

Safety in the Science Laboratory

Reading Preview

Key Concepts

- Why is preparation important when carrying out scientific investigations in the lab and in the field?
- What should you do if an accident occurs?

Target Reading Skill

Outlining As you read, make an outline about science safety that you can use for review. Use the red headings for the main ideas and the blue headings for supporting ideas.

Safety in the Science Laboratory

I. Safety in the lab

A. Preparing for the lab

B.

C.

II. Safety in the field

Lab
zone

Discover Activity

Where Is the Safety Equipment in Your School?

1. Look around your classroom or school for any safety-related equipment.
2. Draw a floor plan of the room or building and clearly label where each item is located.

Think It Over

Predicting Why is it important to know where safety equipment is located?



After hiking for a few hours, your group finally reaches a beautiful campsite by a lake. Your first task is to set up tents. Eager to explore the area, you toss aside the tent directions, thinking to yourself, “How hard could it be?” You begin to put all the pieces together, guessing as you go. When you have finished, you step back to survey your work. You notice that the tent is quite lopsided. Deciding that it will do, you run off with your friends to explore.

Later that night, as you settle into your sleeping bag, heavy rain starts to fall. Water begins to pour in through the lopsided part of the tent. You look for a flashlight so you can investigate. But then you realize that you forgot to pack one.

You have probably heard the motto, “Be prepared.” Obviously, following that advice would have been helpful in this situation. Proper preparation for the camping trip should have included reading the tent directions and packing the proper supplies. The result would probably have been a more enjoyable camping experience.

FIGURE 20

Safety in the Lab

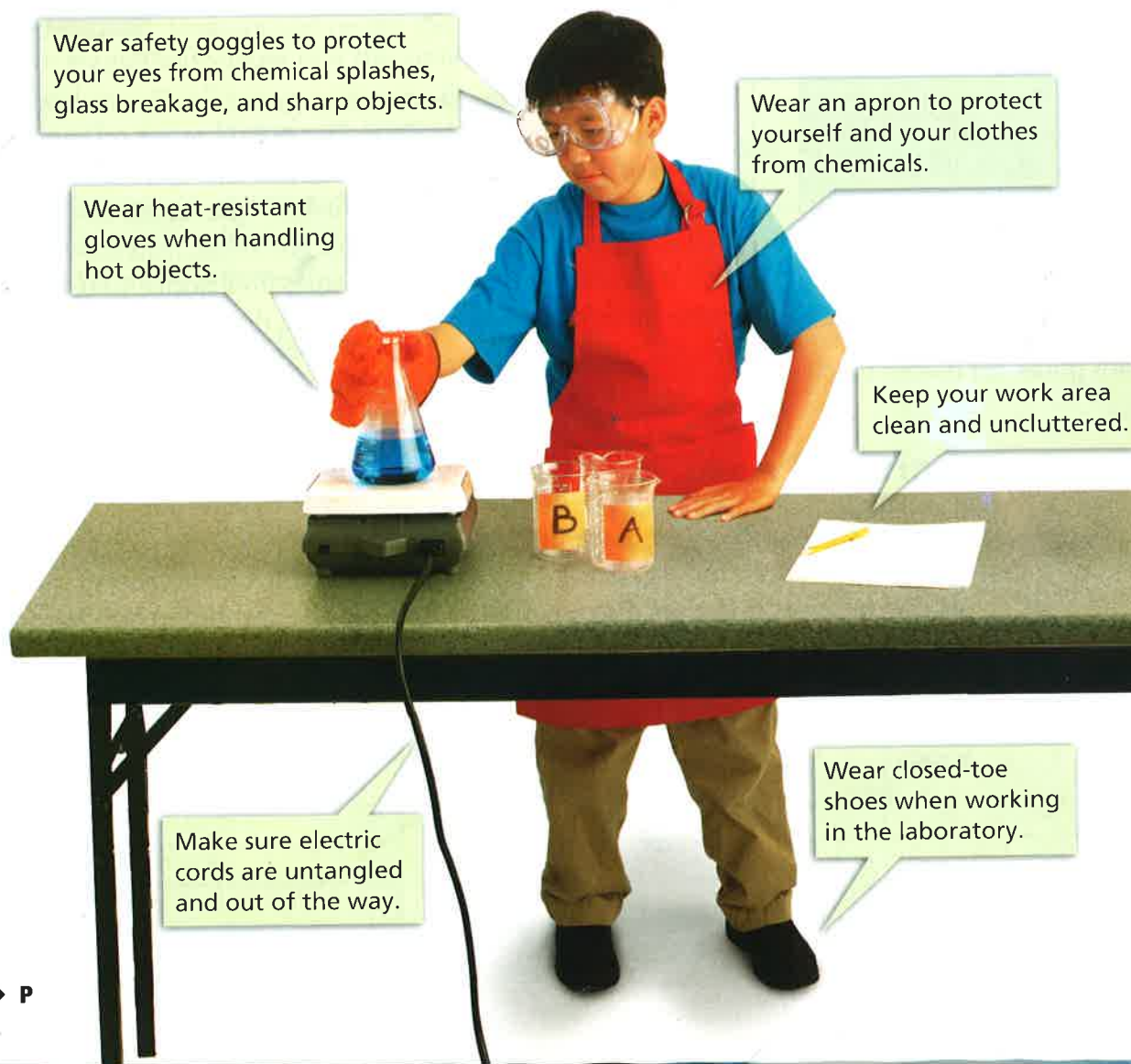
Good preparation for an experiment helps you stay safe in the laboratory. **Observing** List three precautions each student is taking while performing the labs.

Safety in the Lab

Just as when you go camping, you have to be prepared before you begin any scientific investigation. **Good preparation helps you stay safe when doing science activities in the laboratory.**

Thermometers, balances, and glassware—these are some of the equipment you will use in science labs. Do you know how to use these items? What should you do if something goes wrong? Thinking about these questions ahead of time is an important part of being prepared.

Preparing for the Lab Preparing for a lab should begin the day before you will perform the lab. It is important to read through the procedure carefully and make sure you understand all the directions. Also, review the general safety guidelines in Appendix A, including those related to the specific equipment you will use. If anything is unclear, be prepared to ask your teacher about it before you begin the lab.



Performing the Lab Whenever you perform a science lab, your chief concern must be the safety of yourself, your classmates, and your teacher. The most important safety rule is simple: Always follow your teacher's instructions and the textbook directions exactly. You should never try anything on your own without asking your teacher first.

Labs and activities in this textbook series include safety symbols such as those at right. These symbols alert you to possible dangers in performing the lab and remind you to work carefully. They also identify any safety equipment that you should use to protect yourself from potential hazards. The symbols are explained in detail in Appendix A. Make sure you are familiar with each safety symbol and what it means.

Other things you can do to make your lab experience safe and successful include keeping your work area clean and organized. Also, do not rush through any of the steps. Finally, always show respect and courtesy to your teacher and classmates.



Safety Symbols	
	Safety Goggles
	Lab Apron
	Breakage
	Heat-Resistant Gloves
	Plastic Gloves
	Heating
	Flames
	No Flames
	Corrosive Chemical
	Poison
	Fumes
	Sharp Object
	Animal Safety
	Plant Safety
	Electric Shock
	Physical Safety
	Disposal
	Hand Washing
	General Safety Awareness

End-of-Lab Procedures Your lab work does not end when you reach the last step in the procedure. There are important things you need to do at the end of every lab.

When you have completed a lab, be sure to clean up your work area. Turn off and unplug any equipment and return it to its proper place. It is very important that you dispose of any waste materials properly. Some wastes should not be thrown in the trash or poured down the drain. Follow your teacher's instructions about proper disposal. Finally, be sure to wash your hands thoroughly after working in the laboratory.

Safety in the Field

The laboratory is not the only place where you will conduct scientific investigations. Some investigations will be done in the "field." The field can be any outdoor area, such as a schoolyard, a forest, a park, or a beach. **Just as in the laboratory, good preparation helps you stay safe when doing science activities in the field.**

There can be many potential safety hazards outdoors. For example, you could encounter severe weather, traffic, wild animals, or poisonous plants. Advance planning may help you avoid some potential hazards. For example, you can listen to the weather forecast and plan your trip accordingly. Other hazards may be impossible to anticipate.

Whenever you do field work, always tell an adult where you will be. Never carry out a field investigation alone. Ask an adult or a classmate to accompany you. Dress appropriately for the weather and other conditions you will encounter. Use common sense to avoid any potentially dangerous situations.



What are some potential outdoor hazards?

FIGURE 21

Safety in the Field

These students are collecting data outdoors.

Applying Concepts What safety precautions should they keep in mind while performing their activity?



In Case of an Accident

Good preparation and careful work habits can go a long way toward making your lab experiences safe ones. But, at some point, an accident may occur. A classmate might accidentally knock over a beaker or a chemical might spill on your sleeve. Would you know what to do?

When any accident occurs, no matter how minor, notify your teacher immediately. Then, listen to your teacher's directions and carry them out quickly. Make sure you know the location and proper use of all the emergency equipment in your lab room. Knowing safety and first aid procedures beforehand will prepare you to handle accidents properly. Figure 22 lists some first-aid procedures you should know.



Reading
Checkpoint

What should you do when an accident occurs?

FIGURE 22
First-Aid Tips

These first-aid tips can help guide your actions during emergency situations. Remember, always notify your teacher immediately if an accident occurs.

In Case of Emergency	
ALWAYS NOTIFY YOUR TEACHER IMMEDIATELY	
Injury	What to Do
Burns	Immerse burns in cold water.
Cuts	Cover cuts with a clean dressing. Apply direct pressure to the wound to stop bleeding.
Spills on Skin	Flush the skin with large amounts of water.
Foreign Object in Eye	Flush the eye with large amounts of water. Seek medical attention.

Section 4 Assessment

Target Reading Skill Outlining Use the information in your outline about science safety to help you answer the questions below.

Reviewing Key Concepts

- a. **Listing** List two things you should do ahead of time to prepare for a lab.
- b. **Interpreting Diagrams** Suppose a lab included the safety symbols below. What do these symbols mean? What precautions should you take?



- c. **Making Generalizations** Why is it more difficult to prepare for a lab activity in the field than for one in a laboratory?

- a. **Reviewing** Suppose during a lab activity you get a cut and start to bleed. What is the first thing you should do?
- b. **Sequencing** Outline in order the next steps you would take to deal with your injury.
- c. **Making Judgments** Some people feel that most accidents that occur really could have been prevented with better preparation or safer behaviors. Do you agree or disagree with this viewpoint? Explain your reasoning.

Writing in Science

Safety Poster Make a poster of one of the safety rules in Appendix A to post in your lab. Be sure to include the safety symbol, clear directions, and additional illustrations.