Chemistry Syllabus

Hutchison High School Room 140 Hours: 7:15 AM - 2:45 PM.
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Course Description:

Chemistry is a year-long physical science class which builds a strong foundation for college level chemistry and biology courses. Students learn about the structure of matter in order to explain how and why substances behave the way they do.

Laboratory work is an integral part of the learning process and is a significant part of the class. Following proper scientific procedures and protocols, as well as discussing and analyzing results in written and oral format is stressed. Additionally, the ability to read and process material from text is a skill students will be working on all year.

To be prepared for this course you should have completed Algebra I with a B or better.

Course Outline:

Using the text book Glencoe Chemistry: Matter and Change (supplemented with other materials), we shall complete the following through the course of the year:

Semester 1	Semester 2
Unit 1. Intro. to Chemistry & Data Analysis	Unit 7. Hydrocarbons
Unit 2. Properties of Matter	Unit 8. Chemical Reactions
Unit 3. Atomic Structure	Unit 9. The Mole
Unit 4. Electrons & The Periodic Table	Unit 10. Stoichiometry
Unit 5. Ionic Compounds	Unit 11. Gas Laws
Unit 6. Covalent Compounds	Unit 12. Solutions & Acids and Bases
	Unit 13. Redox Reactions & Electrochemistry

Chemistry Booklet:

Each student gets a Chemistry Booklet at the start of the semester. This contains this syllabus, sequence of lessons, and assigned problems for the entire semester and/or unit. It is organized into units, with homework and labs per unit available for working on at any time. There also is a resource portion for data tables and practice problems.

Attendance:

It is your responsibility to ask for any work missed due to excused, unexpected absences when you return. Also, if you are keeping track of where we are in the semester in the Semester Plans portion of your Booklet, you'll have a fair idea as to what you'll be missing. Assignments you miss are due upon your return.

Missed labs must be made up within two weeks of your return.

Grading Policy:

Class grades are weighted, as shown here. Assignment point values and penalties are clearly labeled.

Component	Value
Tests and Quizzes	30.0 %
Homework	17.5 %
Labs	30.0 %
In-Class Work	10.0 %
Semester Final	12.5 %
Total	100.0 %

Grading Scale	
A	90.0 % or More
B	89.9 % - 80.0 %
C	79.9 % - 70.0 %
D	69.9 % - 60.0 %
F	59.9 % or Less

Tests and Quizzes:

There are several unit tests each semester, covering one or more textbook chapters at a time, as well as proficiency quizzes covering concepts within individual chapters.

Students may use one notecard-sized piece of paper on **most** tests and quizzes.

Homework:

Daily Booklet homework is a 5 to 10 problem set following a section of notes, and are checked for completion the next day when a student enters class. If you were absent, indicate on the assignment so you won't lose points. Once class starts, we will go over any problems students had on specific problems. Students are expected to attempt all problems, or risk an incomplete fee.

Booklets are collected at the end of a unit, and points given based on completion. Extra credit is offered for early Booklet submission.

Labs

All labs require data acquisition and written responses made in your lab Booklet. Lab work is checked when Booklets are collected at the end of a unit. For any lab, a question and answer session will occur after all groups have finished their data collection, and before the lab is due - most likely at the start of next class.

In-Class Work

Some assignments during the semester will be done in the classroom only. Such assignments are Unit Review presentations and problem sets, or instructional games that might be done to reinforce a concept or topic.

Semester Final

The comprehensive semester final is worth 12.5 % of your grade. It will consist of roughly 70% conceptual questions and 30% mathematical. Students can use Booklets, as well as any hand written notes you have taken during the semester.

Redo Policy:

Students have the option of redoing any incorrect answers on in-class assignments and labs for 50% credit back. Corrections must be done in a different color (don't erase your original error) and can be turned back in within **two weeks** of return or before the end of the semester, whichever occurs first.

To get points back on tests, students must correct all mistakes on a separate paper, staple it to the original, and turn that in for correction. Problems must be reworked, and answered completely. For example, don't just write A, B, C, or D for multiple choice, explain your correction thoroughly. Afterwards, students can take another version of the test. The best score will be recorded.

Students who correct missed problems on the test retake will get 50 % credit back.

Late Work:

Work submitted up to **two weeks** after the due date will be accepted, but will receive a **late fee**. After the two week time period is up, late work will not be accepted.

Work turned in after the last day of instruction (just before finals) will receive no credit.

Cheating Policy:

Students (and accomplices) caught cheating on assessments will suffer the following consequences:

1. First Strike: students will earn a zero for that assignment, have to contact their parents, and will be reported to the administration.
2. Second Strike and on: students will earn a zero for that assignment, have parental contact, and will have administrative referral for disciplinary action.

Class Expectations

1. Be in class on time, with all necessary materials.
2. Show respect to all people in the class, as well as the classroom itself.
3. While all school and district rules must be followed; what we emphasize:
    a. No hats, hoods, or headgear,
    b. Wear school and science lab appropriate clothing,
    c. Leave all backpacks and large purses in your locker,
    d. Have a hall pass or an escort to leave this room,
    e. Computers are permitted ONLY if they are used in a learning context. Playing games or surfing the web in a non-scholastic manner will result in loss of technology privileges, even if you are done with all your work.
    f. Phones, smart or otherwise, are allowed by permission only.
4. A seating chart will be established that divides students into lab groups shortly after school starts. You are responsible for your seat and surrounding area; please report any graffiti or damage immediately, so you don't get blamed for it.

Repercussions:

Not meeting expectations will result in the following repercussions:

1. Verbal reminder of what is expected,
2. Second verbal reminder,
3. Third verbal reminder and guardian contact,
4. Office referral (lunch detentions first, then stronger repercussions).

I will record infractions, so students know how close they are to lunch detentions etc.

Supply List:

School issued textbook,
Writing sticks, such as pens and pencils,
3-Ring binder with paper OR spiral notebook,
Scientific Calculator (recommended)

A note on calculators:

Calculators (but not cell phone ones!) may be used on most tests and quizzes. Also, if you plan on going further academically, consider purchasing your own graphing calculator and use it as long as you have it.

Classroom calculators are available, but must not leave the classroom.

Chemistry Fall Semester Plan

This is the expected sequence of classroom events throughout the spring semester. As we cover certain topics, check them off so that you can see what assignments are coming up.

Unit 0 – Introduction to the Laboratory and Lab Safety

Lab Safety Rules
Lab 0.0: Safety Lab
Lab Safety Contract
Lab Safety Quiz and Booklet Check

Unit 1 – Introduction to Chemistry & Data Analysis

1. Notes 1.1 – Intro. to Chemistry – Booklet Problems.
   Lab 1.1: Equip. Usage:, Balance, Grad. Cylinders, Beakers
2. Notes 1.2 – Units – Booklet Problems.
3. Notes 1.3 – Notation & Analysis – Booklet Problems
   Lab 1.2: Measuring Density
4. Notes 1.4 – Uncertainty in Data – Booklet Problems.
5. Notes 1.5 – Representing Data – Booklet Problems.

Unit 1 Review
Unit 1 Test and Booklet Check

Unit 2 – Properties of Matter

1. Notes 2.1 – Properties of Matter – Booklet Problems.
   Elements to Memorize/Elements Song
2. Notes 2.2 – Changes in Matter – Booklet Problems.
   Lab 2.1: Outdoor Observations
3. Notes 2.3 – Mixtures of Matter – Booklet Problems.
   Lab 2.2: Separating Mixtures
4. Notes 2.4 – Elements and Compounds – Booklet Problems.

Unit 2 Review
Unit 2 Test and Booklet Check

Unit 3 – Atomic Structure

1. Notes 3.1 – Early Ideas About Matter – Booklet Problems.
2. Notes 3.2 – Defining the Atom – Booklet Problems.
3. Notes 3.3 – How Atoms Differ – Booklet Problems.
   Lab 3.1: Isotope Modeling (Pennium Lab)
   Element Off (First Three Weeks)
4. Notes 3.4 – Radioactive Decay – Booklet Problems.

Isotope Worksheet
First Elements Quiz
Unit 3 Review
Unit 3 Test and Booklet Check

Unit 4 – Electrons & The Periodic Table

1. Notes 4.1 – Light and Energy – Booklet Problems.
   Lab 4.1: Flame Test
2. Notes 4.2 – Quantum Theory – Booklet Problems.
   Lab 4.2: Atomic Emission
3. Notes 4.3 – Electron Configuration – Booklet Problems.
4. Notes 4.4 – Periodic Table Development – Booklet Probs.
   Lab 4.3: Minerals Activity
   Final Elements Quiz
5. Notes 4.5 – Periodic Trends – Booklet Problems.
   Lab 4.4: Periodic Table Scavenger Hunt

Unit 4 Review
Unit 4 Test and Booklet Check

Unit 5 – Ionic Compounds

1. Notes 5.1 – Ion Formation – Booklet Problems.
   Lab 6.1: Build Your Own Ionic Compound!
2. Notes 5.2 – Ionic Bonds – Booklet Problems.
   Ionic bonds wks.
3. Notes 5.3 – Names of Ionic Compounds – Booklet Problems.
   Naming Ionic Compounds 1
   Ion Game
4. Notes 5.4 – Metallic Bonds – Booklet Problems.
   Naming Ionic Compounds 2
   Formula Quiz

Unit 5 Review
Unit 5 Test and Booklet Check

Unit 6 – Covalent Compounds

1. Notes 6.1 – Covalent Bonds – Booklet Problems.
   Lab 6.1: Covalent (Molecular) Compounds
2. Notes 6.2 – Naming Molecules – Booklet Problems.
3. Notes 6.3 – Molecular Structures – Booklet Problems.
   Lab 6.2: Lewis Structures
4. Notes 6.4 – Molecular Shapes – Booklet Problems.
   Lab 6.3: Molecular Shapes Activity
   Shapes Quiz
5. Notes 6.5 – Electronegativity & Polarity – Booklet Problems.
   Lab 6.4: Polar Molecule Activity

Unit 6 Review
Unit 6 Test and Booklet Check

Heading Down the Backstretch

→ Fall Semester Review
→ Fall Semester Final Exam

Chemistry Lab Safety

The chemistry laboratory is a place of discovery and learning. However, by the very nature of laboratory work, it can be a place of danger if proper common-sense precautions aren't taken. While every effort has been made to eliminate the use of explosive, highly toxic, and carcinogenic substances from the experiments which you will perform, there is a certain unavoidable hazard associated with the use of a variety of chemicals and glassware. You must learn and follow the following general safety guidelines to ensure a safe laboratory environment for both you and the people you may be working near. Additional safety precautions will be announced in class prior to experiments where a potential danger exists. Students who fail to follow all safety rules will leave the lab and suffer grading penalties.

Clothing

1. Safety goggles **must be worn at all times** while in the laboratory. This rule must be followed whether you are actually working on an experiment or simply writing in your lab notebook. We will differentiate between lab days and non-lab days, on lab days we will all put on our goggles and not remove them until the end (unless you ask for permission to go in the hall and 'vent your eyeballs'). You have the option of purchasing safety goggles for $8.00 from the instructor or get your own pair locally and have it approved by the instructor. Safety goggles are in the cabinet at the back of the room.
2. Contact lenses are allowed, but tell the instructor if you are wearing them that day. Even when worn under safety goggles, various fumes from chemicals may accumulate under the lens and cause serious injuries or blindness. This was more true in years past, with hard contact lenses.
3. Closed toe shoes and long pants must be worn in the lab. Sandals and shorts are not allowed.
4. Long hair must be tied back, and dangling jewelry, long sleeves, and loose or baggy clothing must be secured.

Conduct

5. Eating and drinking are prohibited at lab stations at all times.
6. No horseplay, such as physical contact, or equipment misusage. Example: do not use DI water bottles to squirt your friends. You don't know for sure what's in them.
7. No unauthorized experiments are to be performed. If you are curious about trying something, consult with your laboratory instructor first.
8. Never taste anything. Never directly smell the source of any vapor or gas; instead by means of your cupped hand, <u>waft</u> a small sample to your nose. Do not inhale these vapors but take in only enough to detect an odor if one exists.
9. Always wash your hands before leaving lab.
10. Learn where the safety and first-aid equipment is located. This includes **fire extinguisher**, **fire blanket**, **shower**, and **eye-wash station** (Demonstrate location/use of fire equip.).
11. If the instructor is injured all lab activity should stop and you should ask for Mrs. Beaty's help if needed and/or call the office from the desk phone (Dial 35513 (nurse), 35510 (principal), 35511 (assistant principal), or35501 (front desk)).
12. Notify the instructor immediately in case of an accident.

MINOR INJURIES:

- ➔ Cuts: Nurse's Office for Band-Aids
- ➔ Minor Burns: Wash immediately with cold water
- ➔ Chemicals on the skin: Rinse immediately with tepid water for 15 minutes

If additional medical attention is required, notify the nurse.

Proper Handling of Chemicals and Equipment

13. Know how to light the Bunsen Burner (Demonstration).
14. Consider **all** chemicals to be hazardous unless you are instructed otherwise.
15. Know what chemicals you are using. Carefully read the label *twice* before taking anything from a bottle. Chemicals in the lab are marked with "At a Glance Chemical Safety Guide".
    Label Components:
    Health Flammability Reactivity Exposure Storage
    Numeric Key:
    0 = None 1 = Limited 2 = Considerable 3 = Radical 4 = Extreme
16. Excess reagents are **never** to be returned to stock bottles. Dispose of any excess chemicals.
17. Many common reagents, for example, alcohols and acetone, are highly flammable. **Do not use them anywhere near open flames.**
18. Always pour **acids into water**. If you pour water into acid, the heat of reaction can cause the water to boil, spattering acid everywhere.
19. If chemicals come into contact with your skin or eyes, **flush immediately** with copious amounts of water at the emergency eyewash station or shower and consult with your instructor (Demonstration).
20. Never point a test tube or any vessel that you are heating at yourself or your neighbor--it may erupt like a geyser. For the same reason never look down into a test tube or vessel being heated on a Bunsen burner – instead look from the side.
21. Dispose of chemicals properly. Ask the teacher how you should dispose of chemicals used in labs. Unless you are explicitly told otherwise, assume that only water may be put in the lab sinks.
22. Clean up all broken glassware immediately and dispose of the broken glass properly in the bucket.
23. Never leave burners unattended. Turn off your burners whenever you leave your workstation.
24. Beware of hot glass--it looks exactly like cold glass.
25. Glassware (tubing, thermometers) should be lubricated before inserting into rubber stoppers (Demonstration). Protect your hands with towels or gloves during the insertion. If a piece of glassware is stuck, give it to your instructor to fix.
26. **ORGANIC LIQUID SPILLS:** Organic liquids spilled on the floor constitute a fire hazard as well as destroy flooring. Using an absorbent material (paper towel, rag) -

    1. Place the absorbent material on the spill.
    2. Wait several minutes.
    3. Pick up the now damp absorbent material.
    4. Allow liquid to evaporate in a fume hood.
    5. Discard in a plastic bag when dry.

27. **ACID SPILLS:** Acid spills can be neutralized with sodium bicarbonate, also known as baking soda, and available in the back room and in the fume hood. Any solid residue should be bagged in plastic and disposed of by the teacher.
28. **ALCOHOL FIRES:** Cover burning material with a fire blanket until it is out.

CHEMISTRY LAB SAFETY CONTRACT 10 POINTS

Read and initial each item, signifying that you agree and understand. Then, tear this page out and turn it in to me.

_____ 1. (a) I understand that I have the option of purchasing my own pair of safety goggles for $8.00. I can provide my own safety goggles if they are approved by the instructor. I further understand that if I do not purchase my own pair, I will be required to wash the public pair that I borrow after use.

(b) I understand that lab accidents are by nature unpredictable and therefore **I am required to wear goggles whenever any person is conducting an experiment somewhere in the room**. I will tie back long hair and loose clothing when I am working in the lab, and will remove dangling jewelry.

(c) Failure to wear appropriate lab clothing may mean missing the lab activity and being required to make it up. Such clothing includes but is not limited to long pants and closed toed shoes.

_____ 2. I understand that contact lenses can absorb and retain chemical vapors. If I choose to wear contact lenses, I understand that I must inform the instructor.

_____ 3.A I understand that I am NEVER allowed to try a procedure that I planned, until I have authorized it with the teacher.

_____ 3.B I understand that I am NEVER to engage in horseplay in the lab, or misuse equipment.

_____ 4. I realize that I must always dispose of chemicals according to the teacher's instructions. I will not put solid wastes in the sink. I will not return unused chemicals to the original container.

5. I know what to do in case of:

_____ (a) any accident (the first step is call out for help).

_____ (b) injury to teacher.

_____ (c) chemical spill or acid spill.

6. I know the proper procedure for:

_____ (a) inserting glass tubing and thermometers into stoppers and rubber tubing
_____ (b) adjusting, lighting, extinguishing, and proper usage of a Bunsen burner
_____ (c) putting out an alcohol fire

7. I know the location and proper use of

_____ (a) fire extinguishers
_____ (b) fire blanket
_____ (c) eye wash
_____ (d) safety shower
_____ (e) fire alarms
_____ (f) telephone
_____ (g) nurse's office
_____ (h) broken glass container

_____ 8. After completing lab work, I will always put away all lab equipment, wash the lab table with a sponge, and wash my hands before leaving the classroom. I understand that my lab partners and I are responsible for cleaning and leaving the lab in good condition for the next class. I will participate in cleaning and reorganizing the lab at the end of activities, even if it requires losing some of our passing time.

_____ 9. I will never take any lab materials out of the lab room.

Please answer the following questions:

1. I (do/do not) wear contact lenses.
2. I (am/am not) color blind.
3. I (have/do not have) allergies. If so, please list them below:

_____

_____

_____

My signature below indicates that I understand and agree to abide by the regulations and procedures outlined above. Furthermore, I agree to abide by any additional printed or verbal instructions provided me by my teacher or school district during the school year. Failure to do so or misbehavior during a laboratory activity may result in exclusion from the lab with no opportunity to make up the lab work missed.

(Print Name) **(Signature)** **(Period)**

Chemistry	Chemistry Safety Lab				
Name:					Correction Credit: Half
Possible Points:	Missed:	Late, No Units, No Work Fee:	First Score:	Corrections:	Final Score:
20		-1 -2 -3 -4 -5			

Record all observations, and write them in complete sentences.

Materials:

Note Card ` Egg 6 M HCl Small Test Tubes

1. Overheating (2 pts) (Demo)

I will demonstrate what happens when a piece of glassware is heated up and quenched (dunked) in cold water.

Record your observations here (at least four).

2. Flame Heat Demonstration (3 pts)

Find the hottest part of a flame: hold your card in it for a couple seconds, then put it under running water BEFORE it catches fire. Look at the resulting burn pattern. **Let me know when your flame is lit and adjusted, and you are ready for your card.**

Draw the burn pattern on your card here. Label the hottest point, then label the best area to have a beaker. When done, dispose of your burn pattern in the trash.

3. Acid in an Eyeball Demonstration (2 pts)

Using an egg, I will demonstrate what can happen to your eye if acid gets into it.

Record at least three observations here.

4. Labeling Demonstration (4 pts)

Take one of the chemicals on the green cart.

What is the chemical's name? _____ and its chemical formula? _____

Write the Health, Flammability, Reactivity, Exposure, and Storage number codes, and the word description goes with each? (For example, 2 = Considerable)

5. Map of the Lab (4 pts)

Draw a map of the lab and label the following: fire extinguisher, emergency shower, eyewash station, telephone, fire blanket, smoke detector, fume hood, broken glass disposal box.

6. Acid to Water and Neutralization Demonstration (2 pts)

I will demonstrate adding acid to water. What happens to the temperature of the solution when I do this?

I will use pH paper to check the acid before neutralizing it. What color does the paper turn?

I will neutralize the acid with baking soda. What happens when I do this? What color does pH paper turn after the neutralization? Record your observations here.

7. Questions (3 pts) Write complete sentences for full credit.

1. What is the first thing to do if something breaks, spills, or creates a hazardous situation?

2. What do you do if the instructor becomes incapacitated?

3. Why should you hold a test tube at a slant when boiling water?