

Physics and Chemistry Laboratory Safety Guidelines

Physics and chemistry are hands-on laboratory classes. Laboratory activities require the use of potentially hazardous equipment. These guidelines should be followed at all times.

General Rules

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. Follow all written and verbal instructions. If you do not understand a direction or part of a procedure, ask the instructor before proceeding.
3. Never work alone. No student may work in the laboratory without an instructor present.
4. When first entering a science room, do not touch any equipment, chemicals, or other materials until you are instructed to do so.
5. Never use laboratory glassware as containers for food or beverages.
6. Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the procedures or by the instructor. Carefully follow all instructions, both written and oral.
7. Read all procedures before beginning.
8. Never fool around in the laboratory. Horseplay, practical jokes, and pranks can be dangerous.
9. Keep work areas clean and tidy at all times. Bring only your laboratory instructions, worksheets, and/or reports to the work area. Other materials (books, purses, backpacks, etc.) should be stored away from lab equipment.
10. Keep aisles clear. Push stools under counters when not in use.
11. Know the locations and operating procedures for essential safety equipment, including first aid kit, eyewash station, safety shower, fire extinguisher and fire blanket. Know where the fire alarm and exits are located.
12. Always work in a well-ventilated area. Use the fume hood when working with volatile substances or poisonous vapors. Never place your head into the fume hood.
13. Be alert and proceed with caution at all times in the laboratory. Notify the instructor immediately of any unsafe conditions you observe.
14. Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water and those solutions designated by the instructor. Solid chemicals, metals, matches, filter paper, and all other insoluble materials are to be disposed of in the proper waste containers. Check the label of waste containers before adding chemical waste.
15. Read equipment labels and instructions before use. Use the prescribed apparatus as directed.
16. Keep hands away from face, eyes, mouth and body while using chemicals or preserved specimens. Wash hands with soap and water after performing all experiments. Clean all work surfaces and apparatus at the end of experiment. Return all equipment clean and in working order to the proper storage area.
17. Experiments must be personally monitored at all times. Do not wander away, distract others, or interfere with other experiments.
18. In the event of a fire drill or actual fire event, chemical containers must be closed, gas valves and fume hoods turned off, and any electrical equipment switched off.

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19. Handle all living organisms used in a laboratory activity in a humane manner. Preserved biological materials are to be treated with respect and disposed of properly.
20. When using knives and other sharp instruments, always carry with tips and points pointing down and away. Always cut away from your body. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.
21. If you have a medical condition (e.g., allergies, pregnancy, etc.), check with your physician prior to working in lab.

Protective Clothing and Equipment

23. Anytime chemicals, heat, or glassware are used, wear laboratory goggles.
24. Contact lenses may be worn provided adequate face and eye protection is provided by specially marked, non-vented safety goggles.
25. Dress properly for lab activities. Long hair, dangling jewelry, and loose or baggy clothing are hazardous. Long hair must be tied back and dangling jewelry and loose or baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed.
26. Lab aprons will be provided if needed, and should be worn during such laboratory activities.

Accidents and Injuries

27. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.
28. If you or your lab partners are hurt, immediately get the instructor's attention.
29. If a chemical splashes in your eye(s) or on your skin, immediately flush with running water from the eyewash station or safety shower for at least 20 minutes. Chemically contaminated clothing and contact lenses must be removed during the flushing process. Notify the instructor immediately.
30. Do not use mercury thermometers, however, if a mercury thermometer is brought in and broken, the mercury must not be touched. Notify the instructor immediately so that the mercury can be properly disposed.

Handling Chemicals

31. All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemicals unless specifically instructed to do so. The proper technique for wafting chemical vapors will be demonstrated to you. Never stick your nose into a container to smell a chemical.
32. Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need.
33. Never return unused chemicals to their original containers.
34. Never use mouth suction to fill a pipet. Use a rubber bulb or pipet pump.
35. When transferring reagents from one container to another, hold the containers away from your body.
36. Acids must be handled with extreme care. You will be shown the proper method for diluting strong acids. Always add acid to water, swirl or stir the solution and be careful

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of the heat produced, particularly with sulfuric acid. Never add water to concentrated acids.

37. Know where the fire pan is located. Handle flammable hazardous liquids over a pan to contain spills. Never dispense or work with flammable liquids anywhere near an open flame or source of heat.
38. Never remove chemicals or other materials from the laboratory area.
39. Take great care when transporting acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully.

Proper Handling of Glassware and Lab Equipment

40. Carry glass tubing, especially long pieces, in a vertical position to minimize the likelihood of breakage and injury.
41. Never handle broken glass with your bare hands. Use a brush and dustpan to clean up broken glass. Place broken or waste glassware in the designated glass disposal container. Never place broken glass in the normal garbage can.
42. Inserting and removing glass tubing from rubber stoppers can be dangerous. Always lubricate glassware (tubing, thistle tubes, thermometers, etc.) before attempting to insert it in a stopper. Always protect your hands with towels or cotton gloves when inserting glass tubing into, or removing it from, a rubber stopper. If a piece of glassware becomes “frozen” in a stopper, take it to your instructor for removal.
43. Fill wash bottles only with distilled water and use only as intended, e.g., rinsing glassware and equipment, or adding water to a container.
44. When removing an electrical plug from its socket, grasp the plug, not the electrical cord. Hands must be completely dry before touching an electrical switch, plug, or outlet.
45. Examine glassware carefully before each use. Never use chipped or cracked glassware. Never use dirty glassware.
46. Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
47. If you do not understand how to use a piece of equipment, ask the instructor for help before attempting to use it.
48. Do not immerse hot glassware in cold water; it may shatter.

Heating Substances

49. Exercise extreme caution when using a gas burner. Take care that hair, clothing and hands are a safe distance from the flame at all times. Do not put any substance into the flame unless specifically instructed to do so. Never reach over an exposed flame. Light gas (or alcohol) burners only as instructed by the teacher.
50. Never leave a lit burner unattended. Never leave anything that is being heated or is visibly reacting unattended. Always turn the burner or hot plate off when not in use.
51. You will be instructed in the proper method of heating and boiling liquids in test tubes. Do not point the open end of a test tube being heated at yourself or anyone else.
52. Heated metals, glass, and ceramic remain very hot for a long time. If in doubt, always treat metal, glassware, and ceramic as if it is hot. They should be set aside to cool and picked up with caution. Use tongs or heat-protective gloves if necessary.

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- 53. Never look into a container that is being heated.
- 54. Do not place hot apparatus directly on the laboratory desktop. Always use an insulating pad or tile square. Allow plenty of time for a hot apparatus to cool before touching it.
- 55. When bending glass, allow time for the glass to cool before further handling. Hot and cold glass has the same visual appearance. Determine if an object is hot by bringing the back of your hand close to it prior to grasping it.

Health Information

- 56. Many experiments involve the use of foods and other consumer items. Students must make the teacher aware of any allergies prior to experiments to help avoid possible allergic reactions. These allergies should be listed on the signed laboratory contract that is handed into the teacher.
- 57. Female students must inform the teacher if they have become pregnant before participating in laboratory experiments. Pregnant women and their developing child can be more sensitive to or at a greater risk of complication when exposed to certain chemicals. This information will remain confidential.

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Student Materials and Safety Agreement

I understand that all assigned school materials must be returned in good condition or purchased before my final grade report will be released. If I am unable to return the Class Reader, I agree to reimburse the school \$10.00 toward its replacement.

I have read and understand all the rules listed in the Physics and Chemistry Laboratory Safety Guidelines, and agree to abide by them at all times when I am in the Physics and Chemistry Laboratories.

	Printed	Signature	Date
Student	_____	_____	_____
Parent or Guardian	_____	_____	_____