

Safety in Science

Do you know who is responsible for your safety in and out of a science laboratory? You can see that person whenever you stand in front of a mirror. Yes, you are the person who is responsible for your own safety. Everyone who shares the same classroom—your teacher and classmates—shares the responsibility as well as the risks. It is vitally important that you, and the people who are working with you, take safety information seriously and follow safety precautions precisely.

In this activity, you will familiarize yourself with the setup of your classroom and with the safety symbols and general procedures related to lab equipment and techniques.

SKILLS MENU

● Questioning	● Performing
● Hypothesizing	● Observing
● Predicting	● Analyzing
● Planning	● Evaluating
● Controlling Variables	● Communicating

Purpose

To review safety procedures and symbols in the science laboratory.

Equipment and Materials

- notebook
- pen or pencil

Procedure



Part A: Mapping Your Classroom

1. In your notebook, draw a rough floor plan of your classroom.
2. On your map, label the location of each of the following:
 - emergency exits
 - eye wash station
 - emergency shower
 - first aid kit
 - fire extinguishers
 - fire blanket
 - broken glass container
 - eye protection and lab aprons
 - MSDS binder
 - additional safety equipment
3. Below your map, make notes on the correct use of each piece of safety equipment. The goal is that you will never need to use any of these pieces of equipment because you will practise safety in the lab.

Part B: General Safety Rules

4. Prepare a table with two columns. List laboratory safety rules in the first column and provide the reason for the rule in the second column.
5. Complete the table with safety rules regarding each of the following:
 - eye protection and lab aprons
 - long hair and hats
 - loose clothing
 - personal items
 - food and drink
 - working alone

Part C: Safety Symbols

6. In your notebook, copy each of the WHMIS symbols in the Skills Handbook.
7. Beside each symbol, write the hazard indicated and explain how the symbol represents the hazard.

Part D: Safe Techniques

8. Work with a partner and demonstrate each of the following techniques to each other:
 - smelling a chemical by wafting
 - pouring a liquid
 - lighting a Bunsen burner
 - heating a test tube over a Bunsen burner
 - unplugging an electrical cord
 - removing and disposing of broken glass
 - cleaning up your lab station

Analyze and Evaluate

- (a) Why is it important to use standardized safety symbols on all hazardous products? **K/U**
- (b) What does WHMIS stand for? **K/U**
- (c) Describe the WHMIS symbol for each of the following: **K/U**
 - (i) flammable and combustible material
 - (ii) poisonous and infectious material causing immediate and serious toxic effects
 - (iii) corrosive material
 - (iv) biohazardous infectious material
- (d) What should you do in each of the following situations? Give reasons for your answers. **T/I**
 - (i) You did not have time to finish your lunch. Should you eat an apple in the science lab before class starts?
 - (ii) You accidentally broke a test tube and swept up the broken glass. Should you put the broken glass into the waste container?
 - (iii) You are allergic to peanuts. Should you tell the teacher?
 - (iv) You are boiling water but not using any hazardous chemicals. Should you wear eye protection and a lab apron?
 - (v) Your beaker has a small crack in it. Should you use it anyway?
 - (vi) The equipment you used is still hot at the end of class. Should you put it away?
 - (vii) You have read the instructions but are still not sure how to do the experiment. What should you do?
- (e) Coming to the lab prepared is very important for your safety and the safety of those around you. Explain why this is the case. **K/U** **A**

Apply and Extend

- (f) List five different occupations in which safety equipment is worn. For each example, explain the safety hazard(s) for which the safety equipment is used. For example, construction workers wear hardhats to protect against head injury from falling or sharp objects. **A**
- (g) Research WHMIS on the Internet or in the library. Write a short paragraph summarizing the purpose of WHMIS and why this system is important in schools and in the workplace. **T/I** **C**



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- (h) WHMIS symbols are applied to dangerous materials used in workplaces. List five examples of workplace products that carry WHMIS labels. Check the containers of these products and record the type of symbol used. **A**
- (i) The following accident report was filed by lab partners Rachelle and Mandeep after a number of students were injured as a result of their actions.

“We were dissolving salt crystals in a beaker of hot water and taking the temperature with a thermometer. We put on aprons but we took off our eye protection because it kept steaming up. Mandeep’s sleeve caught the thermometer and knocked the beaker over, splashing the hot water everywhere. The tip of the thermometer broke off, but it was hardly noticeable, so Rachelle put it back in the drawer. We did not have a mop for the floor, but the puddle will dry by itself eventually. Fortunately, we cleaned up the lab bench before the teacher saw us, so we did not get into trouble. Unfortunately, Rachelle had missed breakfast and the cookie she was munching on got totally soaked on the lab bench.”

Identify all the errors the students made and the possible consequences of their actions. **T/I**