

Laboratory Safety Assignment

1. Look up MSDS's on the website <http://www.ilpi.com/msds>.

OK.

2. Examine the hazard information for each of the following and (a) identify the most significant hazard for each and (b) the type of injury it can cause.

- a. Concentrated sulfuric acid

The best example that I found of this was 99% Sulfuric Acid. It's most significant hazards include accidental skin contact, that hydrogen gas can be given off if it contacts metals, and contact with combustible materials may ignite them.

Types of injuries include chemical burns and irritation of the skin, eyes, and respiratory system.

- b. Methyl alcohol

This appears to be some nasty stuff! This is considered poisonous and may be fatal or cause blindness if swallowed, and if inhaled it can cause nervous system damage, especially to the eyes. It is also quite flammable and can be explosive in vapor-air mixtures above 54°F.

- c. 30% Hydrogen Peroxide

The example that I looked at was listed as 30% in water without stabilizer and Reagent ACS. Its hazards are that it is a strong oxidizer and contact with other material may cause fire. It is also very corrosive.

From a health standpoint it causes skin and eye irritation, burns, and blood abnormalities.

- d. Iodine Crystals

Hazard wise iodine crystals are poisonous and corrosive. It can also be fatal if it is swallowed or inhaled and can cause irritation of the skin, eyes, and respiratory tract.



- i. "A chemical which has a lethal dose of 50 mg per kg but not more than 500 mg per kg of body weight when administered orally to albino rats weighing between 200 and 300 grams each."
 - ii. "A chemical that has a median lethal dose of more than 200 mg per kg but not more than 1000 mg per kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with a bare skin of albino rabbits weighing between 2 and 3 kg each."
 - iii. "A chemical that has a median lethal dose of more than 200 ppm but not more than 2000 ppm by volume of gas or vapor, or more than 2 mg per liter but not more than 20 mg per liter of mist, fumes, or dust, when administered by continuous inhalation for one hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each."
- e. Carcinogen – OSHA considers a chemical to be a carcinogen if:
- i. "It has been evaluated by the international Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or
 - ii. It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology (NTP) (latest edition); or,
 - iii. It is regulated by OSHA as a carcinogen.
6. Summarize the information provided for hydrogen peroxide in the reactivity, toxicology, and safety portions of the MSDS for 30% hydrogen peroxide.

Reactivity: It is stable at room temperature but it can become unstable with excessive heat and if combined with materials like reducing agents, combustible materials, organic materials, metals, acids and alkalis.

Toxicology: It can be absorbed through the skin and eye contact. It is classified as a carcinogen by IARC and others, and can damage blood, upper respiratory tract, skin, eyes, and the central nervous system.

Safety: Use under an exhaust hood to keep vapor levels below threshold limits. Wear a face shield, full suit, vapor respirator, boots and gloves when handling. A Self Contained Breathing Apparatus should be used to avoid inhalation. Consult a specialist before handling.

- a. How might this information be useful in preparing for a safe laboratory experiment?

One would have students leave the room in the event of a chemical spill that involves noxious fumes or other hazards, if a fire breaks out and it can't be immediately extinguished, or if excessive smoke is present.

10. Can students wear contact lenses? Why?

Students should not wear contacts in laboratories involving chemicals or other items that may cause eye irritation. Irritants can get under the contact lenses and cause more eye damage than otherwise might happen.

11. What should you do if:

- a. A student has broken a beaker and cut their finger?

Instruct the other students to stay clear of the area around the broken glass. Have the student apply direct pressure to the cut as soon as possible and hold his hand above his head for a time until the bleeding stops. Use a clean rag or paper towel to help stop the bleeding. Try to keep the cut student and the other students calm during the incident. Contact the school nurse and have the student escorted to the nurse's office. Contact the school janitor to help with the clean up and get the students back on task as soon as it's safe to do so.

- b. Chemicals have splashed in a student's face?

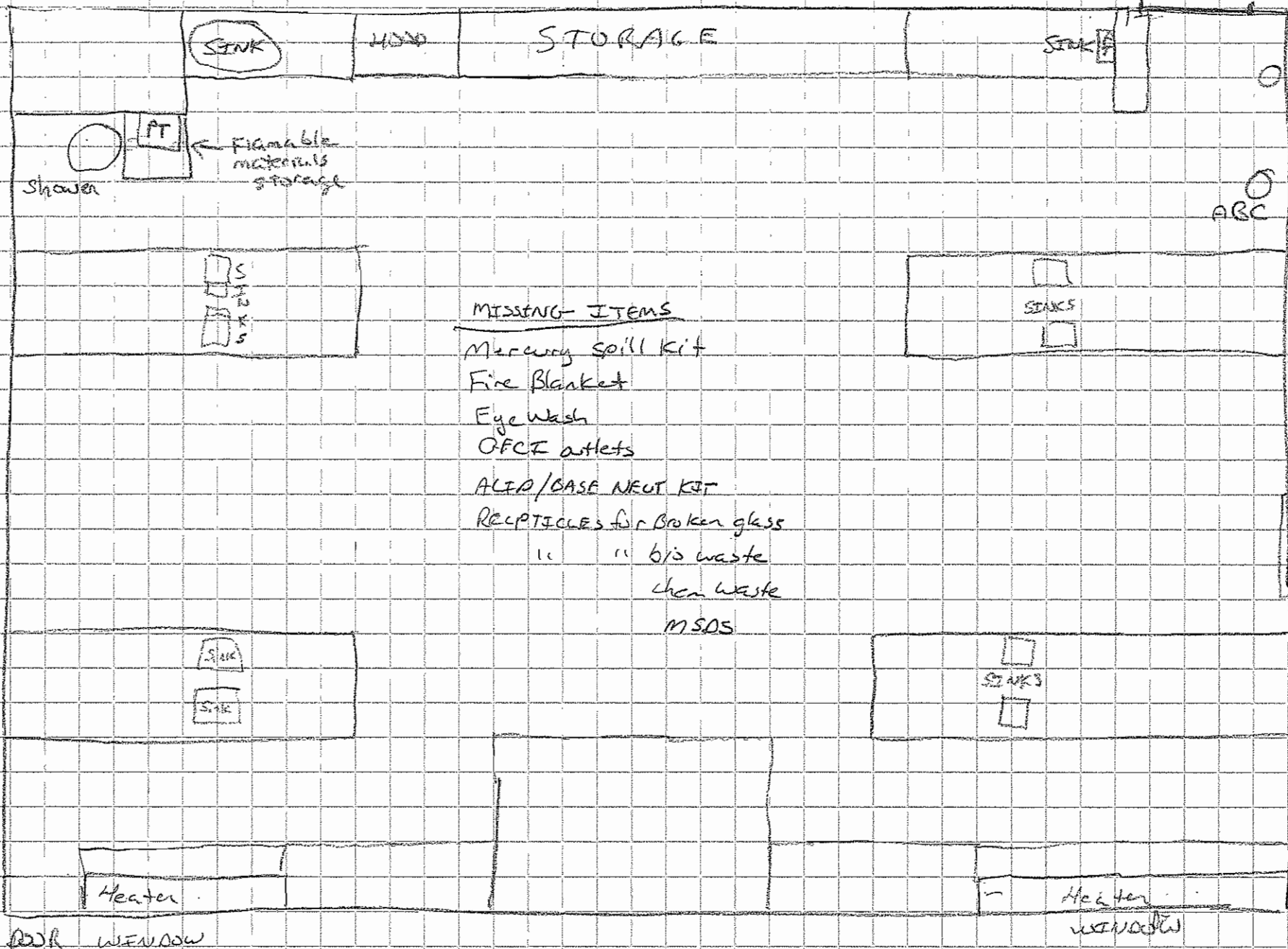
Keep the effected student calm. Depending on the chemical in question get the student to the eye wash, sink, or shower and flood the affected area with water for 15 minutes. Contact the school nurse and have the student escorted to the nurse to be checked. Try to keep the other students on task. If any chemical is spilled follow the above procedure as well.

- c. The fire alarm sounds?

Have the students calmly evacuate the classroom and head toward the nearest safe exit. Use emergency shutdown switches to shut off any electrical and gas equipment in the classroom, and follow the students out the door making sure all students have left the room. Meet in the designated area outside the building and follow school procedures for making sure everyone is out of the building. Keep the students calm and reasonably quiet should instructions have to be given. When the all clear is

C-6 SCIENCE LABORATORY

Fire alarms
IN WALL way
main door



Emergency Shutdown Switch

ABC Fire Exting. Full
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MISSING ITEMS

- Mercury spill kit
- Fire Blanket
- Eye Wash
- OTC outlets
- ALK/BASE NEUT KIT
- RECEPTACLES for Broken glass
- " " bio waste
- Chem waste
- MSDS

door

Heater

Heater

door WINDOW

WINDOW