

AP CHEMISTRY-Mountlake Terrace High School

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2013-14

Brief Description of Course

Welcome to AP Chemistry. About the Course: This course is designed as a full year of college level laboratory science. We will be using the Zumdahl Zumdahl 6th edition book as the primary in-class resource; but we will supplement with lots of secondary material from AP Central, Ebbing and Gammon Gen. Chem 7th Ed; Various AP Test Prep materials; and various on-line video's, lectures, and animations(bio-alive, pHet, Khan academy, you-tube).

We will attempt to cover as many basic chemical principles as possible as we explore the mysteries of mixtures, elements, compounds, solutions and all their properties. We will learn stoichiometry, identify unknowns, and do basic chemical analysis.

We will do as many hands-on, inquiry based, labs as is possible. You can expect at least 2 hours of laboratory experience a week; with some work being finished at home. Science is sometimes a difficult subject to completely understand and you may from time to time experience difficulty. I will make myself available after school and at any other time, if possible. Prerequisites: To be in AP chemistry you need to have taken and passed the year-long Introduction to Chemistry Course(preferably, with an "A") and should have had success in upper level math classes(at least Math Anal/Algebra II).

My website is updated at least twice a week, you can check your grade and find links for helpful tutorial/informational sites.

The Main Goals of the Course:

- 1)To prepare every student to take and pass the AP Chemistry Exam in May.
- 2) To prepare every student for the rigors of college chemistry and college classes in general.
- 3)To understand and appreciate the influence of chemistry in our daily lives.
- 4)To help students garner the critical thinking skills necessary to solve complex problems in a scientific manner.
- 5) To be comfortable with and capable of, completing multifaceted laboratory experiments, and creating complete college level lab reports.
- 6) To be able to work together in a lab situation

Important

This course has lots of information in it that is absolutely necessary that you understand if you wish to be successful. Therefore, every assignment should be completed in the appropriate manner and every quiz/exam passed, if you fail a test you need to make sure you come in and go over material until you completely understand it. Work is due when stated.

Grades: I will go over the grading policy in detail during the first week of class. It will be split into lab, daily work, and tests. To get an A in the class you will need to be proficient in all 3 areas.

Labs: The number of points for each lab will vary. Labs are very difficult to set up and often cannot be left out indefinitely. If you miss a lab you must make it up immediately or you jeopardize your grade. You will be required to purchase and keep a lab notebook. You can expect to do on average about 3-5 hours a week in a laboratory setting. While labs will be started in class, most if not all labs will need to be finished outside of classroom hours. Your teacher and the classroom will be available every day from 7am and from 2-3pm to finish labs, work on problems, and complete and submit lab notebooks. Labs will often be Inquiry-meaning they will have an open ended component-designed for you to “discover” the concept for yourself.

Daily Work/Homework: There are many varied activities that we do in class. You can expect to have 5+ hours of homework a week. This will be something new for many of you, and time management may be one of the most difficult things you face this year. Almost every one of you can expect to feel overwhelmed at some point this year, when this happens it is imperative that you communicate with me immediately(see above times)

Quizzes: These may or may not be announced and will cover recent learning as well as laboratory concepts.

Exams: These will encompass a larger scope of knowledge than quizzes and will occur at the end of units.

Lab Notebook: You will regularly submit a lab notebook for review. Each lab will require a complete lab report containing a detailed introduction, materials/procedure, data, and conclusions. We will follow the school district lab report grading rubric that you are familiar with from your previous science classes.

Group work: A major goal of this class is to learn to work together in a diverse group setting. For each lab you will be paired with a different student and you will work together on the lab and the lab report. You will be assigned to a study group and encouraged to meet regularly. You will occasionally be given group assignments and group quizzes. Remember-Chemistry is life and life should be fun...enjoy!

Unit Information

Summer Work: Foundations of Chemistry.

Zumdahl/Zumdahl Chapters One and Two

These chapters are assigned in June and Expected to be finished before school begins in September. Problems sets are assigned, your teacher will make himself available on several occasions over the summer for help on the problems. They should be largely review of material from Intro. The first week of school will be spent going over this material, doing the first labs, and reviewing lab safety procedures. We will introduce the lab report and lab notebook at this time. You will be expected to do a complete lab report for all major labs in this course. We will use the district lab report rubric for grading purposes.

Content and/or Skills Taught:

Content: Chpt 1 emphasis

Lab Report Lab Notebook Scientific Method Measurement Uncertainty

Significant Figures Dimensional Analysis Group work and group dynamics

Chpt 2 emphasis

Dalton's Atomic Theory and its evidence Modern view of the atom Molecules and Ions

Periodic Table Naming Simple Compounds

Lab Skills Taught-Lab Safety, Names and uses of common lab equipment, Use of Balance, Volumetric Glassware, Separation using Buchner Funnel, Determination of Unknown using Density, Boiling/Freezing Point.

Writing a lab report. We use the district lab report rubric, which emphasizes a detailed

Introduction (abstract, purpose/hypothesis) Materials and Procedure, Data and Observations, Summary and Conclusions sections.

Putting together a Lab Notebook: Requires a detailed table of contents and glossary, will be turned in a graded regularly (about every 2nd or 3rd lab).

Analysis Skills-Percent Composition, Use of the Metric System, Scientific Notation, Significant Figures, Using Dimensional Analysis to solve complex, multistep problems.

Major Assignments and/or Assessments:

Major Labs/lab skills- Use of Volumetric Glassware, Using physical properties to determine and Unknown. Major Assignments-Daily Warm-up Problems, Chapter Problems, Test on chapters 1 and 2. Group Work: Students will be assigned to their first lab group. We will go over group dynamics (who does what, emphasizing the goal of working towards each other's strengths, how to avoid problems, etc.)

Unit Name or Timeframe: Stoichiometry-3 Weeks.

Covering chapters 2 and 3 of Zumdahl.

Content and/or Skills Taught:

Atomic Mass The Mole Molar Mass Percent Composition Naming Chemicals

Determination of Empirical and Molecular Formula Chemical Equations

Stoichiometric Calculations-including Limiting Reactants Vocabulary of Solutions

Composition of Solutions Chemical Reactions in solutions(precip, neut, ox/red)

Stoichiometry of Precipitation Reactions Balancing Oxidation/Reduction Reactions

Lab Skills Taught-Solubility of a Salt, Separation using Filtration and Distillation, Basic Qualitative Analysis Using Solubility rules. Students will submit lab notebooks with first 2 labs for review, will go over the lab report rubric and how labs were graded. Will discuss how the lab group dynamics worked and assign new lab groups the above labs.

Analysis Skills-Name/Formula for ions, polyatomic ions, acids, etc. Solve stoichiometric problems using moles, molar mass, molarity, %composition, percent yield, and limiting agents. Balance chemical reactions. Find empirical/molecular formulas of unknown. Determine and write chemical equations for synthesis, decomposition, single/double displacement, label reaction as acid/base, precip, ox/red. Write net ionic equations, predict reaction using solubility laws and periodic table. Balance oxidation/reduction reactions using 1/2 reactions, and in acid/base.

Major Assignments and/or Assessments:

Major Labs- INQUIRY LAB-Analysis of Food Dyes in Beverages-(Flinn)

INQUIRY LAB-Green chemistry analysis of a mixture(Flinn)

Solubility of a salt. Finding an unknown using solubility rules(basic Qualitative Analysis).

Major Assignments/Assessments: Daily Warm-up, Chapter Problems, Test on Chpts 3 and 4. Take home test(AP release short answer item-Done in study groups, will discuss the roles of study groups in facilitating understanding and the pitfalls of working together. Stoichiometry and multiple choice items from AP prep books) Lab Notebook Check-will present examples from the best lab groups of proper lab reporting.

Unit Name or Timeframe: Gases: Chapter 5.

Content and/or Skills Taught:

Properties of Gases(P,V,n, T), conversion of units. Absolute Zero Gas Laws(Boyle, Avagadro, Charles, Dalton, and Ideal Gas Law) Gas stoichiometry. KMT Root Mean Vel.

Lab Skills-Measuring gases, Finding Absolute zero w/ Charles Law, Using gas law to find molar mass of unknown gas. Effusion rates

Analysis skills-Reaction Stoichiometry of Gases, solving gas law problems, understanding non-ideal gases, relate gas laws to Kinetic Molecular Theory, relate pressure to boiling point.

Major Assignments and/or Assessments:

Major Labs-INQUIRY LAB-Analysis of Hydrogen Peroxide(Flinn)

Using gas law to find molar mass of unknown, using charles law to find absolute zero, using manometer to deduce boyle's law. Use of pHet website for $PV=nRT$ modelling.

Major Assessment-Daily Warm-up problems, chpt 5 problem set, chpt 1-5 test. Take home AP released gas law problem, submitted by lab partners, will go over the problems discussing the need to show detailed work. Submit lab notebook for review.

Unit Name or Timeframe: Thermochemistry-chpt 6

2 weeks

Law of conservation of energy/1st Law of Thermo. Exo/Endothermic reactions

Internal Energy Enthalpy Work-relationship between work and PV Calorimetry

Hess's Law Reaction Stoichiometry involving Heat

Content and/or Skills Taught:

Major Content: As above, heavy emphasis on calorimetry and enthalpy problems.

Skills; Stoichiometry of reactions, Using Hess's Law, Predicting outcomes of reactions.

Major Assignments and/or Assessments:

Major Labs: INQUIRY LAB-designing a hand-warmer (Flinn)

Coffee cup calorimetry for specific heat of unknown, heat of fusion, and heat of reaction (acid/base). Lab practical exam-given an unknown metal identify it by finding it's specific heat(done as lab partners)

Assessment; Daily Warm-ups, Lab Notebook Check, Chapter Problems, In-class multiple Choice test w/ problems from AP prep books

Unit Name or Timeframe: Atomic Structure-Chapter 7

1 week.

Content: Electromagnetic Radiation and the Spectrum Relationship between Frequency, Wave Length

Planck's Constant DeBroglie's Equation Atomic Spectrum Analysis

Quantum Model-ground/excited states Orbital diagrams/shapes

Pauli Principle Aufbau Principle Hund's Rule Electron Configurations Periodic Trends

Skills-

Manipulate/Calculate wavelength, frequency, mass, relationships. Identify atom using spectral analysis Calculate energy of photon Give complete electron configurations for ground states

Pick out valence electrons, relate to periodic table/properties Pick out trends in ionization/electron affinity, atomic radii

Major Assignments and/or Assessments:

Major Lab-using spectrophotometers(Whole class results communicated to develop the graph for absorption; use of pHet modeling, Orbitron website, and you-tube vids) Major Assessments-Daily Warm-ups, Chapter Problems, Quiz chpt 7.

Unit Name or Timeframe: Bonding-Chapters 8 and 9(heavy borrowing from Ebbing and Gammon-7th ed)

2 weeks, plus work over Thanksgiving Break. Friday after thanksgiving the room is open for lab groups and study groups as an all day "catch up and get our work done day"

Content: Types of Bonds-Ionic, covalent, polar covalent Bond length, Bond Energy

Electronegativity Polarity/dipole moment ion size Enthalpy from bond energy

Hybridization and localized electron model sigma/pi bonding para/diamagnetism

Skills-Predict the bond and polarity using electronegativity. Understand periodic properties, use bond energy to calculate enthalpy, write Lewis structures, show resonance in structure, assign formal charge, predict preferred shape using VSEPR, Understand and show all types of hybridization, use hybridization to explain/predict molecular geometry, predict para/dia magnetism,

Communication-will work on writing answers to a short essay-type problem, and how to critique fellow students in a positive manner.

Major Assignments and/or Assessments:

Major Labs-INQUIRY LAB-qualitative analysis and chemical bonding(Flinn)

INQUIRY LAB-separation of a dye mixture using Chromotography(Flinn)

Determining the length of Oleic Acid molecule

Exploring the Orbitron-Website

Major Assessments-Daily Warm-ups, Chapter Problems, Lab notebook check, Test on Chpt 8/9, In class AP released short answer problem. Short answer problem will be done by individuals and assessed by group.

Unit Name or Timeframe: Liquids, Solids, and Solutions

Chapters 10 and 11

4 Weeks (this will include 2wks over Holiday Break in which students will be expected to complete chapter reading and problem sets, teacher will be available during several days of break for assistance)A strong emphasis is made on using the study groups during this time to help each other.

Content: Intermolecular Forces Liquid State Structure and Types of Solids(Crystals, Atomic, Metals, Network, Molecular) Packing and efficiency Vapor Pressure Heating Curves

Review Solubility Rules Molality vs Molarity Solution Stoichiometry Heat of solution Effects of Temperature and Pressure(Henry's Law and Raoult's Law) Solubility Curves

Boiling Point Elevation and Freezing point Depression

Skills-Use properties to identify solid type, relate efficiency to properties, explain phase diagram. Drawing pictures, graphs, and diagrams to communicate the above ideas to a third person. Use molarity, molality, and normality in solution stoichiometry. Calculate heat of solution. Use Henry's law to calculate the effect of Pressure on Concentration. Explain the effect of temp or solutions, draw and explain a solubility curve. Use Raoult's Law to calculate the vapor pressure of a solution. Calculate freezing point elevation and depression, and use this to find the molar mass of a substance.

Major Lab-Calculating Vapor Pressure, Super saturation of sodium thiosulfate, Using Freezing point depression to find molar mass of Napthalene

Lab Practical-Using Physical Properties to Identify Type of Solid, submitted by lab groups.

Assessments-Daily Warm-up problems, chapter problems, Quiz on chpt10/11, Take home AP practice test for holiday break (MC and free response) Submit lab notebooks for review, emphasis on organization of the lab notebook(table of contents, crossed out rather than erasing, all pages numbered, good titles, etc.)

Unit Name or Timeframe: Kinetics

2weeks

Content: Reaction Rates Rate Laws Form of Rate Laws-First Order, Second Order, Zero Order
Half Lives of First and Second Order Integrated Rate Law Reaction Mechanisms

Collision model Activation Energy Chemical Kinetics Effect of Catalyst

Skills-Finding rate law from experimental data and from graph. Determining, writing and manipulating the rate laws and integrated rate laws. Using the half-life equation. Relating rate laws to a reaction graph and vice versa. Write a reaction mechanism, determine the rate determining step and relate it to the rate law. Use the collision model to explain kinetics.

Major Assignments and/or Assessments:

Major Assignment/Assessments: Chapter Problems, Daily Warm-ups, Major Semester Test over first 12 Chpts. Extra time will be provided after school for study groups to meet and prepare for test.

Lab-INQUIRY LAB-Rate of decomposition of Calcium Carbonate(Flinn)

Iodine Clock Experiment-effects of concentration and temp on Reaction Rates. Will also turn in a set of explanations for a variety fo Reaction Rates Demos. Emphasis on the use of clear communication in explanations, use of diagrams, pictures as well as written word.

Unit Name or Timeframe: Chemical Equilibrium.

2 to 3 Weeks

Content: Dynamic Equilibrium Writing Eq. Expression from Law of mass action

Calculating Eq. Constant Equilibrium Position Eq. w/ Pressure and Kp

Heterogeneous Equilibrium Reaction Quotient Calculating Equilibrium Concentrations/Partial Pressures
Le Chatelier's Principle

Major Skills: Use collision model to explain dynamic equilibrium. Given any equation, write the Eq expression, calculate K_{eq} , K_p , and the concentrations of the chemicals involved. Find Q and describe the equilibrium position. Manipulate heterogeneous Eq problems. Calculate the effect of changes concentrations in an equilibrium problem. Describe/manipulate/calculate the effects on a eq. system from changing pressure, temp, volume, conc. (Le Chatelier)

Major Assignment/Assessments-Daily Warm-ups, Chapter Problems, Take home AP Equilibrium Problems for study groups.

Major Labs-INQUIRY LAB-Applications of LeChatelier's Principle(Flinn)

Trimetric Determination of an Equilibrium Constant

Bio-alive-equilibrium animations and interactive material

Unit Name or Timeframe: Acids and Bases

2weeks

Content: Define Acid/Base-Arhenius, Bronsted, Lewis Conjugate A/B pairing

Write Acid/Base Eq. Expressions-Ka/Kb Define Strong/Weak Acid Recognize Mono/Di
Protic acids, amphoteric as well

Show water dissociation, K_w Calculate pH, pOH, and relate to $[H^+]$ and $[OH^-]$ of strong and weak acids and bases

Calculate Percent Dissociation Stoichiometry of polyprotic acids/particularly sulfuric

Acid/Base properties of salts Effect of temperature on A/B Oxoacids

Major Skills-Explain each definition of acids/bases. Write out A/B expression from formula. Recognize strong and weak acids/bases from formulas. Calculate concentrations of H and OH in solution, calculate pH and pOH of strong and weak solutions. Explain auto ionization of water and K_w . Calculate percent ionization and relate to conc, K_a , and pH. Recognize polyprotic acid and note effect of second H on system(esp. sulfuric). Show A/B properties of salts and manipulate. Understand how oxygen produces acid/base substances.

Major Assignments and/or Assessments: Daily Warm-ups. Problem Sets. Test over Equilibrium and Acid/Bases. Take AP Acid/Base essay question.

Major Lab- INQUIRY LAB-ACID/BASE Titrations-(Flinn)

Lab Practical-lab groups given a household cleaner to determine the percent acid/base in the cleaner. Turn in Lab notebook for review, emphasis on the detail in data/observation section of the lab notebook, are you clearly communicating the results/limitations of the lab.

Unit Name or Timeframe: Applications of Aqueous Equilibria

Content: Common ion in acid/bases

Buffered solutions, pH of buffered solutions, buffering capacity

Titration/pH curves-comparing strong/weak acid/bases Equivalence Point

Calculating K_a using E-point Indicators Solubility Equilibria and solubility product

Calculating K_{sp} and solubility Common Ion Effect-manipulating solubility(acid/base influence)

Qualitative Analysis Ion Product-Q Complex Ion Equilibria

Major Skills-Identify the major species in a weak acid/base. Complete problems involving common ions. Explain how and why buffering works, and find the pH of a buffered solution, calculate changes in a

buffered solution do to addition of acid or base. Show how to create a buffer at a given pH and explain buffering capacity. Walk through the titration of a weak acid with a strong base, show where it is buffered, equivalence point, and where it becomes basic, draw the curve. Use an indicator to accurately determine the pH of an acid/base, discuss the limitations of an indicator. Relate solubility to heterogeneous equilibrium, calculate the K_{sp} from solubility and vice versa. Use the common ion effect to manipulate solubility. Explain how solubility can be used to identify and unknown (qualitative analysis). Solve problems involving complex ion equilibria.

Major Assignments and/or Assessments: daily warm-up problems. Chapter problems. Lab practical using qualitative analysis. Submit lab notebook for review-emphasis on the conclusion/summary, making sure that the conclusion is complete and communicates both a complete understanding of the lab and the limitations of the lab.

Major Labs-INQUIRY LAB-Properties of Buffer solutions(Flinn)

Titration curve of buffered solution. Using the correct Indicator. Identifying an unknown using Qualitative analysis.

Unit Name or Timeframe: Spontaneity, Entropy, and Free Energy

Content: (review of enthalpy, Hess's Law) First, Second, and Third Laws of Thermodynamics

Relationship between spontaneity and Entropy Description/Graph of entropy using positional probability

Predicting Entropy from equations Entropy and the 2nd law

Effect of Temperature on Entropy and determining change in S Free Energy and Spontaneity

Understanding and predicting all possible combo of enthalpy, entropy and free energy

Using Standards energies tables do calculations involving a given chemical reaction and the energy associated with it.

Relate Free energy to Pressure

Calculations involving Free energy and Equilibrium, reaction quotient, temperature, and K_{eq} .

Relate Free Energy and work to real reactions and irreversibility.

Skills-communication-groups will grade/critique each other on an essay question. Will spend time on critical analysis skills and communicating to each other on how to improve written explanations.

Major Assignments and/or Assessments: Daily Warm-up problems, Quiz on Thermodynamics, In class preparatory AP essay question on Thermodynamics. Essay question is to be done by individuals than graded by study group, goal is for study group to offer critique and ideas for improvement.

Lab-Lab Practical-Explaining energy changes for a variety of endothermic/exothermic demos. Submit lab notebook.

Unit Name or Timeframe: Nuclear Chemistry

Content: Isotopes Radioactivity Zone of stability.

Alpha, Beta, and Gamma as major types of Radioactive Decay

Positron, Electron capture, and Fission Balancing Nuclear Equations

Half-lives-Carbon-14 dating Fusion and Fission

Major Assignments and/or Assessments: Chapter Problems.

Labs-Demos of Geiger Counter and Cloud Chamber. pHet online lab

Communication-Diagraming and explaining nuclear transformations.

Unit Name or Timeframe: Electrochemistry

Content: (review of oxidation/reduction and 1/2 reactions) Galvanic Cell

Cell Potential Potential using Standards Table Writing Line Notation, drawing galvanic cells

Relationship between Free energy and cell reactions, predicting spontaneity

Effects of concentration on cell potential-batteries

Finding Keq of a cell Electrolysis Electroplating

Major Assignments and/or Assessments: Daily Warm-ups, Chapter problems,

Communication- Drawing of a complete Cell with all parts clearly labeled Ecell calculated.

Lab-Creating a Lead Acid Battery.

Unit Name or Timeframe: Organic Chemistry

Content: Nomenclature(alkanes, enes, ynes, and cyclics) Unsaturated/Sat. hydrocarbons

Cis/Trans Isomerism Addition vs. Substitution reactions

Cyclis hydrocarbons Aromatics Polymers

Functional Groups-alcohols, ethers, esters, ketones, aldehydes, carboxylic acids and amines

Skills-Name all basic hydrocarbons and their functional groups using IAPUC rules. Predict whether substance undergoes substitution or addition reactions based on structure. Explain the stability of aromatic hydrocarbons due to structure and resonance. Describe/Predict esterification of alcohol and

acid. Show how to make a condensation and addition polymer, deduce the monomer give the polymer. Discuss biological polymers (proteins, carbs)

Major Assignments and/or Assessments: daily warm-ups, nomenclature test.

Communication- Study groups create a "book" on nomenclature, each page a different organic group. Study groups exchange books and critique how well they were able to use them to name a variety of organic chemicals.

Labs- Creating Nylon-66, Esters Lab- creating fragrant esters.

Submit lab notebook, emphasis on overall lab notebook organization, neatness, completeness.

Unit Name or Timeframe: The Periodic Table

Two Weeks, one of which is Spring Break where Students will be required to do reading and independent study. I will make myself available on 2 days for labs and problem set review. Study groups are encouraged to use these days as "get caught up" days. Lab groups are encouraged to use these days to perfect their lab notebooks.

Content: Periodic Table Families Trend in Atomic Sizes Elemental Abundance

Group 1A and their oxides Hydrogen and its properties Group 2A

Group 3A, particularly aluminum Group 4A, Carbon and metalloids

Group 5A, Nitrogen, ammonia, oxides Oxyacid and Oxyanions of 5-7A Fertilizers

Group 6A and oxygen/sulfur Group 7A and hydrogen halides Group 8A

Exception to octet rule, structures Transition metals electron configuration (d orbitals)

Complex ion formation and coordination chemistry ligands

oxidation states of transition metals structural/optical isomerism localized electron model

Major Skills taught- Predict size of atoms and ions on periodic table. Predict the typical reactions of all of elements on the periodic table. Particularly how they react w/ water, in acids, and in bases. Basically, the idea is to prepare for the descriptive chemistry question on the AP exam. In addition we look at several of the more common chemicals in everyday life such as sulfuric acid, phosphates, and ammonia and their importance and typical reactions. With the transition metals we talk about the oxidation states and spend time looking at the more common coordination complexes, such as those of Aluminum.

Major Assignments and/or Assessments: Will do 3 descriptive chemistry problems including the newest from AP Central site with new balancing and questioning requirements. Will also do a Quiz and problem set from the book and daily Warm-ups.

Major Labs-Preparation and properties of Hydrogen, oxygen, and carbon dioxide gases. Demos on various families and their properties, 1A and 2A in water, 7A in water vs. the potassium salts, etc. Preparation and properties of coordination compounds of copper, cobalt, and chromium.

Unit Name or Timeframe:Post AP test-

Content and/or Skills Taught: After the AP test we generally spend a week going over the written exam and discussing ways in which we can improve instruction for the following year. Students then are given a week to complete their lab notebook for final submission. They are required to have it reviewed by at least two other students who give them written commentary on how it can be improved, the emphasis is on how well the student has organized his lab notebook, on the thoroughness of each lab report in the notebook, and his/her overall ability to communicate the scientific process.

Students then choose their favorite labs and write why is what their favorite and how it helped to reinforce the material being learned. They also choose their least favorite lab and write how it can be improved next year to better enable them to understand the material.

Textbooks

Title:Chemistry-6th Edition (WE ARE IN THE PROCESS OF ADOPTING THE NEWEST EDITION OF ZUMDAHL BOOK FOR NEXT YEAR)

Publisher: Houghton Mifflin Company

Published Date: Copyright 2003

Author: Steven Zumdahl Second Author: Zumdahl Susan

Description:

Comprehensive General Chemistry Book Used by a large number of Universities as their freshman chemistry text(newer edition). We chose it partly because it is used by the University of Washington. It has a strong emphasis on the complex mathematical chemistry problems. We utilize the corresponding Lab manual for much of our laboratory assignments.

Other Course Materials

Material Type:Other

Description: I use a fair amount of supplemental technology in my classroom, I use powerpoint, graphing calculators, wireless internet(for interactive periodic table, Orbitron,pHet etc) and we have specs and CBLs for classroom use in labs. I keep an up to date website with links, grades, and daily updates.

Material Type :Primary Source

Description: School District Lab Report Rubric. Our school district put together a committee from our 4 high schools to create a district-wide grading rubric on Lab Reports.

Websites

URL:Orbitron

Description: Contains electron orbitals, diagrams, and animations of the various electron orbitals and hybrid orbitals of bonds; animations of sigma and pi bonds and antibonding

pHet-University of Col. –we use this a lot, lots of animations and interactive labs for making atoms, nuclear chem, acid/bases, etc

Bio-alive-another website with lots of interactive material and animations—we use the equilibrium material extensively.

Additional Information

Requirement: Cooperative Learning

How Course Meets Requirement:

All of our labs are group based lab, the students change lab partners after every lab so that by the end of the year they have partnered with every student in the class. This gives the experience of working with a diverse group of personalities and abilities.

Study groups are formed at the beginning of the year and encouraged throughout. We regularly discuss the difference between working together and doing each others work, and develop strategies to help each other get through difficulties.