

Abstract:

We have developed a single laboratory safety seminar to communicate safety information to students from all majors. The seminar covers numerous topics from government regulations, laboratory dress, proper handling of glassware and chemicals, and chemical labeling. All students in our chemistry classes take the seminar and are repeatedly tested on the information as they take other chemistry classes. The students are required to pass a test or re-take the safety seminar. We will discuss the safety class, the testing, the labeling criteria that we use for chemicals, and the use of the MSDS information.

Our Program:

The program involves

- 1-a two-and-a-half hour seminar covering the topics listed below.
- 2-a test that is given in each successive term.
- 3-a labeling system for chemicals that can be easily understood by all students.
- 4-presentation of MSDSs so they are understandable to the students.
- 5-repetition of the material to enforce the principles

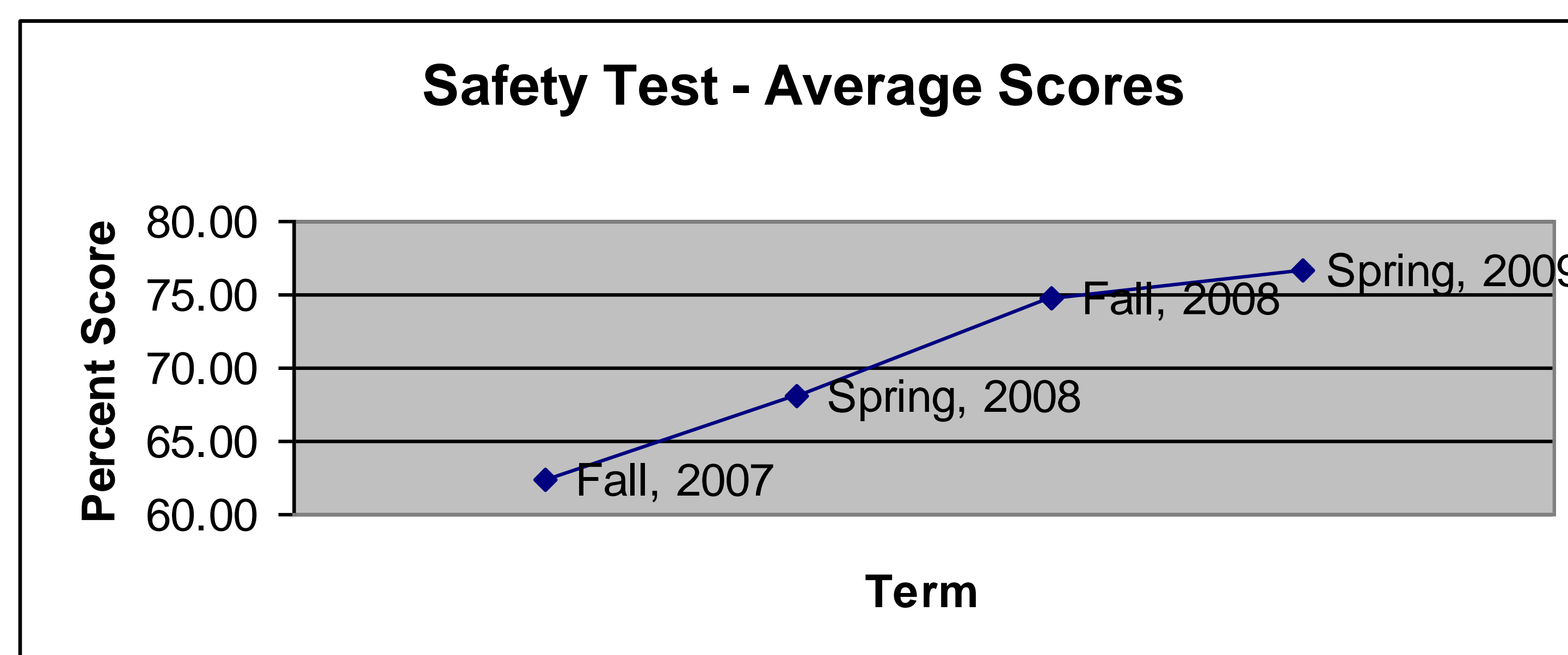
Laboratory and Chemical Safety Seminar Topics

1. What does lab safety comprise?
2. What do you do to avoid an accident?
3. Government Regulations
4. Safety Terminology
5. Personal protective equipment – Laboratory dress code
6. Personal hygiene
7. Handling chemicals, handling glassware
8. First aid
9. MSDS's – information and locations
10. Chemical labeling
11. Fire safety and emergency exits
12. Accidents
13. Housekeeping
14. Chemical Hygiene Plan

All of our students are required to attend the seminar when they take their first chemistry course (freshman or transfers). If a student fails to attend the seminar they will receive a zero for a first lab grade that term and will be dropped from the course for a second violation.

Testing:

At the beginning of each term, a laboratory safety test is given to all returning students. Each student is required to score 80% to pass the test. Any student who does not pass must repeat the seminar. This applies to students in all Chemistry classes. Since we started the testing, the average score of the test has improved.



Lab Dress Code:

Each student is required to sign a dress code or they will not receive credit for attending the seminar. The dress code requires closed shoes, slacks, safety glasses, and proper tops. If a student is not properly dressed for the lab, the penalties are spelled out. The signed sheets are placed in the student's lab.

Dress:

Shoes, not sandals or open shoes, are required in the lab at all times.

Shorts or skirts will not be worn.

Belly-button policy: shirts that expose your midriff are not permitted in lab.

Safety glasses or goggles are required at all times in the lab. Contact lenses should not be worn in the lab.

Penalties:

First violation - you will be sent back to your dormitory or house to make the necessary changes to come under compliance.

Second violation - you will not be allowed to return to the lab on that day. You may make up that experiment on the make-up day.

Third violation – you will receive a zero for that lab.

Chemical Labeling:

The labeling of chemicals is done in accordance with standard practices combining the NFPA, GHS, and IARC information. The primary colors used are those associated with the NFPA diamond. We do not attempt to differentiate between the various levels for blue and yellow labels, but we do so for flammable compounds for storage purposes only. 3/4-inch dots are attached to the bottles to show the various hazards. Different shades of red are used to distinguish flammability. Labeling of bottles also includes information about shelving and the MSDS.

Blue Toxic NFPA blue 2 or greater, GHS class 6, oral LD50 < 1 g/kg

Red Flammable NFPA red 2, GHS 3 or 4 fp between 100-40°C

Red(3) Flammable NFPA red 3, GHS 3 or 4 fp between 40-10°C,

Red(4) Flammable NFPA red 4, GHS 3 or 4 fp below 10°C,

Yellow Corrosive Oxidizer NFPA yellow 2 or greater GHS 5 or 8

Green Carcinogenic Teratogenic Mutagenic IARC 2 or greater listed on MSDS

Dark Green Explosive peroxide former Listed on MSDS

White Does not fit any of the above categories

Material Safety Data Sheets:

MSDSs are accessible in the lab and the information is accessible on line from any computer on campus. The full MSDS is stored in a notebook which is located in the lab. This hard copy of the MSDS allows us to obtain it quickly if an accident occurs. A one-page MSDS is available in a folder at the MSDS station in the lab. This can quickly give information about the chemical from physical properties to hazards to fire fighting.