

# Dougherty High School AP Chemistry Syllabus

## AP<sup>®</sup> Chemistry Class Policy

**Mark Your Calendars! AP Chemistry Test Date → MONDAY MAY 2<sup>nd</sup>, 12pm**

- **Instructor:** Mr. Schnell
- **Email:** [eschnell@srvusd.net](mailto:eschnell@srvusd.net), Schoology also has a messaging feature
- **Mr. Schnell's website:** [www.chemistryrocks.net](http://www.chemistryrocks.net)
- **Sign up for REMIND APP:** download REMIND APP to join @dvapchem class (or txt @dvapchem to 81010)

### CLASS RULE

Don't make anyone unhappy! That includes the teacher, your classmates, visitors, and yourself.

### CLASS EXPECTATIONS

| GENERAL:     | EVERY DAY:   | CLEAN UP:  | EFFORT:        |
|--------------|--------------|------------|----------------|
| 1) Safety    | 1) Jumpstart | 1) Desks   | 1) Work        |
| 2) Respect   | 2) Lesson    | 2) Benches | 2) Questions   |
| 3) Hard work | 3) Clean up  | 3) Floors  | 3) Participate |

### TEXTBOOK

Chemistry, A Molecular Approach 4th Ed.  
– Tro – Pearson Prentice Hall – etext  
Mastering Chemistry – Online supplement to the course

### LABORATORY EXPERIMENTS

The lab experiments represent a collection from various sources  
-Flinn Scientific Inc. Advanced Placement Chemistry Laboratories  
-College Board AP<sup>®</sup> Chemistry: Guided-Inquiry Laboratories  
-Juniata College, Science in Motion, Advanced Placement Labs  
-Advanced Chemistry with Vernier

### OVERVIEW OF AP CHEMISTRY PROGRAM

The class meets four (4) days a week, three 52 min periods and one 86 minute block period. Throughout the school year, 25%+ instructional time will be devoted towards laboratory experiments, inquiry and normal experiments. The other days are lectures, practice problems, experiment continuation, and interactive activities.

- AP Chemistry is a 2nd-year course. You should have already completed Honors Chemistry
- The expectation is that all AP Chemistry students will sign up and take the AP Chemistry Exam

### COURSE DESCRIPTION

AP Chemistry is designed to be the equivalent of the general chemistry course usually taken during the first year of college. The goal is to provide the student with a strong background in many of the basic topics covered in chemistry. The objective of this class is to prepare each and every student to be successful on the AP Chemistry Exam given by the College Board in May. **Please note, an actual college chemistry class would involve more hours of instruction time per week than our current schedule, to compensate, additional time, outside of scheduled class time, will be required. This includes two Saturdays in April prior to the exam. Finally, in order to be successful in this class you must have several hours each week to devote to lab reports, homework, and studying.**

This is a 2<sup>nd</sup> year class, students should have strongly know:

- Atomic Theory
- Molar Relationships
- Electronic Structure
- Periodicity
- Molecular Geometry
- Gas Laws
- Solutions
- Nuclear Chemistry
- Intra/Inter Forces

The following concepts' increase in complexity or unfamiliar nature makes it necessary for more time covering them:

- Equilibrium Chemical Kinetics (Mechanisms, Integrated)
- Thermodynamics (2nd Law, Gibbs)
- Materials Science
- Redox Reactions (Electrochemistry)
- Organic Chemistry
- Buffers, Acid-Base, Titrations
- Coordination Complexes

### NOTEBOOKS and SUPPLIES

In this class we use a composition notebook for warmups and taking notes in class. We use a 3-ring binder with 5 tab dividers for our reference sheets, study materials, and worksheets. Your notebook/binder will be graded on a regular. There will be announced and unannounced notebook/binder checks. It is expected that you put **SIGNIFICANT EFFORT** into your notebook. More information will be given about these items when we begin to use them.

### MATERIALS

This class will use the following supplies. If you cannot obtain the supplies for any reason, the supplies can and will be provided.

| STRONGLY RECOMMENDED – Will be used in class  | Highly suggested   | Optional, but fun!  |
|---|--|---|
| <ul style="list-style-type: none"><li>• Composition Notebook</li><li>• 3-ring binder with 5 divider tabs</li><li>• Colored pencils and/or skinny markers</li><li>• Glue stick NOT tape!!!</li><li>• Red ball point pen</li><li>• NON-graphing scientific calculator*</li><li>• Small scissors</li><li>• Highlighter</li><li>• Black/ Blue pen AND two pencils</li></ul> | <ul style="list-style-type: none"><li>• Small ruler</li><li>• Small pencil sharpener that can collect the shavings</li><li>• Small Post-it Notes</li></ul> | <ul style="list-style-type: none"><li>• Stickers</li><li>• Glitter pens</li><li>• Small envelopes</li></ul> |

\* I HIGHLY recommend the Texas Instruments "Ti-30x **IIS**". This is the calculator that I will be using in class, and I find it to be the easiest (and most logical) to use. You may use a different one but I am not familiar with how to use every calculator out there, and I may not know how to help you with it! Please note you are required to use the teacher provided calculator during all quizzes and assessments if/when we are in school physically.

**SCHOOL POLICIES & PROCEDURES** – All policies, procedures, rules, and disciplinary actions will be followed from the DVHS Student Handbook. Please see the student handbook for further information.

## HOMEWORK

Dougherty Valley High School will be following the District Homework Policy (AR 6154 and BP 6154), please see the Homework Policy on the District Website as well as the Dougherty Valley High School Web Site. ***Please be advised that this policy is/can be different for Honors/AP Courses***

All homework assigned will be due at the start of the next class period unless otherwise noted. Not every homework assignment will be collected and graded. Some assignments are graded for accuracy, some for completion, and some will only have select problems graded.

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## QUIZZES and ASSESSMENTS

In-class quizzes include both closed note and closed book quizzes, and open-note quizzes. Quizzes are often given mid unit and often after each unit. They may be announced or unannounced. Assessments may cover several units at a time. Assessments will be announced in class and/or on Schoology. For test security purposes, cell phones or any other electronic devices (such as "smart watches") are not permitted on your person during an assessment. All electronic devices will be placed in a "cell phone holder" under the teacher's watch until the end of the exam. If you are found with an electronic device during the exam it will be assumed, it was used inappropriately and you will receive a zero on the assessment and your Assistant Principal will be notified.

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## LAB ASSIGNMENTS and SAFETY

Separate handouts concerning laboratory procedures and safety will be passed out in class. All students are required to have a **laboratory notebook**. Lab notebooks will be provided. Lab notebooks may be collected and graded. Written lab work may include the following sections. You will be told each time which sections are required

**You will not be allowed to perform a given experiment if any of the safety rules or any additional rules subject to teacher discretion are not followed. Safety means being prepared, dressed safely, and ready.**

- Prelab Qs
- Materials
- Data Tables
- Purpose/Goal/Q's
- Reagent Table
- Calculations
- Hypothesis
- Procedure Flow Chart
- Post Lab Qs/Report

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## EXTRA HELP and REMINDER

The best way to be successful is to ask questions, spend time reading the book, take notes, participate in discussions, and work as many problems as possible - over and beyond those assigned for homework. Problem solving in chemistry is a skill that can only be improved by practice and exposure to lots of examples. If you do not do the work, you will not be successful. I am excited about this year. I love chemistry and my hope is for you to love it as well. Do not hesitate to ask for help. I am here to help you!

### Perseverance

Keep calm → Track down mistakes → Learn → Improve

## TARDIES, ATTENDANCE and MAKEUP WORK

Tardies are disruptive and may interrupt the progress of other students. Be sure to come to class on time, ready to learn. Tardiness will be addressed in accordance with school policy as specified in the DVHS handbook.

Please note that in order to be successful in this class, additional time at lunch or after school could be required.

Please see the Dougherty Valley High School Webpage for the make-up work policy. If you have a legally excused absence, it is **YOUR RESPONSIBILITY** to find out what the missed class work and homework assignment(s) was and to complete it.

You get the number of days absent to complete missed work.  
***Assignments subject to change at teacher's discretion.***

You get the number of days absent to complete any make-up assessments including quizzes and assessments. You get the number of days absent to complete any make-up quizzes and assessments unless it is an unannounced quiz on old material. If it is an unannounced quiz on old material, you will be required to take it the day you return since studying for it was not expected. If you were only gone the day of the quiz or the assessment, you will take it upon your return to school unless other arrangements have been made with the teacher in advance. Missed quizzes and assessments must be made up during class unless I allow you to make it up during Access Period. If you would like to make it up during Access Period, you must ask via email in advance so I can attempt to make arrangements. If you are absent for a quiz or assessment, you will be given a make-up version. It will cover the same material but can be different questions or a different format.

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## DVHS and CLASS GRADING POLICY

Please see the school website for the DVHS Grading Policy. The DVHS grading scale for progress reports and quarter grades includes - and +. Grades on all assignments, assessments, and overall class grades are final, unless otherwise stated by Mr. Schnell. Please note that +/- grades do not have any effect on GPA's. Final semester grades, which colleges look at, do not use +/- to compute GPA. Only A, B, C, D, and F are used for final semester grades for GPA. Grades are not determined on a curve, and grades are not rounded.

Progress reports will be sent home mid-quarter as well as at the end of each quarter. Final grades will be calculated each semester and are based as follows for 1<sup>st</sup> semester. If this breakdown changes for 2<sup>nd</sup> Semester, or at any other time, you will be notified.

| % of Grade | Category                                   |
|------------|--|
| 60%        | Unit Tests, Mid-Term, Semester Finals      |
| 20%        | Lab Work, Long Term Assignments            |
| 15%        | Quizzes                                    |
| 5%         | Short Term Assignments<br>(Class/Homework) |

**Be on task, productive, engaged ...  
those are all part of doing your work!**

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## STAFF COMMUNICATION POLICY

Email is the typically the fastest and best way to reach me. As a guideline, any communication to staff, via email or telephone, should receive a response within 48 hours (excluding weekends and holidays). If there is no response within 48 hours, please email or call again stating this is the second attempt. The 48-hour guideline may be affected by illness, conferences, or technology problems.

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## LINE OF COMMUNICATION

Any questions or concerns regarding student progress in a class should be addressed through the following process per the student handbook:

1. Student communicating with teacher
  2. Parent communicating with teacher
  3. Parent/Student communicating with counselor
  4. Parent/Student communicating with Assistant Principal
  5. Parent/Student communicating with Principal
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## ACADEMIC HONESTY AND ETHICS POLICY

Honest behavior is an expectation at DVHS. The purpose of the policy is to create and maintain an ethical academic atmosphere in which strong behavioral consequences will be enforced. **Cheating, plagiarism, violation of test procedures will not be tolerated. Violations of academic ethics will be dealt with according to the [DVHS student handbook](#).**

- Copying from another student
- Unauthorized collaboration on assignment
- Using unauthorized materials/resources (spark/cliff notes, cell phones, smart watches, calculators, etc.)
- Submitting an essay written in whole or in part by someone else as one's own
- Preparing an essay or assignment for submission by another student
- Copying an assignment or essay or allowing one's assignment or essay to be copied by someone else
- Using direct quotations, large sections or paraphrased material without acknowledgement
- Buying or selling essays or assignments
- Submitting whole or part of computer-generated documents or materials with or without minor modifications as one's own

**Consequences for Academic Dishonesty will include appropriate disciplinary measures consistent with Board policy and the California Education Code and the DVHS student handbook. One or more of the following consequences may occur, and will be noted in students discipline file. Examples include, but are not limited to:**

1. Parent /Guardian contacted by teacher
2. Referral to assistant principal for disciplinary consequences; parent/guardian will be notified.
3. Loss of all credit for the assignment or test with no makeup permitted.
4. Upon second violation of 2nd degree cheating within the same course, the student may be dropped from the class.
5. Monday School (3 hours)
6. Suspension from school

**Please see the DVHS Student Handbook for complete list of consequences for 1st, 2nd, and 3rd Degree offenses.**

## DVHS EXPECTATIONS

All Students will...

- 1) Accept responsibility for your education, decisions, words, and actions.
  - 2) Act in a way that best represents your school, parents, community and self to promote a safe, healthy environment in which to learn.
  - 3) Be active in the school and community.
  - 4) Maintain balance between academics, co-curricular activities and personal life.
  - 5) Support your fellow students and their activities.
  - 6) Respect cultural diversity, individuality, and choices and rights of others.
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## DVHS SCHOOL LEARNER OUTCOMES

At Dougherty Valley High School, students will:

- Communicate effectively
  - Become critical thinkers and problem solvers who support ideas with reliable evidence
  - Practice integrity, honesty, and ethical behavior as a global citizen
  - Be a responsible partner in the learning process
  - Take ownership of individual growth
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*This syllabus is subject to change at teachers' discretion. It is possible there will be adjustments made to this syllabus and the gradebook categories if/when we return to school physically. You will be notified if there are changes.*

## Donations

Individual courses are no longer asking for/or collecting donations.

**PLEASE support our class and your student(s) by donating to the DVHS Education Fund.**

More information can be found on the DVHS website under the "parents" tab at the top of the home page. **Thank you** for your continued support of DVHS academics!

## Syllabus and Safety Acknowledgment Google Form

Students AND Parent/Guardian need to fill this google form out acknowledging that you read the syllabus and safety guidelines.

<https://forms.gle/qQX7zQL8zHaxz18p6>

## Summer Assignment

Here is a link to the full AP Chemistry Summer Assignment. <https://tinyurl.com/y6wclmu5>

### Course Outline (approximate)

| Semester 1       |                   |                                  | Semester 2                |                   |                                  |
|------------------|-------------------|----------------------------------|---------------------------|-------------------|----------------------------------|
| DVHS Unit        | Textbook Chapters | Corresponding AP Unit from Below | DVHS Unit                 | Textbook Chapters | Corresponding AP Unit from Below |
| Review           | 1 – 4             | I                                | Gas Laws                  | 5                 | II                               |
| Thermochemistry  | 6, 17             | III, XI                          | IMFs & Solutions          | 12                | VII                              |
| Kinetics         | 13                | VIII                             | Acid Base                 | 15, 16            | X                                |
| Mid-Term Exam    |                   |                                  | Electrochemistry          | 18                | XII                              |
| Equilibrium      | 14                | IX                               | Mock AP Exam (mid-term)   |                   |                                  |
| Atomic Structure | 7, 8              | V                                | If time – Organic         | 20                |                                  |
| Bonding          | 9, 10, 11         | IV, VI                           | If time – Projects        |                   |                                  |
| Final Exam       |                   |                                  | Final Exam (MOCK AP TEST) |                   |                                  |

| Unit   | Description<br>Content Skills  | HW   | Labs/Activities<br>$\Delta$ =Inquiry $\otimes$ =Normal  |
|--|--|--|---|
| I:<br>Review Unit<br>Ch. 1, 2, 3, 4<br>2 weeks                 | <b>Unit 1 is a review unit:</b><br>Material covered in Honors Chem and by the summer assignment.<br><b>Matter &amp; Measurements:</b> Classifying matter, dimensional analysis, significant figures<br><b>Atoms, Molecules, Ions:</b> Atomic structure, formulas, nomenclature, oxidation states, etc.<br><b>Stoichiometry:</b> Mole, atomic weight, molecular formula, balancing eqs, limiting reagents, empirical formulas, % comp, % yield, and solution<br><b>Aqueous Reactions and Solution Stoichiometry:</b> Precipitation (net ionic), acid-base, redox, concentrations. | ~20 - 30<br>Book Q's per week<br><br>Worksheets practice problems<br><br>Old FRQ's | $\otimes$ Analysis of Silver in an Alloy – Exp. 2 FLINN<br><br>$\Delta$ #3: <u>What makes Hard water Hard?</u> – You will design and perform an experiment using gravimetric analysis to determine the stoichiometry of the reaction. You will create a precipitate in a chemical reaction, which you will separate from the solution via vacuum filtration using Buchner funnels (SP 1-7)<br><br><u>Chemicals Reactions Video Activity (BI - #3):</u> You will make a narrated video for chemical reactions, showing how atoms are rearranged and/or reorganized   |
| II:<br>Gases<br>Ch. 5<br>1.5 weeks                             | <b>Gases:</b><br>Ideal gas law, van der Waal's equation, Avogadro's Law, STP, Dalton's Law, Graham's Law, kinetic theory of gases, real vs. ideal gases, etc...<br>• <b>Chemical Reactions</b>   | ~20 - 30<br>Book Q's per week<br><br>Worksheets practice problems<br><br>Old FRQ's | $\otimes$ #5: <u>The molar Volume of a Gas</u> – You will react Mg ribbon with HCl in a eudiometer tube to collect gas in that sealed tube over water. Taking measurements of mass, volume, and temperature, you will then determine what is the dry molar volume of that gas (SP 1-7)  |
| III:<br>Thermochemistry<br>Ch. 6<br>1 week                     | <b>Thermochemistry:</b><br>The nature of Energy, Enthalpy, Thermodynamics of Ideal Gases, Calorimetry, Specific Heat, Hess's Law, Standard Enthalpies of Formation (but not calculating $\Delta H_{rxn}$ from them)<br>• <b>Chemical Reactions</b>   | ~20 - 30<br>Book Q's per week<br><br>Worksheets practice problems<br><br>Old FRQ's | $\otimes$ #13 <u>Determine the Enthalpy of a Chemical Reaction</u> – You will use computer temperature probes to measure that heat released from 3 chemical reactions that you will perform. Two of those reactions can be added in some way on paper to get the 3 <sup>rd</sup> reaction. You will verify that Hess's Law holds by comparing your heats of reaction from 2 of the reactions to the heat of reaction of the 3 <sup>rd</sup> since the 1 <sup>st</sup> two should add up to equal the 3 <sup>rd</sup> . (SP 1-7)<br><br>$\Delta$ #12: <u>The Hand Warmer Challenge</u> – Design and perform an experiment using knowledge of calorimetry to design a hand warmer that will release energy based on given specifications using ionic compounds that are soluble in water (SP 1-7) |
| IV:<br>Bonding and Molecular Structure<br>Ch. 8 + 9<br>2 weeks | <b>Chemical Bonding:</b><br>Chemical bonds, Electronegativity, Bond polarity and Dipole moments, Ions: E.C. (but not the exceptions), and sizes, formation of Binary ionic compounds, partial ionic character of covalent bonds. The covalent chemical bond: A model, covalent bond energies and chemical reactions, the Localized electron bonding model, lewis structures, resonance, exceptions to the octet  | ~20 - 30<br>Book Q's per week<br><br>Worksheets practice problems<br><br>Old FRQ's | <u>VSEPR Activity (BI - #2):</u> You will be given a list of chemical formulas and prepare 3D models to the various electro pair arrangements, and complete a table, which shows the Lewis Structure, electron-pair geometry, molecular structure, and use that information to predict the presence or absence of a dipole moment. You will build the molecules using gumdrop candy and toothpicks, taking into account how the lone pairs of electrons affect the shape.   |

|  |  |   |  |
|--|--|---|--|
|  | rule, molecular structure: The VSEPR model.<br>Hybridization (not including 'd' orbitals)<br>• <b>Chemical Reactions</b>   |   |  |
| <b>V:</b><br><i>Periodic Table, Atomic Structure</i><br>Ch. 7<br>1.5 weeks       | <b><u>Atomic Structure:</u></b><br>Atomic spectra, Bohr atom, quantum numbers, molecular geometry, hybrid orbital's, electron configurations, periodic table, trends in the periodic table in terms of physical and chemical properties<br>• <b>Chemical Reactions</b>                                   | ~20 - 30<br>Book Q's<br>per week<br><br>Worksheets<br>practice<br>problems<br><br>Old FRQ's | <b><u>Periodic Trends Graphing Activity</u></b> (BI - #1) – You will graph "Atomic number vs XXXX" and interpret several data sets on atomic properties. Student will then discuss trends as they contribute to PES diagrams in identification of compounds.<br><br><b><u>Spectroscopy and Electron Configuration.</u></b> Students will perform flame tests of various ionic compounds to see with spectrosopes the spectra that the metal elements produce. You will record those spectra, calculate their frequencies and energies, and determine the identity of an unknown by comparing to the spectral fingerprints you have recorded. (SP 1-7)<br><br>Δ #1: <b><u>What is the relationship between the concentration of a solution and the amount of Transmitted light through the solution</u></b> – You will design and/or interpret the results of an experiment regarding the absorption of light to determine the concentration of an absorbing species in a solution (SP 1-7)   |
| <b>VI:</b><br><i>Intermolecular Forces, Solids, Liquids</i><br>Ch. 10<br>2 weeks | <b><u>Intermolecular Forces, Liquids, and Solids:</u></b><br>Dipole–dipole interactions, hydrogen bonding, London forces, liquid state, types of solids, metallic bonding, network solids, vapor pressure, change of state, phase diagrams<br>• <b>Chemical Reactions</b>                                | ~20 - 30<br>Book Q's<br>per week<br><br>Worksheets<br>practice<br>problems<br><br>Old FRQ's | Δ #5: <b><u>Sticky Q: How do you separate molecules that are attracted to one another?</u></b> – You will design and/or interpret the results of a separation experiment in terms of relative strength of interactions among and between the components.(SP 1-7)<br><br>⊗ <b><u>Determining Melting Temperature</u></b> - You will use a Vernier Melt Station to determine the melting temperature of a solid substance. Your sample will be one of several possible pure compounds. On subsequent trials you will be able to accurately determine the melting temperature of your sample, thus identifying the compound (SP 1-7)  |
| <b>VII:</b><br><i>Properties of Solutions</i><br>Ch. 11<br>2 weeks               | <b><u>Properties of Solutions:</u></b><br>Electrolytes and non-electrolytes, molarity, molality, mole fraction, colligative properties, Raoult's Law, Henry's law, freezing point depression, boiling point elevation, and osmotic pressure.<br>• <b>Chemical Reactions</b>                              | ~20 - 30<br>Book Q's<br>per week<br><br>Worksheets<br>practice<br>problems<br><br>Old FRQ's | Δ #4: <b><u>Using Freezing-Point Depression to Find Molecular Weight</u></b> – You will determine the molar mass of a solute by Freezing it. From the Freezing point depression and knowledge of the molality of the solution you will be able to calculate the molar mass of the solute compound (SP 1-7)<br><br>⊗ <b><u>Identification of Solutions</u></b> – Juniata  |
| <b>VIII:</b><br><i>Chemical Kinetics</i><br>Ch. 12<br>2 weeks                    | <b><u>Chemical Kinetics:</u></b><br>Reaction Rates, Rate laws: an introduction, determining the form of the rate law, the integrated rate law, rate laws: a summary, reaction mechanism, the steady-state approximation, a model for chemical kinetics, catalysis<br>• <b>Chemical Reactions</b>         | ~20 - 30<br>Book Q's<br>per week<br><br>Worksheets<br>practice<br>problems<br><br>Old FRQ's | Δ #11: <b><u>What is the rate law of a the fading of Crystal Violet using Beer's Law</u></b> – You will use computers with spectrameters to observe that progress of a chemical reaction that involves a color change. By monitoring that rate of change in the absorbance's of light through the reaction sample and using Beer's Law, you will design how to determine the rate of the reaction and its order and perform the experiment (SP 1-7)<br><br>⊗ <b><u>Iodination of Acetone</u></b> – The purpose of this reaction is to determine the orders for the reactants, the rate expression, and the rate constant for the reaction between iodine and acetone. – Junitata<br><br><b><u>Kinetics Graphing Activity</u></b> (BI - #4) – You will determine the order of a reaction, rate law, rate constant, and half-life through the graphing of given concentration vs. time data for a reaction   |
| <b>IX:</b><br><i>Chemical Equilibrium</i><br>Ch. 13<br>2 weeks                   | <b><u>Chemical Equilibrium:</u></b><br>Equilibrium constant, equilibrium expressions, calculations of K and equilibrium concentrations, Le Chatelier's principle, and how equilibrium is shifted by temperature, concentration, ICE tables, intro to complex ions, etc...<br>• <b>Chemical Reactions</b> | ~20 - 30<br>Book Q's<br>per week<br><br>Worksheets<br>practice<br>problems<br><br>Old FRQ's | <b><u>Equilibrium "Red Rover" Activity</u></b> (BI - #6) – You will play a "game" in which the parts of the class (separated initially into 2 groups), switch places based on different conditions called out<br><br>Δ #13: <b><u>Can we make the colors of the rainbow?</u></b> – You will design and perform an experiment to investigate Le Chatelier's principle by testing several systems at equilibrium and then selecting specific ones to produce the colors of the rainbow based on specific applications of this principle (SP 1-7)<br><br>Δ #15: <b><u>To what extent to common household products have buffering activity?</u></b> (SP 1-7)<br><br>⊗ #10: <b><u>Determination of K<sub>eq</sub> for FeSCN<sup>2+</sup></u></b> - you will prepare a new series of solutions that have varied concentrations of the Fe <sup>3+</sup> ions and the SCN <sup>-</sup> ions, with a constant concentration of H <sup>+</sup> ions. You will use the results of this test to accurately evaluate the equilibrium concentrations of each species. (SP 1-7) |
| <b>X:</b><br><i>Acid / Base</i>  | <b><u>Acids-Bases:</u></b><br>pH, K <sub>a</sub> and K <sub>b</sub> expressions, titration, degree of ionization, K <sub>w</sub> expressions, indicators, equivalence points, Arrhenius, Brønsted-Lowry and  | ~20 - 30<br>Book Q's<br>per week  | ⊗ #8: <b><u>An Oxidation-Reduction Titration:</u></b> The Rx. Of Fe <sup>2+</sup> and Ce <sup>4+</sup> - You will conduct an oxidation-reduction reaction in this experiment in order to determine the amount of iron (II) ions in a solid sample of ferrous ammonium sulfate hexahydrate. (SP 1-7)  |



credit. In general, the AP composite score cut-points are set so that the lowest composite score for an AP score of 5 is equivalent to the average score for college students earning scores of A. Similarly, the lowest composite scores for AP scores of 4, 3, and 2 are equivalent to the average scores for students with college scores of B, C, and D, respectively.

Students who earn AP Exam scores of 3 or above are generally considered to be qualified to receive college credit and/or placement into advanced courses due to the fact that their AP Exam scores are equivalent to a college course score of "middle C " or above. However, the awarding of credit and placement is determined by each college or university and students should check with the institution to verify its AP credit and placement policies.