

Safety in Science

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- Why should you follow safety rules when learning science?
- What are the elements of safety?
- What should you do if there is an accident?



California Science Standards

7.7.a

Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data and display data.

Why Are Safety Rules Important?

All safety rules have two purposes. Safety rules help prevent accidents. They also help prevent injuries if an accident does happen.

PREVENTING ACCIDENTS

So that you'll be safe while doing science activities, it is a good idea to learn some safety rules. The most important safety rule is to follow directions. The directions of a science activity are made to help you prevent accidents. Following directions will also make your work easier, which will help you get better results. ✓

PREVENTING INJURIES

If an accident takes place, you or someone nearby can get hurt. Following safety rules after an accident can help prevent injuries. For example, you should never touch or try to clean up a spilled chemical unless you know how to do it safely. If you are using chemicals in a lab, you should learn how to use them safely.



Prepare As you read this section, look around your classroom and try to find examples of proper safety equipment and procedures.



1. Describe Why should you follow directions in science?

In order to prevent accidents or injuries and to ensure that no mistakes are made.

TAKE A LOOK

2. Explain How can goggles help to keep you safe in science class?

So acid or dust will not get in your eyes.

SECTION 5 Safety in Science *continued*

What Are the Elements of Safety?

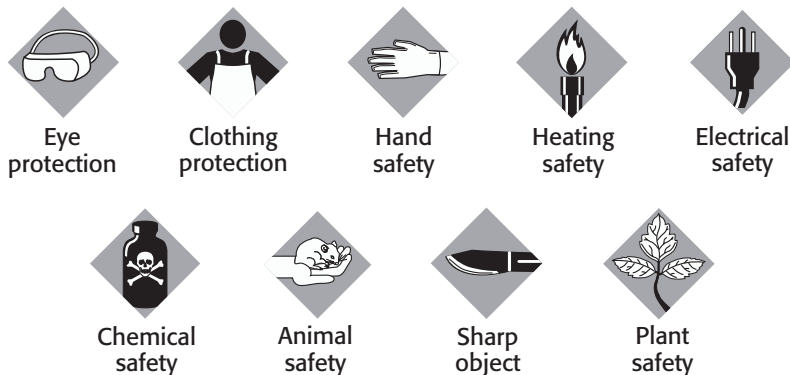
Safety has many parts. To be safe, you need to recognize safety symbols. You also must follow directions, be neat, use equipment correctly, and clean up after experiments.

SAFETY SYMBOLS

Signs and symbols have special meanings when they are used in science. Some of these symbols are safety symbols. They tell you what to do to prevent injuries or accidents.

Look at the safety symbols in the figure below. Each symbol tells you something important. For example, the symbol for animal safety means that you should be careful when you work with live animals. Always follow your teacher’s directions on how to handle animals. Never bring wild animals into the classroom, because they might carry a disease. Remember to always wash your hands after touching a lab animal.

Safety Symbols



TAKE A LOOK

3. Investigate Look around your classroom for safety symbols like the ones in the figure. Give two examples of places where safety symbols are found in your classroom.

In the book and on the fire extinguisher

READING AND FOLLOWING DIRECTIONS

If you want to bake cookies, you use a recipe. The recipe provides all the directions on how to make cookies. When scientists work in a lab, they also follow directions.

Before starting a science activity, read the directions very carefully. If you do not understand them, ask your teacher to explain them. If you can’t finish some of the directions, you should stop your experiment and ask your teacher for help.

When you read, understand, and follow directions, you get better results. You also reduce the chance of causing an accident.

SECTION 5 Safety in Science *continued*

NEATNESS

Before starting any experiment, you should clear your work area of anything you don't need for the lab. Some objects can get in the way and can cause an accident. Long hair and loose clothing can get in the way, too. They should be tied back.

During an experiment, keep your table or desk clean. Gather all the equipment you need for the activity before you start. Arrange your equipment and materials so that they are easy to find and pick up.

Label your materials clearly. Some lab materials look alike and can get mixed up if they are not labeled.

As you collect data, you should record your findings carefully in your data table or notebook. Neatly recorded data are easier to read and analyze.

What to do	Why to do it
Tie back loose hair and clothing.	avoid catching on fire and chemical burns
put your backpack under the table	This will keep your books or backpack from getting in the way during the activity.
Gather all of your equipment before you start the activity.	so you won't neglect your work area getting more equipment during the lab.
clearly label your materials	This will prevent materials that look alike from getting mixed up.

TAKE A LOOK

4. Explain In the table, fill in the blank spaces with things you should do in a lab experiment and the reasons for doing them.

USING PROPER SAFETY EQUIPMENT

Goggles, gloves, and aprons are all pieces of safety equipment that you may use. Some of the safety symbols tell you what safety equipment you need.

For example, when you see the symbol for eye protection, you must put on safety goggles. Your goggles should be clean and fit properly. Your teacher can help you adjust them for a proper fit.

The chemicals that you use may not always be dangerous. However, you should always wear aprons, goggles, and protective gloves whenever you use chemicals. ✓

You should wear protective gloves when handling animals, too. Different gloves are available for different uses. For example, if you are handling warm or hot objects, you should wear heat-resistant gloves.

 **READING CHECK**

5. Identify Give three pieces of safety equipment that you should use when you handle chemicals.

- 1. goggles
- 2. gloves
- 3. apron

SECTION 5 Safety in Science *continued*



These students are wearing protective gloves when they work with chemicals. They put on heat-resistant gloves before lifting the beakers off the hot plates.

PROPER CLEANUP PROCEDURES

At the end of a science activity, always clean up your work area. Put caps back on bottles or jars. Return everything to its proper place. Spills and accidents are less likely to happen when everything is put away correctly. ✓

Wash your glassware, and check for chips and cracks. If you find any damaged glassware, notify your teacher. It should be carefully thrown away in a special container.

If you have extra chemicals, follow your teacher's directions for throwing them away. Once your work area is clear, you should wipe it with a wet paper towel. Finally, wash your hands carefully with soap and water.

READING CHECK

6. Explain Why is it important to clean up correctly after a lab activity?

so spills will not stain or contaminate the next time when they are used again.

Critical Thinking

7. Identify Why is it important to plan ahead for an accident?

so first aid materials are ready and available and everyone knows the first aid procedures that will be needed.

What Should You Do If There Is an Accident?

Even when all the safety rules are followed, accidents may still happen. If an accident happens, try to remain calm. You may be scared, but staying in control will help keep you and others safe. Being prepared and having a plan of action will help you do the right things if an emergency happens.

THINGS TO KNOW BEFORE AN ACCIDENT

The figure on the next page shows some items that you may need to use if an accident happens. Look around your classroom or work area to locate these items. In addition, find out where the exits from the room are and where the telephone is.

Before an accident happens, find out when and how to use the fire extinguisher, the emergency shower, and the eyewash station. Find out what phone number you can call in case there is an emergency. Make sure that the number is clearly written on or near the phone.

SECTION 5 Safety in Science *continued*

Emergency Equipment

▼ A **first-aid kit** contains many things for treating injury, including things to clean and cover wounds.



▶ A **fire extinguisher** is a safe and effective tool for putting out fires.



▶ An **eyewash** is used to remove chemicals or small particles from the eye.



TAKE A LOOK

8. Identify What is an eyewash used for?

washing chemicals and debris - like dust, out of your eyes.

STEPS TO FOLLOW AFTER AN ACCIDENT

If an accident happens, first, remain calm. Try to stay calm and figure out what happened. Look around you for clues, but do not touch anything. Second, make sure that no one (including you!) is in danger. If other students are coming over to see what happened, tell them to stay away so that they don't get hurt.

Third, tell your teacher that an accident happened, even if the accident was small. Explain exactly what happened. If you can't find your teacher, call for help. Finally, ask your teacher if there is anything you can do to help. If not, stay out of your teacher's way.

CARING FOR INJURIES

If an accident happens, someone may need first aid. **First aid** is emergency care for someone who has been hurt. Find the first-aid kit in your classroom. Become familiar with the items in it, such as bandages and protective gloves.

If an accident happens, you can help your teacher give first aid to someone who is hurt. In most cases, you should not give first aid to someone unless you have first-aid training. However, you can provide first aid for some minor injuries. These are given in the table below.

Injury	First-aid procedure
Minor burn from heat	Hold the affected area under cold, running water for at least 15 minutes.
Small cut	Clean the area, cover with a clean cloth or gauze pad, and apply pressure.
Chemicals on the skin	Rinse the area with running water.
Chemicals in the eye	Rinse the eye with running water or in an eyewash.

Critical Thinking

9. Design a Plan You are heating water on a hot plate. You suddenly notice that some papers near the hot plate have caught fire. What should you do? What could you have done to prevent this accident?

Use a wet towel to smother the fire or if too large, use the fire extinguisher.
Next time, clear the space around the hot plate so that no papers are near it.

Section 5 Review

SECTION VOCABULARY

first aid emergency medical care for someone who has been hurt or who is sick

1. Define Write your own definition of first aid.

The immediate response to a wound or injury

2. Explain What are safety symbols?

The signs that warn and inform you to take precautions.

3. Identify What are five elements of safety?

1. Clean work environment
2. correct safety gear is worn.
3. The correct tools are used.
4. First Aid equipment is available and you know where it is
5. When you are finished you clean the area and tools and put them away in their correct locations.

4. List What should you do if an accident happens? List four steps.

1. Tell an adult.
2. Avoid the danger
3. get and or give first aid.
4. put out any fires and or remove the dangerous material when safe to do so.

5. Explain Why are safety rules important?

Safety rules, when followed will prevent accident and injuries and ensure that the correct outcome is achieved.

6. Describe What should you do if you see an animal safety symbol in the directions for a lab?

Do not shake or disturb the animal, Don't let the animal run around or escape. Just observe the animal according to the instructions.