Teaching Techniques & Strategies (from the Teacher’s Guide)

A good AP Chemistry course will have many overall goals, three of which must be 1) to provide college-level chemistry instruction; 2) to provide college-level laboratory experience; and 3) to prepare students for the AP Exam in such a way that they will have the best possible chance for success.

Teachers should clearly communicate these and other goals and objectives to their students at the very beginning of the course. While reasons for taking AP Chemistry can vary from student to student, all students must be committed to achieving the goals set forth by their teacher.

There is no one “correct” way of accomplishing the three goals. Teaching techniques and strategies must be modified to fit individual situations of time constraints, student profiles, and available facilities, and most teachers find that they must manage their time with prudence if they are to meet their goals.

Designing a course, motivating students, and accomplishing goals is a great challenge for teachers. To help with this, the Course Description provides an outline of topics teachers are expected to cover. Although the outline is meant to be a guide, teachers should be careful about what they add to or delete from it. Adding major, time-consuming topics to the outline can result in inadequate coverage of the topics students are expected to master, as can omitting topics from the outline. The discussion in this chapter is intended to help teachers as they begin the hard work of creating an AP Chemistry course.

Use of Time

How time is used is of great concern. Teachers must ensure that important topics are given adequate coverage and students are ready to take the AP Exam, two difficult tasks that the length of a class period can make even more onerous. However, there are ways to find extra time for students to spend on AP Chemistry.

• **Make a schedule and keep to it**
  Make a schedule (one with dates) that shows when topics will be covered and tested and then keep to that schedule. Although some students may fall behind, a steady pace must be maintained so that diligent students are well prepared for the AP Exam and the chemistry classes they may take in college.

• **Assign homework to be done during school breaks**
  Use vacation time during the school year to cover those topics that might not normally receive attention due to time constraints in the classroom. If it is possible to identify next year's AP Chemistry students before the current school year ends, give them textbooks and assign homework for them to complete over the summer vacation.

• **Be available to students**
  Teachers should make themselves available to students outside regular school hours; during this time struggling students can get extra help or attention.

• **Schedule AP Chemistry as a first period class**
  Having AP Chemistry scheduled as a first period class gives the teacher a great advantage. An early morning start means that students are fresh, and if they arrive early, it allows them convenient access to the teacher before the start of the school day. In addition, the class period can be extended by beginning early when necessary. If a first period class is not possible, then a meeting time just before or after an "open" time period (e.g., last period, before or after lunch) can be highly effective "when extra time is needed."
• **Provide regularly scheduled laboratory time**
  It is recommended that students have regularly scheduled time for laboratory work and that it be assigned at least once every week. In order to make the best use of lab time, the teacher may want to give students a pre-lab assignment that will familiarize them with required theory and techniques so that they will be ready to begin the lab as soon as the class period starts. Again, if AP Chemistry can be scheduled before or after an open time period, it may be possible to create a longer period of time for lab than the regularly scheduled period.

• **Use the whole class period**
  The teacher should try as much as possible to create a college-like atmosphere in the classroom. The whole period should be used productively every day, beginning when the starting bell rings and continuing until the dismissal bell. It is recommended that roughly one-third to one-half of the daily class period be spent in lectures and demonstrations while the remaining time be spent working through assigned or example problems.

• **Work through problems on the chalkboard**
  A highly effective strategy for working through problems is to have volunteer students put some of the more difficult problems on the chalkboard; if four or five students are at the chalkboard at one time, then a large number of problems can be quickly gone through and checked. An additional advantage to this strategy is that it allows the teacher to make comments on the presentation of each student’s work, an important area in which student training needs. Students must be taught how to use a logical and easy-to-follow sequence of steps to demonstrate their knowledge of a problem. All too often student work appears as chaotic calculations and scribbles with the final answer circled.

• **Give tests only when necessary**
  Taking time out of the class period for testing presents a true paradox: on the one hand, frequent tests keep students on their toes with regard to mastering recently covered material; on the other hand, testing uses up valuable class time. It is not unusual for an AP Chemistry course to contain 25 or more major topics during the year. If the teacher used one class period to test students on each of these topics, the result would be the loss of over a month of instruction time! Therefore, it is best to give brief quizzes after each unit and restrict the number of major tests to seven or eight during the course of the school year. If there is an open time period just before or after class, the length of time students are given to take one of the major tests can be extended.

• **Encourage students to form study groups**
  Perhaps one of the most effective teaching strategies is to encourage students to form study groups. Study groups allow study and preparation to become a social activity and enable students to learn by both helping and being helped by others. Experience has shown that those students who have a network of social and study contacts within the class are much more successful than those students who try to “go it alone.”

• **Prepare students for the AP Exam**
  When preparing for the AP Exam, students should be encouraged to spend additional extra time outside of class in exam review sessions. Begin holding these sessions early in the spring semester to keep them from turning into cram sessions. Since students enjoy them more if they are a social as well as a study time, make the review sessions voluntary and hold them in a classroom with pizza and soft drinks where students can spend two or three hours in a low-key review of questions found on previous AP Exams. It is especially useful if this time can be student-directed, with the teacher assisting in those ways students find the most helpful. An extra encouragement to study old AP Exam questions, teachers can tell students that some of the questions will appear on their final exam for the class.
**Homework**

Teachers should assign homework every day. Since most AP Chemistry students have busy schedules, it is helpful for them to know well in advance what their assigned homework will be. Providing students at the beginning of each unit with a list of the scheduled homework questions allows them to plan their time and avoid conflicts. Students should keep their homework papers for future reference. To encourage them to examine old homework problems as part of their review for the exam, the teacher may wish to tell students that some of the homework problems will appear on the next quiz or test. It is reasonable to have homework determine as much as 25 percent of a student’s overall grade for the course.

A useful practice is to collect homework from students as they enter the classroom, check it for completeness and accuracy, and return it to them before the problems are reviewed in class. This allows students to correct their papers as the problems are reviewed and use their homework when volunteering to present their work on the chalkboard. It also keeps students “honest” by verifying they have finished their homework before class begins. The teacher can appoint former AP Chemistry students (if they are available) to serve as teaching assistants and check and record the homework while the teacher is presenting theory material or demonstrating a concept. Group work on homework is to be encouraged as long as there is not wholesale copying.

**Tests and Quizzes**

As mentioned earlier, teachers should schedule in-class tests judiciously. Make major tests comprehensive and as similar in format to the actual AP Chemistry Exam as possible. Students who are unfamiliar with the exam’s format cannot be expected to demonstrate their knowledge to its best advantage, so the teacher should expose them to the format and recent changes to the AP Exam at every opportunity. An equation sheet is provided in Section II of the AP Exam and students need to be familiar with the location and form of the equations on that sheet. Students who are provided with the same equation sheet during their in-class tests will be comfortable with it when it is time for them to take the AP Exam. Section I does not provide an equation sheet and prohibits the use of calculators, so it is essential that students learn estimation and “paper and pencil” math skills. It would be tragic if a lack of experience in making calculations without a calculator kept a student from being able to solve problems on the AP Exam.

Students should be familiar with test-taking strategies, particularly those that apply to the AP Exam. They also need to be used to taking timed tests, and the teacher should deliberately construct some in-class tests that put students in a time pressure situation. Finally, when constructing in-class tests, the teacher should incorporate lab experiences into the questions. This is particularly important because a required lab essay became part of Section II of the AP Exam in 1999.

**Lab Experience**

Lab experience is an integral part of any good AP Chemistry course and not just something that is “nice to do if you have the time.” Labs are vitally necessary if students are to have a complete understanding of topics and their application to practical situations. Imagine learning the concept of the equivalence point in an acid/base titration by studying the textbook as compared to actually performing the experiment by using a pH meter and collecting data.

Without lab experience students cannot go beyond a given level of understanding; they must have hands-on experience.
Some AP Chemistry labs will require more time than a normal class period to complete, making it necessary for both teachers and students to be creative and flexible. If AP Chemistry can be scheduled before or after an open time period (e.g., first period, last period, before or after lunch), use that time when necessary for labs. If, during the course, teachers find themselves running short of time, cutting out or reducing labs should not be their solution to the problem. Statistics have shown that there is a positive correlation between the amount of time students spend on lab activities and their final AP Exam grades.

Students should keep a lab notebook that for each lab includes the purpose of the lab, a table of the data collected, clear and easy-to-follow calculations made from the data, any conclusions that can be drawn from the calculations, and any other requirements the teacher wishes to include. When labs are individualized with “unknown” analysis, give students two grades as part of their lab evaluation - one for their accuracy in performing the lab itself and one for their write-up of the lab. It is important that all lab notes and reports are organized and kept in a single notebook. Some colleges will only give laboratory credit if documentation in the form of a lab notebook is available for their inspection, regardless of the student’s AP Exam grade.

Lab work can be done both in small groups and individually. Individual work is probably the most effective configuration because it prevents students in groups from relying on just one student to do the “difficult” parts of the lab. If necessary, however, the teacher can divide students into groups of no more than two. This fosters cooperation between individuals (an important skill to learn) and ensures that both lab partners are engaged in the lab. In fact, some advanced labs can be difficult to perform without a second pair of hands - especially when it is time to collect data.

Consider introducing a system of checking out lab equipment to students that emulates the system used in college chemistry courses. Keep a list of all the materials that are checked out to each lab group at the beginning of the year and use that list at the end of the year when the materials are returned.

Assign each student a locker, cupboard, or drawer in which they can store the equipment entrusted to them during the year. Although it ties up equipment so that other classes cannot use it, this system helps to give AP Chemistry students a college chemistry experience.

As would be expected, rapid advances in technology have opened up many new options for AP Chemistry. Interactive software makes learning both personal and stimulating; videotapes show dramatic chemistry demonstrations; and web sites provide information and serve as references. In addition, recent improvements in computer-based labs (CBLs) allow data to be collected directly by a probe connected to a calculator or computer. The computer then analyzes the data in a dramatic way.

AP Chemistry teachers are encouraged to make use of these and forthcoming technology as part of their course. Certainly it is the technology of the future with which students are expected to be familiar, both on the college level and in industry. Take care, however, to keep the course’s focus on chemical principles and not on the use of technology. Technological advances that produce lab simulations should not be used as a replacement for lab work itself. There is no substitute for students actually putting on lab coats and goggles, rolling up their sleeves, and problem-solving their way through a lab. Many principles can be taught using equipment that is not computer based, and no one should think that expensive computer technology is a requirement for a successful course.
Lab Safety

Lab safety concerns are continually changing; experiments and procedures that were acceptable years ago are considered unsafe today, making compliance with lab safety a “moving target.” Nevertheless, some general safety guidelines do exist.

- **Consult lab safety resources.**
  A good reference manual for the storage and use of chemicals is vital to a safe laboratory environment. Two good references include the Flinn Chemical and Biological Catalog Reference Manual and Hazards in the Chemical Laboratory, edited by L. Bretherick.

- **Observe hazardous waste regulations.**
  There are laws regarding the correct disposal of chemicals, and many laws concerning the disposal of heavy metals are particularly rigid. Before selecting a lab, consider toxicity and disposal and decide whether an alternative lab without toxic chemicals can illustrate a concept just as well.

- **Reduce hazardous waste.**
  If disposing of large quantities of waste is a concern, then consider “going microscale.” Microscale chemistry is a good way to reduce both costs and waste. Some microscale lab manuals are listed in Chapter VI, “Bibliography and Resources.”

- **Store chemicals correctly.**
  Chemicals should be stored in a locked room that is separate from the lab. This storage room should be well ventilated, and the chemicals should be stored by category (not alphabetically!!!) as described in the Flinn catalog. Acids and flammables should be kept in their own vented and locked storage cabinets.

- **Limit access to chemicals.**
  Only those people who need to have access to chemicals should be able to unlock the chemical storage room and the cabinets therein. Students should not be given access to chemicals and their storage room.

- **Designate a chemical coordinator.**
  A trained individual should be responsible for the purchase, inventory, storage, and use of all chemicals. This person may be one of the school’s chemistry teachers, but whoever is chosen will probably require some additional safety training.

- **Teach lab safety.**
  Lab safety is an important part of all good chemistry courses and should be taught as such. Spend some time on lab safety at the beginning of the course: establish rules, demonstrate correct methods of handling chemicals and equipment, and go over the procedures students should follow if an accident occurs.

Textbooks

The selection of an AP Chemistry textbook can cause considerable anxiety, particularly among beginning AP Chemistry teachers. Many teachers find it is difficult to identify the advantages and disadvantages of a text until they have taught with it. The Course Description provides a list of suggested and appropriate texts, any of which can be the focus of an effective course. While the selection of a text is an extremely important consideration, which textbook a teacher chooses is not as important as other course considerations, such as how much time is available each week for contact with students, what lab equipment is available, and the effects of block scheduling on the
The success or failure of a good AP Chemistry course does not hinge on selecting the “best” textbook. Use your own good judgment to choose a text and make accommodations as necessary.

**Review Materials**

A number of AP Chemistry books that summarize course work and provide sample problems with solutions can be found in most bookstores and many libraries. Some of these are excellent, and students who use these guides as a supplement to, not a substitute for, the textbook and the AP Chemistry course will find them good resources to turn to for a succinct review and summary of the material covered.

**College Board Assistance**

The AP Program offers a wide variety of publications and materials to familiarize teachers with the aims and expectations of the program. These include the Course Description created by the AP Chemistry Development Committee, sample multiple-choice tests and free-response questions, and sample student essays with explanations of the scoring guidelines. (Please see Chapter VIII, “AP Publications and Videos,” for more information about these resources.) The staff members of the College Board regional offices are always available to answer questions about the AP Program. They can put teachers in touch with regional consultants who can assist them through workshops in AP Chemistry courses. (Please see the inside front cover of this guide for contact information.)

In some areas of the country, AP teachers have formed support groups to develop materials and share ideas. The College Board provides a similar service for AP teachers through an electronic mailing list. This free resource gives them the opportunity to have their questions answered and problems solved; to respond to the concerns of other AP Chemistry teachers; and to share assignments, syllabi, and teaching ideas. When a teacher has a specific problem, he or she can depend on the generosity of several fellow mailing list subscribers to share their experiences, advice, and resources. Teachers list their favorite web sites, add links to each other’s sites to their own web pages, and even provide technical support for each other whenever possible. Participants include not only high school AP Chemistry teachers, but also college and university professors and interested professionals in the field of chemistry. To find out how to subscribe to the mailing list, go to the “Teachers” section of the AP web site at www.collegeboard.org/ap.

**Teaching Techniques for Advanced Topics**

Teachers may find the teaching of advanced topics to be intimidating. What should be taught, what should be left out, and which approach is the best one to take? This section is intended to give teachers some idea of where to begin when developing units on kinetics, equilibrium, thermochemistry, electrochemistry, and organic chemistry.

**Kinetics**

A unit on kinetics should include a study of the

- requirements for effective collisions between molecules
- graphical representation of an energy pathway (including activation energy and net energy change)
• definition of reaction rate
• graphical representation of concentration versus time for reactions of zero, first/and second order (and how this graph can be used to determine reaction order)
• idea that rate equations must be determined from experimental data (unless the reaction mechanism is known)
• equations for the half-life of a zero, first, and second order reaction
• determination of a rate law from a reaction mechanism given the speed of each step in that mechanism

An effective technique to use when teaching kinetics is to give plenty of real-life examples that may not necessarily be specific to chemistry. To illustrate the point of the rate determining step in a reaction mechanism, try using the example of the steps involved in building a brick wall. Assume there are four sequential steps - the brick must be

1. purchased and loaded onto a truck,
2. driven to the job site,
3. unloaded from the truck and taken to the place where the wall is to be built, and
4. assembled to form a wall.

How fast the wall is built is determined by whichever of these four steps takes the longest to complete. If the bricks must be unloaded one at a time by hand, then Step #3 determines how fast the wall is built. If the truck delivering the bricks is very slow or breaks down, then Step #2 determines how fast the wall is built.

A good lab for teaching reaction rate, reaction order, rate equations, and activation energy is Experiment 27 - “Rates of Chemical Reactions II: Rate and Order of H₂O₂ Decomposition,” in Laboratory Experiments for “Chemistry: The Central Science”: fifth edition, by John H. Nelson and Kenneth C. Kemp. Although memorization of integrated rate equations is not required for the AP Exam, students benefit from having a working knowledge of how these are derived and used.

**Equilibrium**

There is no concept more important to the understanding of advanced topics in AP Chemistry than equilibrium. Until equilibrium is introduced, students are used to thinking that ‘all reactions are spontaneous and complete. A unit on equilibrium should include a study of

• equilibrium constants and what their values mean in terms of which predominates at equilibrium - reactants or products
• the idea that equilibrium constants can be based upon gas pressure
• the idea that solids, pure liquids, and solvents in pure dilute solutions are not included in an equilibrium constant expression
• how an overall equilibrium constant is found from equilibrium constants of individual steps
• prediction in the shift of reactants and products where a system is out of equilibrium
• Le Châtelier’s Principle for concentration, gas pressure, and temperature
• how to solve equilibrium problems for equilibrium concentrations or equilibrium constant values (and how to approximate equilibrium concentrations)
• equilibrium as it applies to acids and bases
• the common ion effect
• buffers
• acid-base titrations and titration curves
• solubility products

Try using the example of spectators at a small town sports stadium to teach the concept of equilibrium. Before the game, the stadium is empty and all of the sports fans wait outside the gates. Once the gates have been opened, the fans flood in; but even during the height of the game people continue to enter and leave the stadium. Assuming the number of people who are entering is the same as the number of people who are leaving, there is no net change in the total attendance, and so the number of people inside the stadium can be said to be at “equilibrium.” If it is a big game, this equilibrium attendance may be many thousands; if it is a small or uninteresting game, the equilibrium attendance may be low. If one divides the number of people in the stadium by the number of people who live in the town, it will be equivalent to an “equilibrium constant;” the importance of the game is equivalent to the temperature dependence of an equilibrium constant.

It is very important to teach the concept of buffers (which is always a difficult one for students) by having students do a lab that requires them to make a titration curve. A good lab for accomplishing this is “pH Titration of an Unknown Weak Base,” in *Analytical Chemistry Lab Manual*, published by the University of Washington’s Department of Chemistry for its Chemistry 321 course. This lab uses a weak base-strong acid titration to determine the equivalence point, which is at a pH below 7. The usual technique of strong acid standardization is used, and the equivalence point can be found by using the “second derivative” technique on a computer.

**Thermochemistry**

A unit on thermochemistry should, include a study of

• definitions of heat, endothermic and exothermic equations
• the idea that total internal energy change is dependent on heat and work
• the idea that pressure volume work is the only significant work to be considered in most chemical reactions
• the idea that heat exchanged at constant external pressure is termed “enthalpy change”
• calorimetry, entropy, and absolute entropy
• how to determine changes in entropy from absolute entropies
• the relationship between free energy and the spontaneity of a reaction
• the relationship between the change in free energy and enthalpy change, entropy change and temperature
• the relationship between free energy change and equilibrium constants and determining spontaneity under nonstandard conditions
Students find solution calorimetry particularly challenging to understand. It is necessary to emphasize to them that in a closed system the net energy change must be zero and that the same amount of heat energy released by a reaction must be absorbed by the solution and the calorimeter. This concept requires students to integrate concepts of mole calculation, stoichiometry, and heat calculations; any of which they can do independently but have difficulty tackling when all three are in the same problem.

A good lab for teaching this concept is Experiment 6 - “Thermochemistry and Hess’s Law,” in Laboratory Experiments for Advanced Placement Chemistry, by Sally Ann Vonderbrink. This lab shows a wonderful integration of three different solution calorimetry reactions and how Hess’s Law can be used to determine theoretical values.

**Electrochemistry**

A unit on electrochemistry should include a study of

- definitions of oxidation reduction, oxidizer, and reducer
- how to balance redox reactions by the half-reaction method
- the characteristics of voltaic (galvanic) cells and electrolytic cells and how they are different (use specific examples)
- electrochemical cell notation
- electrochemical stoichiometry and the relationship between charge, current, and time
- cell potential and its relationship to free energy
- calculation of cell potentials from electrical potentials - both standard and nonstandard states
- the relationship between cell potentials and equilibrium constants

When teaching this topic, try using a redox cell demonstration involving a copper electrode in a copper sulfate solution and a zinc electrode in a zinc sulfate solution. By using one-molar concentrations, the theoretical cell potential can be easily calculated and compared to the observed potential by using a multimeter. This approach also illustrates the dependence of a salt bridge, since the potential (and current!) drops to zero when the salt bridge is removed.

**Organic Chemistry**

It is hard for a beginning teacher to know what to cover in this seemingly limitless topic. An effective approach is to concentrate on helping students to learn and recognize functional groups (e.g., esters, carboxylic acids, alcohols, etc.) as well as the nomenclature of the alkenes, alkynes, and alkanes. In addition, give brief attention to such topics as esterification and saponification. A good organic chemistry lab is a fairly simple one: Experiment 38 “Preparation of Aspirin and Oil of Wintergreen,” in Laboratory Experiments for “Chemistry: The Central Science”, fifth edition, by John H. Nelson and Kenneth C. Kemp. In this lab, compounds with a benzene ring are used and formed (which is a good example of resonance and delocalized electrons), and students are able to observe the “fruity” odor of an ester.
Suggestions for New AP Chemistry Teachers

Dr. Charles M. Roberts

Oklahoma School of Science and Mathematics

Oklahoma City, Oklahoma

Over the last six years I have presented many teacher workshops. During my workshops I like to share the following suggestions for teachers who are just beginning an AP Chemistry course.

- Obtain copies of previous editions of the AP Chemistry Teacher's Guide and use the ideas in them as a springboard for planning your course.
- Do more than just "teach to the exam." While this may greatly simplify your life in the short run, in the long run it does not serve your students' best interests.
- Do not be afraid to set high standards. Demand high levels of performance from your students at all times - if you don't, then most likely they won't.
- Gain your students' respect by treating them with respect. Become their biggest cheerleader.
- Remember to reward progress no matter how small it may be. Students need an endless stream of positive feedback from you if they are going to learn the material.
- Create an atmosphere in the classroom that facilitates inquiry and the active mental involvement of each student. Your students’ interest in taking on great academic and personal challenges is directly proportionate to your genuine enthusiasm and passion for leading them.
- Remember that accidents will happen during laboratories and how you respond to them sets the tone for subsequent laboratories. Students who are made to feel badly every time they break a beaker will quickly lose their initiative - and may very well have even more accidents.
- Encourage students to think of themselves as “athletes of the mind.” This requires them to develop the same level of commitment and focus in their daily lives that Olympic athletes do. I share with my students a copy of a newspaper article that appeared in The Daily Oklahoman that describes the 12 attributes of Olympic gold medalists: drive, commitment, self-esteem, integrity, visualization, self-control, concentration, mental toughness, coachability, teamwork, leadership, and perspective. These attributes were determined by an in-depth study of winners of various types of sports in Olympic competition, and I believe they are a part of successful people in all walks of life.
- Talk with your students about techniques that will significantly affect their success, such as how to take effective notes in class, how to use the textbook to their best advantage, and how to form and use study groups of three to four people. Lastly, teach them the value of being intellectual risk-takers (e.g., let them know it is acceptable to be wrong because then both of you know a piece is missing from their knowledge base).
- Teach your students how the human brain works as it acquires new information - the brain stores information in long-term memory where it will be available for recall later. Students must learn that the infamous “cram sessions,” which too many of them believe in, will only allow the vast majority of that information to be used for 24 to 48 hours at the most - and then it is gone! Success on any comprehensive exam can only be achieved if students have large amounts of information available to them for recall from long-term memory. My
experience is that students are more likely to adopt new strategies that lead to greater success if they are made aware of the reason for each strategy.

• Develop test-taking strategies that address the four distinct parts of the exam, which I identify as the: 1) multiple-choice section, 2) chemical reactions question, 3) essay questions, and 4) free-response problems. For example, because the multiple-choice section of the AP Exam must be taken without calculators, have students practice answering multiple-choice questions without their calculators. This can be very intimidating at first since many students have become calculator-dependent; but as they practice solving problems without a calculator, their confidence and ability levels will rise. Students generally “play on game day like they’ve practiced,” so we as their coaches must provide them with the best preparation techniques we can.

• Take advantage of the wealth of testing resources that are available to help you prepare your students for the AP Exam. A number of organizations provide exams that can be used for this purpose, including the College Board and the American Chemical Society Division of Chemical Education Examinations Institute at Clemson University.

• Educate your administration about the special needs and requirements of an AP Chemistry course and then do not be afraid to ask them to make the hard decisions you feel are necessary to facilitate student success within your particular environment.

• Educate the parents of your students about the greater demands of your course compared with the other, non-AP courses their children may be taking. Communicate with them personally throughout the year to sustain their interest and involvement. An open house that includes a student demonstration of lab experiments is an effective way to help parents learn about your school’s AP Chemistry program.

• Find ways to relax and smell the roses. Maintain your sense of humor, because there will be times when you will need it. Teaching an AP Chemistry course is rewarding but it can also be stressful. Humor is definitely a great prescription for not going crazy.