



## Chapter 29

# Environmental Health

### Lesson 1

Air Quality

### Lesson 2

Protecting Land and Water

### Lesson 3

Advocating for  
a Healthy  
Environment





# FOLDABLES™

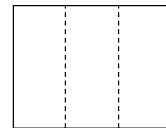
## Study Organizer

### Before You Read

Make this Foldable study guide to record and collect information on air quality and types of pollution. Begin with a sheet of 11" x 17" paper.

#### ▶ Step 1

Fold a sheet of paper into thirds.



#### ▶ Step 2

Unfold. Fold 2" of the bottom side of the paper upward. Glue or staple the sides of the fold to form pockets.



#### ▶ Step 3

Label as shown. Place 3" x 5" notecards or pieces of paper inside the pockets.

Air Pollution	Indoor Air Pollution	Noise Pollution

### As You Read

As you read and discuss the material in the chapter, use your Foldable to record and define terms, identify and explain each type of pollution, and list possible causes and effects.

### Quick Write

**Using Visuals.** Taking care of the environment is everyone's responsibility. In what specific ways do you and your family actively take part in protecting the environment?



## Lesson 1

# Air Quality

### VOCABULARY

air pollution  
smog  
Air Quality Index (AQI)  
asbestos  
radon  
noise pollution  
decibel


### YOU'LL LEARN TO

- Relate the nation's environmental health goals and objectives to individual, family, and community health.
- Identify sources of air pollution and strategies for reducing it.
- Develop strategies to evaluate information relating to a variety of critical environmental health issues.



Breathing is something you do without thinking. Write a paragraph explaining how you think breathing polluted air could negatively affect your health.



 Air quality affects all living organisms, including humans. *Why is it important to alert the public when air pollution levels are extremely high?*

Modern technology has improved the lives of many people in the world. However, the pollution of air, land, and water that may result from technological advances can harm the environment and therefore individual health.

## Air Pollution

Air pollution is a serious problem in this nation. It is linked to an estimated 50,000 to 120,000 premature deaths each year. The U.S. health care costs associated with outdoor air pollution range from \$40 to \$50 billion per year. For this reason, one goal of *Healthy People 2010* is to reduce the proportion of persons exposed to air that does not meet the U.S. Environmental Protection Agency's (EPA) health-based standards for ozone, a major component of air pollution, to promote individual, family, and community health.

**Air pollution** is the contamination of the earth's atmosphere by substances that pose a health threat to living things. The EPA monitors air quality and sets U.S. air quality standards. The agency has identified five major air pollutants whose levels need to be regulated in order to have cleaner air nationwide. These pollutants are described in **Figure 29.1**.





FIGURE 29.1

## FIVE COMMON AIR POLLUTANTS

The EPA has set national air quality standards for these pollutants.

Air Pollutant	Sources	Primary Health Concerns
<b>Ozone (O<sub>3</sub>)</b> is a gas composed of three oxygen atoms. Ground-level ozone is a major component of <b>smog</b> , a yellow-brown haze that forms when sunlight reacts with air pollution.	O <sub>3</sub> forms from a chemical reaction between nitrogen oxide compounds and volatile organic compounds (VOCs). Motor vehicle exhaust, industrial emissions, gasoline vapors, and chemical solvents are the primary sources of nitrogen oxides and VOCs.	O <sub>3</sub> can irritate and inflame lung airways. It is linked to aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses such as pneumonia and bronchitis.
<b>Particulate Matter (PM)</b> is a general term for particles such as dust, dirt, soot, smoke, mold, and liquid droplets that are found in the air.	PM may be emitted directly into the air from sources such as motor vehicle exhaust and factories. PM may also form in the air through chemical reactions between gases.	PM is linked to aggravated asthma, chronic bronchitis, decreased lung function, and premature death.
<b>Carbon Monoxide (CO)</b> is a colorless, odorless gas that contains carbon and oxygen. It is formed when carbon in fuel is not burned completely.	Outdoor sources of CO include motor vehicle exhaust and industrial processes. Indoor sources include gas stoves, cigarette smoke, and unvented gas and kerosene space heaters.	CO is poisonous. It prevents the body from receiving the oxygen it needs. It affects people with heart disease and can harm the central nervous system. Large quantities are fatal.
<b>Sulfur Dioxide (SO<sub>2</sub>)</b> is a gas made up of sulfur and oxygen. It dissolves in water to form an acid, and it reacts with other gases in the air to form sulfates and other harmful particles.	SO <sub>2</sub> is formed when fuel that contains sulfur (such as coal and oil) is burned, when gasoline is extracted from oil, and when metals are extracted from their ores.	SO <sub>2</sub> contributes to respiratory illnesses and aggravates existing heart and lung diseases.
<b>Nitrogen Oxides (NO<sub>x</sub>)</b> is a general term for a group of highly reactive gases that contain varying amounts of nitrogen and oxygen.	These substances form when fuel is burned at high temperatures. Primary sources include motor vehicles and electric utilities.	Nitrogen oxides help form ground-level ozone. They form particles that cause or trigger serious respiratory problems.



## Reducing Air Pollution

The Clean Air Act of 1990 regulates the five pollutants described in Figure 29.1. Even with such laws in place, air quality can vary. The **Air Quality Index (AQI)**, developed by the EPA, is *an index for reporting daily air quality*. Shown in **Figure 29.2**, the AQI informs the public about local air quality and whether air pollution levels pose health risks.

You and your family can take the following actions to help reduce air pollution.

- ▶ **Reduce car use.** Walk or bicycle, take public transportation, or carpool to your destination.
- ▶ **Conserve energy.** Turn off lights when not in use. Set the air conditioner at a higher temperature. Put on extra layers of clothing instead of turning up the heat.
- ▶ **Use air-friendly machinery.** Small motors such as those found on mowers, chain saws, and leaf blowers emit pollutants. Use manual machinery when possible.

FIGURE 29.2

### AIR QUALITY INDEX (AQI)

The AQI alerts people to possible health effects of breathing polluted air.

Range	Air Quality	Color Code
0 to 50	<b>Good:</b> There is little or no health risk.	Green
51 to 100	<b>Moderate:</b> Some pollutants may pose a health concern for a small number of individuals.	Yellow
101 to 150	<b>Unhealthy for Sensitive Groups:</b> Unless a person has specific health concerns, pollution levels in this range are not likely to cause health problems.	Orange
151 to 200	<b>Unhealthy:</b> All individuals may experience some minor negative effects.	Red
201 to 300	<b>Very Unhealthy:</b> More serious effects may be felt by all individuals.	Purple
301 to 500	<b>Hazardous:</b> Entire population is at risk.	Maroon





## Indoor Air Pollution

Most people spend about 90 percent of their time indoors. EPA studies indicate that indoor levels of certain pollutants may be 2 to 5 times—and on occasion more than 100 times—higher than outdoor levels. Sources of indoor air pollution include building and furnishing materials such as carpeting and furniture made of certain pressed woods. Another source is old insulation containing **asbestos** (as-BES-tuhs), a fibrous mineral that has fireproof properties. When materials containing asbestos deteriorate, tiny fibers of the mineral are released into the air. Household cleaning products and other chemicals also contribute to indoor air pollution. Another major source is the particles and gases that form as a result of combustion. Stoves, furnaces, fireplaces, heaters, and tobacco smoke can all contaminate indoor air. Inadequate ventilation increases the problem. Energy-efficient homes may have so little air exchange that pollutants build up to dangerous levels.

### Health Concerns of Indoor Air Pollution

The effects of indoor air pollution depend on the contaminant and the length of exposure. Immediate health concerns include irritation of the eyes, nose, and throat; headaches; dizziness; and fatigue. Long-term exposure to some pollutants can cause asthma. Exposure to lead, especially in children, can damage the kidneys, liver, brain, and nerves. Asbestos has been linked to lung cancer, especially in people who smoke. High levels of carbon monoxide can cause death.

The EPA estimates that **radon**, an odorless, radioactive gas, causes at least 14,000 lung cancer deaths per year. Radon is produced during the natural breakdown of the element uranium in soil, rocks, and water. It can seep into a house through cracks in the foundation. Home testing is the only way to assess exposure to radon. Homes with high levels of radon require increased indoor-outdoor air exchange. Some may need structural work to reduce radon levels.

### Managing Indoor Air Pollution

To manage indoor air pollution, you must first identify the contaminants. Often, removing or replacing an object or appliance and providing sufficient indoor-outdoor air exchange will solve the problem. Make sure that hot water heaters and furnaces are properly vented and operating efficiently to avoid a buildup of carbon monoxide. Many families have installed carbon monoxide detectors to warn of a toxic buildup. Similar detectors are available for radon. Homeowners who discover the presence of asbestos or lead should seek professional help in removing these contaminants.



#### What is sick building syndrome?

The term *sick building syndrome* (SBS) refers to a situation in which the occupants of a building experience health problems that seem to be linked to the atmosphere within the building. Symptoms of SBS include headache; itchy and irritated eyes, throat, or nose; dizziness and nausea; fatigue; inability to concentrate; and a sensitivity to odors. SBS sufferers often report relief soon after leaving the building.



#### TOPIC Indoor Air Pollution

Go to [health.glencoe.com](http://health.glencoe.com) and click on Web Links for information on ways to minimize indoor air pollution.

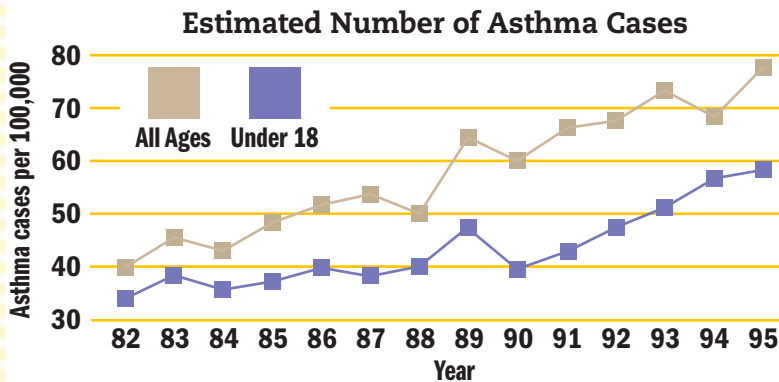
**ACTIVITY** List five ways a person can help minimize indoor air pollution. Share your findings with the class.



# Real-Life Application

## Indoor Air Pollution and Asthma: What You Can Do

The incidence of asthma in people of all ages is increasing. Indoor air pollution has been identified as a major contributor to this increase. Study the graph, answer the questions on the right, and then complete the activity.



Source: National Center for Health Statistics, National Health Survey, 1982-1995

### ACTIVITY

Work with a small group. Use reliable library and online sources to investigate additional measures that can improve indoor air quality. Cite your sources, and provide an explanation of why each source is reliable.

What can be done to reduce the levels of such triggers as dust and pet dander in the home?

In the 1960s children and teens were outside at least three hours each day. Today, they are outside less than two hours each day. How might these facts relate to the increase in asthma?

Today's homes allow less air to circulate. How might this contribute to the increase in asthma? What can be done to increase ventilation?

Tobacco smoke is one of the leading contributors to asthma attacks. How can exposure to tobacco smoke be limited or prevented?

## Noise Pollution

Traffic, loud music, and power tools such as mowers and construction equipment are all sources of noise pollution. **Noise pollution** is harmful and unwanted sound of sufficient intensity to damage hearing. Hearing impairment caused by noise rarely leads to total deafness; however, the hearing loss is permanent, and hearing aids often do not compensate for the damage.

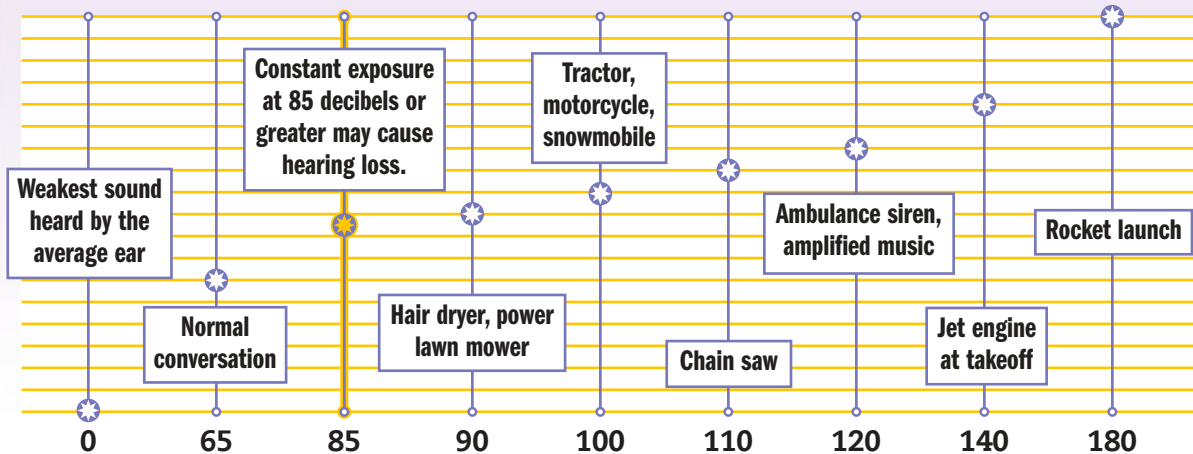
A **decibel** is a unit used to express the relative intensity of loudness of sound. Normal conversation is about 65 decibels. Exposure to noise levels of 85 decibels and above can result in temporary hearing loss, often accompanied by ringing in the ears. Normal hearing will usually return, but continued exposure can lead to permanent hearing loss. **Figure 29.3** shows the decibel levels of various sounds.





FIGURE 29.3

## DECIBEL LEVELS OF COMMON SOUNDS



### Reducing Noise Pollution

There are several ways to reduce noise pollution in your environment. Be sure to keep the volume down on stereos, radios, and television sets. Avoid unnecessary use of the car horn. When possible, use manual tools instead of power tools.

## Lesson 1 Review

### Reviewing Facts and Vocabulary

1. Define *air pollution* and *noise pollution*.
2. Describe the EPA's role in monitoring air quality.
3. List two actions you can take to help reduce noise pollution.

### Thinking Critically

4. **Evaluation.** Relate the nation's environmental health goals and objectives in *Healthy People 2010* to individual, family, and community health.
5. **Analyzing.** Imagine that the media has reported an AQI of 175. Paul, who has asthma, can't decide whether he wants to go in-line skating outdoors or play basketball in the air-conditioned gym. Determine which choice is healthier for Paul, and explain your decision.

### Applying Health Skills

**Accessing Information.** Think of a specific critical health issue related to air pollution. Find information on this topic, and develop strategies to evaluate this information and information relating to a variety of critical health issues. Make a list of these strategies.



**WORD PROCESSING** Use a word-processing program to produce your list of strategies. See [health.glencoe.com](http://health.glencoe.com) for help in using word-processing software.





# Protecting Land and Water

### VOCABULARY

**biodegradable**  
**landfill**  
**hazardous waste**  
**deforestation**  
**urban sprawl**  
**wastewater**


### YOU'LL LEARN TO

- Identify sources of land and water pollution.
- Assess the impact of population on community and world health.
- Analyze the influence of laws on health-related environmental issues.
- Examine strategies for reducing land and water pollution.



Write a brief public service announcement encouraging people to help keep lakes, rivers, and streams free of pollution.



 Most wastes are disposed of in landfills and covered with soil to prevent the spread of disease by insects and rodents.

The wastes generated by human activity can pollute both land and water. However, there are many actions people can take to reduce pollution and help preserve land and water resources.

## Waste Disposal

Many wastes are **biodegradable**, or *able to be broken down by microorganisms in the environment*. However, when biodegradable materials are discarded in quantities too large for nature to handle, or when materials are not biodegradable, other waste-disposal solutions must be found.

## Solid Waste

Much solid waste ends up in landfills. A **landfill** is *an area that has been safeguarded to prevent disposed wastes from contaminating groundwater*. Landfills must be located away from certain areas to protect groundwater (water that collects under the earth's surface) and must be lined with special materials to prevent leakage. Landfill operators must follow practices that reduce odor and control disease-carrying insects and rodents.

**FIGURE 29.4**

## HAZARDOUS WASTES

Source/Activity That Generates Waste	Type of Waste Produced
Arts and crafts (e.g., painting, building models)	Solvents, paints, adhesives
Dry cleaning	Solvents
Construction	Oils, solvents, paints
Vehicle maintenance	Solvents, paints, ignitable wastes, used oil and batteries
Yardwork and gardening	Pesticides, herbicides, solvents
Household tasks	Solvents, oils, cleaning materials, paints, paint thinner

### Hazardous Waste

A **hazardous waste** is a substance that is explosive, corrosive, highly reactive, or toxic to humans or other life forms. Industrial processes generate some hazardous wastes. Others are generated by common activities, including those described in **Figure 29.4**. Household products such as batteries are also considered hazardous wastes. Many of these wastes are banned from landfills and must be disposed of at special collection sites so that they don't contaminate the environment.

*Nuclear wastes*, a collection of radioactive materials that pose serious hazards to humans and other life forms, are a type of hazardous waste. Exposure to radiation can increase the risk of cancer. It can also alter a person's sex cells, causing genetic abnormalities to be passed on to offspring. Because of the long decay rates of some radioactive materials, these materials must be isolated in secure facilities for thousands of years.


### Expansion and Development

Throughout history population growth has been accelerating. It took half a million years for humankind to reach a population size of 1 billion, but the next billion people were born in a span of only 80 years, and close to 1½ billion more have been born since 1975. In certain U.S. communities and world regions, population growth impacts include a low quality of life and much human suffering. Rapid population growth also leads to swift deterioration of the land and to a severe drain on resources such as water.

Urban development can also have a dramatic impact on the land. As new cities are built, room for them must be cleared. This clearing has been at the expense of wilderness areas and rain forests.





 Using public transportation instead of driving reduces pollution and helps conserve resources. *How might an efficient public transportation system improve community health?*

## Disappearing Forests

Developing nations in Central America, Africa, and Southeast Asia are rapidly expanding in agriculture and industry. These nations have been clearing tropical forests on a massive scale for fuel and to make way for farms and ranch land. This **deforestation**, or *destruction of forests*, has upset the fragile balance of nature.

Aside from providing a home to countless plant and animal species, the world's great forests play a vital part in controlling soil erosion, flooding, and sediment buildup in rivers, lakes, and reservoirs. Deforestation interferes with these processes. It can also change regional patterns of rainfall as a result of altered rates of evaporation, transpiration (vapor exhaled from the surface of green plants), and runoff. Without trees, precipitation declines and the region grows hotter and drier. Ultimately, desertlike conditions prevail where there were once rich, tropical grasslands.

## Urban Sprawl

*The spreading of city development (houses, shopping centers, businesses, and schools) onto undeveloped land* is called **urban sprawl**. As the land surrounding cities becomes developed, environmental problems can occur. Runoff from parking lots and fertilized lawns may contaminate the drinking water supply. Air quality worsens as increased automobile and lawnmower usage adds more engine exhaust to the air.

To help address the problem of urban sprawl, city planners are rethinking the way suburbs are organized to help reduce consumption of natural resources and decrease the amount of pollution. In planned communities, schools and businesses are located within walking distance of homes, and sidewalks are required. Walking the short distances from home to work, school, or shopping provides physical activity for pedestrians, saves resources, and reduces pollution. The inclusion of efficient public transportation in these communities helps reduce the number of people driving to work. Consequently, fewer vehicles are on the highways, reducing both the level of pollution and the number of injuries and deaths caused by traffic accidents.

## Water Supplies and Pollution

**T**he EPA requires water suppliers to monitor and test water before sending it through municipal and community water systems. If the water is contaminated, the supplier must shut down the system and fix the problem. No agencies monitor the quality of water coming from private wells, however. Water treatment and purity depend on actions taken by those who use the well.



All drinking water is susceptible to pollution. Because the water can come from large sources such as rivers, lakes, and aquifers (water-bearing layers of rock, sand, or gravel) that underlie several counties or states, the pollution source can be far away from where the water is used.

## Polluted Runoff

About 40 percent of the nation's rivers, lakes, and coastal waters are not safe for swimming or other types of water recreation. Water pollution is sometimes caused by illegal dumping of industrial chemical wastes, but a greater contamination problem is created by pollution that comes from many sources throughout the environment. Most surface water contamination is caused by polluted runoff—rainwater or snowmelt that runs over the land, picking up such contaminants as pesticides, fertilizers, and wastes. Polluted runoff can also contaminate groundwater, the primary source of drinking water for millions of people in the United States.

## Wastewater

**Wastewater**, used water that comes from homes, communities, farms, and businesses, is another source of water pollution. Along with sewage, wastewater includes water that is generated and discharged from industries, feedlots, and many other sources. Wastewater contains harmful substances such as human and animal wastes, metals, and pathogens. Some wastewater must be treated by cooling in order to prevent thermal pollution. Thermal pollution occurs when the temperature of discharged water is higher than the temperature of a body of water in the environment. Because this hot water can disrupt aquatic ecosystems, it must be cooled before it enters the environment. The EPA regulates the treatment and discharge of wastewater under the Clean Water Act. Treated water that is released back into the environment must be safe for humans and other living organisms.

## Other Sources of Water Pollution

Other sources of water pollution include:

- ▶ **Sediment.** Sediment from land erosion can destroy aquatic ecosystems and clog lakes, stream channels, and harbors.
- ▶ **Oil.** Some oil contamination comes from the cleaning of oil tankers and the release of oil from offshore drilling rigs. Problems can also occur when people dump used motor oil and household chemicals down household and storm drains.




## Strategies for Protecting Water Supplies

There are actions you can take to help prevent the contamination of drinking water.

### To protect drinking water:

- ▶ **Recycle engine oil.** Just 1 quart of oil can contaminate up to 2 million gallons of drinking water.
- ▶ **Be careful about what you put down the drain.** In areas that use septic systems, harmful chemicals may end up in your drinking water.
- ▶ **Keep cars, boats, and watercraft maintained.** Prevent fuel and lubricant leaks by keeping engines well tuned.

 **Polluted runoff is a major source of water pollution in the United States.**



## CHARACTER CHECK

**Citizenship.** When you dispose of hazardous household materials properly, you are demonstrating good citizenship and respect for the environment. **Make a pledge to always dispose of hazardous materials in a responsible manner. Share your knowledge about the dangers of hazardous materials with others, and encourage them to make responsible decisions.**

## Reducing the Risks

You and your family can take steps to help keep our land and water clean.

- ▶ Recycle materials whenever possible to reduce the amount of waste going to landfills. You'll learn more about reducing solid wastes in Lesson 3.
- ▶ Dispose of all materials properly. Don't put oil paints, paint solvents, or batteries into the trash. Don't pour household chemicals or motor oil down the drain or onto the ground. Instead, take these and other hazardous materials to the appropriate collection sites.
- ▶ Follow directions when using chemicals such as cleaning products, fertilizers, and pesticides, and don't overuse them.
- ▶ Reduce water usage. Repair leaky faucets. Follow the recommendations for landscape watering that apply to your area. Reducing water usage decreases the amount of water that must be treated.



## Lesson 2 Review

### Reviewing Facts and Vocabulary

1. What is a *landfill*?
2. Assess the impact of population on community and world health.
3. How can polluted runoff contaminate water supplies?

### Thinking Critically

4. **Applying.** Analyze the influence of laws like the Clean Water Act on health-related issues.
5. **Analyzing.** You have probably heard the saying, "Water, water everywhere, but not a drop to drink." Explain this statement in terms of available drinking water.

### Applying Health Skills

**Advocacy.** Create a comic book about a superhero named Captain Cleanup and his or her adventures cleaning up land and water pollution. The comic book should be targeted to elementary school students and contain a strong message about what young people can do to reduce land and water pollution.



**WEB SITES** Use your comic book as part of a Web page you develop on reducing pollution. See [health.glencoe.com](http://health.glencoe.com) for help in planning and building your own Web site.





## Lesson 3

# Advocating for a Healthy Environment

### VOCABULARY

**conservation**  
**preycling**  
**recycling**

### YOU'LL LEARN TO

- Identify strategies for conserving resources, preycling, and recycling.
- Develop strategies for protecting the environment.
- Describe a variety of community and world environmental protection programs.




Make a list of the environmental benefits of participating in a recycling program.

Many of today's environmental problems result from the lifestyle and consumer choices we make. In this lesson you'll learn about strategies to protect the health of the environment, both in your community and worldwide.

## Conserving Resources

Most natural resources don't exist in an endless supply. The coal, natural gas, and petroleum we use for fuel took millions of years to form. It takes about 20 years for a tree to become large enough to cut for use as paper. These examples illustrate the need to conserve our natural resources. **Conservation** is the protection and preservation of the environment by managing natural resources to prevent abuse, destruction, and neglect. The actions that you and your family take at home have an impact on the environment. Some actions you can take to conserve natural resources are featured on the next page.



 Planting trees helps replenish this natural resource. **How do trees benefit the environment?**





Putting on an extra layer of clothing instead of turning up the heat helps conserve natural resources.

*Why is it important to conserve natural resources?*



Turning off lights saves electricity. *How else can you reduce electricity use in your home?*

## Heating and Cooling

- ▶ Seal leaks around doors, windows, and electrical sockets to prevent heated or cooled air from escaping. Keep doors and windows shut, and close fireplace vents when the fireplace is not in use to keep cooled or heated air inside the home.
- ▶ During heating season, wear an extra layer of clothing instead of turning up the thermostat. Keep the thermostat at about 68°F. For further conservation, turn the thermostat down at bedtime.
- ▶ Keep the thermostat at about 78°F during air-conditioning season. Use a fan to keep air circulating—this will make the area feel cooler.

## Water Conservation

- ▶ Wash clothes in warm or cold, not hot, water. Accumulate a full load before washing laundry or running the dishwasher.
- ▶ Fix leaky faucets, and never let water run unnecessarily. Turning off the water while brushing your teeth or shaving can save 4.5 gallons of water per minute.

- ▶ If you have a large-capacity toilet tank, fill plastic bottles with water, seal them, and place them in the tank. The bottles will keep the tank from filling completely, which will save up to a gallon of water per flush.

## Lighting and Appliances

- ▶ Replace traditional lightbulbs with compact fluorescent bulbs, which use less energy and last longer.
- ▶ Switch off lights when you leave a room.
- ▶ Turn off televisions, radios, computers, and other appliances when they are not in use.
- ▶ Use a microwave or toaster oven instead of a conventional oven when cooking a small amount of food.
- ▶ Don't preheat a conventional oven for longer than necessary. Avoid opening the oven door unnecessarily while the appliance is in use.



## Precycling and Recycling Programs

The easiest, most cost-efficient way of conserving natural resources is reducing the quantity of waste. Precycling and recycling are two ways of accomplishing this goal.

### Precycling

**Precycling**—*reducing waste before it is generated*—means purchasing and using products wisely. How can you precycle? Reduce your use of products that are used once and then discarded. For example, try using cloth napkins instead of paper ones. Purchase products in bulk or in the largest package appropriate for your use to reduce excess packaging. Buying products such as laundry detergent or fruit juice as concentrates also reduces packaging. Choose products designed to be recycled. For example, look for the code on plastic packages. Those that carry a 1, 2, or 3 are most easily recycled.

Precycling also involves reusing materials. Reusing paper or plastic shopping bags or carrying your own cloth bags is a form of precycling. So is donating unneeded household goods or clothing to charities instead of discarding them.

### Recycling

**Recycling** is the processing of waste materials so that they can be used again. Recycling has several benefits:

- ▶ **Recycling conserves resources.** Both energy and raw materials are conserved by recycling. For example, making a can from recycled aluminum takes only 10 percent of the energy needed to make a new can from raw materials.
- ▶ **Recycling reduces reliance on landfills.** Landfill space is limited, and it cannot keep up with increasing demands. Because of this, it is important to reduce the amount of waste that gets deposited in landfills.
- ▶ **Recycling protects environmental health.** Recycling utilizes materials that might otherwise harm the environment if disposed of in landfills. Thus recycling efforts lead to a cleaner and more healthful environment.



Carrying your own cloth bags instead of using paper or plastic ones is one way to precycle.

*What is another example of precycling?*







# Hands-On Health ACTIVITY

## One Planet—Your Role

In this activity you will create a chart that demonstrates the need to conserve resources.

### What You'll Need

- pen or pencil and notebook paper
- poster board or construction paper
- markers


### What You'll Do

1. Divide a sheet of paper into three columns. Label the columns "Items I Throw Away Every Week," "Ways of Precycling or Recycling," and "Why It Matters."
2. List at least five items in the first column, and complete the other two columns for those items.

3. Work in a small group. Combine the best ideas and create a poster-sized chart, similar to the one on your sheet of paper, that includes several ways to precycle or recycle commonly used items. Use persuasive language, and illustrate your group's chart.
4. Present the chart to the class. Then display it in the classroom or in a school hallway.

### Apply and Conclude

Find statistics on how precycling and recycling help reduce waste and pollution. Be sure to relate the data to the actions described in your poster.

 **Manufacturers put codes on plastic containers to give consumers information on how to recycle.**



### TIPS FOR RECYCLING AND REDUCING WASTE

More than 80 percent of household waste can be recycled. The following are some guidelines for specific recyclable materials.

- ▶ **Aluminum.** Rinse cans and other aluminum items such as pie pans and frozen food trays. Crush them to save space.
- ▶ **Cardboard.** Flatten cardboard boxes and tie them together.
- ▶ **Glass.** Rinse all glass containers. Recycle metal lids separately.
- ▶ **Plastics.** Look for the code on the container. Most recyclers take plastics marked with a 1, 2, or 3.
- ▶ **Newspaper.** Stack newspapers and tie the bundles with string or rope, or place the papers in paper shopping bags for easy handling.
- ▶ **Glossy Paper.** Contact services that help you remove your name from mailing lists. Find out whether a local retirement or community center can use discarded magazines. What you can't eliminate or redistribute, recycle.



## Protecting the Environment

Here are some practical suggestions for becoming involved in protecting the environment:

- ▶ **Become an informed consumer.** Evaluate products with regard to their impact on natural resources. Give feedback to companies on ways they can help protect the environment.
- ▶ **Contact organizations that promote the conservation of resources and educate people on environmental issues.** Ask for ideas on how to conserve natural resources. Consider joining an environmental organization. Most of these organizations can give you information on current environmental issues. They can also suggest ways to promote the health of the environment.
- ▶ **Take action against local polluters.** The environmental problems in your community directly affect your health. Targeting local polluters is an effective way of protecting your health and that of your family and neighbors. Join with others to inform elected officials of your concerns.

 Much of the waste generated in a typical American home can be recycled. *What materials are recycled in your community?*



### Lesson 3 Review

#### Reviewing Facts and Vocabulary

1. Define the term *conservation*.
2. What is the difference between *precycling* and *recycling*?
3. List three environmental benefits of recycling.

#### Thinking Critically

4. **Analyzing.** How does conserving resources protect the health of the environment?
5. **Applying.** Develop strategies to conserve natural resources in your home. List three strategies not included in this lesson that your family can undertake to conserve resources.

#### Applying Health Skills

**Accessing Information.** Research and describe a variety of community and world environmental protection programs. Create a chart to display the information that you obtain. Include the name of the community or country, the name of the program, and a brief description of the program's mission.



**SPREADSHEETS** Use spreadsheet software to organize your information and create your chart. See [health.glencoe.com](http://health.glencoe.com) for tips on how to create and use a spreadsheet.



# What You Can Do



**P**eople in the United States produce an average of 20,000 pounds of carbon dioxide (CO<sub>2</sub>) a year. Decreasing that number would make us healthier (by making the atmosphere cleaner and slowing down global warming) and wealthier (by lowering bills for electricity, heating fuels, and gas). To reduce the amount of CO<sub>2</sub> in the air, follow these tips from Environmental Defense and the World Wildlife Fund.

### 1. Get It Just Right

Don't overheat or overcool rooms. Set the thermostat lower in winter and higher in summer.

Average annual CO<sub>2</sub> reduction: approximately 500 pounds for each 2°F adjustment

### 2. Pitch In

Reduce waste and promote energy-efficient measures at your school. Help set up community recycling programs.

Average CO<sub>2</sub> reduction: 4 pounds for every pound of office paper recycled

### 3. Get Smart on Wash Day

Wash laundry in warm or cold water, not hot.

Average annual CO<sub>2</sub> reduction: as much as 500 pounds for two loads a week

### 4. Home Improvement

Plant trees next to your house, and paint your house a light color if you live in a warm climate or a dark color in a cold climate.

Average annual CO<sub>2</sub> reduction: approximately 5,000 pounds

### 5. Don't Bag It

Buy minimally packaged goods and reusable products. Recycle.

Average annual CO<sub>2</sub> reduction: 1,000 pounds for 25 percent less garbage. ■

**TIME**  
to **THINK...**

**About CO<sub>2</sub>**

The tips above describe great ways to reduce CO<sub>2</sub>. What is CO<sub>2</sub>? Create a flow chart with the class that shows how CO<sub>2</sub> contributes to global warming. Is there anything that you do daily that makes you part of the flow chart?



## Health Skills Application



**1. Accessing Information.** Choose one of the five air pollutants tracked by the EPA. Research whether that pollutant is present in the air in your community. Write a brief report summarizing your findings. (LESSON 1)



**2. Advocacy.** Polluted runoff may occur as a result of heavy rains that wash fertilizers and pesticides from lawns. Write a public service announcement encouraging people to carefully follow application instructions for these products. (LESSON 2)



**3. Goal Setting.** Talk with your family about ways to conserve natural resources. Then use the goal-setting steps to choose and work toward a family conservation goal. As part of the goal-setting process, have each family member sign a pledge to do his or her part to conserve resources. (LESSON 3)

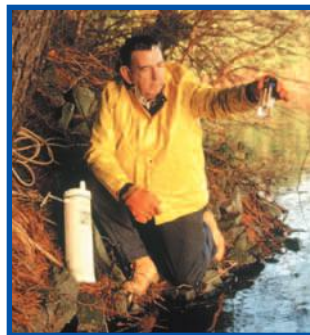


## CAREER Corner

### Environmental Engineering Technician

Would you like to improve the quality of the environment? If so, you might enjoy a career as an environmental engineering technician.

Environmental engineering technicians work closely with environmental engineers and scientists in developing methods and devices used in the prevention, control, and correction of environmental hazards.



To become an environmental engineering technician, you will need a two-year associate's degree or extensive on-the-job training. Find out more about this and other health careers by clicking on Career Corner at [health.glencoe.com](http://health.glencoe.com).



## BEYOND the Classroom

### Parent Involvement

**Accessing Information.** Find out what materials are recycled in your community. Work with a parent or other adult family member to interview managers of several recycling centers or hazardous waste collection sites. Put together an informative pamphlet that describes local waste-management and recycling services. Make your pamphlet available to other families in your neighborhood.



### School and Community

**Volunteering Opportunities.** Locate a recycling center or charitable organization in your community that collects donated items for resale. Contact the agency to find out what volunteer positions are available. Share what you have learned with your classmates.





# Chapter 29 Review

## After You Read

Use the notes you have taken in your Foldable to review what you have learned about air quality and the types of pollution.



### ▶ EXPLORING HEALTH TERMS *Answer the following questions on a sheet of paper.*

#### Lesson 1 *Match each definition with the correct term.*

**air pollution**                      **noise pollution**

**asbestos**                              **radon**

**decibel**                                **smog**

#### **Air Quality Index (AQI)**

1. A yellow-brown haze that forms when sunlight reacts with air pollution.
2. An index for reporting daily air quality.
3. A fibrous mineral that has fireproof properties.
4. An odorless, radioactive gas that can cause cancer.
5. A unit used to express the relative intensity of loudness of sound.

#### Lesson 2 *Fill in the blanks with the correct term.*

**landfill**                                **biodegradable**

**deforestation**                      **urban sprawl**

**hazardous waste**                    **wastewater**

6. \_\_\_\_\_ wastes can be broken down by microorganisms in the environment.
7. A substance that is explosive, corrosive, highly reactive, or toxic to humans and other life forms is known as \_\_\_\_\_.
8. The destruction of forests is known as \_\_\_\_\_.
9. The spreading of city development onto undeveloped land is called \_\_\_\_\_.
10. \_\_\_\_\_ is used water that comes from homes, communities, farms, and businesses.

#### Lesson 3 *Replace the underlined words with the correct term.*

**precycling**  
**recycling**

**conservation**

11. Recycling is the protection and preservation of the environment by managing natural resources.
12. Conservation involves making decisions about products *before* you purchase them in order to reduce waste.
13. The processing of materials so that they can be used again in some form is precycling.

### ▶ RECALLING THE FACTS *Use complete sentences to answer the following questions.*

1. Name five common air pollutants.
2. List two strategies for managing indoor air pollution.
3. Temporary hearing loss may occur when a person is exposed to noise levels at or above what decibel level?
4. If many wastes are biodegradable, why are landfills necessary?
5. What is nuclear waste?
6. List three sources of water pollution and two ways of reducing this type of pollution.
7. Name three ways to conserve natural resources.
8. List three precycling strategies.
9. What are three practical ways to become involved in protecting the environment?

**▶ THINKING CRITICALLY**

- 1. Evaluating.** Explain how keeping your automobile engine in good condition can reduce air pollution.
- 2. Analyzing.** Before the development of modern landfills, trash was discarded in pits and open dumps. Explain how today's landfills are an improvement over this waste-disposal strategy.

- 3. Applying.** List three grocery store items that create excessive waste. Suggest an alternative for each item.

**TAKS****Test Practice**

**Read the passage below, and then answer the questions.**

**Editorial: Support Recycling**

(1) Did you know that the typical american family throws away more than 1,200 pounds of trash per year? (2) And that about 80 percent of that garbage ends up in landfills? (3) Soon, these landfills will be full, and we are running out of places to put new ones. (4) How can we reduce these mountains of garbage? (5) We can do it by recycling. (6) Some people object to recycling because they think it costs too much, but recycling actually saves money because it means less solid waste disposal. (7) Others say that people are too lazy to separate trash and wash out cans and bottles. (8) This is not true. (9) Across the country, people have shown their willingness to pitch in and recycle. (10) The greatest thing about recycling is that it is something each of us can do to help the Earth. (11) No matter what our age, size, economic or education level, we can all take part. (12) The Earth is the place where we all are living, and so we should care.

1. What change, if any, should be made to sentence 1?

- A** Change *throws* to *throughs*.
- B** Change the question mark to a period.
- C** Change *american* to *American*.
- D** Make no change.

2. What is the most effective way to rewrite the last sentence?

- A** Although we will not be on the Earth forever, we should still care.
- B** The Earth is where we live, and we should remember to clean it up.
- C** The Earth is where we make our home, and it is our responsibility to keep it safe and healthy.
- D** We all live here, and we should try to improve our planet.

3. Write a paragraph using persuasive techniques to urge people to recycle newspapers or bottles and cans.