type.

1. Matter & Measurement
2. Atoms, Ions & Nomenclature
3. Electronic Configuration
4. Stoichiometry
5. Qualitative & Quantitative Chemistry
6. Gases
7. Periodicity
8. Bonding
9. **Thermochemistry**
10. Transition Metal Basics
11. Organic Basics
12. Net Ionic Equation Writing *(although not listed as MAJOR, it is very IMPORTANT)*
13. **Equilibrium**
14. **Acids & Bases**
15. **Kinetics**
16. **Electrochemistry**
17. Colligative Properties

Students are urged to spend at least 5 hours outside of classroom time going over the material.

Grading and Evaluation in Class:

Test:	**40%**
Lab:	**30%**
HW/CW/Quizzes:	**30%**

Class Format:

The vast amount of material to be covered in a two-semester college level course, with the national AP exam to be given in mid-May, requires a fast paced lecture/lab format. It is required that you take notes, although handouts and outlines of difficult topics will be provided. Use you textbook as a resource to help further your understanding of the topics. Throughout the year you will work on a variety of mathematical problems, free-response questions, and multiple choice questions to help you prepare for the AP Chemistry exam. Lab participation and collaboration are also an important part of the course requirements. Expect to have homework each night.

Attendance in this class is VERY IMPORTANT. I realize that you are all-around students and that you may need to leave early for other school events such as sports or field trips. Please try to schedule doctors appointments on teacher workdays so that you do not have to miss class. It will be up to you to make the decision that is right for your success in this class. With that being said, I will provide every opportunity to help you be successful and not fall behind. I have 3rd period planning during all lunches, please feel free to contact me in advance so that I may give you a pass to bring your lunch to my classroom for tutoring sessions. If you need help after school, please let me know in advance.

If you EVER have problems or feel like you need help, do not wait until the day of the test!! Your education is YOUR responsibility!! (With a little help from me!!)