

SAFETY RULES

Your school laboratory, like your kitchen, need not be dangerous. In both places, understanding how to use materials and equipment and following proper procedures will help you avoid accidents.

The activities in this textbook have been tested and are safe, as long as they are done with proper care. Take special note of the instructions accompanying the word CAUTION! whenever it appears in an activity. These instructions will help you understand how to use electricity, laboratory equipment, and chemicals safely.

Follow the safety rules listed below. Your teacher will give you specific information about other safety rules for your classroom. You will also be told about the location and proper use of all safety equipment.

1. Give your teacher your complete attention when listening to instructions.
2. Learn the location and proper use of the safety equipment available to you, such as safety goggles, protective aprons, heat-resistant gloves, fire extinguishers, fire blankets, eyewash fountains, and showers. Find out the location of the nearest fire alarm.
3. Inform your teacher of any allergies, medical conditions, or other physical problems you may have. Tell your teacher if you wear contact lenses.
4. Read through the entire activity before you start. Before beginning any step, make sure you understand what to do. If there is anything you do not understand, ask your teacher to explain.
5. Do not begin an activity until you are instructed to do so.
6. If you are designing your own experiment, obtain your teacher's approval before carrying out the experiment.
7. Clear the laboratory bench of all materials except those you are using in the activity.
8. Follow your teacher's instructions regarding the No Crowding Zone.
9. Wear protective clothing (a lab apron or a lab coat) and closed shoes during activities involving heating substances or using chemicals. Long hair should be tied back.
10. Wear safety goggles when using hazardous or unidentified materials and when heating materials.
11. Do not taste or touch any material unless you are asked to do so by your teacher.
12. Do not chew gum, eat, or drink in the laboratory.
13. Do not rock or lean on lab stools.
14. Do not run or play games in the laboratory.
15. Do not throw any objects, including paper, chalk, pens, and liquids.
16. Carry lab equipment, containers of chemicals, and glassware carefully.
17. Read and make sure you understand all safety labels.
18. Label all containers.
19. When taking something from a bottle or other container, double-check the label to be sure you are taking exactly what you need.
20. If any part of your body comes in contact with a chemical or specimen, wash the area immediately and thoroughly with water. If your eyes are affected, do not touch them but wash them immediately and continuously for at least 15 minutes and inform your teacher.

- 21.** Handle all chemicals carefully. When you are instructed to smell a chemical in the laboratory, follow the procedure shown here. Only this technique should be used to smell chemicals in the laboratory. Never put your nose close to a chemical.



- 22.** Hold the container(s) away from your face when pouring liquids.
- 23.** Place test tubes in a rack before pouring liquids into them. If you must hold the test tube, tilt it away from you before pouring liquids in.
- 24.** Clean up any spilled water, chemicals, or other materials immediately, following instructions given by your teacher.
- 25.** Do not return unused chemicals to original containers. Do not pour them down the drain. Dispose of chemicals as instructed by your teacher.
- 26.** Special care must be taken when dissecting an organism. A dissection must be performed cautiously and patiently. Be sure to follow the instructions in the text and also those that your teacher gives you. Each time you dissect, you should do the following:

- Make sure that the area you are working in is well ventilated.
 - Wear safety goggles and an apron at all times.
 - Wear disposable gloves when performing a dissection to prevent any chemicals from coming in contact with your skin.
 - Gently rinse your specimen under running water to wash away excess preservatives.
 - Wash all splashes of the preservative solution off your skin and clothing immediately. If you get any chemical in your eyes, rinse thoroughly for at least 15 minutes and inform your teacher.
 - Position your specimen so that it is not directly beneath your face and nose.
 - Familiarize yourself with the safe and proper use of all dissecting instruments.
 - Report dull or damaged equipment immediately. Dull blades will slip and may cause injury.
 - Use the dissection tools carefully. Be sure to follow your teacher's instructions when using a knife or razor blade. In most cases, you will be asked to cut away from yourself and away from others.
 - Always cut gradually through layers of tissue.
 - Always thoroughly wash your hands and lower arms with soap and warm water after completing your dissection work.
 - Dispose of any waste material in the container provided by your teacher.
- 27.** Whenever possible, use electric hot plates for heating materials. Use flames only when instructed to do so. Read the special Bunsen burner safety procedures listed under safety rule number 47.
- 28.** When heating materials, always wear safety goggles and use hand protection if required.
- 29.** When heating glass containers, make sure you use clean Pyrex or Kimax. Do not use broken or cracked glassware. Always keep the open end pointed away from yourself and others. Never allow a container to boil dry.

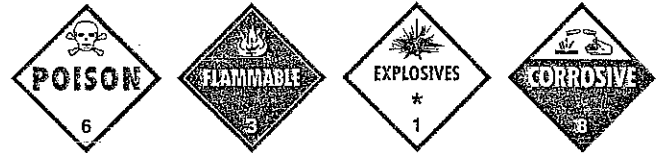
30. When heating a test tube over a flame, use a test tube holder. Holding the test tube at an angle and facing away from anyone, move it gently through the flame so that the heat is distributed evenly.
31. Handle hot objects carefully. Hot plates can take up to 60 minutes to cool off completely. Hot and cold hot plate burners can look the same. If you burn yourself, immediately apply cold water or ice.
32. Keep water and wet hands away from electrical cords, plugs, and sockets.
33. Always unplug electrical cords by pulling on the plug, not the cord. Report any frayed cords or damaged outlets to your teacher.
34. Make sure electrical cords are not placed where anyone can trip over them.
35. When cutting with a knife or razor blade, follow your teacher's instructions. In most cases, you will be asked to cut away from yourself and away from others.
36. When walking with a pair of scissors or any pointed object, keep the pointed surface facing the floor away from yourself and away from others.
37. Watch for sharp or jagged edges on all equipment.
38. Place broken or waste glass only in specially marked containers.
39. Follow your teacher's instruction when disposing of waste materials.
40. Report to your teacher all accidents (no matter how minor), broken equipment, damaged or defective facilities, and suspicious-looking chemicals.
41. Be sure all equipment is shut off when not in use. Be ready to shut off equipment quickly if it breaks down or if an accident occurs.
42. Clean all equipment before putting it away.
43. Put away all equipment and chemicals after use.
44. Wash your hands thoroughly using soap and warm water after working in the science laboratory. This practice is especially important when you handle chemicals, biological specimens, or microorganisms.
45. Do not take any equipment, materials, or chemicals out of the laboratory.
46. Do not practice laboratory experiments at home unless directed to do so.
47. If a Bunsen burner is used in your science classroom, make sure you follow the procedures listed below. (NOTE: Hot plates should be used in preference to Bunsen burners whenever possible.)
 - Do not wear scarves or ties, long necklaces, or earphones suspended around your neck. Tie back long hair and roll back or secure loose sleeves before you light a Bunsen burner.
 - Obtain instructions from your teacher on the proper method of lighting and using the Bunsen burner.
 - Do not heat a flammable material (for example, alcohol) over a Bunsen burner.
 - Be sure there are no flammable materials nearby before you light a Bunsen burner.
 - Do not leave a lighted Bunsen burner unattended.
 - Always turn off the gas at the valve, not at the base of the Bunsen burner.
48. If a fire occurs, make sure you follow the procedures listed below.
 - Do not panic. Remain calm.
 - Notify your teacher immediately. Act quickly to provide help in an emergency.
 - Shut off all gas supplies at the desk valves if it is safe to do so.
 - Pull the fire alarm.
 - Follow your teacher's instructions if your assistance is required.
 - If your clothing is on fire, roll on the floor to smother the flames. If another student's

clothing is on fire, use a fire blanket to smother the flames.

- Avoid breathing fumes.
- Do not throw water on a chemical fire.
- If the fire is not quickly and easily put out, leave the building in a calm manner.

49. Labelling and placarding assists shippers, carriers, fire departments, police, emergency response personnel, and others in complying with and enforcing the regulations governing the safe transport of hazardous materials by highway, rail, water, and air. The labelling of hazardous material is specific to the hazard class of the material. The placards represent the hazard class(es) of the material(s) contained within the freight container, motor vehicle, or rail car.

Become familiar with the warning labels that are placed on containers of potentially dangerous materials. You should be able to identify and understand each of the labels shown here.



Hazardous Material Warning Placards

The warnings on labels of household products were developed to indicate exactly why and to what degree a product is dangerous. Pay careful attention to any warning labels on the products or materials that you handle.