



PimaCommunityCollege

West Campus

CHM 125IN Consumer Chemistry Syllabus for Spring 2008

Course Information:

Course Prefix/Number: **CHM 125IN**

Course Title: **Consumer Chemistry**

Semester: **Spring 2008**

CRN (Section Code): **24831**

Class Days/Times: **MW 9:10-12:00 a.m.**

Site/Room: **SCI K207**

Credit Hours: **4.0**

Teaching Format: **Integrated Lecture/Lab**

Instructor Information:

Name: **David A. Katz**

Office: **E-235 (Tortolita Building)**

US Mail: **Pima Community College
2202 W. Anklam Rd.
Tucson, AZ 85709-0270**

Phone/Voice Mail: **(520) 206-6044**

E-mail: **David.Katz@Pima.edu**

Web site: **<http://www.chymist.com>**

Availability: **Office hours: MW 8:00-9:00 a.m.; 3:30-4:30 p.m. TTh 10:00-11:00 a.m.; F 8:00-9:00 a.m.**

Generally, in addition to my office hours, I am in the office at least 30 minutes before class (if I am not in the lab). I am also available by appointment.

Instructional Materials:

Required Text: Selinger, Ben, **Chemistry in the Marketplace**, 5th Ed., Harcourt Brace (Thompson Learning), 1998.

Laboratory Manual: Laboratory Experiments for Chem 125 will be available for download from the internet at <http://www.chymist.com> under the heading Pima Chem Courses (left-hand menu) and then Chem 125 (Left-hand menu) The web files are in PDF format and require Adobe Acrobat Reader (available for free at <http://www.adobe.com>)

Laboratory Reference and Safety Manual: Katz, David A., **The General Chemistry Laboratory Survival Manual**, Hayden McNeil Publishing Co., 2006.

Note: Textbooks are available at the West Campus bookstore. The PCC Bookstore can be accessed and books ordered via the Internet at www.Pima.bkstr.com.

Course Description:

CHEMISTRY 125IN is an overview of the chemistry of everyday products and processes for the non-science major. Lecture discussions and activities will involve the chemistry of toothpaste, deodorants, cosmetics, soaps and detergents, foods, fabrics, toys, paints, plastics and other products commonly found in the kitchen, laundry, bathroom, bedroom, and workshop. No previous chemistry background required. Chemical principles and basic concepts will be explained as part of discussions of specific products.

This is an integrated course. Classes are held in a chemistry laboratory and will integrate lecture, discussion, activities, and experiments in each class session.

This course satisfies one semester of a general education laboratory science requirement.

Course Objectives:

Upon completion of the course, the student will be able to do the following:

1. Classify all samples of matter as an element, compound or mixture.
2. Describe the arrangement of the basic subatomic particles within the atom which lead to differences in mass, stability and reactivity of the elements along with their positioning on the periodic table of elements.
3. Describe the composition of a material from its chemical name or label ingredients.
4. Classify certain substances as acids, bases, and salts, and identify these compounds among commonly encountered household materials, and relate each to the pH scale.
5. Identify structures, simple naming, and applications of organic compounds in household products.
6. Distinguish and read label information on a wide range of consumer products and be able to find information on any "unknown" ingredient.
7. Discuss the development process involved with bringing a consumer product to the marketplace.
8. Describe environmental aspects of consumer products in the local, state, regional, national and international realms.
9. Discuss current problems and potential problems of consumer products and additives.
10. Describe current and alternative energy sources and resources.
11. Describe radioactivity in terms of atomic nuclear decay, the workings of a nuclear power plant, and the societal impact of this phenomenon.

Course Outline

The following outline presents topics, activities, and experiments in the order they will be discussed and/or performed in class. The course content does not necessarily follow the book in a chapter by chapter and page by page order. **Read chapters before the material is discussed in class.**

During the semester, there will be a number of interactive discussion sessions in class. These may be based on material from the textbook or on supplemental readings on topics or applications supplied by your instructor.

Date	Topic	Reading Assignment	Lab Experiment and/or Activities
Jan. 23	Properties of some common chemicals Physical and chemical properties Elements vs. compounds Chemical bonding	Chapter 1 pages 1-15 Handout: Element Symbols Internet: Web Elements Periodic Table	Elements and spectra (Class activity) Mystery Powders
Jan. 28	Names of chemicals Health and risk LD ₅₀ ADI (ADR) TLV Risk Assessment Safety information - where to find it MSDS	Chapter 2 pages 17-42 Handout: Formula Writing and Nomenclature of Chemical Compounds	Laboratory Orientation Check-in Lab safety Chemical Reactions
Jan. 30	Solutions Chemical equations		Safety Test The Synthesis of Zinc Iodide: Tracking a Chemical Reaction
Feb 4	Acids, Bases, and pH Organic chemistry Structure and Nomenclature of Hydrocarbons Functional group compounds		Acids, Bases, and pH using red cabbage paper indicator (Class activity) Esters: An Introduction to Organic Chemistry Reactions
Feb 6	The basic facts: reading labels on products References to decipher labels		Economics of a Chemical Product
Feb. 11	Chemistry in the Laundry Whiter and brighter: soaps and detergents Other household cleaning agents Dry cleaning Where does it go when it goes down the drain?	Chapter 3 Pages 43-66 Note: Topic for 1 st report is due today	Evaluation of cleaning effectiveness of soaps and detergents with additives (Class activity) The Chemistry of Soaps and Detergents: Part 1. Preparation of a soap and a detergent
Feb. 13	Chemistry of surfaces Solutions Emulsions Foams	Chapter 6 Pages 141-158	Drops on a penny (Class activity) The Chemistry of Soaps and Detergents: Part 2. Properties of soaps and detergents
Feb. 18	Chemistry in the kitchen Nutrients Starch Fats and oils, oh my! I can't believe it's really....	Chapter 4 pages 67-108	Potato Chip Tasting (class activity) Testing for Starch (class activity) Extraction of Fat From Potato chips How Big is a Fatty Acid Molecule

Date	Topic	Reading Assignment	Lab Experiment and/or Activities
Feb. 20	Chemistry of cooking		Butter in a Bottle (Demonstration) Zip-lock pickles (Class activity) Root beer (Class activity) Popcorn Homework: Microwave popcorn
Feb. 25	Chemistry in the dining room Foods and food additives	Chapter 15 pages 427-466	Apple browning: a look at antioxidants (Demonstration) Make your own orange drink: food additives and how they affect our food (Class activity) Easy cheese (Class activity)
Feb. 27	Food and food additives (continued)		Chromatography: The Extraction and Identification of Artificial Colors from Foods Homework: How Yeast Works
Mar. 3	Flour and bread Legal highs: Foods as drugs Vitamins and minerals		Energy of a Peanut: Determining the Caloric Content of Selected Foods
Mar. 5	Water	Note: Topic for 2 nd report is due today	Testing the Waters: How Good is That bottled Water and How Effective is Your Water Filter NOTE: If you want to test your water from home, bring in a fresh 1 L (1 qt) sample.
Mar. 10	Chemistry in the boudoir Selling sex: cosmetics and personal care products	Chapter 5 pages 109-140	Toothpaste Preparation of a Skin Cream
Mar. 12	Perfumes	Note: 1 st report is due today	Isolation of an essential oil
Mar. 17-22	Spring Break – No Classes		
Mar. 24	Tanning and sunscreens	Chapter 13 pages 327-367	Perfumes If you would like to examine your own perfume, bring in a 1 mL sample from home
Mar. 26	Chemistry in the medicine cabinet Aches, pains, and pills		Preparation and Evaluation of Sunscreens
Mar. 31	Over the counter medications		The Drug Lab: Synthesis of Aspirin and Acetaminophen
Apr. 2	Chemistry of hardware and software Plastics and polymers Carpets	Chapter 9 pages 213-250	Standardization of a Basic Solution and Analysis of Stomach Antacid Tablets
Apr. 7/9	Glass		Identification of a polymer Liquid Crystals
Apr. 14	Metals	Chapter 10 Pages 281-282	Polymers Preparation of synthetic rubber
Apr. 16	Fibers and fabrics Leather	Chapter 11 pages 283-299	Polishing your metals

Date	Topic	Reading Assignment	Lab Experiment and/or Activities
Apr. 21	Paper		Preparation of a synthetic dye Dyes and dyeing
Apr. 23	Paints Adhesives Concrete	Chapter 12 Pages 301-325	Papermaking and evaluation of papers Adhesives
Apr. 28	Chemistry in the garden Soil science - it ain't just dirt Dealing with critters: Pesticides	Chapter 7 pages 159-199	Paper testing (continued) Soils and geological formations Mining for natural resources
Apr. 30	Swimming pool chemistry	Chapter 8 pages 201-212 Note: 2 nd report is due today	Paper testing (continued) Making pastel crayons Making crayons
May 5	Chemistry and energy The other side of the wall outlet Energy sources and resources: Natural resources: coal, oil, and natural gas. Chemistry and your car	Chapter 14 pages 369-426	Petroleum (Demonstration) Batteries
May 7	Batteries Fuel Cells Alternative energy sources: wind power, hydroelectric, geothermal, solar power.		Fuel cells
May 12	Chemistry and Radiation Radioactivity Heavy metals and radiation Metals in the environment Biological effects Nuclear energy: reactors and waste Nuclear weapons	Chapter 16 Pages 467-483	Nuclear chemistry experiments Lab Check-out
May 14 or 19	Final Exam		

Course Requirements:

The final course grade will be based on attendance, class participation, quizzes, exams, lab experiments, projects, two short reports, and a final exam. The approximate percent weight of each is given below:

Short Reports (see schedule of important dates)	30%
Exams, quizzes, lab experiments, and projects	50%
Attendance	10%
Final Exam	10%

CHM 125IN Course Policies and Information

Assignments and Activities

Assignments and activities, will be assigned in class. Depending on the assignment, they may be collected and graded, or, they will be reviewed in a question and answer sessions in class.

Preparing for Class

As an integrated class, we will discuss information, as scheduled on the syllabus, and will do activities and/or experiments in every class. It is your responsibility to read the assigned material in advance and to **download and read experiments and/or activities** to be performed in each class. There are computers available in the laboratory with Internet capabilities, so you can access the experiments online, but you are not permitted to print out each and every experiment and/or activity.

Quizzes

There will be occasional quizzes or assignments, which will count as quizzes, during the semester. Each quiz will cover a specific topic or assignment. All quizzes have the same weight, even if the point count on particular quizzes differs. All quizzes are announced in class. Every effort is made to grade and return quizzes by the next class. Grades on quizzes are calculated as percentages.

Exams

There will be four exams during the semester. The exams will be open book/open notes or take-home exams. The exams cover information discussed in class and supplementary readings or related material assigned. Problems or calculations, if required, must show proper set-ups and calculations. Questions will require written answers and some discussions (short essay type questions). Every effort is made to grade and return exams in about one week to ten days (about three class periods). Grades on exams may be calculated as percentages based on total possible point scores.

- Exam 1 will cover elements, the periodic table, chemical bonds, compounds, acids and bases, chemistry and risk, chemistry and laundry, and chemistry and surfaces.
- Exam 2 will cover chemistry in the kitchen, cooking and chemistry in the dining room.
- Exam 3 will cover chemistry in the boudoir, medicine cabinet, and hardware and software.
- Exam 4 will cover chemistry in the garden, swimming pool, energy and radioactivity.

Final Exam

There will be a final exam at the end of the semester. The final exam is cumulative, and will include topics from the entire semester. If your final exam grade is significantly higher than your exam and quiz average during the semester, extra weight will be given to the final exam.

Short Reports

Students will write two short reports for the course. The reports will be on **two different, unrelated household products or current issues related to the chemistry discussed in this course**. The report may be a follow-up to class discussions, but must contain significant additional information over and above that in the textbook or class discussion. Topics for the short report must be approved by your instructor. (This is to reduce multiple duplications of topics.) If the report concerns a manufactured product, you should contact the manufacturer for information. Reports must contain a bibliography of sources used. (Note: Obtaining information from companies can be unreliable. Available information may be very general and delivery may take several weeks. Allow sufficient time to get information.) Additional information on the report is given later in this syllabus.

To avoid duplication of topics and to give you suggestions on finding and managing information, topics should be submitted in writing in advance of starting your reports. Should you encounter difficulty in obtaining information on the topic of your choice, the topic can be changed at a later date.

The topic for your first report must be submitted, in writing, for approval by **February 11, 2008**.

The topic for your second report must be submitted, in writing, for approval by **March 5, 2008**.

The first report is due no later than **March 12, 2008**

The second report is due no later than **April 30, 2008**.

Please submit **two copies** of your report. (One for your instructor's records)

Submitting Work

All quizzes, exams, and projects should be submitted in writing no later than the dates specified. Late papers will be downgraded by 10 points in the first 24 hours and an additional 10 points until the next class period. After that, a grade of zero will be recorded for that assignment.

You may submit your assignment via the Internet if you cannot be in class on the day it is due. The time stamp on the message, when it is received, will determine the date. **You should receive a reply confirming that your emailed message or assignment was received within 48 hours of submitting it.**

Please be advised that email occasionally gets misdirected, can end up being blocked by a spam filter, or lost in cyberspace. (blank subject lines or subjects such as "Hello" may go directly into a trash file.) It is your responsibility to make sure that the message was received.

Make-up Policy

THERE ARE NO MAKE-UP EXAMS OR QUIZZES no matter how valid your excuse may be. All exams and quizzes are scheduled with advance notice and they are given once only. THIS INCLUDES PARTS OF AN EXAM MISSED AS A RESULT OF LATENESS TO CLASS. If you miss a quiz or exam, it does not count against you (i.e., you will not get a grade of "zero"), but your grade will be calculated differently from the percent weights stated in the course requirements.

NOT SUBMITTING A SHORT REPORT WILL RESULT IN A GRADE OF "ZERO" FOR THAT ASSIGNMENT.

MISSING THE FINAL EXAM WILL RESULT IN A GRADE OF "ZERO" AND CAN RESULT IN YOUR FAILING THE COURSE.

If you know in advance that you will be late or not be present for a quiz or an exam, special arrangements can be made for you to take that quiz or exam under special conditions, such as taking the exam one day earlier than the class. Such requests must be made at least one week before the scheduled test day. If you have a conflict with the final exam, it must be resolved by the last day of class during the semester. Failure to resolve a conflict will not excuse you from the final exam.

Academic Integrity

Violations of scholastic ethics are considered serious offenses by Pima Community College, the Department of Chemistry and by your instructor.

Cheating on exams or quizzes will result in a grade of "zero" for that exam or quiz, and, at the instructor's discretion, possibly an F for the course. The zero will be calculated into your final grade point average for this course.

All work done for this class must be your own. While you may discuss assignments with other class members, the final written project must clearly be your own. You may use work from books, the internet, and other materials if it is properly cited. Copying from a published source without proper reference or from a person without acknowledgement, is considered to be plagiarism and will result in an F for the assignment, and, at the instructor's discretion, possibly an F for the course. There will be no exceptions.

Students may consult the PCC Student Handbook sections on student code of conduct, on scholastic ethics and on the grade appeal procedure. Copies are available at PCC campus libraries and at <http://www.pima.edu/~coadmissions/studresp.htm>.

Attendance

Attending class is a major responsibility you have in this course. As an integrated course, a major portion of your grade is based on activities and laboratory experiments which are part of each class. Relevant information and applications of course material, as well as demonstrations, are also presented in class, that material is not in the textbook. If you miss a class, your instructor can tell you what material was covered and summarize any discussions that took place, however, instructors do not have a set of formal lecture notes you can copy. It is your responsibility to get detailed notes from one (or preferably two) classmate(s).

Missing a significant number of classes will seriously affect your final grade. Since there is an experiment in almost every class, 3 missed experiments are counted as a grade of zero.

If you are absent from class for an extended period due to illness, an accident, or another valid reason, please have someone contact your instructor.

Extra Credit

There is no extra credit other than extra credit problems and questions that may be on exams.

You must demonstrate that you have mastered a substantial amount of the course material to obtain a passing grade.

Lateness

Since this class involves a great deal of hands-on learning, lateness to class results in missed information and is disruptive to the other students. Please make every effort to get to class on time. If you do arrive late for a class, please come into the

room quietly, find a seat, and get organized for class. Please avoid walking across the front of the classroom, disrupting the lecture or discussion. Try to walk around the back of the room.

If work or other circumstances will prevent you from getting to class on time, please see your instructor as soon as possible to discuss the problem.

Storms

In the event of a severe storm, or other major weather problem, the area may experience transportation disruptions and traffic delays. If an exam is scheduled or a major assignment is due on a day when there is a severe weather problem (this excludes normal rainfalls), the exam or assignment deadline will be postponed until the next class.

Classroom Behavior:

Because of insurance limitations, non-registered visitors are not allowed at class sessions or on field trips.

Possession of drugs, alcohol or firearms on college property is illegal.

Eating, drinking, smoking and soliciting are not allowed in classrooms.

Pets (service animals excepted), telephones, pagers and other electronic devices that distract students are not permitted in classrooms. Please turn off these devices during classes.

Students are expected to exhibit courteous and respectful behavior in class. You are here for the purpose of furthering your education. Students who are disrespectful of others or who are creating disturbances that interfere with the conduct of the class or the learning of others will be asked to leave.

Withdrawals

Students may withdraw from class at any time during the first 2/3 of the semester without instructor permission and without incurring any grade penalty. Please be kind enough to inform your instructor if you withdraw.

Students who are not regularly attending class and who have not submitted any assignments nor taken any quizzes or exams by the 45th day census date (see calendar) are assumed NOT to be participating in the class and will be withdrawn.

Please be sure to withdraw yourself by **April 9** if you do not expect to complete the class; otherwise you may receive a grade of "F" for the course and may affect your academic standing at the college.

Incomplete grades are only given when a significant amount of class has been missed for medical or other legitimate reasons. (see information which follows)

ADA Compliance

Pima County Community College District strives to comply with the provisions of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. Students with disabilities requiring special accommodations must notify the instructor of this need or directly contact the Disabled Student Resources Office on your campus at the beginning of the semester.

Workload

Students are expected to spend the normal amount of time required for a college course attending class sessions, doing assignments and research, reading and preparing for exams. The standard Carnegie Unit of college credit assigns 1 credit hour for each 15 hours of class time and assumes that students spend two hours working outside the classroom for each hour of classroom instruction. For a three-credit course, this translates to 135 hours per semester or an average of nine hours per week for a 15/16-week semester.

CHM 125 Grading System/Policies

Your final grade will be a weighted average of your work during the semester and are calculated as follows:

A	=	100-90%
B	=	89-80%
C	=	79-70%
D	=	69-60%
F	=	below 60%

The actual percentage may vary based on a final class distribution, but will not be higher than these percentages.

When calculating final grade averages, a single quiz or exam grade that falls significantly below the average of your other quizzes and exams will be discounted so it will have a minimum effect on your grade average.

My policy is that no one will miss a grade by one point. If your actual average falls at 89, and 90 is an "A", then your grade will be rounded up to a 90. An 88.9 will be a "B". The same applies to the other grade ranges.

Incomplete (I) grade:

"I" grades must be requested in writing by the student. Final decisions regarding an incomplete grade are made by the instructor and are subject to review by the Department Chair and the Division Dean. Generally, the student must have successfully completed at least 2/3 of the course material to receive an "I" grade.

Incomplete grades are generally reserved for medical and family emergencies that are of significant duration or occur at a critical time during the semester, they are not a way to withdraw if you are failing the course. Please contact your instructor before the last week of class to be sure that there is sufficient time to consider your request.

An incomplete grade generally implies that a student has completed a substantial portion of the course and has shown sufficient initiative to complete the course on his or her own. The student will receive a copy of the standard "I" form filed with the grade. This form will detail specifically what must be done to complete the course. A student has one year to complete the required work, otherwise the grade automatically reverts to an "F."

Late Withdrawal grade:

Your instructor has the ability to enter a late withdrawal grade (W) at the end of the semester as a final grade for the course if you request it and have not withdrawn by the normal two-thirds mark of the semester. Once final grades have been entered, you cannot retroactively request a D or F to be changed to a W.

If you have not attended class, and have not withdrawn by the 2/3 semester date, your instructor will not honor a late withdrawal request.

Please be aware that a W may affect your financial aid or other funding. You are advised to check with the funding organization to make sure there are no adverse effects to a W grade.

Final Grades:

Students no longer receive a grade transcript from the college mailed to their home address at the end of the semester. Students must log on to Banner Online Services to retrieve their grade information or may check grades by calling MAX 2000 at 206-4880. For privacy and security reasons, instructors may not post grades and may **NOT** give grades over the telephone.

Spring 2008 Calendar of Important Dates

Jan. 22	Spring classes begin
Feb. 6.	Last day to withdraw with a refund
Feb. 11	Topic for 1st Report due
Feb. 21-22	Rodeo Days – no classes
March 1	45 th day
March 5	Topic for 2nd Report due
March 17-23	Spring Break – no classes
March 12	1st Report due
March 20	Withdrawal deadline
April 30	2nd Report due
May 13	Last day of classes – Last day to request a W grade
May 14-20	Final exam week

SOME SUGGESTIONS FOR SUCCEEDING IN CHEMISTRY

Chemistry is a complex subject. It includes a great number of abstract concepts along with mathematical manipulations of equations and data. There is also a large vocabulary of technical terms. Succeeding in chemistry requires **constant study and review** of class material since many concepts build upon previous material. This is not a course where one can cram information before a quiz or exam.

The following suggestions will be helpful in helping you to succeed in this course:

1. Always read the chapter in the textbook, or other assigned readings, before it is covered in class.

Before a thorough reading, **scan the chapter(s)** to find out the kind of material covered. Look at any learning objectives or chapter outlines, the section headings, illustrations and tables, margin notes, and boxes containing relevant information and applications. Also look at the chapter summary and types of questions asked at the end of the chapter.

Read the chapter. You probably will not understand all the material after the first reading, it may take several readings. *Make notations of anything you do not understand* in the textbook or on a separate sheet of paper - you will **not** remember them unless you write them down.

When necessary, go back to previous chapters and review pertinent information that forms the foundation of the current material.

2. Attend the lectures.

Each chapter will be explained in lecture along with illustrations, relevant applications, and demonstrations. Important concepts will be stressed. Often, concepts will be explained in a different way from your textbook. Keep your notes from your chapter reading handy during the lecture to check that all your questions or uncertainties are addressed.

3. Ask questions.

The only *stupid questions* are those that are **not** asked. If you do not understand something, chances are that there are others with the same question - **ASK IT**, no one else will.

If you are really self-conscious about asking questions in class, then ask your instructor before or after class. Also, stop in your instructor's office during his/her office hours or make an appointment to meet with your instructor.

4. Keep your work organized.

Well organized material is easier to follow and understand. Organize your notes by topic and sub-topic or rewrite them in outline form. Make notations in your notes of things you do *not* understand. This organization is helpful when reviewing for quizzes and exams. Good organization is especially helpful with problem solving. For each problem, you should show the formula used or a concept map of the solution. Identify what is being asked, and list the given data and additional factors or information needed. Substitute the proper terms into the formula and be sure to include the proper physical units. Do the arithmetic last. Use of the physical units in a problem provide a quick means for checking your results.

5. Try all the homework questions and problems.

If you get stuck on a problem, no matter how little or how much you have done of it, *do not spend more than 10 minutes* with it, try another problem. Try the problem again, from scratch, the following morning or evening. If you are still stuck, then write a notation on your paper telling what your difficulty is (e.g. "what do I do next?"; "how do I use this item of data?", etc...). At

the earliest possible opportunity, ASK your instructor or a tutor for help. **SAVE YOUR WORK** (including your rough notes) - it will give your instructor a starting point for an explanation and help you to see your error or difficulty.

6. Study and review the course material on a regular basis.

Try to study in short sessions. You will retain more information from several 10 or 15 minute study sessions than you will from one long session. Make up some cards listing items that you have difficulty remembering, carry them with you, and review them when you find yourself unoccupied (such as waiting for someone, standing in a line, etc...). It is also helpful to make up mnemonics for lists of items or terms, or for concepts.

7. Get the addresses and telephone numbers of TWO classmates.

If you miss a class, you can get the notes from one or both classmates. Study together, you will be surprised at how much you learn from each other.

One of the best ways to get help in the course is to talk to your instructor. Make an appointment with him/her and **keep it**.

Short Report Information:

Two short reports are required as part of this course:

The reports will be on a **two different, unrelated, consumer products** (including over the counter drugs, but not prescription drugs) of your choice. The report may be a follow-up to class discussions, but must contain additional information beyond the class discussion and the textbook or supplemental readings. Ideas for topics can be found in specialized magazines such as *Discovery*, *Scientific American*, *Invention & Technology*, *Smithsonian*, or *Popular Science* (to name a few), news magazines such as *Time* or *Newsweek*, newspapers such as *The New York Times* science section or *The Arizona Daily Star* (or other local paper), and the Internet. (Note: most magazines and newspapers have web sites that include news stories from recent issues.)

The report should tell what the product, or products (if a comparison) are, the active ingredients (if applicable), how it was developed, how it works, and as much of the science behind it that you can find. You may include comparisons between similar products along with your own testing of the product (testing is not required). Information can be obtained from a number of sources including books, magazines (such as *Consumer Reports*, *Consumer Digest*, *Time*, etc...), U.S. patents (Internet address: *uspto.gov*), and the Internet. You should contact the manufacturer of each product for information using their consumer telephone number, usually listed on the product label. (Note: Some consumer departments are quite good at supplying information, others will be of little or no help. Do not ask them too much information as they are afraid you may be a competitor trying to get proprietary information. It may take 2-3 weeks, or more, to get information through the mail, and, in some cases, the information never arrives.) If you are using the Internet, try looking for a web site from the manufacturer or under the product names on the Internet (try addresses such as *Tide.com*, *Tylenol.com*, etc.).

Topics for the short reports must be approved by your instructor. (This reduces duplication of topics and will help you manage your information.)

The text of the report should be **five pages in length**, typed, and double spaced. (Do not quadruple space between paragraphs.) The report may be longer than 5 pages, if required, to complete your information.

Margins should be no greater than **one inch** (2.5 cm), top, bottom and sides.

Type size should be no greater than **12 point**, except for headings.

Diagrams, pictures, charts, and graphs are considered additional material and do not count toward the five page paper length. The diagrams do not have to be placed in the body of the report and can be added on separate pages at the end. Be sure you refer to any diagrams, pictures, charts, or graphs in the body of the paper to indicate why they are included.

Use three or more unique references, some of which should be fairly recent (within the past two years). Use multiple sources, not just different sections of a single web site or a single book or magazine. Look for sources that may tell negative or unfavorable information about your topic to obtain a balanced overview of your topic. Do not believe everything you read, you must apply some critical thinking to the information you find. Put the information in your own words rather than copying directly from the reference or the internet. Use footnotes or appropriate citations, where applicable, to acknowledge borrowed material, informing the reader of the source of statements or quotations, or for presenting explanatory or supplementary material not appropriate to the text. Not citing direct quotes or downloaded material is considered plagiarism and will result in a grade of zero for the report.

All sources used in the researching and writing of the report should be listed in a **bibliography**. Generally, the bibliography will be on page 6 of the report. The bibliography (and also footnotes, if you use them in your writing style) presents the following information:

For a book:

Author's name (last name first), the title of the book (underlined or in italics) including any series or volume number, the edition, if other than the first, the publisher, the place of publication (or home office of the publisher), the date of publication on the copyright page, and relevant page numbers. An example of a book reference is:

Saferstein, Richard, *Criminalistics, An Introduction to Forensic Science*, 7th Ed., Prentice Hall, Upper Saddle River, NJ, 2001, pages 228-257.

For an article:

The name of the writer, the title of the article in quotation marks, the title of the periodical (underlined or in italics), the volume number (underlined or in bold print), the date of the issue of the periodical, and the page numbers. An example of a magazine reference is:

Roger, J., P. Angel, and Neville J. Woolf, "Searching for Life on Other Planets", *Scientific American*, **274**, No. 4, April 1996, P. 60.

For Internet material:

The name of the author or publisher of the home page, the title of the article in quotation marks, the title of the magazine or journal or database (underlined or in italics), Internet address of the article, and the date the article or the home page was last updated. (The internet address, by itself, is not considered a valid reference.) An example of an Internet reference is:

Proctor & Gamble, "The Tide Fabric Care Network", http://www.pg.com/frameset_fs.jhtml?frameURL=www.tide.com, 2003

Please note that www.google.com is not an acceptable reference.

Internet references will be checked by your instructor. Failure to find and connect to an internet reference will invalidate that reference.

For unpublished material:

The name of the writer or individual (last name first), the title in quotation marks (if it is an article), and the date. If the information is relayed in an interview or by letter, tell the individuals professional position and use the term *personal communication* in place of the title. An example of unpublished information is:

Smith, John P., Technical Service Engineer, Nuclear Missile Company, *personal communication*.

Diagrams, charts, tables, and pictures may be included in addition to the text of the paper. They are best added as separate pages at the end of the report rather than trying to space them into the body of the text. When referring to a table, write *see Table 1* (Roman or Arabic number may be used) and when referring to a picture or diagram write *see Figure 1*. Give credit to the source if the table or figure is not original.

If a proper bibliography is not included, the grade on the paper will be penalized a minimum of 10 points.

English Composition:

This is a chemistry course and the paper is on a scientific topic. You are, however, expected to write with proper organization, composition, spelling, and grammar befitting a college level report. It is suggested that you may want to have your paper reviewed by your English teacher before completing your final product.

Binding:

A single staple in the upper left hand corner of the report is sufficient for binding the pages together. Fancy report covers, spiral bindings, and other types of bindings are not necessary and do not improve your grade.

Please submit two copies of your report. (One for your instructor's records) A minimum of 10 points will be deducted if a second copy is not supplied.

Report information and references may be checked by your instructor through a variety of Internet sources and resources.

Grades are based on content and accuracy of information, relevance to chemistry, proper references and citations, and composition. Reports are evaluated "as is" and are not returned for correction or updating of information.

If the report is less than five pages long, you will be penalized 15 points for each page under 5.

If your margins or spacing are too large or your type size is too large, you will lose 10 points per violation.

Late reports will be penalized 5 points the first 24 hours, and 10 points for the rest of that week. An additional penalty of 10 points will be imposed for the following week. After the second week, late papers will not be accepted and assigned a grade of zero.

Caveats:

Your instructor will make every attempt to follow the above procedures and schedules, but they may be changed in the event of extenuating circumstances.

Students submitting assignments are advised to make copies for their own protection.

If you move during the semester, please file a change of address form at any PCC campus registration office.