

Safety in the Chemistry Laboratory

Lab work is the key to progress in science. Therefore, systematic, careful lab work is an essential part of any science program. In this class, you will practice some of the same fundamental laboratory procedures and techniques that experimental chemists use to pursue new knowledge.

The equipment and apparatus you use will involve serious safety hazards, just as they do for working chemists. You must be aware of these hazards. Your teacher will guide you properly using the equipment and carrying out the experiments, but you must also take responsibility for your part in this process. With active involvement of you and your teacher, these risks can be minimized so that working the chemistry laboratory can be a safe, enjoyable process of discovery.

These safety rules always apply in the lab:

1. Always wear a lab apron and safety goggles. Wear these safety devices whenever you are in the lab, not just when you are working on an experiment.
2. No contact lenses in the lab. Contact lenses should not be worn during any investigation using chemicals (even if you are not wearing goggles). In the event of an accident, chemicals can get behind contact lenses and cause serious damage before the lenses can be removed. If your doctor requires that you wear contact lenses instead of glasses, you should wear eye-cup safety goggles in the lab. Ask your doctor or your teacher how to use this important eye protection.
3. Personal apparel should be appropriate for laboratory work. On lab days avoid wearing long necklaces, dangling bracelets, bulky jewelry, and bulky or loose-fitting clothing. Long hair should be tied back. Loose, dangling items may get caught in moving parts, accidentally contact electrical connections or interfere with the investigation in a potentially hazardous manner. In addition, chemical fumes may react with some jewelry, such as pearls, and ruin them. Cotton is preferable to wool, nylon, or polyester. Wear shoes that will protect your feet from chemical spills and falling objects—open-toed shoes or sandals, and shoes with woven leather straps are not allowed in the laboratory.
4. NEVER work alone in the laboratory.

Work in the lab only while under the supervision of your teacher. Do not leave equipment unattended while it is in operation.

5. Only books and notebooks needed for the experiment should be in the lab. Only the lab notebook and the textbook should be used. Keep other books, backpacks, purses, and similar items in your desk, locker, or designated storage areas.
6. Read the entire experiment before entering the lab. Your teacher will review applicable safety precautions before the lab. If you are not sure of something, ask your teacher about it.
7. Always heed safety symbols and cautions written in the experimental investigations and handouts, posted in the room, and given verbally by your teacher. Make sure you know the procedures to follow in case of a fire or an emergency.
8. Know the proper fire drill procedures and the location of fire exits and emergency equipment. Make sure you know the procedures to follow in case of a fire or an emergency.
9. If your clothing catches fire, do not run WALK to the safety shower, stand under it, and turn it on. Call to your teacher while you do this.
10. Report all accidents to the teacher immediately, no matter how minor. In addition, if you get a headache, feel sick to your stomach, or feel dizzy, tell your teacher immediately.
11. Report all spills to your teacher immediately. Call your teacher rather than trying to clean up a spill yourself. Your teacher will tell you if it is safe for you to clean up the spill; if not, your teacher will know how the spill should be cleaned up safely.
12. Student-designed inquiry investigations must be approved by the teacher before being attempted by the student.
13. DO NOT perform unauthorized experiments or use materials and equipment in a manner for which they were not intended. Use only materials and equipment listed in the materials list or authorized by your teacher. Steps in a procedure should only be performed

as described in the textbook or lab manual or approved by your teacher.

14. Stay alert in the lab, and proceed with caution. Be aware of others near you or your equipment when you are performing an experiment. If you are not sure how to proceed, ask.
15. Horseplay in the lab is very dangerous. Laboratory equipment and apparatus are not toys; never play in the lab or use time or equipment for anything other than their intended purpose.
16. Food, beverages, chewing gum, and tobacco products are NEVER permitted in the laboratory.
17. NEVER taste chemicals. Do not touch chemicals or allow them to contact areas of bare skin.
18. Use extreme CAUTION when working with hot plates or other heating devices. Keep your head, hands, hair, and clothing away from the flame or heating area, and turn heating devices off when they are not in use. Remember that metal surfaces connected to the heated area will become hot by conduction. Gas burners should be lit only with a spark lighter. Make sure all heating devices and gas valves are turned off before leaving the laboratory. Never leave a hot plate or other heating device unattended when it is in use. Remember that many metal, ceramic, and glass items do not always look hot when they are hot. Allow all items to cool before storing.
19. Exercise caution when working with electrical equipment. Do not use electrical equipment with frayed or twisted wires. Be sure your hands are dry before using electrical equipment. Do not let electrical cords dangle from workstations; dangling cords can cause electrical shocks and other injuries.
20. Keep work areas and apparatus clean and neat. Always clean up any clutter made during lab work, rearrange apparatus in an orderly manner and report any damaged or missing items.
21. Always thoroughly wash your hands with soap and water at the conclusion of each investigation.

Student's Name _____

Student's Signature _____

Parent's Name _____

Parent's Signature _____

Safety Symbols and Safety Guidelines for Students



EYE PROTECTION

- ▶ Wear safety goggles, and know where the eyewash station is located and how to use it.
- ▶ Swinging objects can cause serious injury.
- ▶ Avoid directly looking at a light source, as this may cause permanent eye damage.



HAND SAFETY

- ▶ Wear latex or nitrile gloves to protect yourself from chemicals in the lab.
- ▶ Use a hot mitt to handle resistors, light sources, and other equipment that may be hot. Allow equipment to cool before handling it and storing it.



CLOTHING PROTECTION

- ▶ Wear a laboratory apron to protect your clothing.
- ▶ Tie back long hair, secure loose clothing, and remove loose jewelry to prevent their getting caught in moving parts or coming in contact with chemicals.



HEATING SAFETY

- ▶ When using a Bunsen burner or a hot plate, always wear safety goggles and a laboratory apron to protect your eyes and clothing. Tie back long hair, secure loose clothing, and remove loose jewelry.
- ▶ Never leave a hot plate unattended while it is turned on.
- ▶ If your clothing catches on fire, walk to the emergency lab shower, and use the shower to put out the fire.
- ▶ Wire coils may heat up rapidly during experiments. If heating occurs, open the switch immediately, and handle the equipment with a hot mitt.
- ▶ Allow all equipment to cool before storing it.



CHEMICAL SAFETY

- ▶ Do not eat or drink anything in the lab. Never taste chemicals.
- ▶ If a chemical gets on your skin or clothing or in your eyes, rinse it immediately with lukewarm water, and alert your teacher.
- ▶ If a chemical is spilled, tell your teacher, but do not clean it up yourself unless your teacher says it is OK to do so.



ELECTRICAL SAFETY

- ▶ Never close a circuit until it has been approved by your teacher. Never rewire or adjust any element of a closed circuit.
- ▶ Never work with electricity near water; be sure the floor and all work surfaces are dry.
- ▶ If the pointer of any kind of meter moves off the scale, open the circuit immediately by opening the switch.
- ▶ Light bulbs or wires that are conducting electricity can become very hot.
- ▶ Do not work with any batteries, electrical devices, or magnets other than those provided by your teacher.



GLASSWARE SAFETY

- ▶ If a thermometer breaks, notify your teacher immediately.
- ▶ Do not heat glassware that is broken, chipped, or cracked. Always use tongs or a hot mitt to handle heated glassware and other equipment because it does not always look hot when it is hot. Allow the equipment to cool before storing it.
- ▶ If a piece of glassware breaks, do not pick it up with your bare hands. Place broken glass in a specially designated disposal container.
- ▶ If a light bulb breaks, notify your teacher immediately. Do not remove broken bulbs from sockets.



WASTE DISPOSAL

- ▶ Use a dustpan, brush, and heavy gloves to carefully pick up broken glass, and dispose of it in a container specifically provided for this purpose.
- ▶ Dispose of any chemical waste only as instructed by your teacher.



HYGIENIC CARE

- ▶ Keep your hands away from your face and mouth.
- ▶ Always wash your hands thoroughly when you are done with an experiment.