

## Chapter 16

# Tobacco

### Section 1

#### Teens and Tobacco

### Building Health Skills

- **Analyzing Influences**  
Examining Advertising Tactics

### Section 2

#### Chemicals in Tobacco Products

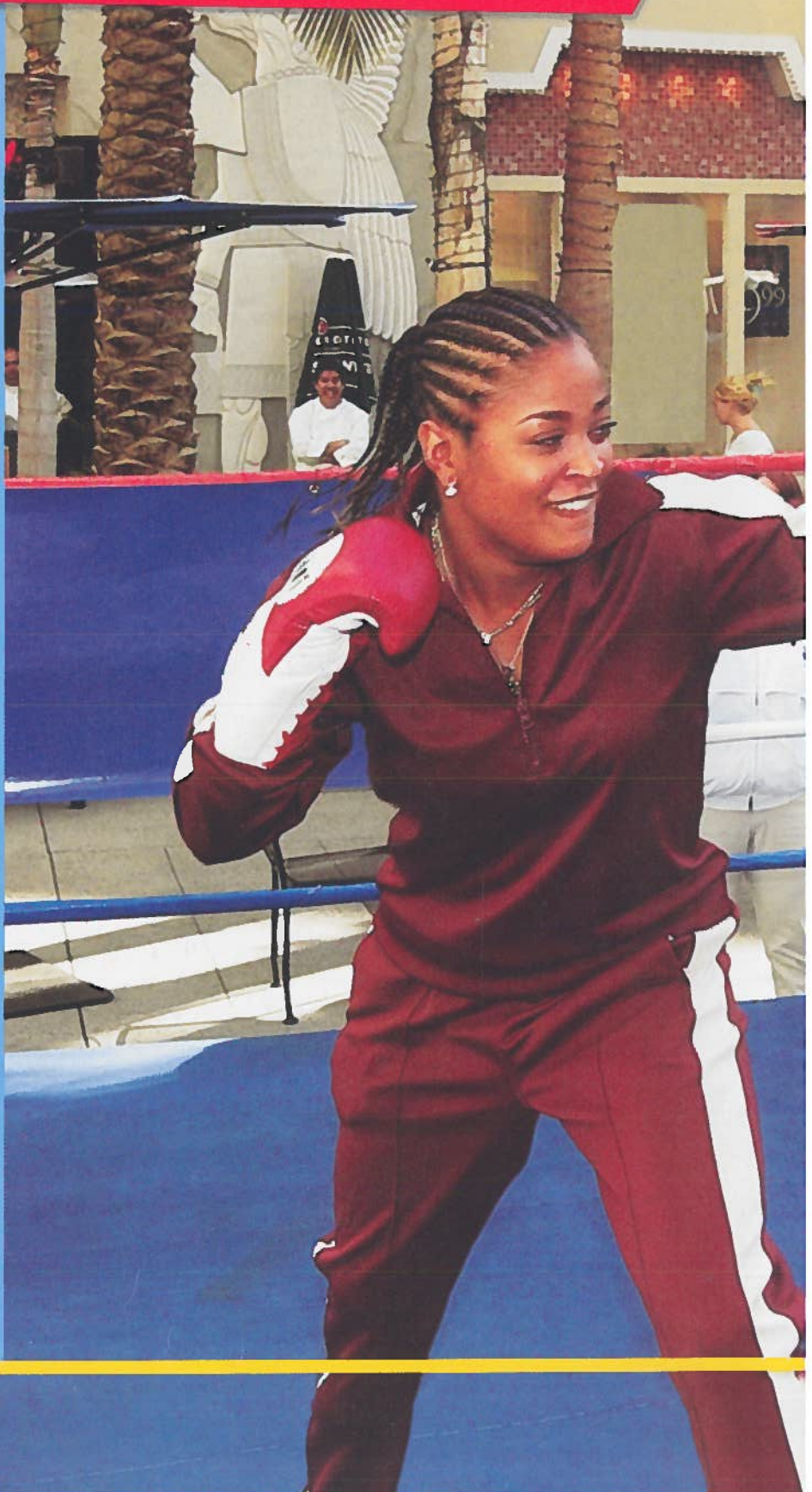
### Section 3

#### Risks of Tobacco Use

- **Hands-On Activity** Make a Model of a Smoker's Lungs

### Section 4

#### Saying No to Tobacco



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# TEENS Talk

CLASSROOM VIDEO #16

## Tackling Tobacco

### Preview Activity

#### Why Do Teens Start to Smoke?

Complete this activity before you watch the video.

1. List three reasons why you think that some teens start to smoke.
2. Get together with a partner to discuss the reasons you each wrote down. Between the two of you, how many different reasons did you come up with?
3. Design a T-shirt or bumper sticker with an anti-smoking message. The message should address at least one of the reasons why you and your partner think that some teens start to smoke.

## Section 1

# Teens and Tobacco

### Objectives

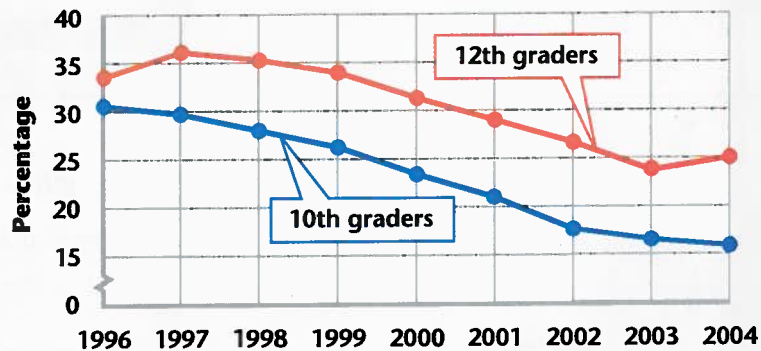
- **Identify** three factors that influence teens' decisions about tobacco use.
- **Describe** the various forms of tobacco products.

### Vocabulary

- nicotine
- smokeless tobacco
- chewing tobacco
- snuff

### Warm-Up

**Health Stats** This graph shows how the percentage of 10th graders and 12th graders who smoke has changed.



**WRITING** What does this graph reveal about the popularity of smoking among high school students?

## Why Teens Use Tobacco

When your parents were teens, they lived in a much smokier environment than you do today. Only a few decades ago, people smoked on airplanes, in movie theaters, in restaurants, and at work. Today, people know a lot more about the dangers of tobacco use. As a result, tobacco use has fallen sharply and it is not as socially acceptable as it once was.

Despite all of the health warnings, some people do start using tobacco. Few users can pinpoint the exact reason they started smoking or using smokeless tobacco. But, both users and nonusers refer to the same factors when discussing their decision. **Friends, family, and the media greatly influence whether someone starts to use tobacco.**

**Influence of Friends** Most people who become addicted to tobacco start using it during their teens. Friends are an important influence. Teens with friends who use tobacco are more likely to also use tobacco. They may feel pressure to be part of the group.

On the other hand, if a teen's friends do not use tobacco, it is less likely that he or she will make the decision to use it. Many teenagers credit their friends for helping them resist the temptation to use tobacco.

**Influence of Family** Your parents may have first made you aware of tobacco's negative health effects. They also may have offered you advice on how to avoid tobacco use. Other family members, such as older sisters or brothers, may be positive role models for you.

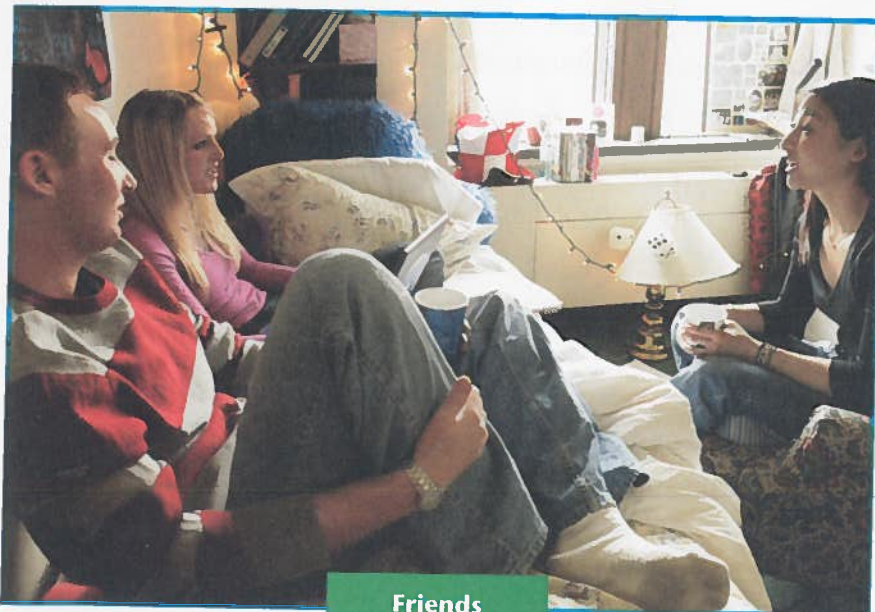
Studies show that children of smokers are much more likely to smoke, even if their parents try to discourage them. Why are children of smokers more likely to smoke? These children may think of smoking as a behavior related to adulthood. They may simply assume that they will use tobacco just like their parents do.

**Influence of Media** Anti-tobacco advertising in magazines, television, and other media also may have influenced your decision not to smoke. You probably have read or heard much about the dangers of tobacco through the media. Many anti-tobacco ads are designed to get the attention of teens. Anti-tobacco programs were designed to compete with the appealing ads created by tobacco companies.

The advertising of tobacco products on radio and television has been banned for over 30 years. In the 1990s, further regulations were placed on tobacco advertising. Ads placed near schools were banned. Tobacco companies were told to discontinue cartoon-like ads that appeal to children and teens. In addition, tobacco companies were required to help pay for anti-smoking education.

Despite all these regulations, tobacco companies still find ways to promote their products. They advertise on Web sites and in places where cigarettes are sold. They use direct mail. The companies also sponsor events and offer discounts to keep prices low.

**Connect to YOUR LIFE** What people or factors have influenced your decisions about tobacco use?



Friends



Media

**FIGURE 1** Friends and family can be positive influences that steer teens away from tobacco use. However, the media, especially the movies, have long been criticized for glamorizing tobacco use.



Family

Go Online

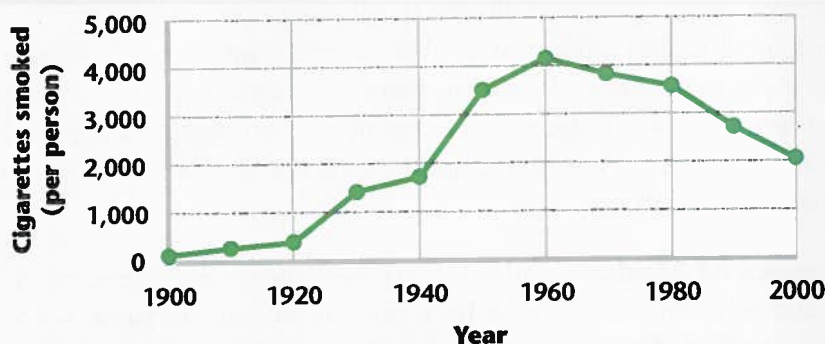
HEALTH  
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## Cigarette Use in the United States



**FIGURE 2** Cigarette use has fallen sharply since people have become more aware of its negative health effects. **Reading Graphs** In 1964, the Surgeon General issued the first report on the negative health effects of smoking. What effect did the report seem to have on cigarette use? Explain.

## Tobacco Products

Tobacco products are made from the dried, processed leaves of tobacco plants. Tobacco plants naturally produce a chemical that acts as an insecticide to protect the plants' leaves from insects. This insecticide is **nicotine**, a very addictive chemical in tobacco products.

In its pure liquid form nicotine is extremely poisonous. In fact, each year thousands of young children are poisoned from eating cigarettes and cigars. Tobacco users are not immediately poisoned by nicotine because only a small amount enters the body at a time.

As you will learn in Sections 2 and 3, even small amounts of nicotine can have profound effects on several body systems. **Tobacco users take in nicotine whenever they use cigarettes, cigars, pipes, or smokeless tobacco products.**

**Products That Are Smoked** There is a wide variety of tobacco products that are smoked. When the tobacco is processed for these products, preservatives, flavorings, and other substances may be added. Some of these substances contribute to the harmful effects of smoking.

- ▶ Cigarettes are the most frequently used tobacco product. Cigarettes consist of cured and shredded tobacco leaves rolled in paper.
- ▶ *Bidis*, which are imported from India, are cigarette-like products that consist of tobacco wrapped in a leaf and tied with string.
- ▶ *Kreteks*, which are imported from Indonesia, contain ground clove. The clove alters the cigarette's flavor and numbs the lungs.
- ▶ Cigar and pipe tobacco is less processed than cigarette tobacco. It usually contains more nicotine than cigarette tobacco.

Many people think that products such as *bidis*, *kreteks*, cigars, pipes, and water pipes are safe alternatives to cigarettes. This is not true. No matter how tobacco is burned, cancer-causing chemicals and other harmful substances are produced.

**Smokeless Tobacco** Tobacco that is chewed, placed between the lower lip and teeth, or sniffed through the nose is known as **smokeless tobacco**. As you will read in Sections 2 and 3, these products cause direct harm to the lining of the mouth, tongue, teeth, and gums. Smokeless tobacco also contains many of the same harmful chemicals found in tobacco smoke, including nicotine. In 1986, the Surgeon General concluded that smokeless tobacco is not a safe substitute for cigarettes.

- ▶ **Chewing tobacco**, also known as “dip” or “chew,” consists of poor-quality, ground tobacco leaves mixed with flavorings, preservatives, and other chemicals. Wads of chewing tobacco are placed between the cheek and gum.
- ▶ **Snuff** is finely ground, powdered tobacco. It may be a dry powder, or oil may be added to make the snuff moist. Most snuff users place it in their mouths, between the lower lip and teeth. Some users sniff it through their nose.

When chewing tobacco and snuff are held in the mouth, the products cause increased saliva production. The user often spits out the excess saliva and tobacco juice. This is why smokeless tobacco is often called “spit” or “spitting tobacco.”



**FIGURE 3** Most smokeless tobacco products are held in the mouth. Although they do not harm the lungs like smoking does, these products pose other risks to a user's health.

## Section 1 Review

### Key Ideas and Vocabulary

1. Describe three factors that influence a person's decision about tobacco use.
2. What is nicotine?
3. List the types of tobacco products that are smoked and the smokeless tobacco products.
4. What part of the body is most affected by the use of smokeless tobacco?

### Critical Thinking

5. **Sequencing** Consider the three factors that may influence a teen's decision about tobacco use—friends, family, and media. Which do you think has the greatest influence? Which has the least influence? Explain.

## Health and Community

**Smoking in Movies** For many years, filmmakers have been accused of glamorizing smoking. Watch two movies in which one of the main characters smokes. In a report describe how smoking was treated in each film. Was smoking portrayed in an accurate way? Present your observations to your class. **WRITING**

6. **Evaluating** Which do you think have a greater influence on a teen's thoughts about smoking—tobacco ads or anti-tobacco ads?
7. **Making Judgments** At most schools, teens caught with alcohol face stronger punishments than teens caught with tobacco products. Do you think fewer teens would use tobacco if they faced stronger punishments?

## Examining Advertising Tactics

Tobacco companies used to spend billions of dollars a year to advertise their products. Their ads appeared on television, in magazines, in newspapers, and on billboards.

Why do companies spend so much money on advertising? The ultimate goal of advertising, of course, is to increase a company's profits. To do this, advertising is used to attract new users, increase customer use of a product, or to persuade people to switch brands. On a daily basis, you are bombarded with hundreds of advertisements. Use the following guidelines to help you identify and resist the techniques that advertisers use to influence you.



## 1 Identify the tactics being used to sell the product.

These are some common advertising techniques.

- ▶ **Humor** Funny ads may cause you to associate a product with fun or feeling good.
- ▶ **Slogans and Jingles** Catchy phrases or tunes may help you remember the product.
- ▶ **Testimonials** “Satisfied customers” may convince you that the product works.
- ▶ **Attractive Models** The use of attractive models communicates the idea that attractive or successful people use the product.
- ▶ **Positive Images** The ad may imply that you need the product to be strong, independent, and successful.
- ▶ **Bandwagon Approach** The ad makes you think that everyone uses the product. You may want to “jump on the bandwagon” too.
- ▶ **Appeal to the Senses** The use of beautiful or exciting scenery, colors, or music appeals to the senses.
- ▶ **Price Appeal** The ad may imply the product is a better bargain than other products.

## 2 Identify the ad’s target audience.

These questions can help you determine whom an ad is trying to reach.

- ▶ In what setting does the ad take place? If it is a sporting event, for example, the ad is probably targeted at sports fans.
- ▶ What are the characters in the ad doing? If they are doing the latest fad, the ad may be targeted at teens or young adults.
- ▶ Where does the ad appear? Advertisers know which television shows and magazines attract the audience they want to reach.

## 3 Identify the ad’s message.

What exactly is the ad trying to convince you to believe?

- ▶ Write a one-sentence statement that describes what the ad wants you to believe about the product. Start your sentence as follows, “If I use this product, then . . .” For example, “If I use this product, then I will be happier and have more friends.”
- ▶ Reread the statement you wrote. Do you think it could be true? Why or why not?



### Practice the Skill

1. Examine the ad for a tobacco product on the previous page.
  - a. Identify the tactics being used by the advertiser.
  - b. Who do you think the ad is trying to reach? What is its message?
2. Search the Internet for vintage print ads for tobacco products. In this case, *vintage* means classic or old. Some Web sites have print ads grouped by decade.
3. Select and print three different cigarette ads. For each ad, describe the setting, characters, and behaviors. Decide which tactic is being used to sell the product. Then write a one-sentence statement that expresses the ad's message as you see it.
4. Work in a small group and compare ads. Identify the most common messages in cigarette ads. Are there different messages for different audiences? How have the messages changed over time?
5. Use one or more of the advertising tactics described to make an anti-tobacco poster.



## Section 2

# Chemicals in Tobacco Products

### Objectives

- ▶ **Explain** how nicotine affects the body.
- ▶ **Identify** two other dangerous substances in tobacco smoke.
- ▶ **Examine** why using smokeless tobacco is not a safe alternative to smoking.

### Vocabulary

- stimulant
- tar
- carcinogen
- carbon monoxide

### Warm-Up

- **Myth** Low-tar and low-nicotine cigarettes are safer than regular cigarettes.
- **Fact** Although the amount of tar and nicotine in these cigarettes may be reduced, carbon monoxide levels are not. Also, smokers tend to smoke more of these cigarettes and inhale more deeply in order to feel the same effects as they felt from regular cigarettes.

**WRITING** Where do you think that most teens get their information about tobacco products? How factual do you think this information is?



## Nicotine and the Body

Nicotine is a type of drug called a stimulant. **Stimulants** are drugs that increase the activity of the nervous system. In smokers, nicotine enters the blood mainly through the lungs. In smokeless tobacco users, nicotine enters the blood through the lining of the mouth or nose.

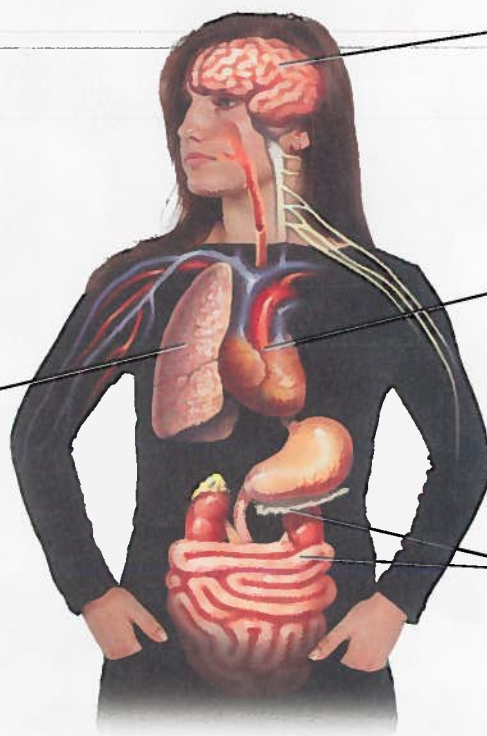
Once in the blood, nicotine reaches the brain within seconds. There, it takes the place of certain neurotransmitters—chemicals that send signals between cells. By mimicking these neurotransmitters, nicotine affects breathing, movement, learning, memory, mood, and appetite.

**Nicotine's Short-Term Effects** The immediate effects of nicotine on the body depend largely on how much nicotine is used and on the user's history of tobacco use. **The major short-term effects of nicotine use are increased heart rate, increased blood pressure, and changes in the brain that may lead to addiction.** Figure 4 outlines nicotine's short-term effects on several body systems.

First-time tobacco users may experience mild signs of nicotine poisoning, which include rapid pulse, clammy skin, nausea, and dizziness. However, in frequent users, nicotine stimulates the area of the brain that produces feelings of reward and pleasure. These effects last for about 30 minutes. It is these feelings that make the continued use of tobacco seem appealing.

## Effects of Nicotine

**FIGURE 4** Nicotine acts as a stimulant. It has many immediate effects on several body systems. **Interpreting Diagrams** How does nicotine affect the heart? How does it affect the brain?



### Nervous System

- Increases activity level
- Mimics neurotransmitters
- Decreases some reflex actions
- Activates the brain's "reward pathway"

### Cardiovascular System

- Increases heart rate and the force of contractions
- Increases blood pressure
- Reduces blood flow to skin
- Increases risk of blood clotting

### Respiratory System

- Increases mucus production
- Decreases muscle action in the lungs' airways
- Causes breathing to become more shallow

### Digestive System

- Increases saliva production
- Decreases the amount of insulin released from the pancreas
- Increases bowel activity

**Nicotine Addiction** People who use tobacco frequently begin to rely on it for feelings of alertness and pleasure. Ongoing use of nicotine causes the body to develop a tolerance to nicotine. With tolerance, the user needs more and more nicotine to produce the same effects on the mind and body.

As tolerance increases, nicotine addiction develops. Once people are addicted, they experience strong cravings for nicotine. They might feel irritable or anxious in places or situations in which they cannot use tobacco.

The time it takes to become addicted depends on several factors including genetics, frequency of use, and age. Studies show that teens may become addicted faster and more intensely than adults. In fact, it may take only a few cigarettes for some teens to become addicted.

**Psychological Dependence** Tobacco users might also become dependent on nicotine for psychological reasons. Tobacco use may become a habit used to cope with stressful situations. Or, it may become associated with social situations, such as hanging out with friends. These psychological factors can make quitting difficult.

**Nicotine Withdrawal** If a nicotine addict goes without nicotine for even a short time, he or she may experience nicotine withdrawal. Symptoms of nicotine withdrawal include headaches, irritability, difficulty sleeping, inability to concentrate, and intense nicotine cravings. Withdrawal effects may begin as soon as 30 minutes after the last dose of nicotine.

**Connect to  
YOUR LIFE**

Have you ever observed someone experiencing nicotine withdrawal? Describe his or her behavior.

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**Web Code:** ctn-5162

**FIGURE 5** Tobacco products contain many harmful chemicals. Some of these chemicals are a natural part of tobacco. Others are added when the tobacco is processed or form when tobacco is burned.

### Some Chemicals in Tobacco Smoke

- Acetone
- Ammonia
- Arsenic
- Benzene
- Butane
- Cadmium
- Carbon monoxide
- Formaldehyde
- Hydrogen cyanide
- Methanol
- Naphthalene
- Nickel
- Propane
- Stearic acid
- Uranium
- Vinyl chloride



Acetone is also found in nail polish remover.



Cadmium is also found in batteries.



Formaldehyde is also found in embalming fluid.

Arsenic is also found in weed killer.



Stearic acid is also found in candle wax.



Naphthalene is also found in mothballs.

## Other Dangerous Chemicals

As you can see in Figure 5, nicotine is only one of many chemicals in tobacco that can harm your body. In fact, tobacco smoke contains more than 4,000 chemicals. **In addition to nicotine, two of the most harmful substances in tobacco smoke are tar and carbon monoxide.**

**Tar** The dark, sticky substance that forms when tobacco burns is known as **tar**. Tar is a mixture of hundreds of chemicals. Smokers of any type of tobacco product—including cigarettes, herbal cigarettes, cigars, and pipes—expose their bodies to the short-term effects of tar.

- ▶ Brown stains on fingers and teeth
- ▶ Smelly hair and clothes
- ▶ Bad breath
- ▶ Paralysis of cilia lining the airways
- ▶ Increased number of respiratory infections, such as colds and the flu
- ▶ Impaired lung function, which leads to reduced athletic ability

In addition to these short-term effects, tar also causes long-term damage to the body. Tar contains many chemicals that are known **carcinogens** (kahr SIN uh junz), or cancer-causing agents. Tar can also damage the respiratory system to the point that it can no longer function. You will read more about the long-term effects of tar in Section 3.

**Carbon Monoxide** When substances—including tobacco—are burned, an odorless, poisonous gas called **carbon monoxide** is produced. Once inhaled and absorbed into the blood, carbon monoxide binds to the hemoglobin molecules in red blood cells in place of oxygen. When this happens, red blood cells cannot transport as much oxygen as the body cells need.

To make up for the shortage of oxygen, a smoker's breathing and heart rates increase. Over time, this strain can damage the cardiovascular system and other organs.

**Chemicals in Smokeless Tobacco** Some people think that using smokeless tobacco products is safe because no smoke is produced or inhaled. **However, smokeless tobacco contains many of the same dangerous chemicals that are in tobacco smoke.** There are no safe tobacco products.

Smokeless tobacco is at least as addictive as cigarettes. In fact, with each dose of chewing tobacco, a user absorbs about two and a half times the nicotine as a person who smokes one cigarette. A snuff user absorbs about twice the nicotine as a person who smokes one cigarette.

The life-threatening effects of smokeless tobacco use, such as cancer, will be discussed in Section 3. Smokeless tobacco also has a number of other effects that are unpleasant or may lead to health problems.

- ▶ Stained teeth
- ▶ Bad breath and drooling
- ▶ Receding gums and tooth decay

To avoid these unpleasant side effects, many smokeless tobacco users eventually turn to smoking to satisfy their nicotine craving. Then they expose their bodies to the additional hazards of tar and carbon monoxide.



**FIGURE 6** In addition to other harmful chemicals, many smokeless tobacco products contain sand and sugars. Both of these can damage the gums. Note how smokeless tobacco caused the gums to pull away from the teeth in this photo.

## Section 2 Review

### Key Ideas and Vocabulary

1. What type of drug is nicotine? How does nicotine affect the body?
2. What effects do tar and carbon monoxide have on the bodies of smokers?
3. What is a carcinogen?
4. Explain how smokeless tobacco products harm the body.

### Critical Thinking

5. **Applying Concepts** What facts about tobacco would you use to convince a friend not to start using tobacco?

## Health at Home

**Life After Quitting** Interview two family members, neighbors, or friends who have quit smoking. Ask them how they stopped smoking, how difficult it was, and how their lives have changed. In a paragraph, compare and contrast their experiences. **WRITING**

6. **Making Judgments** Do you think that drugstores, which sell medicines, should also sell tobacco products? Why or why not? **WRITING**
7. **Evaluating** Why do you think that tobacco users are willing to live with unpleasant side effects, such as stained teeth and bad breath?

## Section 3

# Risks of Tobacco Use

### Objectives

- ▶ **Describe** the long-term health risks of tobacco use.
- ▶ **Identify** the long-term risks of exposure to secondhand smoke.
- ▶ **Examine** how smoking by a pregnant woman can affect her baby.

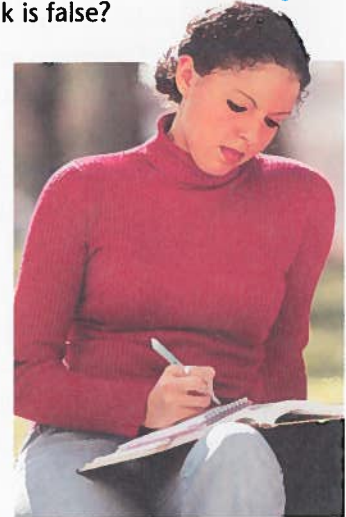
### Vocabulary

- chronic obstructive pulmonary disease (COPD)
- chronic bronchitis
- emphysema
- leukoplakia
- mainstream smoke
- sidestream smoke
- secondhand smoke

### Warm-Up

**Quick Quiz** All of the following statements are true except for one. Which statement do you think is false?

- 1 In the United States, over 400,000 people die from smoking each year.
- 2 Children of people who smoke have a greater risk of developing asthma.
- 3 Scientists have developed cures for chronic bronchitis and emphysema.
- 4 Smokers die about 13 years earlier than nonsmokers.
- 5 Smokeless tobacco increases one's risk of cardiovascular disease.



**WRITING** Explain why you gave the answer that you did.

## Long-Term Risks

In Section 2, you read about the immediate effects that tobacco has on a person's health. You may have noticed some of these effects, such as stained teeth and bad breath, in tobacco users you know. What you cannot notice, however, is the development of much more serious problems. **With every dose of tobacco, users increase their risk of developing respiratory diseases, cardiovascular disease, and several different forms of cancer.**

Did you know that tobacco use is the leading cause of preventable death in the United States? Cigarette smoking alone is directly responsible for the deaths of over 400,000 Americans each year. Many more people die each year from cigar, pipe, and smokeless tobacco use. More than 6 million children living today may die early because of a decision they will make during their teen years—the decision to use tobacco.

### Connect to YOUR LIFE

What warning label would you put on cigarette packages? Why?



**FIGURE 7** Over time, smoking can affect the function of many body systems and processes. Although some of these effects may be merely unpleasant, serious damage to the respiratory system can be life threatening.

#### Smoking also leads to . . .

- Increased risk of stomach ulcers
- Slower healing of injuries
- Increased colds and flus
- Increased allergies and asthma
- A constant runny nose
- Frequent headaches
- Dulled sense of taste and smell
- Premature wrinkling

## Respiratory Diseases

You may know smokers who suffer from a hacking cough that does not go away. “Smoker’s cough” is the result of damage caused by tar. Cells that line the respiratory tract have hairlike extensions called cilia. The cilia move in a sweeping motion and push mucus and particles away from the lungs and toward the throat to be swallowed.

Tar sticks to the cilia, prevents them from moving, and damages them over time. Dust, tobacco smoke toxins, and mucus then accumulate in the airways. Coughing is the body’s attempt to clear the airways.

Tobacco smoke and other accumulating toxins also irritate the lining of the bronchi. Bronchi are the tubes that carry air between the trachea and the lungs. The bronchi become inflamed, which restricts the amount of air that can enter and leave the lungs.

**Chronic Obstructive Pulmonary Disease** If a person continues to smoke over a long period of time, the damage that occurs to the respiratory system becomes permanent. He or she may develop **chronic obstructive pulmonary disease (COPD)**, a disease that results in a gradual loss of lung function.

COPD develops slowly, but its effects are severe. People with COPD find it difficult to fill their lungs with air. Simple activities, such as climbing stairs, may leave them gasping for breath. Chronic bronchitis and emphysema are two types of COPD. Many people with COPD have both chronic bronchitis and emphysema.

- ▶ **Chronic Bronchitis** In people with **chronic bronchitis**, the airways are constantly inflamed. Over time, mucus-producing cells increase in size and number, producing more and more mucus. The constricted airways and overproduction of mucus make breathing difficult.

## Hands-On Activity

### Make a Model of a Smoker's Lungs

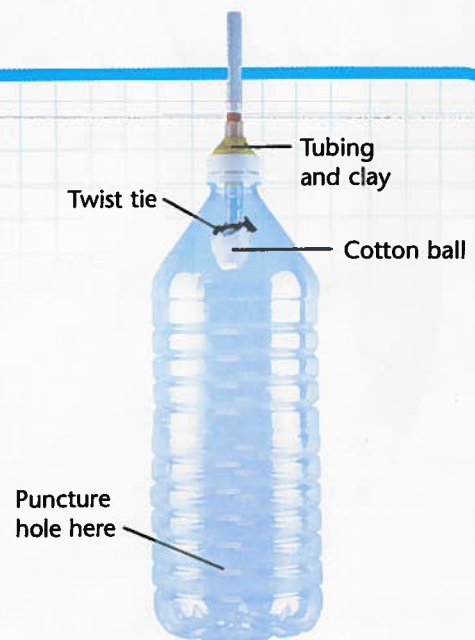
In this activity, you will construct a simple smoking machine to demonstrate how smoking affects the lungs.

#### Materials

- plastic bottle with cap
- plastic tubing
- clay
- cotton ball
- twist tie
- cigarette
- safety matches

#### Try This

- 1 Your teacher will make a hole in the bottle cap about the size of the tubing. Your teacher will also poke a hole in the side of the bottle.
- 2 Thread the tubing into the hole in the bottle cap, and seal the edges with clay.
- 3 Place the cotton ball over the tubing on the underside of the cap. Use the twist tie to secure it.
- 4 Insert the cigarette into the other end of the tubing so that the side you light points up.
- 5 Screw the cap onto the bottle.
- 6 Squeeze the bottle to force some air out of it. Then cover the hole with your thumb.
- 7 Have your teacher light the cigarette. With your thumb over the hole, pump the bottle slowly and steadily. This will draw air in through the cigarette.



- 8 When the bottle is full of air, uncover the hole to let some air out. Cover the hole before drawing air in through the cigarette again.
- 9 Your teacher will extinguish the cigarette and dispose of it.

#### Think and Discuss

- 1 Describe the appearance of the cotton ball after the smoking test.
- 2 What does the inside of the bottle look like?
- 3 Use the model to describe what smoking does to a smoker's teeth, throat, and lungs.

► **Emphysema** Recall that your lungs contain millions of tiny alveoli, or air sacs. Normally, the alveoli expand as you breathe in oxygen and contract as you breathe out carbon dioxide. Tobacco smoke damages alveoli tissue. The damage can lead to **emphysema**, a disorder in which alveoli in the lungs can no longer function properly.

With emphysema, the alveoli lose shape and elasticity. Less oxygen can get into the alveoli and less carbon dioxide can get out. Eventually, the alveoli walls start to break down, which reduces the area in which gas exchange can occur. As a result, people with emphysema are always short of breath.

**COPD Treatments** Cigarette smoking is responsible for about 90 percent of all COPD deaths. Although there is no cure for COPD, quitting smoking will prevent symptoms from getting worse. Treatments focus on relieving symptoms and slowing the progress of the disease. Possible treatments include medications that open airways, breathing exercises, oxygen treatments, and in severe cases, lung transplants.

## Cardiovascular Disease

Cardiovascular disease—diseases of the heart and blood vessels—kill about 138,000 smokers in the United States every year.

- ▶ A smoker is two to three times more likely to have a heart attack than a nonsmoker.
- ▶ Cigarette smoking doubles a person's chances of suffering a stroke.
- ▶ Smokers are 10 times more likely to develop circulation problems in blood vessels that bring blood to the stomach, kidneys, legs, and feet.

These statistics are not surprising when you consider the damage that substances in tobacco products do to the heart and blood vessels. **The combined effects of nicotine, tar, and carbon monoxide force the cardiovascular system to work harder to deliver oxygen throughout the body.** Tobacco use also raises blood pressure, which, over time, weakens blood vessels and places strain on many organs.

Studies also show that the chemicals in tobacco smoke increase blood cholesterol levels and promote atherosclerosis—the thickening and hardening of artery walls. In addition, nicotine increases the blood's tendency to clot. Clots may block blood flow through narrowed arteries, leading to a heart attack or stroke.

### Connect to YOUR LIFE

How do you think smoking would affect your ability to stay active as you age?

## Cancer

Both tobacco smoke and smokeless tobacco contain many ingredients that are known carcinogens. **Tobacco use is a major factor in the development of lung cancer, oral cancers, and several other cancers.**

Many factors influence a tobacco user's risk of developing cancer. Some of these factors include when the person started using tobacco, how much tobacco the person has used, and how often the person is exposed to other people's smoke.

**FIGURE 8** Most smokers are not fully aware of the damage occurring to their lungs until it is too late.

**Comparing and Contrasting** Compare the lungs of a person with emphysema and a person with lung cancer to the healthy lung.



▲ Healthy lung



▲ Lung with emphysema



▲ Lung with cancer



**Lung Cancer** Lung cancer is the leading cause of cancer death for both women and men. Scientists estimate that more than 85 percent of all deaths caused by lung cancer are related to smoking. Unfortunately, by the time most lung cancers are diagnosed successful treatment is unlikely. Only 15 percent of lung cancer patients survive for more than five years.

**Oral Cancer** Smoking and smokeless tobacco are also associated with oral cancers—cancers of the mouth, tongue, and throat. About 90 percent of oral cancers occur in people who use or have used tobacco. The survival rate for oral cancer is higher than for lung cancer. However, surgery to remove the cancer may be disfiguring.

Tobacco users may develop white patches on their tongues or the lining of their mouths called **leukoplakia** (loo koh PLAY kee uh). Because the sores sometimes become cancerous, they should be monitored by a doctor.

**Other Cancers** Tobacco carcinogens affect many organs in the body. As a result, tobacco users also have an increased risk of cancers of the esophagus, larynx, stomach, pancreas, kidney, bladder, and blood, among other sites.

## Secondhand Smoke

When a person smokes, smoke enters the air from two sources. **Mainstream smoke** is exhaled from a smoker's lungs. Both the cigarette filter and the smoker's lungs trap a lot of substances before they can enter the air in mainstream smoke. The other source, **sidestream smoke**, is smoke that goes into the air directly from the cigarette. Sidestream smoke contains twice as much tar and nicotine as mainstream smoke.

The combination of mainstream and sidestream smoke is called **secondhand smoke**, or environmental tobacco smoke. Secondhand smoke is inhaled by everyone near the smoker.



**Dangers of Secondhand Smoke** Long-term exposure to secondhand smoke can cause cardiovascular disease, many respiratory problems, and cancer. In fact, secondhand smoke exposure increases the risk of a sudden heart attack by about 30 percent. Each year, secondhand smoke causes about 50,000 deaths from heart attacks and lung cancer.

Children are especially vulnerable to secondhand smoke. Each year, secondhand smoke contributes to about 300,000 respiratory infections in children younger than 18 months. Children who are exposed to secondhand smoke are more likely to develop allergies and asthma. Their asthma symptoms are more likely to be worse than those of children who are not exposed. Inhaled secondhand smoke can cause recurring, long-lasting ear infections—a leading cause of hearing loss.

**Avoiding Secondhand Smoke** Although secondhand smoke is still a serious problem, great progress has been made to eliminate it. Federal, state, and local laws now prohibit or restrict smoking in many public places and workplaces. As smoking becomes less socially acceptable, smoking in public will become even less common.

Breathing clean air is a serious issue for everyone. The government and several health organizations have made great strides to protect you from secondhand smoke. But it is important that you also protect yourself.

- ▶ Ask smokers not to smoke around you.
- ▶ Be firm when telling guests that they can't smoke in your home or car.
- ▶ Pick restaurants that do not allow smoking or at least sit in no-smoking areas.

**Connect to  
YOUR LIFE**

Describe how you feel when you are exposed to secondhand smoke.

Chemicals from secondhand smoke soak into hair, clothing, furniture, and other surfaces.

Ear infections from secondhand smoke lead to over 1 million doctor visits each year.

Millions of school days are missed each year due to illnesses caused by secondhand smoke.



**FIGURE 9** About 35 percent of children in the United States are exposed to secondhand smoke at home on a regular basis.

Go Online

PLANETDIARY

**For:** More on secondhand smoke

**Visit:** PHSchool.com

**Web Code:** ctd-5163



**SURGEON GENERAL'S WARNING:** Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy.

**SURGEON GENERAL'S WARNING:** Smoking By Pregnant Women May Result in Fetal Injury, Premature Birth, and Low Birth Weight.

**FIGURE 10** Despite warning labels, some pregnant women continue to smoke. However, the numbers are falling.

## Tobacco Use and Pregnancy

Many of the harmful chemicals in tobacco smoke pass directly from a pregnant woman to her developing baby. **Pregnant women who smoke put their babies at risk for many health problems.** Tobacco smoke increases the baby's heart rate, reduces the baby's oxygen supply, and slows cell growth.

The babies born to mothers who smoke weigh, on average, six ounces less than the babies of nonsmokers. Low birthweight is a risk factor for many problems that could affect a baby throughout his or her entire life.

- ▶ Cerebral palsy
- ▶ Sight impairment
- ▶ Hearing problems
- ▶ Learning difficulties

Pregnant women who smoke also have higher rates of miscarriages, premature births, and stillbirths than women who do not smoke. Babies whose mothers smoked during pregnancy are also at much higher risk for sudden infant death syndrome (SIDS). SIDS is an unexplained disorder in which a seemingly healthy baby dies suddenly, usually while sleeping.

In addition, nursing mothers who smoke produce less milk than nonsmoking mothers. The nicotine in their milk can cause vomiting and diarrhea in nursing babies.

## Section 3 Review

### Key Ideas and Vocabulary

1. What are three long-term health risks associated with smoking?
2. Describe **leukoplakia**. Why should leukoplakia be monitored by a healthcare professional?
3. Identify three health risks associated with exposure to secondhand smoke.
4. List four problems for which babies of smoking mothers are at risk.

### Critical Thinking

5. **Relating Cause and Effect** Do you think that smokers are also vulnerable to the dangers of secondhand smoke? Explain.

## Health at School

**Anti-Smoking Quotes** Interview your peers who do not use tobacco. Ask them to describe how and why they made their decision. Create a brochure containing the most notable quotes along with related facts about tobacco. Do not use students' names. Work with your teacher to find out how you can share your brochure with younger students. **WRITING**

6. **Evaluating** People who fight for the rights of smokers claim that smoking is a personal choice and that they should be allowed to smoke anywhere they want to. Do you agree with this argument? Why or why not? **WRITING**

# Saying No to Tobacco

## Section 4

### Objectives

- ▶ **Examine** how refusal skills will help you stick with your decision not to use tobacco.
- ▶ **Describe** the benefits of quitting tobacco use.
- ▶ **Identify** the most important factor for successfully quitting tobacco.

### Vocabulary

- nicotine substitute

### Warm-Up



Dear Advice Line:

A bunch of my friends chew tobacco, especially when we get together to play sports. I know that it is not good for you, but I feel like a wimp when everyone else is chewing and I'm not. What if I just use chewing tobacco when we are playing?

**WRITING** Write a response to this teen to help with the decision he is facing.

## Avoiding Tobacco Use

Your decision not to use tobacco will help you stay healthy now and reduce your risk of developing life-threatening diseases in the decades to come. As a nonuser, you are part of the growing majority of teens and adults who do not use tobacco. Your example may encourage others not to use tobacco.

At some point during your teen years, it is likely that someone will offer you a cigarette or another tobacco product. What will you do if this situation arises? **Sticking to your decision not to use tobacco involves being able to say no clearly and with confidence.**

It may be helpful to have a response prepared in advance so that you are not caught off guard. Simply stating, "I do not smoke," should be enough to end the conversation. Or, you could explain that you work hard to stay in shape and you do not want to spoil it. Fewer than one out of four teens smoke, which indicates that most teens do say no.

Do not assume that you can start using tobacco now and then quit. Studies show that people who start using tobacco in their teens have a more difficult time quitting than people who start using tobacco as adults. Refer to pages 378–379 for help in developing refusal skills.

### Connect to YOUR LIFE

How would you say no to a cigarette or other tobacco product offered to you?

## Changes in a Smoker's Body After Quitting

### First Days

#### After 20 minutes

- Blood pressure and heart rate return to normal
- Temperature of hands and feet increases to normal

#### After 8 hours

- Oxygen and carbon monoxide levels return to normal

#### After 24 hours

- Risk of sudden heart attack decreases

#### After 48 hours

- Senses of smell and taste start to improve

### After 3 months

- Circulation improves; lung function improves

### After 9 months

- Coughing and nasal congestion diminish
- Respiratory infections are less frequent
- Energy level increases

### After 1 year

- Excess risk of heart disease is half that of a current smoker



**FIGURE 11** Immediately after a person kicks the tobacco habit, the body begins to repair damage from the harmful substances to which it was exposed. Some of these repairs occur within days, while others may take decades. **Classifying** What benefits occur to the respiratory system after a smoker quits?



## Benefits of Quitting

Surveys show that about nine out of ten smokers want to quit. Quitting tobacco use is not easy because it involves breaking an addiction. Nicotine may be just as addictive as some other drugs, such as cocaine and heroin. Quitting also involves breaking many habits associated with smoking. Taking time to consider the benefits of quitting, however, can make the difficult process seem even more worthwhile.

The tobacco user who quits can expect many immediate and long-term benefits. **The health benefits of quitting tobacco use begin immediately and continue throughout life. Society also benefits every time a tobacco user quits.** Figure 11 displays the changes that occur in a smoker's body after quitting.

**Cardiovascular Benefits** Immediately after quitting tobacco use, blood pressure lowers and heart rate returns to normal. As time passes, circulation improves and the risk of heart disease and stroke becomes similar to that of nonsmokers.

**Respiratory Benefits** Gradually, the cilia lining the air passages regain normal function. Breathing becomes easier as the lungs become free of tar, excess mucus, and other debris.

**Psychological Benefits** People who quit tobacco use usually feel increased confidence. They feel that they have regained control over their lives rather than allowing the tobacco to control them.

**Benefits to Society** Quitting tobacco also benefits society. Tobacco use costs society about \$100 billion per year. These expenses pay for healthcare for tobacco-related illnesses, damages and injuries from smoking-related fires, and loss of earnings from disease and early death.

### After 5 years

- Stroke risk is the same as a nonsmoker
- Risk of mouth and throat cancer is half that of a current smoker

### After 10 years

- Lung cancer death rate is about half the rate of a current smoker
- Life expectancy is comparable to a nonsmoker



## Tips for Quitting

Breaking an addiction to tobacco is not easy, but millions of people have done it. **The most important factor in successfully quitting tobacco is a strong personal commitment.** Most people quit on their own. Others attend classes or seek other forms of professional help.

Some people who quit find that quitting abruptly, or going “cold turkey,” works for them. Other people may quit by gradually reducing their use of tobacco over an extended period of time. No single method works best for everyone.

Quitting is most difficult within the first week or two after the last cigarette. By then, symptoms of nicotine withdrawal have usually subsided, but psychological symptoms may continue. There are many things you can do to help cope with withdrawal symptoms.

- ▶ Make a list of the reasons why you quit. Keep it handy.
- ▶ Throw away all tobacco products and anything that reminds you of tobacco use, such as ashtrays.
- ▶ Do little things to change your daily routine, such as sitting in a different seat at the kitchen table.
- ▶ Tell your family and friends that you have quit so that they can be there for support.
- ▶ Avoid being around people who use tobacco.
- ▶ Put aside the money you save. Reward yourself with a present.
- ▶ Exercise or call a friend to take your mind off smoking.

**Connect to  
YOUR LIFE**

**What would you do to support a friend or family member who is trying to quit tobacco use?**



**Go Online**

**PHSchool.com**

**For:** More on quitting tobacco use

**Visit:** PHSchool.com

**Web Code:** ctd-5164



**FIGURE 12** With the help of nicotine patches or gum, tobacco users can gradually overcome their nicotine addiction.

**Getting Help** Many resources are available to help tobacco users quit. For those who want to quit on their own, several health organizations offer booklets and pamphlets containing tips for quitting. Contact groups such as the American Lung Association or the American Cancer Society for more information and tips on quitting tobacco use.

Those who feel that they need professional help can attend local workshops or support groups. Some programs offer counseling on the phone or online. Local hospitals and other healthcare facilities frequently offer programs for helping tobacco users quit. A healthcare professional can advise you about where to get help.

**Nicotine Substitutes** Some tobacco users have such a strong addiction to nicotine that quitting can be very uncomfortable and difficult. These people may benefit from nicotine substitutes. A **nicotine substitute** is a product that contains nicotine, but not the other harmful chemicals found in tobacco. By slowly cutting back on the dose of a nicotine substitute, the user can reduce withdrawal symptoms.

The two most common types of substitutes are nicotine gum and nicotine patches. Inhalers and nasal sprays are also available. People younger than 18 need a prescription for any of these products.

Nicotine substitutes are only the first step in a program to break a nicotine addiction. People who use nicotine substitutes still expose their bodies to the negative effects of nicotine. Nicotine substitutes should never be used along with tobacco products.

## Health and Community

**Resources for Quitting** What resources are available to help people in your community quit tobacco use? Create a poster that informs people of the services that are available, their costs, and other important details. With permission, hang the poster in the school library, nurse's office, or other visible location.

- 6. Calculating** Brent used to spend \$5 a day on cigarettes. Now that he has quit smoking, about how much extra money will he have each month? Each year? **MATH**

## Section 4 Review

### Key Ideas and Vocabulary

1. Describe how refusal skills can help you say no to tobacco.
2. Identify four major benefits of quitting tobacco use.
3. What is the most important factor for successfully quitting tobacco? What are two ways that a person may choose to quit?
4. What is a **nicotine substitute**? Identify two types of nicotine substitutes.

### Critical Thinking

- 5. Evaluating** Do you think government money should be spent on programs to help people quit smoking? Why or why not? **WRITING**

**Tackling Tobacco** What misconceptions did you have about tobacco products before watching this video?

## Section 1 Teens and Tobacco

### Key Ideas

- ✓ Friends, family, and the media greatly influence whether someone starts to use tobacco.
- ✓ Tobacco users take in nicotine whenever they use cigarettes, cigars, pipes, or smokeless tobacco products.

### Vocabulary

- nicotine (402)
- smokeless tobacco (403)
- chewing tobacco (403)
- snuff (403)



## Section 2 Chemicals in Tobacco Products

### Key Ideas

- ✓ The major short-term effects of nicotine use are increased heart rate, increased blood pressure, and changes in the brain that may lead to addiction.
- ✓ In addition to nicotine, two of the most harmful substances in tobacco smoke are tar and carbon monoxide.

- ✓ Smokeless tobacco contains many of the same dangerous chemicals that are in tobacco smoke.

### Vocabulary

- stimulant (406)
- tar (408)
- carcinogen (408)
- carbon monoxide (409)



## Section 3 Risks of Tobacco Use

### Key Ideas

- ✓ With every dose of tobacco, users increase their risk of developing respiratory diseases, cardiovascular disease, and several different forms of cancer.
- ✓ If a person continues to smoke over a long period of time, the damage that occurs to the respiratory system becomes permanent.
- ✓ The combined effects of nicotine, tar, and carbon monoxide force the cardiovascular system to work harder to deliver oxygen throughout the body.
- ✓ Tobacco use is a major factor in the development of lung cancer, oral cancers, and many other cancers.

- ✓ Long-term exposure to secondhand smoke can cause cardiovascular disease, many respiratory problems, and cancer.

- ✓ Pregnant women who smoke put their babies at risk for many health problems.

### Vocabulary

- chronic obstructive pulmonary disease (COPD) (411)
- chronic bronchitis (411) • emphysema (412)
- leukoplakia (414) • mainstream smoke (414)
- sidestream smoke (414) • secondhand smoke (414)

## Section 4 Saying No to Tobacco

### Key Ideas

- ✓ Sticking to your decision not to use tobacco involves being able to say no clearly and with confidence.
- ✓ The health benefits of quitting tobacco use begin immediately and continue throughout life. Society also benefits every time a tobacco user quits.

- ✓ The most important factor in successfully quitting tobacco is a strong personal commitment.

### Vocabulary

- nicotine substitute (420)



## Reviewing Key Ideas

### Section 1

- In nature, nicotine acts as a(n)
  - growth agent in plants.
  - insecticide.
  - plant pigment.
  - nutrient.
- Why is tobacco use less socially acceptable than it used to be?
- How can friends be both positive and negative influences in regard to tobacco?
- Critical Thinking** Do you think there should be more or fewer restrictions on the advertising and sale of tobacco products? Explain.

### Section 2

- The odorless gas in tobacco smoke that binds to hemoglobin is
  - carbon dioxide.
  - carbon monoxide.
  - tar.
  - nicotine.
- Describe how nicotine affects the brain.
- How does the development of nicotine addiction differ in teens and adults?
- How does tobacco smoke affect a smoker's air passages?
- Critical Thinking** Why do you think some people believe they can use tobacco without becoming addicted?

### Section 3

- The smoke that a smoker exhales into the air is called
  - environmental tobacco smoke.
  - mainstream smoke.
  - sidestream smoke.
  - secondhand smoke.
- What are three types of cancer that have been linked to tobacco use?
- Name one disorder that babies of mothers who smoked are at risk for.
- Critical Thinking** What do you think are the most effective ways to protect nonsmokers from the effects of secondhand smoke? Explain.

### Section 4

- Which benefit occurs first after someone quits smoking?
  - Blood oxygen levels return to normal.
  - Lung function improves.
  - The risk of having a stroke returns to normal.
  - Senses of taste and smell return to normal.
- What would you suggest to an ex-smoker to help him or her not start smoking again?
- Discuss the different methods a person could use to quit smoking.
- Critical Thinking** Some employers prefer not to hire smokers because their healthcare costs are higher. Do you think it is appropriate not to hire someone because he or she smokes? Why or why not? **WRITING**



## Building Health Skills

- Making Decisions** Suppose that your favorite uncle has come to visit. He asks you for an ashtray. Smoking is not allowed in your home. How would you handle this situation tactfully?
- Advocacy** Suppose that you work for an advertising firm. The Surgeon General has hired your firm to work on a new anti-smoking campaign. Develop a 30-second public service commercial that will discourage young people from smoking. **WRITING**
- Setting Goals** Evaluate how smoking could affect your career goals.

## Health and Community

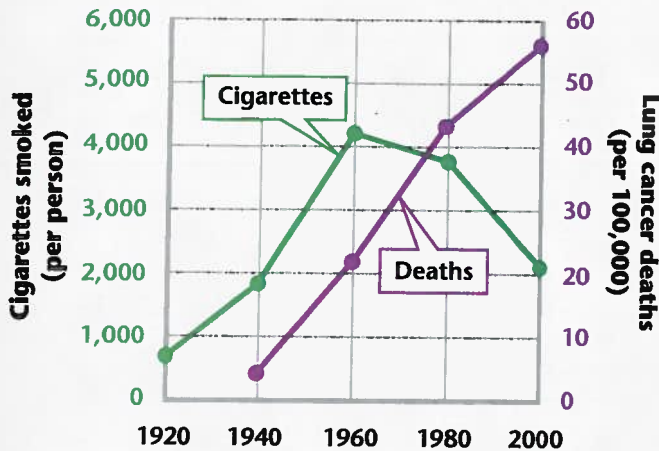
**Volunteering to End Smoking** Contact a local chapter of the American Cancer Society, American Lung Association, or other similar agency. Find out about their efforts to reduce smoking in your community. Ask about volunteer opportunities for teens. Create a flyer describing the possible opportunities and share it with your health class. **WRITING**



# Standardized Test Prep

## Math Practice

The graph shows the number of cigarettes smoked per person from 1920 to 2000, and the number of lung cancer deaths from 1940 to 2000. Use the graph to answer Questions 21–23.



- When did the number of cigarettes smoked per person reach its peak?  
A 1940      B 1960  
C 2000      D It has not reached its peak.
- Why do you think that this graph does not show a significant decrease in lung cancer deaths?  
F There is no relationship between cigarette smoking and lung cancer deaths.  
G There has not been a significant decrease in cigarette smoking.  
H Lung cancer takes years to develop.  
J People survive longer with lung cancer now than in 1940.
- What would be the best title for this graph?  
A Lung Cancer Deaths From 1920–2000  
B Causes of Lung Cancer  
C Cigarettes Smoked vs. Lung Cancer Deaths  
D The Rise and Fall of Cigarette Smoking

### Test-Taking Tip

After you have completed the test, use any extra time to review your answers. Double check answers that you were unsure of.

## Reading and Writing Practice

Read the passage. Then answer Questions 24–27.

In 1998, a settlement between the states and tobacco companies prohibited the companies from directly or indirectly targeting youth in their advertising or promotions. Some people argue that the order has been violated. For example, several companies introduced fruit or candy-flavored cigarettes. Anti-smoking activists complained that these flavors clearly appeal to young people who are not used to the taste of cigarettes. The flavored cigarettes are a way to attract young people to smoking. One tobacco company has agreed to stop selling fruit or candy-flavored cigarettes.

- In this passage, the word *settlement* means a(n)  
A establishment.  
B colony.  
C agreement.  
D punishment.
- Why are anti-smoking activists against the production of candy-flavored cigarettes?  
F The tobacco companies did not have permission to produce candy-flavored cigarettes.  
G The tobacco companies are violating the settlement by marketing a product to youth.  
H The flavors hide the real taste of the cigarettes.  
J The flavorings may be toxic.
- From the context of this passage, you can conclude that  
A the tobacco companies clearly violated the settlement.  
B the settlement has a lot of room for interpretation.  
C fewer young people have started smoking since the 1998 settlement.  
D candy-flavored cigarettes are more harmful than regular cigarettes.

### Constructed Response

- In a paragraph, describe the anti-smoking activists' argument. Do you agree with this argument? Why or why not?