1.5 Safety in Life Science Research

Standards

6-8-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Lesson Objectives

- Identify common safety symbols and lab safety rules.
- Explain how to stay safe while doing field research.
- State what to do in case of an accident during scientific research.

Lesson Vocabulary

- fieldwork

Introduction

Some life scientists mainly do lab research. Other life scientists, like the botanist in **Figure** 1.13, work in natural settings. This is called **fieldwork**. Whether in the lab or the field, research in life science can be dangerous. It's important to be aware of the risks and how to stay safe.

FIGURE 1.13

This field botanist is collecting water samples near the wild pitcher plants she is studying. These insect-eating plants are rare, and there are many unanswered questions about them. Why might her research be risky?

Safety in the Lab

A science lab has many potential dangers. That's why lab procedures and equipment are often labeled with safety symbols, like the ones in **Figure** 1.14. These symbols warn of specific hazards, such as flames or broken glass.

Learn the symbols so you can recognize the dangers. Then learn how to avoid them.

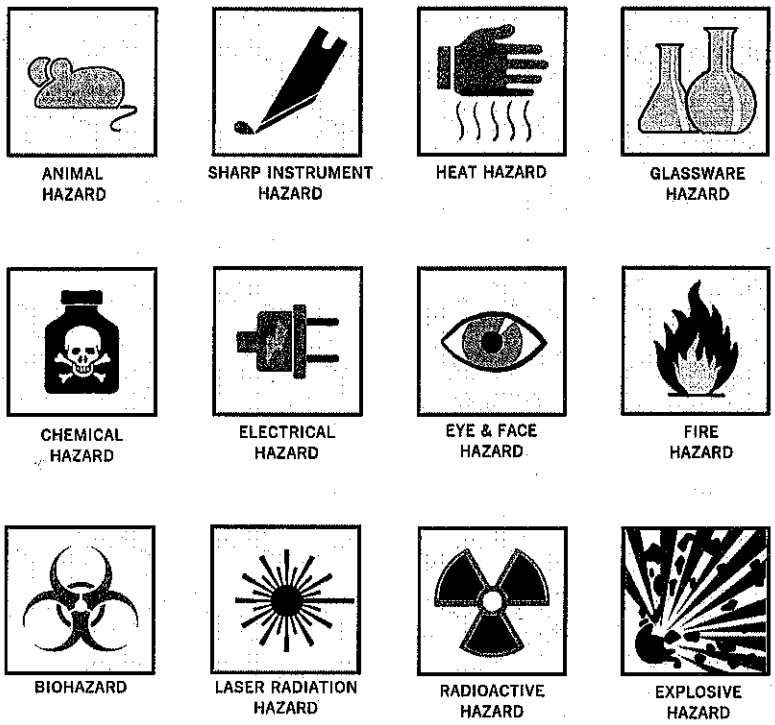


FIGURE 1.14
Common safety symbols

The best way to avoid lab dangers is to follow the lab safety rules listed below. Following the rules can help prevent accidents. Watch this funny student video to see just how important some of these rules are. Video http://www.youtube.com/watch?v=NjJz85bQqdM .

Lab Safety Rules

- Wear long sleeves and shoes that completely cover your feet.
- If your hair is long, tie it back or cover it with a hair net.
- Protect your eyes, skin, and clothing by wearing safety goggles, an apron, and gloves.
- Use hot mitts to handle hot objects.
- Never work alone in the lab.
- Never engage in horseplay in the lab.
- Never eat or drink in the lab.
- Never do experiments without your teacher's approval.
- Always add acid to water, never the other way around. Add the acid slowly to avoid splashing.
- Take care to avoid knocking over Bunsen burners. Keep them away from flammable materials such as paper.
- Use your hand to fan vapors toward your nose rather than smelling substances directly.
- Never point the open end of a test tube toward anyone—including you!
- Clean up any spills immediately.
- Dispose of lab wastes according to your teacher's instructions.
- Wash glassware and counters when you finish your work.
- Wash your hands with soap and water before leaving the lab.

Safety in the Field

Many of the lab safety rules are common-sense precautions. Common-sense should also prevail in the field. Be aware, however, that field research may have its own unique dangers. Therefore, other safety rules may apply when you work in the field. The rules will depend on the particular field setting and its specific risks.

Consider the field botanist in **Figure** 1.13. There may be microorganisms in the water that could make her sick. She might come into contact with plants that cause an allergic reaction. The water or shore might be strewn with dangerous objects such as broken glass that could cause serious injury. To stay safe in the field, she needs to be aware of these risks and take steps to avoid them. If you work in the field or take a science fieldtrip, you should do the same—and always follow your teacher's instructions.

In Case of Accident

Even when you follow the rules, accidents can happen. Immediately alert your teacher if an accident occurs. Report all accidents, whether or not you think they are serious.

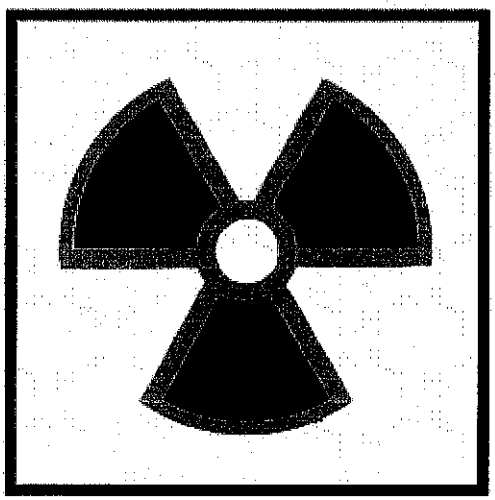
Lesson Summary

- Lab safety symbols warn of specific hazards, such as flames or broken glass. Knowing the symbols allows you to recognize and avoid the dangers.
- Following basic safety rules, such as wearing safety gear, helps prevent accidents in the lab and in the field.
- All accidents should be reported immediately.

Lesson Review Questions

Recall

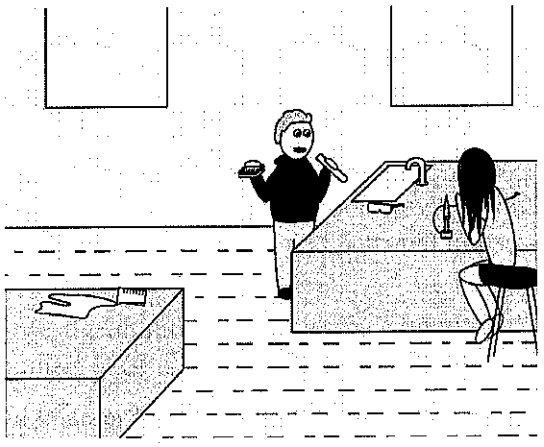
1. Look at the safety symbol in the picture below. What hazard does it represent?



2. Identify three safety rules that help prevent accidents in the lab.

Apply Concepts

3. Examine this sketch of students working in a lab. Identify at least three lab safety rules they are breaking.



Think Critically

4. Assume you are a field researcher studying ants. What risks might you face? How could you reduce or avoid these risks?

Points to Consider

In this chapter, you learned that life science is the study of life and living things.

1. What separates life from nonlife?
2. What characteristics define living organisms?