

2.7 LABORATORY SAFETY

Catastrophic Risks

The greatest catastrophes associated with a laboratory environment are:

- ?? Fire and explosion in the handling and storage of flammable, explosive and combustible chemicals
- ?? Burns from chemicals and/or open flames
- ?? Poisoning from chemical misuse

Common Hazards

Most frequently reported accidents include:

- ?? Eye injuries from chemical splashes and/or spills
- ?? Inhalation of vapors, fumes and/or gases
- ?? Slips/falls on spilled liquids
- ?? Cuts from broken glass
- ?? Injuries resulting from improper handling of or mislabeled chemicals
- ?? Burns from open flame or chemicals

Accident Prevention

To minimize the potential for accidents to occur in laboratories, these procedures should be followed:

- ?? The instructor in charge shall not leave any laboratory while class is in session. If it should be necessary for the instructor to leave the room, another teacher shall be placed in charge. Each school should develop a specific procedure.
- ?? All school community members who will be using laboratory facilities should review the "Laboratory Safety Rules". Laboratory users should sign the closing statement to these rules. The document signed by students should be maintained on file by the class instructor. The document signed by teachers and aides should be forwarded to the School Personnel Office. Laboratory safety inspections should be completed weekly. A formal documented inspection should be completed monthly using a checklist developed by the Science Department staff. A sample checklist is provided in this manual to assist in its development. Completed inspection checklists should be maintained by the laboratory instructor for a period of three years.

LABORATORY SAFETY RULES (Students & Teachers)

Personal Protective Equipment

1. ANSI-approved personal protective equipment (eye face, body) shall be worn.
2. Footwear should cover the feet completely - no open toed shoes are permitted in the labs.
3. Wear a lab coat or apron to protect skin and clothing from chemicals.
4. Gloves should be worn to resist penetration of chemicals; check for holes, tears or rips.
5. Eye protection shall be worn when handling any chemical.

Handling of Glassware

1. Follow instructor's procedures for glass cutting and polishing.
2. Never handle glass that has been heated until you have allowed ample time for cooling.
3. Lubricate glass tubes and rubber stopper holes with soapy water or glycerin, before connecting.
4. Wrap the tubing and stopper with cloth to protect hands against glass breakage during connection.

General Rules

1. All students should be instructed in hazards of chemicals and equipment as they are introduced to them.
2. Store all chemicals within U.L. approved cabinets and label them.
3. Date chemicals as received in the laboratory.
4. Keep all chemicals in properly labeled containers.
5. Poisons should be kept in bottles marked with the skull and crossbones and labeled "poison". Store them apart from other reagents.

6. The laboratory instructor should be contacted about any unlabeled chemicals for appropriate action.
7. When storing chemicals on shelves, provide ample space between bottles so they can be grasped firmly.
8. Incompatible chemicals should be stored separately and, if necessary, in flammable storage containers.
9. Know where fire suppression and extinguishers are, and how to use them.
10. The Chemical Hazard Communication Program will be followed. MSDS will be maintained for all chemicals.

Signature

Date

School _____

- | | | |
|-----|--|--------|
| 1. | Is all electrical equipment properly maintained and grounded? | Yes No |
| 2. | Is proper eye protection available and worn? | Yes No |
| 3. | Are chemicals clearly labeled? | Yes No |
| 4. | Are large containers of acids stored together on bottom shelves or in an acid storage closet? | Yes No |
| 5. | Are shelves fastened to the wall | Yes No |
| 6. | Is the ventilation adequate for the work performed and operational? | Yes No |
| 7. | Are all individuals in the lab wearing appropriate closed toe footwear? | Yes No |
| 8. | Are lab coats or aprons worn to protect skin and clothing from chemicals? | Yes No |
| 9. | Are gloves worn to resist penetration of chemicals free of holes, tears and rips? | Yes No |
| 10. | Is all glassware free of broken, rough and sharp edges? | Yes No |
| 11. | Are chemicals dated as they are received by the laboratory | Yes No |
| 12. | Is ample space between chemicals on shelves so that bottles can be grasped firmly? | Yes No |
| 13. | Are incompatible chemicals stored separately and where necessary, in flammable storage containers? | Yes No |
| 14. | Have all students/staff reviewed the "Laboratory Safety Rules"? | Yes No |
| 15. | Is the Chemical Hazard Communication Program available and up to date? | Yes No |
| 16. | If No's are checked, follow-up is needed. The principal should designate the appropriate corrective action, such as a work order | Yes No |

Inspector

Date