Welcome to AP Chemistry!
Mrs. Golliday
Room 4244
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Description

This course is designed to provide a classroom and laboratory experience equivalent to a first-year college chemistry course. It is intended that you will gain sufficient expertise to perform successfully on the AP Chemistry National Test on May 4th 2014. This may seem like a lot of time, but this is a very comprehensive and difficult test which demands thorough preparation that must start at the beginning of the course and continue consistently throughout. All of the material covered on the test will be presented in the course; careful study and practice through working assigned problems will boost your chances for success.

Class Meeting Times

The AP Chemistry course meets for 50 minutes on Monday and Friday 1st period (8:05-8:55) and 80 minutes on Tuesday, Wednesday, and Thursday (7:35-8:55). You must be present in the classroom by 7:35 am on extended days. Being tardy will affect your ability to complete labs and tests in the time allotted and therefore affect your grade.

Textbook

Brown, Theodore E., H. Eugene LeMay, and Bruce E. Bursten. Chemistry: The Central Science. Prentice Hall. 12th Edition AP Edition

Assessment

The grading system is based on total points earned out of total points available. Grades will be based on tests, quizzes, homework assignments and labs. There are no retakes on tests, but we will do corrections for an independent grade. You may correct and retake quizzes during learning lunch on Monday or Wednesday. Anticipated points are listed below. These may be modified in response to weather or in response to classroom needs. Check PowerSchool frequently.
1st Semester:

- 5 exams worth 60 points each
- 8 quizzes worth 15 points each
- 15 labs worth 10 points each
- 1 Formal Lab Report and Folder-Poster Presentation worth 50 points
- 10 assignments checks worth 5 points each
- Midterm AP Question Reviews worth 5 points each unit.
- 5 Test Corrections worth 5 points each
- Midterm exam worth: 100 points – 50% take home and 50% in class.

2nd Semester:

- 5 exams worth 60 points each
- 6 quizzes worth 15 points each
- 15 labs worth 10 points each
- 10 assignment checks worth 5 points each
- 5 Test corrections worth 5 points each
- 1 project worth 50 points
- I will provide an optional AP practice take home exam over spring break. You can add a full letter grade to any unit exam from 3rd quarter with correct answers. Due 3/23/14 with no exceptions. You cannot let tutors, relatives or friends assist you with any questions or problems. You cannot discuss the exam with ANYONE in person or digitally. You can use internet postings/readings, your notes, your book, and your review books.
- There will be numerous (and well spread out) AP Question Reviews worth 5 points each topic.

Rules and Expectations

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- Attend Class. Regular attendance is imperative. If you must be out please let me know in advance if at all possible. After returning from an absence, find out what you missed by asking other class members and see me to get handouts or to make arrangements to do any make-up work. Plan to do this before school. Check your unit schedule.

- Keep current in the material. It is very important that you do not procrastinate; do the work as it is assigned. At the beginning of each unit, about every 2 weeks, a calendar for the unit will be distributed and uploaded to Canvas. The calendar will include all daily assignments (text references, assigned problems, etc.) for the unit and the dates of labs, quizzes, and tests.

- Ask for help when you need it. I am available before school and learning lunch to answer your questions about chemistry. Often, we can find other times to meet by appointment. Don't wait until the night/morning of a quiz or test. I promise to make helping you a priority every single day.

- Canvas is updated regularly with class unit schedules, handouts, and lectures. I will also post answer keys to practice exercises and problems. Check your answers carefully and review the solutions. I post these to help you not fall behind. Some problems are difficult and you will be expected to solve similar problems on quizzes and exams. Please master the work I give you – not memorize it!

Chapter	Unit and Topics	Dates	# Days
1, 2, 3	**Unit 1 – Matter, Measurement, Atomic Structure, Formulas, Nomenclature, Reactions, and Stoichiometry. This is review material from Chemistry.**	8-13 To 8-28	12
6, 7, 18.1, 23.1	**Unit 2 - Electronic Structure and Periodicity.**	8-29 To 9-18	14
13.1-13.5, 4, 5, 18.5	**Unit 3 – Solutions and Thermochemistry**	9-19 To 10-16	19

8, 9	**Unit 4 – Chemical Bonding (Intramolecular Forces)**	10-17 To 11-6	13
10, 11, 12	**Unit 5 - States of Matter (Intermolecular Forces). Notes: many examples will also be used from Chapters 22 and 24 to identify IMF's. Also, do not master the sample exercises in Chapter 12 – it is read only; look for IMF relationships.**	11-7 To 12-11	22
	Semester 1 Exam Review and Exam	12-12 To 12-18	5

Chapter	Topic (Textbook Section)	Dates	# Days
14	**Unit 6 - Kinetics**	1-5 To 1-22	13
15, 22.5	**Unit 7 - Equilibrium**	1-23	15

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		To 2-12	
16, 17	**Unit 8 – Acid–Base Equilibria**	2-13 To 3-13 (unit exam on 3/12)	19
19, 23.2-23.3	**Unit 9 – Chemical Thermodynamics.**	3-13 To 4-2	10
20	**Unit 10 – Electrochemistry**	4-6 To 4-16	9
	AP Practice Exam and Review	4-17 To 5-1	11
	AP Exam	5-4	
	Inquiry Lab Report, Lab Portfolio, and Poster Board Presentations- You will present 5/15-5/19	5-4 To 5-20	12
	Final Exams – There is no final exam for AP Chemistry	5-21 To 5-27	4

Unit Learning Objectives

Unit 1 – Chapters 1, 2, and 3

LO 1.1 The student can justify the observation that the ratio of the masses of the constituent elements in any pure sample of that compound is always identical on the basis of the atomic molecular theory.
LO 1.2 The student is able to select and apply mathematical routines to mass data to identify or infer the composition of pure substances and/or mixtures.
LO 1.3 The student is able to select and apply mathematical relationships to mass data in order to justify a claim regarding the identity and/or estimated purity of a substance.
LO 1.4 The student is able to connect the number of particles, moles, mass, and volume of substances to one another, both qualitatively and quantitatively.
LO 1.17 The student is able to express the law of conservation of mass quantitatively and qualitatively using symbolic representations and particulate drawings.
LO 1.18 The student is able to apply conservation of atoms to the rearrangement of atoms in various processes.
LO 3.1 Students can translate among macroscopic observations of change, chemical equations, and particle views.
LO 3.2 The student can translate an observed chemical change into a balanced chemical equation and justify the choice of equation type (molecular, ionic, or net ionic) in terms of utility for the given circumstances.
LO 3.3 The student is able to use stoichiometric calculations to predict the results of performing a reaction in the laboratory and/or to analyze deviations from the expected results.
LO 3.4 The student is able to relate quantities (measured mass of substances, volumes of solutions, or volumes and pressures of gases) to identify stoichiometric relationships for a reaction, including situations involving limiting reactants and situations in which the reaction has not gone to completion.
LO 3.5 The student is able to design a plan in order to collect data on the synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions.
LO 3.6 The student is able to use data from synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions.

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Unit 2 – Chapters 6, 7, 18.1, 23.1

LO 1.5 The student is able to explain the distribution of electrons in an atom or ion based upon data.
LO 1.6 The student is able to analyze data relating to electron energies for patterns and relationships.
LO 1.7 The student is able to describe the electronic structure of the atom, using PES data, ionization energy data, and/or Coulomb's law to construct explanations of how the energies of electrons within shells in atoms vary.
LO 1.8 The student is able to explain the distribution of electrons using Coulomb's law to analyze measured energies.
LO 1.9 The student is able to predict and/or justify trends in atomic properties based on location on the periodic table and/or the shell model.
LO 1.10 Students can justify with evidence the arrangement of the periodic table and can apply periodic properties to chemical reactivity.
LO 1.11 The student can analyze data, based on periodicity and the properties of binary compounds, to identify patterns and generate hypotheses related to the molecular design of compounds for which data are not supplied
LO 1.12 The student is able to explain why a given set of data suggests, or does not suggest, the need to refine the atomic model from a classical shell model with the quantum mechanical model.
LO 1.13 Given information about a particular model of the atom, the student is able to determine if the model is consistent with specified evidence.
LO 1.14 The student is able to use data from mass spectrometry to identify the elements and the masses of individual atoms of a specific element.
LO 1.15 The student can justify the selection of a particular type of spectroscopy to measure properties associated with vibrational or electronic motions of molecules.
LO 1.16 The student can 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.

Unit 3 – Chapters 13.1-13.5, 4, 5, 18.5

LO 1.19 The student can design, and/or interpret data from, an experiment that uses gravimetric analysis to determine the concentration of an analyte in a solution.
LO 2.8 The student can draw and/or interpret representations of solutions that show the interactions between the solute and solvent.
LO 2.9 The student is able to create or interpret representations that link the concept of molarity with particle views of solutions.
LO 2.10 The student can design and/or interpret the results of a separation experiment (filtration, paper chromatography, column chromatography, or distillation) in terms of the relative strength of interactions among and between the components.
LO 2.14 The student is able to apply Coulomb's law qualitatively (including using representations) to describe the interactions of ions, and the attractions between ions and solvents to explain the factors that contribute to the solubility of ionic compounds.
LO 2.15 The student is able to explain observations regarding the solubility of ionic solids and molecules in water and other solvents on the basis of particle views that include intermolecular interactions and entropic effects.
LO 3.8 The student is able to identify redox reactions and justify the identification in terms of electron transfer.
LO 3.11 The student is able to interpret observations regarding macroscopic energy changes associated with a reaction or process to generate a relevant symbolic and/or graphical representation of the energy changes.
LO 5.2 The student is able to relate temperature to the motions of particles, either via particulate representations, such as drawings of particles with arrows indicating velocities, and/or via representations of average kinetic energy and distribution of kinetic energies of the particles, such as plots of the Maxwell-Boltzmann distribution.
LO 5.3 The student can generate explanations or make predictions about the transfer of thermal energy between systems based on this transfer being due to a kinetic energy transfer between systems arising from molecular collisions.
LO 5.4 The student is able to use conservation of energy to relate the magnitudes of the energy changes occurring in two or more interacting systems, including identification of the systems, the type (heat versus work), or the direction of energy flow.
LO 5.5 The student is able to use conservation of energy to relate the magnitudes of the energy changes when two nonreacting substances are mixed or brought into contact with one another.

LO 5.6 The student is able to use calculations or estimations to relate energy changes associated with heating/cooling a substance to the heat capacity, relate energy changes associated with a phase transition to the enthalpy of fusion/vaporization, relate energy changes associated with a chemical reaction to the enthalpy of the reaction, and relate energy changes to $P\Delta V$ work. **LO 5.7** The student is able to design and/or interpret the results of an experiment in which calorimetry is used to determine the change in enthalpy of a chemical process (heating/cooling, phase transition, or chemical reaction) at constant pressure. **LO 5.8** The student is able to draw qualitative and quantitative connections between the reaction enthalpy and the energies involved in the breaking and formation of chemical bonds.
Unit 4 – Chapters 8 and 9
LO 2.1 Students can predict properties of substances based on their chemical formulas, and provide explanations of their properties based on particle views. **LO 2.13** The student is able to describe the relationships between the structural features of polar molecules and the forces of attraction between the particles. **LO 2.17** The student can predict the type of bonding present between two atoms in a binary compound based on position in the periodic table and the electronegativity of the elements. **LO 2.18** The student is able to rank and justify the ranking of bond polarity on the basis of the locations of the bonded atoms in the periodic table. **LO 2.21** The student is able to use Lewis diagrams and VSEPR to predict the geometry of molecules, identify hybridization, and make predictions about polarity. **LO 2.22** The student is able to design or evaluate a plan to collect and/or interpret data needed to deduce the type of bonding in a sample of a solid. **LO 5.1** The student is able to create or use graphical representations in order to connect the dependence of potential energy to the distance between atoms and factors, such as bond order (for covalent interactions) and polarity (for intermolecular interactions), which influence the interaction strength.
Unit 5 – Chapters 10, 11, 12
LO 2.3 The student is able to use aspects of particulate models (i.e., particle spacing, motion, and forces of attraction) to reason about observed differences between solid and liquid phases and among solid and liquid materials. **LO 2.4** The student is able to use KMT and concepts of intermolecular forces to make predictions about the macroscopic properties of gases, including both ideal and nonideal behaviors. **LO 2.5** The student is able to refine multiple representations of a sample of matter in the gas phase to accurately represent the effect of changes in macroscopic properties on the sample. **LO 2.6** The student can apply mathematical relationships or estimation to determine macroscopic variables for ideal gases. **LO 2.7** The student is able to explain how solutes can be separated by chromatography based on intermolecular interactions. **LO 2.11** The student is able to explain the trends in properties and/or predict properties of samples consisting of particles with no permanent dipole on the basis of London dispersion forces. **LO 2.12** The student can qualitatively analyze data regarding real gases to identify deviations from ideal behavior and relate these to molecular interactions. **LO 2.16** The student is able to explain the properties (phase, vapor pressure, viscosity, etc.) of small and large molecular compounds in terms of the strengths and types of intermolecular forces. **LO 2.19** The student can create visual representations of ionic substances that connect the microscopic structure to macroscopic properties, and/or use representations to connect the microscopic structure to macroscopic properties (e.g., boiling point, solubility, hardness, brittleness, low volatility, lack of malleability, ductility, or conductivity). **LO 2.20** The student is able to explain how a bonding model involving delocalized electrons is consistent with macroscopic properties of metals (e.g., conductivity, malleability, ductility, and low volatility) and the shell model of the atom. **LO 2.23** The student can create a representation of an ionic solid that shows essential characteristics of the structure and interactions present in the substance. **LO 2.24** The student is able to explain a representation that connects properties of an ionic solid to its structural attributes and to

the interactions present at the atomic level. **LO 2.25** The student is able to compare the properties of metal alloys with their constituent elements to determine if an alloy has formed, identify the type of alloy formed, and explain the differences in properties using particulate level reasoning. **LO 2.26** Students can use the electron sea model of metallic bonding to predict or make claims about the macroscopic properties of metals or alloys. **LO 2.27** The student can create a representation of a metallic solid that shows essential characteristics of the structure and interactions present in the substance. **LO 2.28** The student is able to explain a representation that connects properties of a metallic solid to its structural attributes and to the interactions present at the atomic level. **LO 2.29** The student can create a representation of a covalent solid that shows essential characteristics of the structure and interactions present in the substance. **LO 2.30** The student is able to explain a representation that connects properties of a covalent solid to its structural attributes and to the interactions present at the atomic level. **LO 2.31** The student can create a representation of a molecular solid that shows essential characteristics of the structure and interactions present in the substance. **LO 2.32** The student is able to explain a representation that connects properties of a molecular solid to its structural attributes and to the interactions present at the atomic level. **LO 3.10** The student is able to evaluate the classification of a process as a physical change, chemical change, or ambiguous change based on both macroscopic observations and the distinction between rearrangement of covalent interactions and noncovalent interactions. **LO 5.9** The student is able to make claims and/or predictions regarding relative magnitudes of the forces acting within collections of interacting molecules based on the distribution of electrons within the molecules and the types of intermolecular forces through which the molecules interact. **LO 5.10** The student can support the claim about whether a process is a chemical or physical change (or may be classified as both) based on whether the process involves changes in intramolecular versus intermolecular interactions. **LO 5.11** The student is able to identify the noncovalent interactions within and between large molecules, and/or connect the shape and function of the large molecule to the presence and magnitude of these interactions.
Unit 6 – Chapter 14
LO 4.1 The student is able to design and/or interpret the results of an experiment regarding the factors (i.e., temperature, concentration, surface area) that may influence the rate of a reaction. **LO 4.2** The student is able to analyze concentration vs. time data to determine the rate law for a zeroth-, first-, or second-order reaction. **LO 4.3** The student is able to connect the half-life of a reaction to the rate constant of a first-order reaction and justify the use of this relation in terms of the reaction being a first-order reaction. **LO 4.4** The student is able to connect the rate law for an elementary reaction to the frequency and success of molecular collisions, including connecting the frequency and success to the order and rate constant, respectively. **LO 4.5** The student is able to explain the difference between collisions that convert reactants to products and those that do not in terms of energy distributions and molecular orientation. **LO 4.6** The student is able to use representations of the energy profile for an elementary reaction (from the reactants, through the transition state, to the products) to make qualitative predictions regarding the relative temperature dependence of the reaction rate. **LO 4.7** The student is able to evaluate alternative explanations, as expressed by reaction mechanisms, to determine which are consistent with data regarding the overall rate of a reaction, and data that can be used to infer the presence of a reaction intermediate. **LO 4.8** The student can translate among reaction energy profile representations, particulate representations, and symbolic representations (chemical equations) of a chemical reaction occurring in the presence and absence of a catalyst. **LO 4.9** The student is able to explain changes in reaction rates arising from the use of acid-base catalysts, surface catalysts, or

enzyme catalysts, including selecting appropriate mechanisms with or without the catalyst present.
Unit 7 – Chapter 15
LO 3.9 The student is able to design and/or interpret the results of an experiment involving a redox titration. **LO 6.1** The student is able to, given a set of experimental observations regarding physical, chemical, biological, or environmental processes that are reversible, construct an explanation that connects the observations to the reversibility of the underlying chemical reactions or processes. **LO 6.2** The student can, given a manipulation of a chemical reaction or set of reactions (e.g., reversal of reaction or addition of two reactions), determine the effects of that manipulation on *Q* or *K*. **LO 6.3** The student can connect kinetics to equilibrium by using reasoning about equilibrium, such as Le Chatelier's principle, to infer the relative rates of the forward and reverse reactions. **LO 6.4** The student can, given a set of initial conditions (concentrations or partial pressures) and the equilibrium constant, *K*, use the tendency of *Q* to approach *K* to predict and justify the prediction as to whether the reaction will proceed toward products or reactants as equilibrium is approached. **LO 6.5** The student can, given data (tabular, graphical, etc.) from which the state of a system at equilibrium can be obtained, calculate the equilibrium constant, *K*. **LO 6.6** The student can, given a set of initial conditions (concentrations or partial pressures) and the equilibrium constant, *K*, use stoichiometric relationships and the law of mass action (*Q* equals *K* at equilibrium) to determine qualitatively and/or quantitatively the conditions at equilibrium for a system involving a single reversible reaction. **LO 6.7** The student is able, for a reversible reaction that has a large or small *K*, to determine which chemical species will have very large versus very small concentrations at equilibrium. **LO 6.8** The student is able to use Le Chatelier's principle to predict the direction of the shift resulting from various possible stresses on a system at chemical equilibrium. **LO 6.9** The student is able to use Le Chatelier's principle to design a set of conditions that will optimize a desired outcome, such as product yield. **LO 6.10** The student is able to connect Le Chatelier's principle to the comparison of *Q* to *K* by explaining the effects of the stress on *Q* and *K*.
Unit 8 – Chapter 16, 17
LO 1.20 The student can design, and/or interpret data from, an experiment that uses titration to determine the concentration of an analyte in a solution. **LO 2.2** The student is able to explain the relative strengths of acids and bases based on molecular structure, interparticle forces, and solution equilibrium. **LO 3.7** The student is able to identify compounds as Bronsted-Lowry acids, bases, and/or conjugate acid-base pairs, using proton-transfer reactions to justify the identification. **LO 6.11** The student can generate or use a particulate representation of an acid (strong or weak or polyprotic) and a strong base to explain the species that will have large versus small concentrations at equilibrium. **LO 6.12** The student can reason about the distinction between strong and weak acid solutions with similar values of pH, including the percent ionization of the acids, the concentrations needed to achieve the same pH, and the amount of base needed to reach the equivalence point in a titration. **LO 6.13** The student can interpret titration data for monoprotic or polyprotic acids involving titration of a weak or strong acid by a strong base (or a weak or strong base by a strong acid) to determine the concentration of the titrant and the p*Ka* for a weak acid, or the p*Kb* for a weak base. **LO 6.14** The student can, based on the dependence of *K*w on temperature, reason that neutrality requires [H+] = [OH–] as opposed to requiring pH = 7, including especially the applications to biological systems. **LO 6.15** The student can identify a given solution as containing a mixture of strong acids and/or bases and calculate or estimate the pH (and concentrations of all chemical species) in the resulting solution. **LO 6.16** The student can identify a given solution as being the solution of a monoprotic weak acid or base (including salts in which one ion is a weak acid or base), calculate the pH and concentration of all species in the solution, and/or infer the relative

strengths of the weak acids or bases from given equilibrium concentrations.
LO 6.17 The student can, given an arbitrary mixture of weak and strong acids and bases (including polyprotic systems), determine which species will react strongly with one another (i.e., with $K > 1$) and what species will be present in large concentrations at equilibrium.
LO 6.18 The student can design a buffer solution with a target pH and buffer capacity by selecting an appropriate conjugate acid-base pair and estimating the concentrations needed to achieve the desired capacity.
LO 6.19 The student can relate the predominant form of a chemical species involving a labile proton (i.e., protonated/deprotonated form of a weak acid) to the pH of a solution and the pKa associated with the labile proton.
LO 6.20 The student can identify a solution as being a buffer solution and explain the buffer mechanism in terms of the reactions that would occur on addition of acid or base.
LO 6.21 The student can predict the solubility of a salt, or rank the solubility of salts, given the relevant Ksp values.
LO 6.22 The student can interpret data regarding solubility of salts to determine, or rank, the relevant Ksp values.
LO 6.23 The student can interpret data regarding the relative solubility of salts in terms of factors (common ions, pH) that influence the solubility.

Unit 9 – 19, 23.2-23.3

LO 5.12 The student is able to use representations and models to predict the sign and relative magnitude of the entropy change associated with chemical or physical processes.
LO 5.13 The student is able to predict whether or not a physical or chemical process is thermodynamically favored by determination of (either quantitatively or qualitatively) the signs of both $\Delta H°$ and $\Delta S°$, and calculation or estimation of $\Delta G°$ when needed.
LO 5.14 The student is able to determine whether a chemical or physical process is thermodynamically favorable by calculating the change in standard Gibbs free energy.
LO 5.15 The student is able to explain how the application of external energy sources or the coupling of favorable with unfavorable reactions can be used to cause processes that are not thermodynamically favorable to become favorable.
LO 5.16 The student can use Le Chatelier's principle to make qualitative predictions for systems in which coupled reactions that share a common intermediate drive formation of a product.
LO 5.17 The student can make quantitative predictions for systems involving coupled reactions that share a common intermediate, based on the equilibrium constant for the combined reaction.
LO 5.18 The student can explain why a thermodynamically favored chemical reaction may not produce large amounts of product (based on consideration of both initial conditions and kinetic effects), or why a thermodynamically unfavored chemical reaction can produce large amounts of product for certain sets of initial conditions.
LO 6.24 The student can analyze the enthalpic and entropic changes associated with the dissolution of a salt, using particulate level interactions and representations.
LO 6.25 The student is able to express the equilibrium constant in terms of $\Delta G°$ and RT and use this relationship to estimate the magnitude of K and, consequently, the thermodynamic favorability of the process.

Unit 10 – Chapter 20

LO 3.12 The student can make qualitative or quantitative predictions about galvanic or electrolytic reactions based on half-cell reactions and potentials and/or Faraday's laws.
LO 3.13 The student can analyze data regarding galvanic or electrolytic cells to identify properties of the underlying redox reactions.

Laboratory Program

The laboratory experiments are chosen to illustrate concepts discussed in class. Students are expected to be able to collect, manipulate, and analyze data. The labs require you to follow or develop processes and procedures, take observations, accomplish multiple trials and use statistical analysis to derive conclusions. Students are required to have a bound student carbonless duplicate lab notebook (provided). Prior to lab, you must have prelab questions answered, data tables set up and labeled, graphs set up, and know your procedure. For inquiry labs, your procedure must be written before doing the lab. I will be rotating through the room to check your lab notebooks for preparation for lab. You will not be permitted to do the experiment if the prelab questions and data tables/graphs are not ready for data. This is a safety issue. All labs are required and if you do not complete data collection then you will receive a zero for that lab. Every lab assignment must have a handwritten, lab report in your lab book. Use the following in order to receive maximum credit:

- Date experiment performed
- Title of experiment
- Lab hand out stapled to copy produced from lab manual
- Purpose —State the problem/questions clearly; substantiate the question and explain the reason for the investigation. – completed before data collection.
- Theory: Prelab questions and/or Theory (Refer to your lab handout) – completed before data collection.
- Procedure: (Refer to the handout). For labs in which you are given procedures you DO NOT have to rewrite the procedures but you must include any procedural changes noted. This is common in chemistry lab. For inquiry labs you will have to write procedures for the inquiry lab that follows the practice procedure in EXPLICIT detail with precise quantitative directions. – completed prior to data collection.
- Data: Data must have numbers with descriptive units in correct significant figures. Data must be recorded ***directly into lab book*** and you must also turn in data table sheet from the lab hand out. Some labs have multiple data tables and multiple graphs. Be organized and check that you have not missed anything. – Labeled data tables and graphs are prepared PRIOR to data collection. This demonstrates to me your comprehension of the instructions and satisfies my concerns for safety.
- Analysis, Discussion, and Conclusions – Answer post lab questions for all parts of your lab. Explain all calculations which produced data in data table. Answers to questions should be written in complete sentences with question stated in answer. Please be careful in your handwriting and include units and variables when necessary. I have to be able to read your work.

First Semester:

1. Performance of lab safety session – ACS Video sheet, quiz, and safety contract – week 1 chap1 – no writeup in lab book – handout only (ACS)
2. Some Measurements of Mass and Volume (CSCC) week 2 chap 1
3. Separation of a Dye Mixture Using Chromatography - AP Inquiry #5 (Flinn) week 3 chap 1
4. Isotopes and Mass Spectroscopy (CSCC) week 4 chap 2
5. Percent Copper in Brass Beer's Law - AP Inquiry #2 (Flinn)week 5 chap 6
6. Solubilities within a family (CSCC) week 6 chap 7
7. The Synthesis and Analysis of Aspirin (Vernier #22; Flinn) week 7 chap 3
8. Green Chemistry Analysis of a Mixture - AP Inquiry #7 (Flinn) week 8 chap 3
9. Ionic Reactions in Aqueous Solutions (CSCC) week 9 chap 3
10. Thermochemistry and Hess's Law (CSCC)week 10 chap 5
11. Qualitative Analysis and Chemical Bonding - AP Inquiry #6 (Flinn) week 11 chap 8
12. Geometric Isomers (CSCC) week 12 chap 9
13. Hydrates and Thermal Decomposition (CSCC) week 13 chap 4
14. Conductivity of Aqueous Solutions (CSCC) week 14 chap 4
15. What Makes Hard Water Hard - AP Inquiry #3 (Flinn) week 15 chap 4

2nd Semester:

1. Kinetics of a Reaction (Flinn) 2 day Chap 14 week 19
2. Rate Determination and Activation Energy (Vernier Labquest #35) 1 day Chap 14 week 20

3. Analysis of Hydrogen Peroxide - AP Inquiry #8 (Flinn)1 day chap 14 week 21
4. The Determination of an Equilibrium Constant (Vernier #10) 1 day Chap 15 week 22
5. Le Chatliers Principle (CSCC)1 day Chap 15 week 23
6. Acidity of Beverages - AP Inquiry #4 (Flinn) 1 day Chap 16 week 24
7. Equilibria with Weak Acids and Bases (CSCC) 1 day chap 16 week 25
8. Buffers (Vernier #19) 1 day chap 17 week 26
9. Acid-Base Titration (Vernier #7) 1 days chap 17 week 27
10. A Solubility Product Constant (Vernier #23; CSCC) 1 day chap 17 week 28
11. Qualitative analysis of cations and anions (Flinn)1 days chap 17 week 29
12. Spontaneity (CSCC) 1 day Chap 19 week 30
13. Thermochemistry and complex ions (Flinn)1 day chap 19 and 23 week 31
14. Electrochemistry and electrode potential (Flinn)1 day chap 20 week 32
15. Natural Radioactivity (CSCC)1 day chap 21week 33

Course Mock Exam and AP Chemistry National Exam

The course final exam "mock" will likely be during the last full week of April, shortly after we return from spring break. It will cover material from both semesters and follow an identical format to the National Exam.

The first part of the three-hour test lasts 90 minutes, constitutes 50% of the grade and consists of 60 multiple-choice questions which must be done without a calculator. The second part lasts 90 minutes and counts 50% of the grade. This free-response section consists of 7 multi-part comprehensive problems and essay topics. You can use your calculator on the free response.

The AP Practice Tests from which we'll do problems and essays throughout the course will give you a lot of examples of AP free-response questions. We will use the reference sheets provided and the calculator you intend to use on the test.

The 2015 National AP Chemistry Exam is scheduled for the morning of Monday, May 4.

The test is graded by the College Board at the beginning of the summer with scores typically available in early to mid-July.

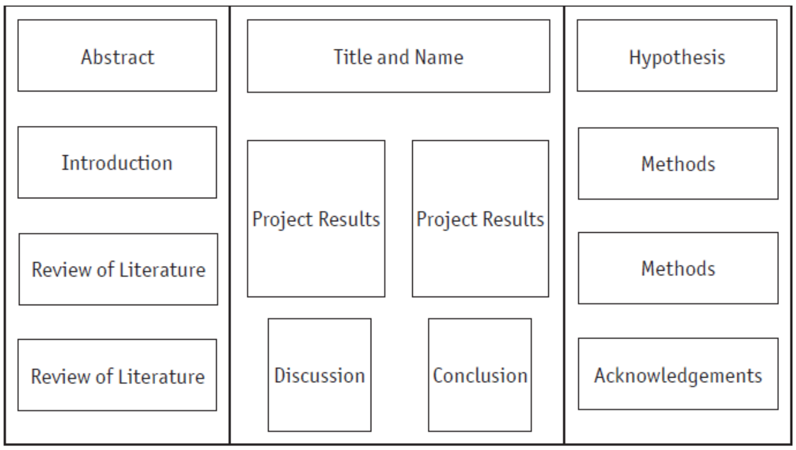
After the Exam

There are nearly 3 weeks remaining of the course after we take the exam. This time will be used to create a folder-poster board presentation, submit a lab portfolio, and type a formal lab report using the format on the next page.

- All students will generate a lab binder portfolio, which will contain a table of contents, all lab handouts, and copies of all returned lab reports stapled where appropriate in the binder. This portfolio is exceptionally valuable and you should retain it because universities are known to request it when reviewing your AP scores in order to determine credit earned.

- Each designated lab group will perform a 10 minute poster board presentation on the lab of their choice. We will use folders to make our presentations.

Poster Presentation Layout - one folder per lab group



Formal Lab Report Sections: Headings must be present. Each person writes their own report.

Title:

Abstract: Summary and Summation of lab. 250 words or less. Must identify your variables and summarize your conclusions.

Review of Literature: Provides past research reported in literature and background information. Introduces the topic historically and scientifically. Presented in a logical order, which will lead to the statement of purpose or rationale for the work. You must provide 3 references from scientific journals. Use infoohio or ask the librarian if you do not know how to access scientific journals.

Statement of Purpose/Hypothesis: Identifies a clear prediction or outcome to an event. Identifies the questions that the research seeks to explain.

Methods and Materials: Lists and/or demonstrates the use of equipment and supplies, and describes procedures to be used to execute the experiment.

Results: Data tables and graphs must be included.

Analysis and Discussion: The student explains and interprets the data through data and error analysis.

Conclusion: States whether or not the results support the hypothesis, suggests future research, and discusses the importance this research has to the scientific community or society.

Applications: How is this experiment related to everyday world applications, major societal or technological components (e.g., concerns, technological advances, innovations) such as how spectroscopy can be used to distinguish real art from fake art?

Welcome to AP Chemistry!
Mrs. Golliday
Room 4244
tami.golliday@bexleyschools.org

References: Use appropriate formatting. Three different references from peer reviewed scientific journals.

Each Group will determine the following responsibilities: Lab chosen to present, person designated to purchase the poster board.

Group will determine the Person Responsible for the following responsibilities: Poster Board Layout, Title, Abstract, Review of Literature, Statement of Purpose/Hypothesis, Methods and Materials, Results, Analysis and Discussion, Conclusion, and Application.