

# Chapter 11


# Vaping and Tobacco

Lesson 11.1

Lesson 11.2

Health Effects of Vaping and Tobacco

Preventing and Treating Tobacco Use

Look for the skills icon  throughout this chapter for opportunities to practice your health skills.



## Check Your Health and Wellness Skills

In this chapter, you will learn skills for protecting your health from the harms of nicotine and tobacco. To understand the skills you currently use, take the following inventory of your behaviors. Indicate how well you think you use each skill. Use a scale of 1–5, 1 meaning you do not use the skill and 5 meaning you feel completely comfortable using it.

Skill	How Well Do You Use Each Skill?
I try to limit my time around people who are smoking cigarettes.	Write your score.
When I spend time with someone who is smoking, I shower soon after.	Write your score.
I feel comfortable saying <i>no</i> when my friends tell me I should try vaping.	Write your score.
I manage stress well—by getting physical activity or listening to music, for example.	Write your score.
I surround myself with people who respect my decisions and do not make fun of me.	Write your score.
I know tobacco companies sponsor people to encourage vaping on social media.	Write your score.
I recognize that depictions of people smoking in movies do not show tobacco's long-term health effects.	Write your score.
I encourage my friends and family members who use tobacco to quit.	Write your score.
I do not accept car rides from people who smoke or vape.	Write your score.
If people do not respect my decision not to use tobacco, I leave the situation.	Write your score.
<b>Total</b>	Write your total.

Add up your responses to each statement. The higher your score, the more comfortable you feel avoiding the harms of nicotine and tobacco. Which skill do you think is most important for you? Which skill is the most challenging for you? Which skill would you most like to improve? In this chapter, you will learn how to perform these skills better and more often.



As you listen to your teacher present the information in the chapter, record any comments or questions you may have about the content on a separate sheet of paper or electronically. Then, review your comments and questions with a partner. Try to answer each other's questions using information your teacher shared and content in the chapter. If you have any questions you cannot answer, discuss them with the rest of the class. Use reliable resources to pursue and verify the answers to your questions.



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## Setting the Scene

### Vaping Is Just a Bad Idea

As a high school freshman, you are excited to meet new people and expand your social circle. You have enjoyed hanging out after school with some older students and getting invited to parties with them on the weekends. Some of these older students vape and keep asking you to try it. They say that vaping is not as bad for you as smoking regular cigarettes, but you really do not want to develop an addiction. You remember your uncle smoked cigarettes for years and had a very hard time stopping. Also, some of the older students who vape are always coughing. A few are now even smoking regular cigarettes in addition to vaping.

One Saturday night, you walk into a party where two of your new friends are vaping. One of them passes you a vape to try.

consequences of each alternative. What is the healthiest decision you can make in this situation?

2. If you choose not to vape, what are some strategies you can use to stick with your decision? How can you explain your decision to people who might pressure you?
3. Think about what you can do to advocate for the health of those who choose to vape and pressure others. If you were in this situation, what would you say to your new friends to have a conversation about the consequences of vaping?

### Thinking Critically

1. What would you do in this situation? Use the decision-making process you learned in Lesson 2.1 to think through the decision you face and the

# Lesson 11.1

## Health Effects of Vaping and Tobacco

### Essential Question?

How would deciding to use tobacco products today affect your lifelong health?

### Learning Outcomes

After studying this lesson, you will be able to

- identify different tobacco products and explain why they are addictive;
- assess the hazardous effects of nicotine;
- describe harmful substances in cigarette smoke that result in serious illnesses and diseases;
- distinguish between myths and facts about vaping;
- analyze the dangerous effects of vaping on the body's systems;
- summarize the risks of smokeless tobacco;
- identify mental, social, and legal consequences of using tobacco products; and
- analyze the impact of secondhand and thirdhand smoke and aerosol.

### Key Terms

aerosol  
asthma  
carbon monoxide  
carcinogens  
chronic bronchitis  
chronic obstructive pulmonary disease (COPD)  
e-liquid  
emphysema  
leukoplakia  
nicotine  
popcorn lung  
secondhand aerosol  
secondhand smoke  
smokeless tobacco  
tar  
thirdhand smoke  
tobacco  
vaping devices

### Warm-Up Activity

#### Tobacco Use and Death

**Comprehend Concepts** The table that follows shows the top 10 leading causes of death for adults in the United States, according to the Centers for Disease Control and Prevention (CDC). Before reading this lesson, review the table and consider how each leading cause of death might relate to smoking, vaping, and using smokeless tobacco. As you read, take notes about how tobacco and nicotine relate to each cause of death. If everyone made the decision not to use tobacco products, would the leading causes of death change? Why or why not?

#### Leading Causes of Death

1. Cardiovascular disease
2. Cancer
3. Accidents (unintentional injuries)
4. Chronic lower respiratory diseases
5. Stroke
6. Alzheimer's disease
7. Diabetes
8. Influenza and pneumonia
9. Kidney disease
10. Suicide

**S**moking is the leading cause of preventable death in the United States. Still, every day in the US, about 2,000 people younger than 18 smoke their first cigarette. Some people who smoke cigarettes start by vaping, which increases their risk for smoking by seven times. Using any tobacco product can lead to nicotine addiction and a lifetime of health issues. Friends and family members of people who smoke or vape can also develop health conditions from inhaling secondhand or thirdhand smoke and aerosol. In this lesson, you will learn about the health effects of tobacco products.

### Tobacco Products

According to the Food and Drug Administration (FDA), a *tobacco product* is any product made or derived from tobacco and intended for human consumption.

This definition includes products made from tobacco or from *synthetic* (manmade) substances derived from tobacco. **Tobacco** is a plant with leaves that contain the chemical **nicotine**, a toxic substance that gives tobacco products their addictive quality. Historically, cigarettes were the most commonly used tobacco product among teens. Today, vaping is the most common form.

Cigarettes are an example of a combustible tobacco product. Combustible tobacco products are *smoked*, or burned and then inhaled. Other combustible tobacco products include rolled tobacco, cigars, cigarillos, pipes, blunts, hookah and water pipes, and bidis and kreteks (clove cigarettes). Smokeless tobacco products are noncombustible and include chewing tobacco, dipping tobacco, snuff, gutka or gutkha, and dissolvables.











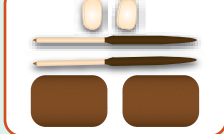




Unlike other tobacco products, **vaping devices** heat tobacco or synthetic nicotine without burning it. Examples of these devices include e-cigarettes, vaporizers (also called *vapes* or *vape pens*), hookah pens, e-cigars, and e-pipes. Often called *electronic nicotine delivery systems (ENDS)*, these tobacco products are noncombustible and contain either tobacco or an **e-liquid** made of nicotine (or another drug) and other chemicals. Some people believe that vaping devices are safer, healthier, or less addictive than regular cigarettes. The reality is that all tobacco products can lead to addiction and serious health consequences (**Figure 11.1**).

**tobacco** plant with leaves that contain the chemical nicotine

**nicotine** toxic substance that gives tobacco products their addictive quality

**vaping devices** tobacco products that heat tobacco or synthetic nicotine without burning it, producing an aerosol

**e-liquid** substance made of nicotine (or another drug) and other chemicals; is heated during vaping

Types of Tobacco Products		
Combustible Tobacco	Smokeless Tobacco	Vaping Devices (or ENDS)
Cigarettes 	Chewing tobacco 	E-cigarettes 
Cigars, cigarillos, and blunts 	Dipping tobacco and snuff 	Vaporizers (vapes and vape pens) 
Rolled tobacco 	Snus 	E-cigars 
Bidis and kreteks 	Dissolvables 	E-pipes 
Pipes 		Hookah pens 
Hookah and water pipes 		

**Figure 11.1** Tobacco products may be combustible, smokeless, or electronic, but all can have serious health consequences. **Do all of these tobacco products contain nicotine?**

Combustible Tobacco, top to bottom: Voronina Svetlana/Shutterstock.com; domnitsky/Shutterstock.com; Andris Tkacenko/Shutterstock.com; Claudine Van Massenhove/Shutterstock.com; dimpank/Shutterstock.com; Gerisima/Shutterstock.com  
Smokeless Tobacco, top to bottom: J.A. Dunbar/Shutterstock.com; Rob Hainer/Shutterstock.com; gopixgo/Shutterstock.com; Goodheart-Willcox Publisher  
Vaping Devices: United States Food and Drug Administration

# The Impact of Nicotine

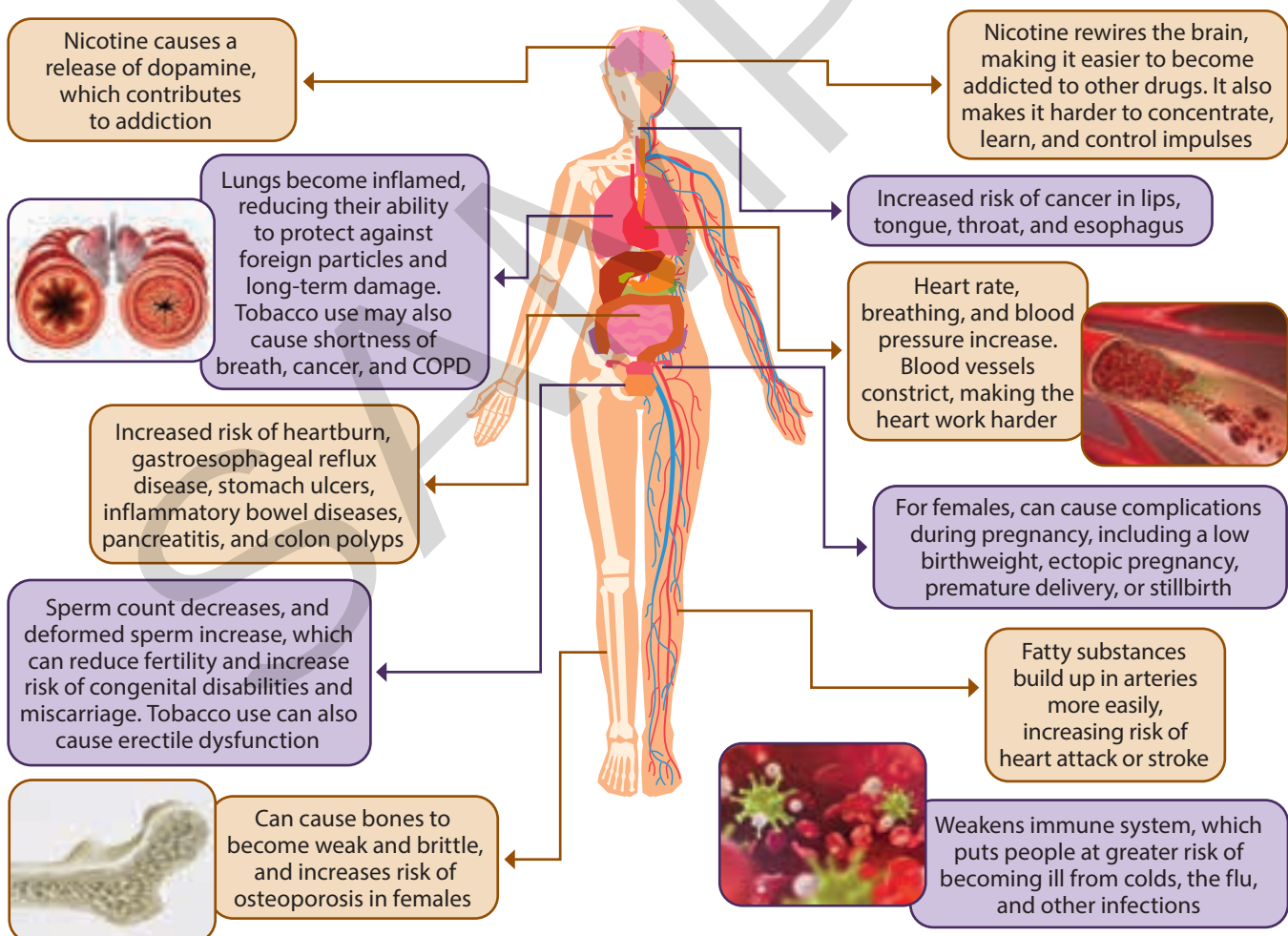
One thing almost all tobacco products have in common is that they contain nicotine. Most combustible tobacco products contain nicotine from the leaves of the tobacco plant. E-liquids with nicotine contain a synthetic form. In fact, e-liquids in vapes sometimes contain *more* nicotine than cigarettes.

Nicotine is a highly addictive substance, which means it is difficult to stop using. In fact, in 2010, the US Surgeon General identified that nicotine was as addictive as cocaine and heroin. As a result, a person who uses nicotine is at serious risk for becoming addicted and developing a *substance use disorder*. The stages of substance use are experimentation, regular use, tolerance, dependence, and addiction. Once someone has an addiction to nicotine, that person will experience unpleasant withdrawal symptoms without the substance.

On top of being addictive, nicotine is toxic and extremely harmful to a person's health (**Figure 11.2**).

## Cardiovascular System

The *cardiovascular system* includes the heart and blood transportation system in your body. When people use any tobacco product, nicotine enters their bloodstream. Nicotine's presence triggers the release of the hormone *adrenaline*.



Left, top to bottom: Lightspring/Shutterstock.com; Crevis/Shutterstock.com; Middle: Lilanakani/Shutterstock.com; Right, top to bottom: Christoph Burgstedt/Shutterstock.com; Yurchanka Siarhei/Shutterstock.com

**Figure 11.2** Nicotine is highly toxic to a person's body systems, and its harmful effects are not always reversible.

Adrenaline causes an increase in heart rate, breathing, and blood pressure. This makes the heart work harder to pump blood faster around the body.

Nicotine also causes the blood vessels to constrict. This means the heart works harder to pump blood through increasingly narrow vessels. Over time, this can lead to high blood pressure and cardiovascular disease. It also makes it more difficult for oxygen and nutrients to reach the skin, nails, hair, and mouth. As a result, people who use nicotine develop more wrinkles in their skin, brittle nails, thin hair, bad breath, and diseases of the mouth.

Gradually, nicotine leads to changes in the walls of blood vessels, causing fatty substances such as cholesterol to build up more easily in the arteries. This disrupts the flow of blood through the body as fatty deposits restrict blood transportation. Over time, this buildup can cause cardiovascular disease, which is the leading cause of death in the US.

## Respiratory System

The *respiratory system's* primary function is to enable breathing. Nicotine causes inflammation of the lungs and also reduces the lungs' ability to protect against foreign particles, which can lead to long-term damage. As a result, people who use nicotine may experience shortness of breath. Nicotine use also increases risk for developing chronic obstructive pulmonary disease (COPD) and cancer, which are also leading causes of death in the US.

## Nervous System

The *nervous system* consists of the brain, spinal cord, and nerves. Nicotine usually acts as a stimulant, increasing heart rate, blood pressure, and breathing. In large doses, it can also act as a sedative, reducing anger and anxiety.

Nicotine causes the release of a chemical called *dopamine* in the brain. Dopamine leads to a pleasurable sensation, just like when people use heroin or cocaine. People continue to use nicotine because they want this good feeling. Over time, the body develops a tolerance to nicotine, and people need higher levels of nicotine to enjoy the same effects. Using nicotine disrupts the brain's natural production of dopamine. As a result, people become dependent on nicotine to experience dopamine's positive sensations. This is why addiction happens so easily.

Teens are especially sensitive to the effects of nicotine because their brains are still developing. Using nicotine rewires the brain and makes it easier to develop an addiction to other drugs. Nicotine also makes it harder to concentrate, learn, and control impulses.

## Digestive System

Nicotine has harmful effects on the digestive system. The body is not able to process food as easily. Common conditions such as heartburn, gastroesophageal reflux disease, and ulcers may develop due to nicotine use. Nicotine use also increases the risk of Crohn's disease (a form of inflammatory bowel disease), as well as pancreatitis and colon polyps.

## Immune System

Using nicotine also leads to a weakened immune system. Your *immune system* includes organs, tissues, and cells that defend against disease-causing bacteria, parasites, and viruses. People who use nicotine have a greater risk of becoming ill from diseases like the common cold, flu, pneumonia, and meningitis.

## Reproductive System

Nicotine affects the male and female reproductive systems. Males who use nicotine have a lower sperm count and more deformed sperm. This can reduce fertility and increase risks for congenital disabilities and miscarriage. Nicotine use can also damage blood vessels in the penis, leading to erectile dysfunction. In females, nicotine use can damage egg cells, reducing fertility. Pregnant people who use nicotine are more likely to experience complications, including a low-birthweight baby, ectopic pregnancy (a pregnancy that develops outside the uterus), premature delivery, or stillbirth.

## Health Effects of Cigarettes

Did you know that, on average, long-term users of cigarettes die 13–15 years earlier than people who do not use cigarettes? According to the US Surgeon General, people who smoke have a higher risk for developing type 2 diabetes mellitus, colorectal and liver cancers, vision loss, tuberculosis, and arthritis. Smoking cigarettes also leads to stained teeth and hair and clothes that smell like smoke. In addition to nicotine, cigarette smoke contains toxic, cancer-causing chemicals and can lead to respiratory conditions.
















## Toxic Chemicals

Cigarettes and cigarette smoke contain thousands of chemicals and toxic substances that harm the body (**Figure 11.3**). Nicotine is just one of these harmful substances. Cigarette smoke contains high levels of **carbon monoxide**, a poisonous gas. When inhaled, carbon monoxide interferes with the ability of red blood cells to carry oxygen.

### carbon monoxide

poisonous gas that interferes with the ability of red blood cells to carry oxygen throughout the body

## Chemicals Found in Cigarette Smoke

 <b>Acetone</b> <ul style="list-style-type: none"><li>• Found in nail polish remover</li></ul>	 <b>Butane</b> <ul style="list-style-type: none"><li>• Used in lighter fluid</li></ul>	 <b>Lead</b> <ul style="list-style-type: none"><li>• Used in batteries</li></ul>
 <b>Acetic acid</b> <ul style="list-style-type: none"><li>• An ingredient in hair dye</li></ul>	 <b>Cadmium</b> <ul style="list-style-type: none"><li>• Active component in battery acid</li></ul>	 <b>Methanol</b> <ul style="list-style-type: none"><li>• A main component in rocket fuel</li></ul>
 <b>Ammonia</b> <ul style="list-style-type: none"><li>• A common household cleaner</li></ul>	 <b>Carbon monoxide</b> <ul style="list-style-type: none"><li>• Released in car exhaust fumes</li></ul>	 <b>Naphthalene</b> <ul style="list-style-type: none"><li>• An ingredient in mothballs</li></ul>
 <b>Arsenic</b> <ul style="list-style-type: none"><li>• Used in rat poison</li></ul>	 <b>Formaldehyde</b> <ul style="list-style-type: none"><li>• Embalming fluid</li></ul>	 <b>Tar</b> <ul style="list-style-type: none"><li>• Material for paving roads</li></ul>
 <b>Benzene</b> <ul style="list-style-type: none"><li>• Found in rubber cement</li></ul>	 <b>Hexamine</b> <ul style="list-style-type: none"><li>• Found in barbecue lighter fluid</li></ul>	 <b>Toluene</b> <ul style="list-style-type: none"><li>• Used to manufacture paint</li></ul>

A–Z: Nadiia Ishchenko/Shutterstock.com; schanz/Shutterstock.com; gowithstock/Shutterstock.com; JR AK/Shutterstock.com; shinja jang/Shutterstock.com; Joe Belanger/Shutterstock.com; Charles Knowles/Shutterstock.com; Toa55/Shutterstock.com; John Gomez/Shutterstock.com; Arina P Habich/Shutterstock.com; Kenishirotie/Shutterstock.com; STEFANY LUNA DE LINZY/Shutterstock.com; Vera Larina/Shutterstock.com; ungvav/Shutterstock.com; Kyle Lee/Shutterstock.com

**Figure 11.3** These are among the thousands of toxic chemicals and substances found in cigarettes and cigarette smoke. **Would you otherwise ingest any of these chemicals?**

This reduces the amount of oxygen in the blood and the amount of oxygen that reaches the heart. As a result, after beginning to smoke, someone who once ran one lap around the track without becoming out of breath may be breathless after running half as far.

Cigarette smoke also contains more than 70 **carcinogens**, or cancer-causing substances. These increase a person's risk for developing cancers of the mouth, throat, esophagus, lung, and bladder. Cancerous cells grow rapidly and form a mass of cells, called a *tumor*. These tumors can spread to other parts of the body.

Due to the toxic chemicals in cigarette smoke, people who smoke have a higher risk for developing osteoporosis, ulcers, fertility issues, and gum disease. Cigarette use can interfere with eating by changing the shape of taste buds. When food does not taste as good, some people who smoke long-term lose their appetite and interest in eating.

## Respiratory Conditions

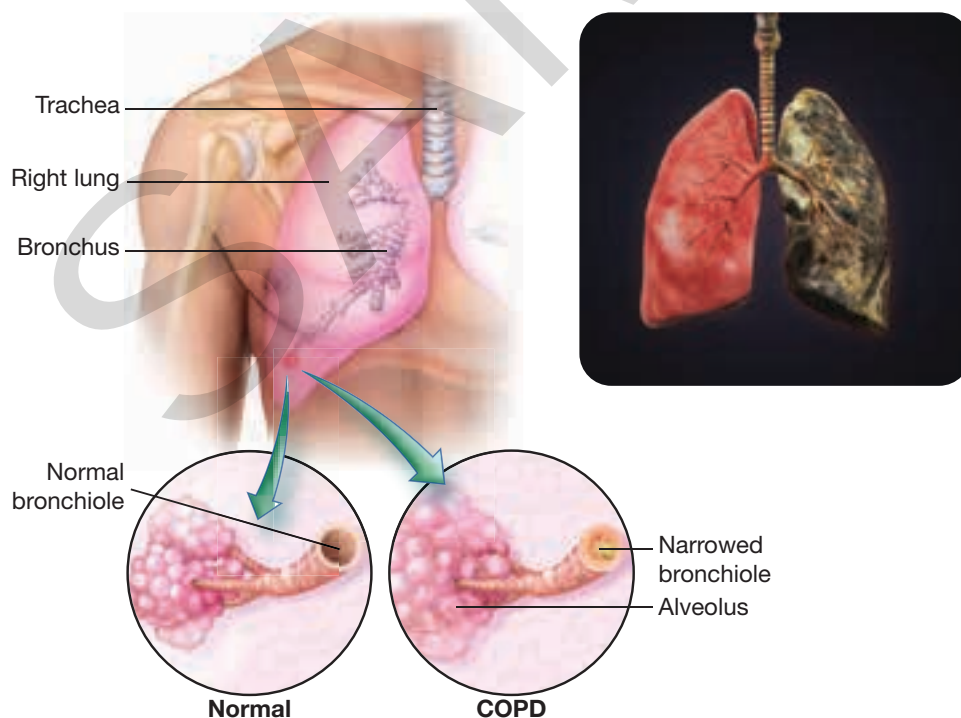
Smoking damages the respiratory system and makes breathing more difficult. Burning tobacco produces a residue known as **tar**, which consists of small, thick, sticky particles. Over time, as smoke repeatedly passes through the bronchial tubes, tar builds up in the lungs. Tar disrupts the ability of fine, hair-like projections called *cilia* to effectively clear the lungs of foreign particles.

Smoking-related damage to the lungs contributes to chronic (long-lasting) respiratory diseases and can trigger asthma attacks. **Chronic obstructive pulmonary disease (COPD)** is a group of conditions that make breathing more difficult (Figure 11.4). Most people who develop COPD have a combination of chronic bronchitis, emphysema, and asthma.

**carcinogens**  
cancer-causing substances

**tar** residue consisting of small, thick, sticky particles; builds up in the lungs as a result of smoking

**chronic obstructive pulmonary disease (COPD)**  
group of conditions that make breathing more difficult; includes chronic bronchitis, emphysema, and asthma



**Figure 11.4** Chronic obstructive pulmonary disease (COPD) clogs the bronchioles and damages the lungs, making it more difficult to breathe. On the left is a normal, healthy lung. On the right is a smoker's lung, which shows the cumulative effects of COPD. *What three lung diseases are grouped in COPD?*

Left: © Body Scientific International; Right: iStock.com/Nerthuz



**chronic bronchitis**

condition in which the bronchial tubes become swollen and irritated, narrowing the pathway to the lungs

**emphysema** condition that causes the lungs to lose elasticity; permanently enlarges airways and destroys the alveoli in lung tissue

**asthma** chronic condition in which airways constrict and fill with mucus; blocks airflow to and from the lungs

**Chronic bronchitis** is an ongoing condition in which the bronchial tubes become swollen and irritated, narrowing the pathway to the lungs. This makes it increasingly difficult for the lungs to take in enough oxygen. People with bronchitis experience coughing spells and have difficulty catching their breath.

**Emphysema** is a disease that causes the lungs to lose elasticity, permanently enlarging the airways. Emphysema destroys the *alveoli*, or sacs of air, that make up lung tissue. The destruction of alveoli makes breathing difficult. As a result, a person has to breathe faster to get enough oxygen into the lungs and bloodstream.

**Asthma** is a chronic disease caused by blockages of airflow to and from the lungs. Inhaling cigarette smoke irritates the lining of the airways, which can cause an asthma attack. Because cigarette smoke damages the cilia, the lungs cannot eliminate unwanted particles. These particles stay in the airways and continue to trigger asthma attacks.



## Case Study

### “Just” a Vape



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While Dwayne is in the hospital with pneumonia, his doctor tells him that a likely factor for his illness is his daily vaping habit. She warns him of the harmful effects on his respiratory system. Dwayne is stunned—he did not realize vaping was harmful to his health. He grew up knowing that cigarettes were dangerous; he has seen pictures of damaged smokers’

lungs in his health classes. Vaping seemed safe, especially since he was using nicotine-free vape.

Ximena has loved playing basketball since she was a kid. Lately, however, she has coughing fits during practice and gets out of breath more quickly. Ximena does not vape, but she sits with her friends while they do. She knows that is probably what is causing her coughing fits. Ximena does not want to spend less time with her friends, but she worries about not making the varsity team next year if she does not get away from the aerosol.

Audrey is around people who use tobacco all the time. Her mom smokes cigarettes, and her older brother vapes. One day, a boy at school offers Audrey a vape. Audrey thinks to herself that one time cannot hurt. Audrey remembers her mother’s stained yellow teeth and fingers and her brother’s worsening asthma and smelly clothes. Audrey shakes her head, gives the vape back, and says, “No, thanks. I’ve seen what smoking has done to my family and I don’t want to start.”

## Practice Your Skills

### Make Decisions

Consider the stories of Dwayne, Ximena, and Audrey. Are they making healthy decisions? What, if anything, can they do to be healthier? Rewrite each person’s story to include a healthier decision and

include any necessary knowledge or refusal skills each person would need to make these decisions. Share your new stories with a partner and discuss how a few small decisions can affect your health. Then, write a story about your own personal experience with tobacco. If you could go back in time in your story, what decisions would you make?

# Health Effects of Vaping

Some people see vaping, or the use of vaping devices, as a harmless alternative to smoking cigarettes. While vaping is less harmful than cigarette smoking, it is *not* harmless (Figure 11.5). Many people believe that vaping produces a water vapor that people inhale. In reality, vaping produces an **aerosol**, or a suspension of fine particles or droplets in the air—like dust, smoke, deodorant spray, or bug spray.

Vaping introduces nicotine (or another drug) into a person’s body and poses significant health risks. E-liquids with nicotine contain large amounts of nicotine. Even some e-liquids that claim to be nicotine-free contain nicotine. As you have learned, nicotine is a dangerous, addictive substance that harms the body’s systems.

**aerosol** suspension of fine particles or droplets in the air

## Myths and Facts about Vaping

The infographic features a central black banner with the text '\*\*\* REALITY CHECK \*\*\*'. Above the banner, five colorful speech bubbles contain common myths. Below the banner, five corresponding colored boxes provide the reality check for each myth. The myths and their reality checks are:

- Myth:** "When I vape, I am just inhaling water vapor."  
**Reality Check:** E-liquid pods can contain the same amount of nicotine as 20 cigarettes. Nicotine-free e-liquids may even contain nicotine.
- Myth:** "Vaping doesn't hurt anyone else."  
**Reality Check:** Vaping companies sell their products and make money through social media campaigns.
- Myth:** "My e-liquid is just flavoring."  
**Reality Check:** Vaping produces aerosol, not water vapor. This aerosol can contain harmful substances.
- Myth:** "Everyone I follow on social media vapes."  
**Reality Check:** Bystanders also breathe the harmful chemicals in secondhand aerosol exhaled by people who vape.
- Myth:** "Vaping isn't addictive since there is no nicotine."  
**Reality Check:** E-liquids contain harmful chemicals, including some that have been linked to serious diseases.

**Figure 11.5** The statements at the top show common misconceptions about vaping. Read each accompanying explanation to see why these ideas are incorrect. *Did you previously believe that vaping was harmless?*

smartboy10/DigitalVision Vectors via Getty Images

In addition to the dangers posed by nicotine, vaping also harms health in other ways. Vape battery explosions can cause serious injury and even death. Some people use vaping devices to consume other drugs like marijuana. Vaping any e-liquid can have serious health risks.

Most of the time, when people vape, they are consuming an e-liquid made of many chemicals. The vaping device heats the e-liquid into an aerosol that people inhale (Figure 11.6). When someone vapes, these chemicals enter the body and affect its organs and systems.

Scientists are still studying the long-term effects of inhaling the chemicals contained in aerosol. This research is difficult because companies that manufacture e-liquids are not required to list all the ingredients in the e-liquid. This means people who vape do not know what exactly they are inhaling into their lungs. Some people may claim that the chemical flavorings in e-liquids are *generally recognized as safe (GRAS)*. This means the FDA has approved that they are safe for ingestion. It does *not* mean the FDA has stated they are safe to inhale.

Scientists do know that inhaling the chemicals in aerosol can lead to respiratory conditions, including inflammation and long-term lung damage. As more people vape, reports of lung diseases are increasing. One rare lung disease related to vaping is **popcorn lung** or *bronchiolitis obliterans*. Diacetyl, a flavoring found in more than 75 percent of flavored e-liquids, causes this disease. Popcorn lung causes scarring and inflammation in the *bronchioles*, the smallest airways in the lungs. This can lead to persistent coughing, shortness of breath, and difficulty breathing.

**popcorn lung** condition that damages the lungs' smallest airways; leads to coughing and shortness of breath



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**Figure 11.6** Aerosol created by vaping devices contains many harmful chemicals that are connected to serious health consequences. Chemicals include volatile organic compounds (VOCs), or pollutants that evaporate in the air; ultrafine particles that can be inhaled deep into people's lungs; and cancer-causing substances.

# Health Effects of Smokeless Tobacco

Forms of **smokeless tobacco** include chewing tobacco, snuff, *snus* (a form of snuff), and dissolvable tobacco. Chewing tobacco involves placing wads, or *plugs*, of tobacco leaves between the cheeks and gums. Snuff is a finely cut or powdered tobacco that people inhale or place between the cheek and gums. Dissolvable tobacco comes in the form of flavored mouth drops or strips.

All forms of smokeless tobacco contain nicotine and carcinogens. The harmful effects of these substances are the same as if they were smoked. The presence of nicotine makes smokeless tobacco just as addictive as cigarettes. In fact, because people place smokeless tobacco directly into the mouth, people who use these products actually absorb even more nicotine than people who smoke (**Figure 11.7**).

Because using smokeless tobacco does not involve inhaling smoke, people who use these products are less likely to develop lung diseases than people who smoke. People who use smokeless tobacco do, however, increase their risk of developing other serious diseases. When using smokeless tobacco, people absorb nicotine through their mouth tissues. Nicotine stains the teeth and can lead to gum recession. Using smokeless tobacco can also lead to **leukoplakia**, a condition characterized by thickened, white, leathery spots inside the mouth. This condition can develop into oral cancer. Smokeless tobacco use leads to an increased risk of cardiovascular disease, respiratory irritation, gum disease, and tooth decay.

## smokeless tobacco

tobacco product that is chewed or snuffed rather than smoked

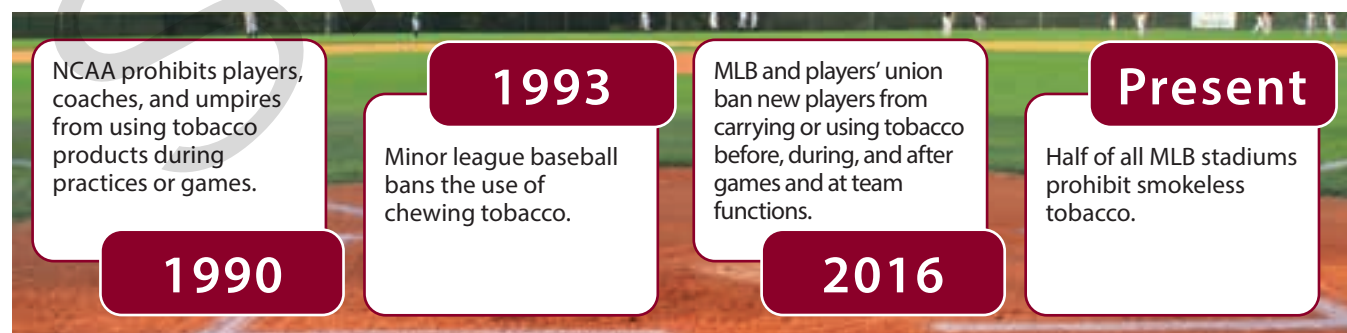
## leukoplakia

condition characterized by thickened, white, leathery spots inside the mouth; can develop into oral cancer

## Mental, Social, and Legal Consequences

Using tobacco impacts not just a person's body, but also a person's mind and social relationships. As you know, the different dimensions of health are interconnected. Consequences in one area of health also affect other areas of health. The effects of tobacco use are long lasting and can shape your future in serious ways.

## Smokeless Tobacco Bans in Baseball



World in Hand/Shutterstock.com

**Figure 11.7** Though chewing and dipping tobacco have long been associated with baseball, this trend has been on the decline for a few decades. Recognizing the dangers to players' health, various organizations and many players support the ban of smokeless tobacco. *Do users of smokeless tobacco absorb more or less nicotine than people who smoke? How?*



## Research in Action

### Tobacco Use and Risky Behaviors

Did you know that engaging in some risky behaviors makes you more likely to try others as well? Risky behaviors are actions that can have negative health consequences. They include behaviors like smoking cigarettes, vaping, being physically violent, texting and driving, and engaging in sexual activity that can result in sexually transmitted infections (STIs) and unplanned pregnancies.

Many teens tell themselves that risky behaviors are not harmful if they are less risky compared to other behaviors. For example, some teens justify their decision to vape by saying that vaping is safer than smoking cigarettes. What teens do not realize is that vaping makes them much more likely to smoke

cigarettes in the future. A 2017 study by researchers at the Centers for Disease Control and Prevention found that students in grades 7–12 who had ever tried vaping were *more than twice as likely* to start smoking.

Students who use tobacco products also have a greater risk of engaging in other risky behaviors. Researchers in one study compared the rates of risky behaviors among high school students who had or had never used tobacco products. Students who used tobacco products were more likely to engage in risky behaviors, including getting in a physical fight, texting and driving, and having more sexual partners. They were also more likely to use other health-harming substances, such as alcohol, marijuana, and illegal drugs.

### Practice Your Skills

#### Practice Health-Enhancing Behaviors

Research shows that teens who vape or smoke have riskier health-related behaviors than those who do not. With a partner, discuss what factors you think explain this association. Why does making one risky choice lead to other risky choices? What barriers

prevent some teens from making better health choices? With your partner, brainstorm ways teens can end a habit of making risky choices. What resources and support could teens use? What information can arm them to resist negative influences and make healthier choices? Create an infographic that illustrates the influences leading to a pattern of risky behavior and steps teens can take to interrupt the pattern.

## Mental Consequences of Addiction



If they cannot smoke or vape, or if they are trying to quit, people may experience intense cravings, sadness, anxiety, or irritability.

pathdoc/Shutterstock.com; United States Food and Drug Administration

**Figure 11.8** Even if people want to, the consequences to their mental health make it very hard to quit vaping, smoking, or chewing tobacco.

## Mental Consequences

Most teens believe they can smoke, vape, or chew tobacco occasionally or even regularly for a few years and then easily quit. The reality, however, is that addiction happens very quickly and makes it very difficult to stop using tobacco products (**Figure 11.8**).

Using nicotine can rewire your brain so you are more likely to develop addictions to other drugs. Nicotine can also make it harder to concentrate, learn, and control impulses. People who use nicotine are more likely to engage in other risky behaviors, such as sexual activity and illegal drug use. Nicotine can also make mental health conditions and mental illnesses worse if people use nicotine to relieve symptoms instead of seeking treatment.

## Social Consequences

Tobacco use can seriously harm a person's social relationships. An addiction to nicotine hurts not just the person with the addiction, but also everyone around that person. When people feel dependent on a substance

such as nicotine, getting more of that substance can seem more important than anything else. As a result, teens may lie to their parents, guardians, or friends or steal money to buy cigarettes, smokeless tobacco, vaping devices, or e-liquid. Lying and theft can cause long-term trust issues in a relationship and the community. In addition, teens who use tobacco model this behavior for others, which can lead others to develop addictions too.

Because tobacco use harms people's health, people may withdraw from teens who use tobacco products. People who use tobacco products may have to leave a social situation to smoke or vape and feel left out.

## Legal Consequences

Teens who use and misuse tobacco can experience serious legal consequences. In the US, all states prohibit people under the age of 21 from buying tobacco products. Some cities, such as Beverly Hills in California, have banned the sale of tobacco products altogether. Teens who try to buy tobacco products or ask someone else to buy them may have to pay fines or perform community services. Some states suspend driving privileges for teens who illegally buy or possess tobacco products.

Many schools have policies that prohibit use of cigarettes, smokeless tobacco, and vaping devices. Students who bring tobacco products to school or use them at school-sponsored events may face disciplinary actions and even suspension. Teens can also face legal consequences for using tobacco products in public places, including restaurants and workplaces.

## Secondhand Smoke and Aerosol

People who use tobacco products are not the only ones at risk for negative health outcomes because of nicotine. Smoking and vaping both release substances into the air other people breathe. In the case of cigarette smoking, this substance is called **secondhand smoke**. People who regularly inhale secondhand smoke because they live or socialize with people who smoke have a greater risk of developing lung cancer or heart disease. Secondhand smoke is especially dangerous for fetuses, infants, and children (**Figure 11.9**).

### secondhand smoke

smoke that people inhale involuntarily when someone nearby is smoking

## Secondhand Smoke During Pregnancy and Childhood

### Fetuses exposed to secondhand smoke during pregnancy

- receive nicotine and carbon monoxide through the placenta, which reduces the amount of oxygen passed to the fetus
- experience increased risk of death, premature birth, or low birthweight

### Babies and children exposed to secondhand smoke during pregnancy

- have an increased risk of sudden infant death syndrome (SIDS)
- commonly experience behavior-related issues, including attention deficit disorders, hyperactivity, and aggression

### Children exposed to secondhand smoke during childhood

- experience more respiratory conditions such as pneumonia, bronchitis, and asthma attacks
- have higher rates of sore throats and ear infections
- are more likely to develop smoking habits of their own



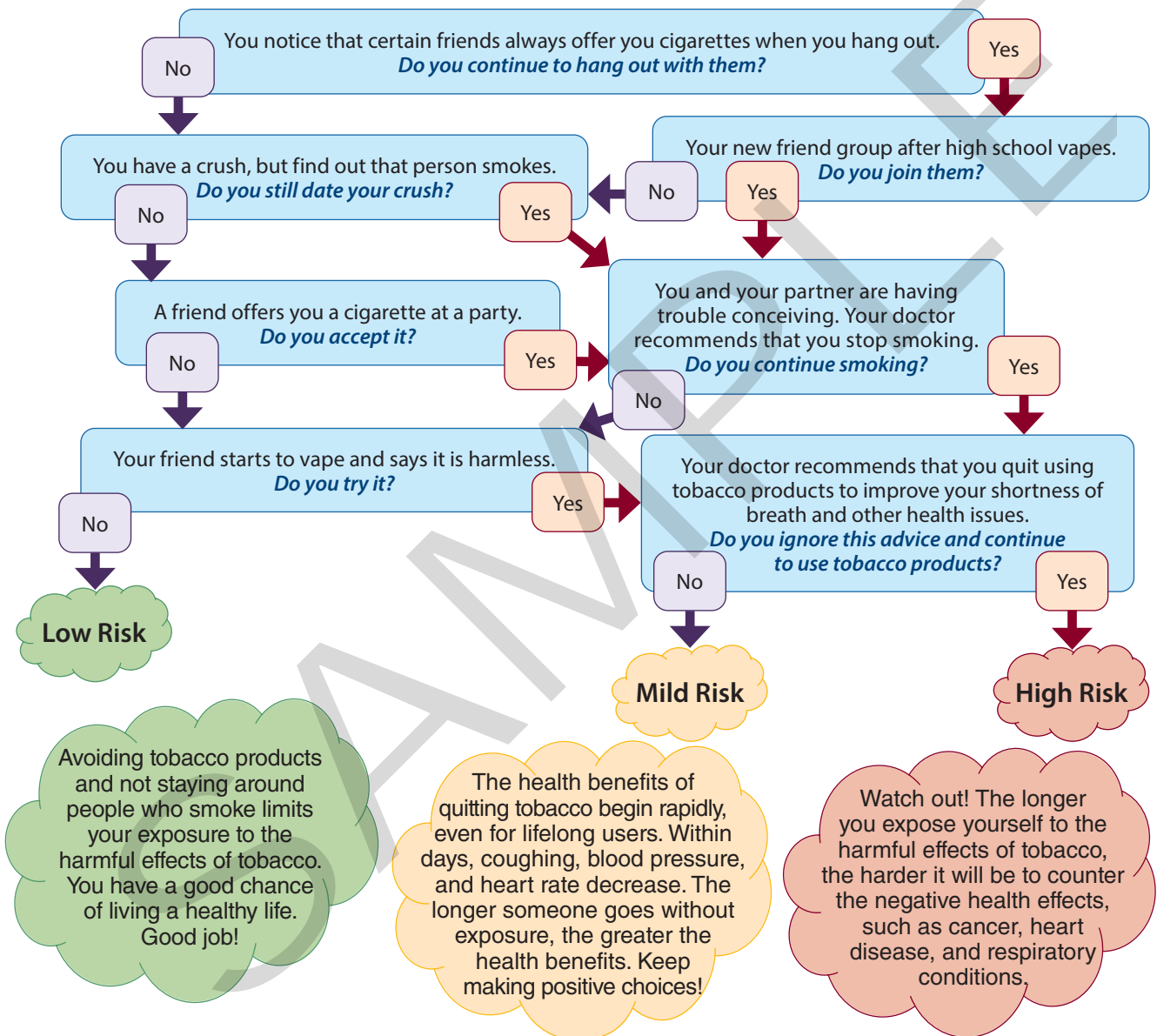
Anucha Naisuntorn/Shutterstock.com

**Figure 11.9** Fetuses, infants, and children are especially vulnerable to secondhand smoke, throughout pregnancy and while they grow. Smoking also increases a pregnant person's risk of miscarriage. ***Is secondhand aerosol dangerous for fetuses, infants, and children too?***

## Choose Your Future: Vaping and Tobacco

Right now, you may have a hard time seeing how small decisions impact your health. It is important to remember, however, that choices you make regarding your health have far-reaching impacts on your future. Starting with the box at the top of the flowchart, walk through hypothetical

decisions you could make during your life. Certain lifestyles are associated with a higher risk for negative health consequences, while other lifestyles have a lower risk for those same consequences. Choices made at each step have impacts that ripple out toward your future.



### Practice Your Skills

#### Make Decisions

Answer the questions in the flowchart and determine your level of risk in the activity. Look at each decision and analyze why you chose the path

that you did. What influenced your decision to make one choice over another?

For each scenario in the flowchart, write a short scene in which you decide to make the healthier decision. Use refusal skills and the facts you learned in this lesson to back up your decisions.

Vaping produces **secondhand aerosol**, which people nearby inhale. According to the US Surgeon General, secondhand aerosol from vaping can contain harmful chemicals such as nicotine, diacetyl, and heavy metals.

Concerns about the dangerous effects of secondhand smoke have led a number of states to pass laws banning smoking in many public areas. These laws protect the health of customers and staff. Some states have enacted similar laws to protect people from secondhand aerosol.

If you share the air with people who are smoking or vaping, taking certain steps can reduce your risk of exposure to secondhand smoke and aerosol:

- Avoid spending time in places that allow smoking and vaping.
- Do not accept car rides from people who smoke or vape while driving.
- Ask that people smoke or vape only outdoors or in a particular room sealed off from the rest of a home or building.
- Increase air circulation in buildings where people smoke or vape by opening the windows to let in fresh air.
- Perhaps most importantly, encourage a friend or family member who smokes or vapes to stop and support the person's efforts toward quitting.

#### **secondhand aerosol**

suspension of fine particles that people inhale involuntarily when someone nearby is vaping

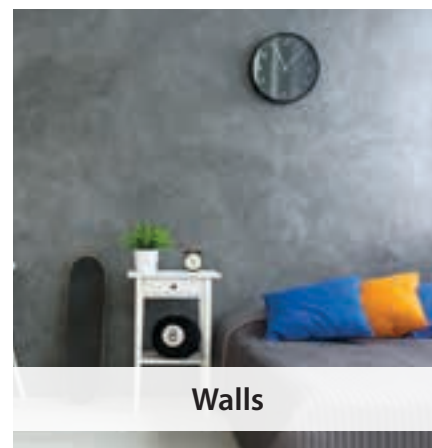
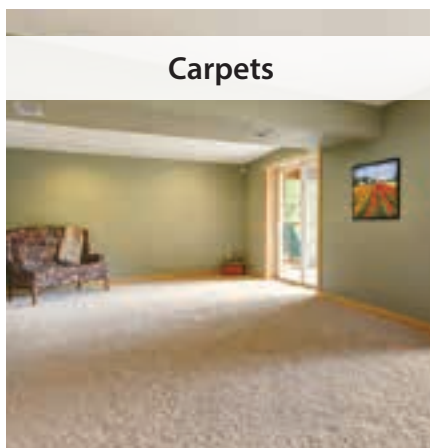
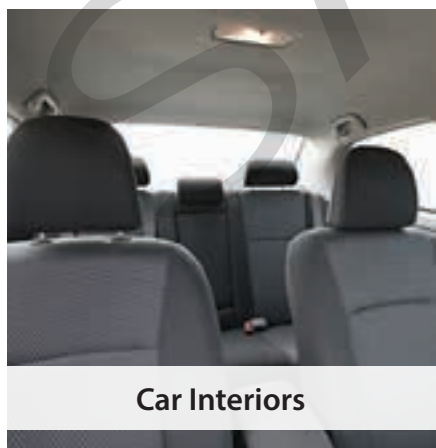
## Thirdhand Smoke and Aerosol

**Thirdhand smoke** refers to the particles and gases left over after a cigarette is extinguished. Similarly, the particles and gases left over from a vaping device are called *thirdhand aerosol*. The particles in thirdhand smoke and aerosol land and remain on virtually any surface in the area where someone has smoked or vaped (**Figure 11.10**). Exposure to thirdhand smoke and aerosol can lead to serious diseases such as asthma and cancer. These chemicals can even become more dangerous over time.

#### **thirdhand smoke**

particles and gases left over after someone smokes a cigarette; remains on surfaces nearby

### Thirdhand Smoke and Aerosol



**Figure 11.10** The particles and gases left over from cigarettes and vaping devices remain on nearby surfaces and are difficult to clean away.

Left to right: Peter Gudella/Shutterstock.com; Artazum/Shutterstock.com; Photographee.eu/Shutterstock.com



Eliminating thirdhand smoke and aerosol is extremely challenging. Common cleaning methods such as vacuuming, wiping down surfaces, and airing out rooms do not eliminate the residue. Particles remain behind, even after the smell fades. This means that people often are not aware of their exposure to thirdhand smoke and aerosol.

The best way to avoid thirdhand smoke and aerosol is not to allow someone to smoke or vape around you, including in your home or car. You can also protect yourself by showering after exposure to thirdhand smoke or aerosol and opening the windows in your car or home if someone is smoking or vaping. In addition, tell other people about the dangers of thirdhand smoke and aerosol. Many people who smoke or vape do not realize they are harming those around them.

## Lesson 11.1 Review

### Know and Understand

1. Explain the difference between combustible and noncombustible tobacco products.
2. How does nicotine use impact cardiovascular health, immediately and in the future?
3. Describe how nicotine use leads to addiction.
4. What respiratory conditions does smoking cigarettes cause? Choose one condition and describe it in your own words.
5. Which chemical in vaping aerosol can cause popcorn lung?
6. What kind of cancer is associated with using smokeless tobacco?

7. Describe the difference between secondhand and thirdhand smoke and aerosol.

### Think Critically

8. Why do many teens think vaping is harmless?
9. Explain how using tobacco products negatively impacts mental health, family health, and social relationships.
10. How could the legal issues associated with using tobacco products affect your future?
11. How does addiction to tobacco impact a person's community?



### REAL WORLD Health Skills

**Advocate for Health** Talk to your parent or guardian about any relatives who have been affected by diseases associated with using tobacco. Use effective communication skills to start this conversation and ask questions to clarify information.

Then, using the information you learn, write a letter to your fellow students about the impact tobacco use can have on a person's life. Use vocabulary your peers will understand and tell the story of one of your family members to influence your peers to make positive health choices.

# Preventing and Treating Tobacco Use

## Essential Question?

What can you do to protect yourself from nicotine addiction?

## Lesson 11.2

### Learning Outcomes

After studying this lesson, you will be able to

- analyze the influences that affect whether or not a person uses tobacco;
- analyze the government's role in preventing tobacco use and encouraging quitting;
- practice skills for resisting tobacco and preventing tobacco use;
- assess the difficulty of quitting tobacco use; and
- summarize strategies used to quit tobacco use.

### Key Terms

laryngectomy  
nicotine replacement  
public service  
announcements  
(PSAs)  
response substitution  
stimulus control

### Warm-Up Activity

#### Differences in Smoking Rates

**Analyze Influences** The table that follows shows differences in smoking rates among US adults based on gender, race, education, and income. Working in groups, choose one of the four factors and brainstorm reasons your group thinks these differences exist. Discuss the listed reasons and explain how the factor can influence a person's likelihood of using tobacco. Present your complete list of reasons and summary of the factor's influence to the class.

Gender	Race/Ethnicity
15.8% adult men 12.2% adult women	24% American Indians/Alaska Natives 15.2% Caucasians 14.9% African Americans 9.9% Hispanics 7.1% Asian Americans
Level of Education	Income
36.8% GED certificate 18.7% high school diploma 7.1% undergraduate degree 4.1% graduate degree	21.4% income less than \$35,000 15.3% income \$35,000–\$74,999 11.8% income \$75,000–\$99,999 7.6% income greater than \$100,000

The many negative health consequences of using tobacco products discourage people who prioritize their health from smoking, vaping, and chewing tobacco. Still, some people choose to use tobacco products despite the consequences. Fortunately, there are strategies you can use to prevent tobacco use in your personal life and community. Knowing about treatment options for people with an addiction to nicotine can help you advocate for the health of your family, friends, and community.

# Factors Affecting Tobacco Use and Misuse

People choose to use tobacco products for a number of reasons. The environment and a person's experiences influence these reasons. Risk factors and protective factors for tobacco use include the following.

## Individual Factors

Individual factors are the factors related to your identity and behaviors. These factors include genetic makeup, mental health, and stage of development.

Genetic makeup influences how likely a person is to develop an addiction to nicotine. Researchers have identified several genes that impact risk for nicotine addiction. This means that having a family history of nicotine addiction increases a person's risk for developing a substance use disorder using tobacco products.

Some teens smoke, vape, or chew tobacco in an attempt to manage their mental health. Teens may feel stressed at school and turn to smoking or vaping as a way to relax. They may also be trying out a new identity. Teens may associate using tobacco with maturity, sophistication, glamour, rebellion, or toughness. Mental health conditions can increase the risk of nicotine addiction in teens. Rather than turning to tobacco products, people with mental health conditions and mental illnesses need to seek professional treatment.

Another individual factor that influences risk is stage of development. Teens are at increased risk for addiction because their brains are still developing.

## Environment

Your environment includes your family, culture, peers, community, and the media (Figure 11.11). All of these components affect your risk for using tobacco.

**Figure 11.11** You are much more likely to use tobacco if celebrities you follow or people in your friend groups, culture, school, family, or neighborhood use tobacco or are open to using tobacco. *What other people in your environment may influence your perspective on tobacco?*

## Attitudes about Tobacco in Your Environment



s/Shutterstock.com; Diego Cervo/Shutterstock.com; andrey\_l/Shutterstock.com



## Rates of Tobacco Use Around the World

Many factors influence rates of tobacco use around the world. Rates of tobacco use vary by country, sex, race and ethnicity, and age, to name a few.

Rates of smoking vary considerably by country. People who live in higher-income countries are less likely to smoke than those who live in low-income countries. One explanation for this difference is that people with higher incomes tend to have higher levels of education. People with higher levels of education may be more aware of the health hazards of using tobacco.

Rates of smoking also vary by sex. In most countries, males are more likely to smoke than females. Health experts believe these differences may reflect different gender roles. For example, some

parts of the world may view females smoking as less acceptable than males smoking. In addition, females may not have access to money or be able to afford cigarettes in some countries.

Rates of smoking are higher in some age groups than in others. Only about 10 percent of adults ages 18–24 smoke, compared to about 16 percent of adults ages 25–64. Smoking is less common (8.2 percent) in adults ages 65 and older.

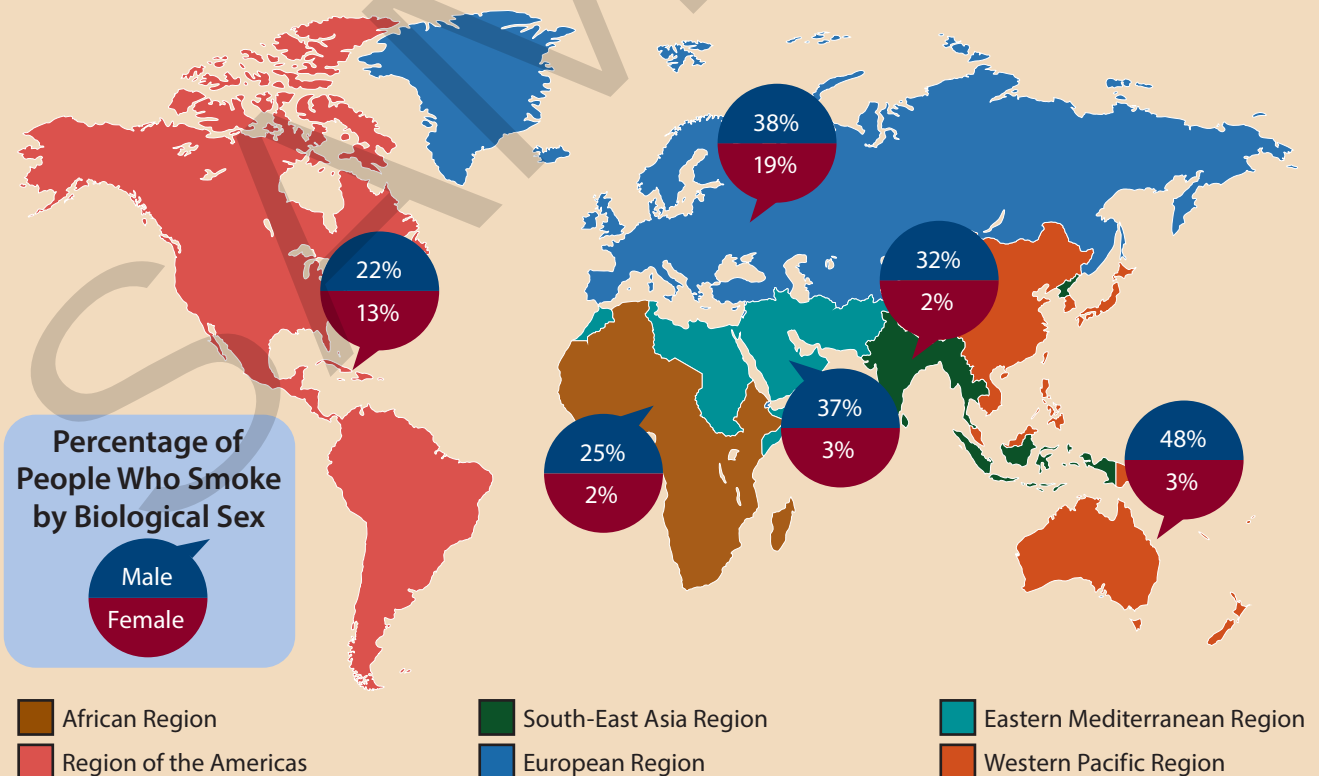
Vaping rates around the world are growing rapidly. The US, Japan, and the United Kingdom currently have the highest rates. Given the health risks of vaping, some countries have banned the use or sales of vaping devices completely. These countries include Chile, Nicaragua, Egypt, and Singapore.

### Practice Your Skills

#### Analyze Influences

Study the illustration of smoking rates in different regions of the world, according to the World Health Organization (WHO). What do you observe? What are the similarities between different world regions? What

are the differences? List the reasons you think may contribute to different rates of smoking in different parts of the world. Then, compare your reasons with those of a partner. How could you test which factors have the biggest influence? What are some questions health researchers could be testing? Describe how knowing these factors could help reduce tobacco use.



Andrei Minsk/Shutterstock.com

Social factors influence whether teens smoke, vape, or chew tobacco. Teens are much less likely to use tobacco products if their families set clear expectations. Teens whose family members or cultures strongly oppose tobacco use are less likely to use tobacco products.

Teens with friends who smoke, vape, or chew tobacco are also much more likely to use tobacco products themselves. Teens may experience peer pressure to use tobacco. They may worry others will not like or accept them if they choose not to (Figure 11.12). Real friends, however, do not want their friends to endanger their health.

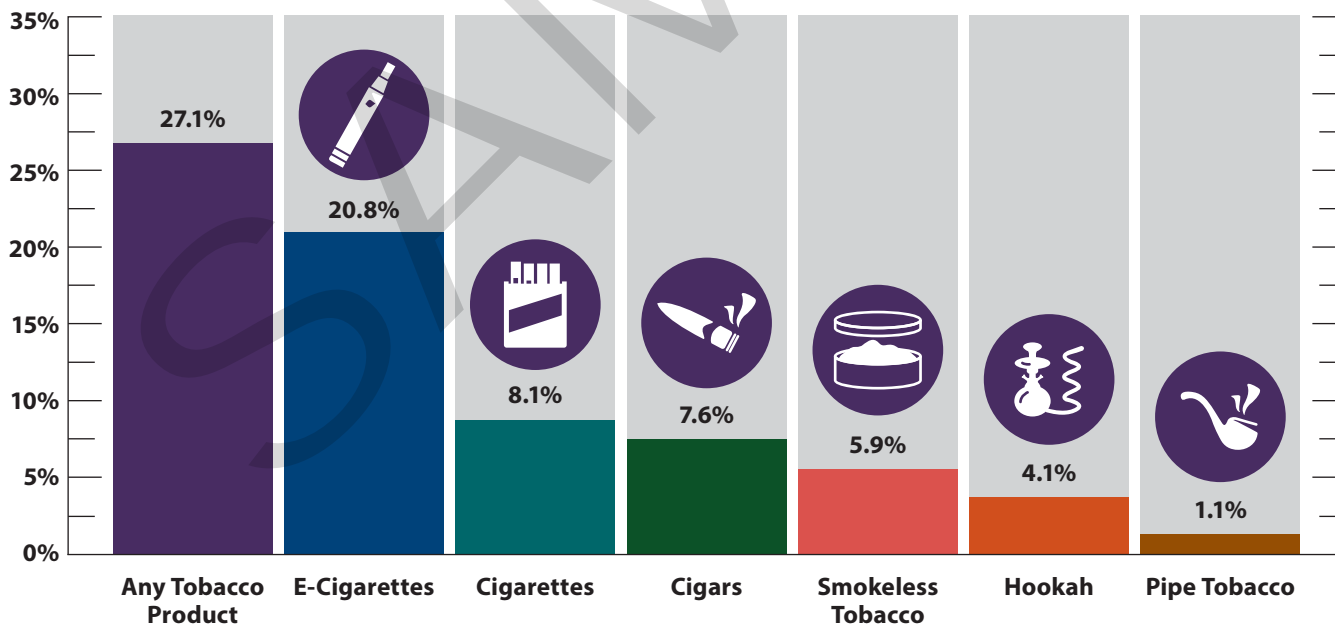
Another environmental factor is the community in which people live. Communities with violence, less education, and financial struggles often show higher rates of tobacco use. The availability of tobacco products within a community also affects whether teens and adults will use tobacco.

The media is an important part of people’s environment. People often look to celebrities for ideas about fashionable clothing, new hairstyles, and lifestyle choices like tobacco use. Teens also imitate the behaviors of their peers on social media. Social media, however, only tells a small portion of a person’s story. It may not capture the serious health consequences of tobacco use immediately and in the future.

## Preventing Tobacco Use and Misuse

Did you know that most adults who smoke picked up the habit when they were teens? Avoiding a lifetime of tobacco use starts now, with the decisions you make today.

### Tobacco Product Use Among High School Students in 2018



Gentzke AS, Creamer M, Cullen KA, et al. Vital Signs: Tobacco Product Use Among Middle and High School Students — United States, 2011–2018. *MMWR Morb Mortal Wkly Rep* 2019;68:157–164.

**Figure 11.12** While cigarette use has declined among high school students, the use of e-cigarettes and other vaping devices has increased drastically. Sixty-six percent of teens believe the myth that their e-liquid is made of just flavoring.

*Why do you think so many high school students are willing to use vaping devices like e-cigarettes?*

Smoking costs society an estimated \$289 billion a year in healthcare costs. Given the serious threat to public health, governments have strategies to regulate the sale, use, cost, and advertisement of tobacco products (Figure 11.13). Organizations have created mass media campaigns and **public service announcements (PSAs)** discouraging tobacco use.

Successful campaigns emphasize short- and long-term health effects, strategies for refusing tobacco, and the fact that most teens do not use tobacco. Teens who regularly see these advertisements and campaigns are less likely to use tobacco products.

Ultimately, the decision about whether or not to use tobacco products lies with you. You can use several skills to protect yourself from tobacco use and misuse. These include building healthy relationships, learning strategies for managing stress, thinking critically about the media you see, and using refusal skills.

## Build Healthy Relationships

Many teens feel pressure to use tobacco products if they have close friends who engage in this behavior. Fitting in during social situations if other people are smoking, vaping, or chewing tobacco and you are not can be difficult. In healthy friendships, however, your friends respect the choices you make and do not pressure you. People choose friends because they enjoy spending time with them, not because they use tobacco products.

If your friends do not respect your decision to avoid tobacco products, focus on developing other friendships. Perhaps you have grown apart from some of your other friends. Try to form friendships with people who respect you and accept your choices.

## Learn to Manage Stress

Some people start using tobacco products to relieve stress. Smoking, vaping, or chewing tobacco may help them relax or not worry about a difficult situation. Using tobacco ends up increasing stress, however. An addiction to nicotine causes more issues than it solves and has negative mental and social consequences. Fortunately, there are many ways of managing stress that are more effective and do not have negative health consequences. Instead of using tobacco products, try the following methods for managing stress:

- **Listen to music:** Create a playlist of songs that help you relax and feel good. Listen to this playlist when you are feeling anxious or need to reduce stress.
- **Talk to a friend:** Find a friend who is a good listener and reach out to that person when you are feeling stressed. Social support is one of the best ways to manage stress.

**public service announcements (PSAs)**  
media messages that support public health

# Government Regulations on Tobacco Products

## Bans on the sale of tobacco products

The sale of tobacco is prohibited to anyone younger than 21 years of age. Government programs also banned the sale of all candy- and fruit-flavored cigarettes and the sale of cigarettes in vending machines in places where minors are allowed.

## Bans on smoking and vaping in public places

Some states have laws banning smoking and vaping in public places. These laws reduce exposure to secondhand smoke and aerosol and reduce triggers for people trying to quit nicotine.

## Taxes on tobacco products

Federal, state, and municipal governments have set high taxes on the purchase of tobacco products, decreasing their sale, especially among teens.

## Warnings on packages and advertisements

All tobacco product packaging and advertisements must contain warnings stating the risks associated with tobacco use.

## Bans on advertising

Tobacco companies are banned from producing TV, radio, magazine, and newspaper advertisements for their products.

**Figure 11.13** Restricting the ability for teens to buy and use tobacco products is an effective way for the government to prevent nicotine addiction.

- **Get physical activity:** All types of aerobic physical activity—from jogging to playing basketball to dancing—cause your body to release *endorphins*, or chemicals that make you feel better. Physical activity is also good for physical health.
- **Do a simple activity:** Focusing on a simple activity that is not stressful can help relieve stress. Try doing an activity with your hands, such as coloring or woodworking. This will distract you from whatever is stressing you and help you relax.


## Think Critically

Advertisements for cigarettes, vaping devices, and smokeless tobacco try to make these products look attractive. Companies that sell tobacco products cannot advertise on TV, radio stations, or billboards. Because an estimated 480,000 people die every year from diseases caused by tobacco in the US, tobacco companies have to use sneaky strategies to persuade people to use their products. Fortunately, critical thinking can help you recognize the tobacco industry’s sneaky practices and avoid being tricked.


Most people today know that cigarettes are dangerous. Since this knowledge has spread, tobacco companies have changed the types of products they sell to appeal to young people. Some tobacco products look like mints, toothpicks, electronic devices, breath strips, and flavored candy. These products have names that resemble sugary snacks more than addictive tobacco products. To advertise these products, some tobacco companies mimic popular social media trends to appeal to young people.

To resist these strategies, use critical thinking skills to analyze tobacco products and the messages from tobacco companies (**Figure 11.14**). People who understand the manipulative nature of tobacco advertisements resist them better. Analyzing advertisements can remind you about the serious consequences of tobacco use.

## Analyzing Advertisements



1. Identify that the content is an ad. Sometimes, especially on social media, it can be difficult to tell what content is sponsored.
2. Identify the product or service being sold.
3. Identify the target audience for the ad. How old are the actors?
4. Identify the advertising techniques used. What mood or feeling is portrayed? Does the ad use happy or fun, fast music? flashy graphics? modern culture references?



Left to right: Mike Orlov/Shutterstock.com; Soifer/Shutterstock.com

**Figure 11.14** Smoking and vaping advertisements are designed to make tobacco products appear cool and harmless.  
*What about the advertisements shown makes vaping seem harmless?*

## Use Refusal Skills

Refusal skills can help you avoid using tobacco and make decisions that benefit your health now and in the future. If you do not want to use tobacco products or want to quit using tobacco, spend time with people who feel the same. Make sure the people around you know you do not want to use tobacco products or inhale their secondhand smoke and aerosol. Firmly explain the reasons behind your decision. Then stick to your decision and refuse to give in (**Figure 11.15**).

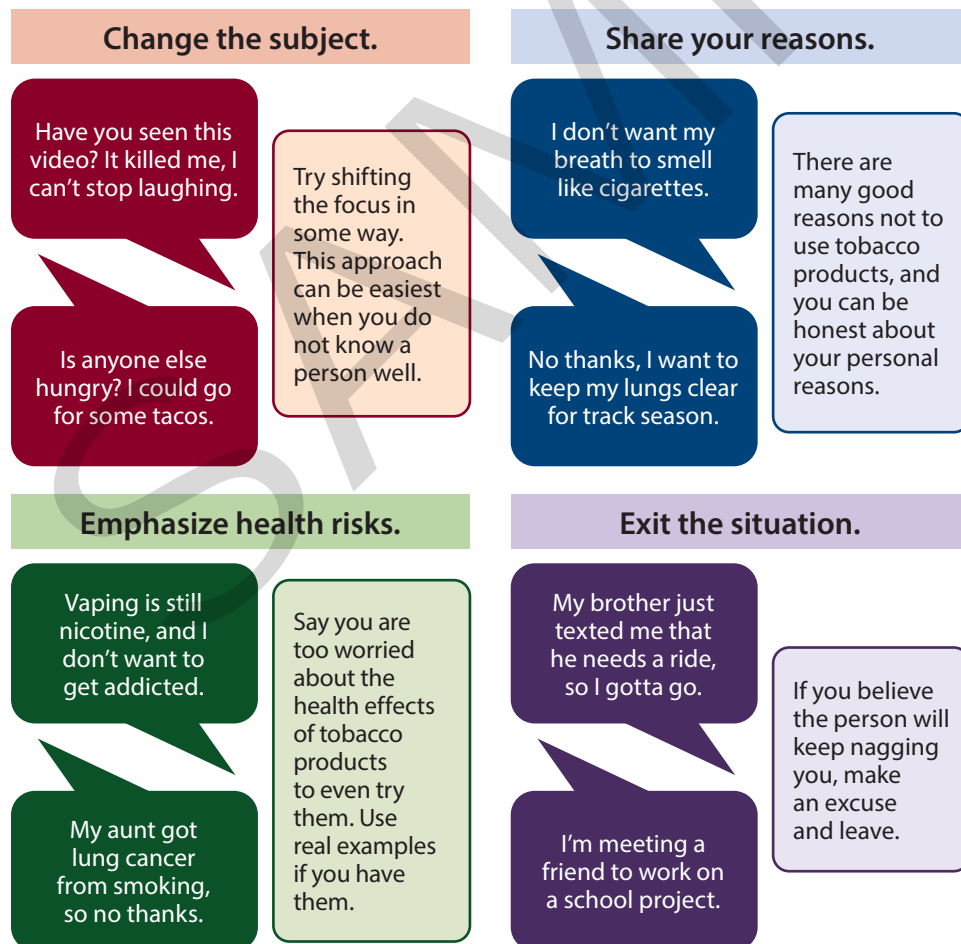
Sometimes teens worry that people will not like them if they choose not to use tobacco. Remember that your true friends will support your decision. If you have a friend who judges or leaves you out because you do not use tobacco, that friendship is not worth keeping. True friends will support your decision and respect you for who you are.

## Treating Tobacco Use and Misuse

A nicotine addiction is hard to break. Even people who experience life-threatening, smoking-related illnesses have difficulty quitting. For example, about 40 percent of people who have had a laryngectomy continue to smoke. A **laryngectomy** is a surgical procedure that removes the larynx, requiring a person to breathe through an opening in the neck.

**laryngectomy** surgical procedure that removes the larynx, requiring a person to breathe through an opening in the neck

### Approaches to Refusing Tobacco



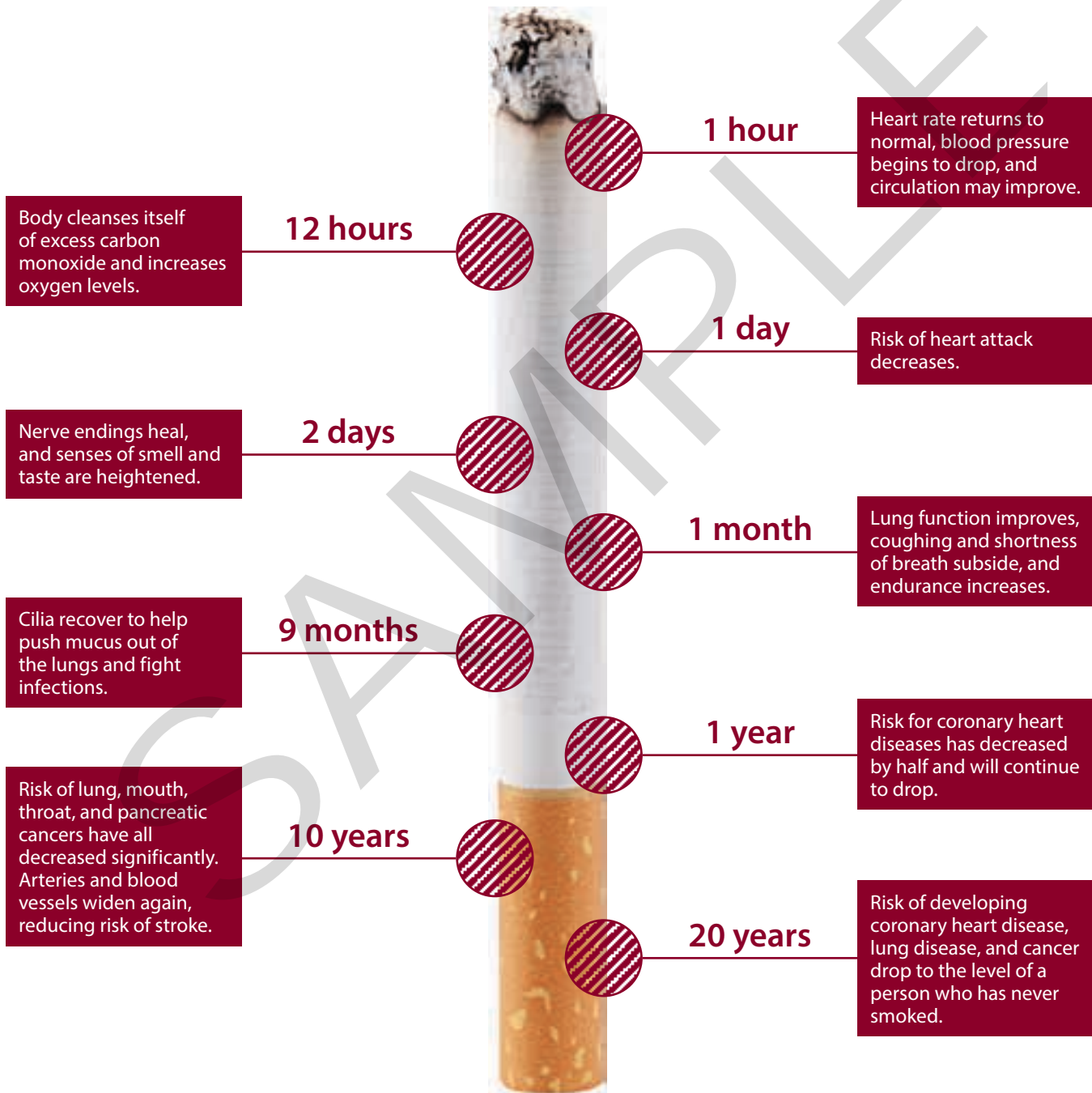
**Figure 11.15** Before you face situations in which someone offers you tobacco, imagine various situations and how you might respond. Play out each situation in your mind and practice different responses.



This procedure is typically performed when a person has cancer of the larynx. Similarly, more than one-half of people who have had a heart attack or surgery resulting from lung cancer continue to smoke. Despite these statistics, it is never too late to stop using tobacco. People who successfully quit smoking experience many health benefits (Figure 11.16).

Although quitting tobacco is difficult, nicotine addiction can be treated. Treatment methods include nicotine replacement, medication, and self-management techniques.

## Benefits of Quitting Smoking Over Time



Voronina Svetlana/Shutterstock.com

**Figure 11.16** Some benefits develop after just a few hours or days of quitting smoking. Other benefits accumulate within a year or more after quitting. These benefits increase the longer a person goes without using tobacco.



### Tobacco in the Media: Then and Now

A long time ago, tobacco companies advertised their products on TV and the radio, as well as in magazines and newspapers. After scientific data clearly demonstrated the very serious health consequences of tobacco use, however, bans forced tobacco companies to stop this type of advertising.

Today, tobacco companies still cannot advertise using these methods. Instead, they try to avoid these laws by using social media. On social media, tobacco companies pay *ambassadors* and *influencers* to post content and link followers to tobacco products. Sometimes, posts by influencers do not even

mention tobacco, but advertise upcoming parties or events where people promote or give away tobacco products. Teens may see these posts and not even recognize they are attempts at getting people to try tobacco products.

TV shows and movies also expose many teens to smoking, vaping, and chewing tobacco. In fact, 26 percent of movies rated G, PG, or PG-13 show tobacco use. It may seem harmless to simply see smoking or vaping in a movie. Research shows, however, that children and teens who see tobacco use in movies are more likely to start smoking.

### Practice Your Skills

#### Set Goals

Take a few minutes to think about why so many companies now use social media to advertise tobacco products. Then discuss with a partner why these ads lead to increased rates of tobacco use. Do you think these ads should be legal? Why or why not? Do you

think most teens recognize that these social media posts are advertisements designed to make money for tobacco companies? What strategies could help teens see through these techniques? With your partner, set five SMART goals to protect yourself from the impact of these advertisements. Share these SMART goals with the class, act on them, and evaluate how helpful they are.

## Nicotine Replacement

Some approaches to treating nicotine addiction rely on **nicotine replacement**. In this treatment, people who use tobacco continue to put nicotine into their bodies, which lessens their withdrawal symptoms and cravings, making it easier to quit. In this way, people who use tobacco gradually treat their addiction by using smaller and smaller amounts. Eventually, people find they are no longer dependent on nicotine. Commonly used nicotine replacement strategies are nicotine gum, the nicotine patch, and nicotine lozenges.

Companies sometimes market vaping devices like e-cigarettes as a nicotine-replacement tool for people who want to quit smoking. Unlike nicotine patches and lozenges, vaping devices have not been approved by the US government as a successful and safe form of smoking cessation.

#### nicotine replacement

treatment for nicotine addiction that continues to put some nicotine into the body; lessens withdrawal symptoms and cravings, making it easier to quit

## Medications

Sometimes medications prescribed by a doctor help people quit using tobacco. These medications usually simulate *dopamine*, the chemical the brain releases in response to nicotine. People who take these medications cope better with withdrawal from nicotine.



## Skills for Health and Wellness

### Refusing Tobacco

Even if your friends do not smoke, vape, or chew tobacco, you may find yourself in a situation where others want you to use tobacco products. In a situation like this, the choice you make will impact your health in the moment and for years to come.

Smoking, vaping, or chewing tobacco even one time can harm your health and lead you on the path to a serious addiction. Do you know what you would say if one of your classmates offered you tobacco?



### Practice Your Skills

#### Communicate with Others

Partner with two of your classmates to form a group of three. Then, in your group, role-play a situation in which two of your friends want you to smoke, vape, or chew tobacco. During your refusal, follow these steps:

1. Reflect on what you have learned about the harmful effects of tobacco and nicotine.
2. If your friends are using tobacco, express concern. You might say, "I don't want to see you get sick."
3. State your refusal. Sometimes a simple "No, I don't smoke" is enough to end the conversation. If it is not, try giving a reason, telling a story, asking a question, or changing the subject. Make eye contact and speak firmly. You might say:

- "My dad has lung cancer because he smoked. There's no way I'm trying that."
- "If my family finds out, I'll get grounded and won't be able to go to the concert."

4. Stick to your refusal. Think about the consequences of tobacco use. Are the long-term health effects really worth trying a new vape flavor or fitting in? State your refusal as many times as you need to and leave the situation, if needed.

Rotate roles in the role-play and practice using three to five different phrases to state your refusal. Afterward, discuss which statements were most and least effective. Also discuss what it means if you have to leave a situation because your friends keep pressuring you to use tobacco. If your friends do not respect your decision, are they really your friends?

## Self-Management Strategies

Self-management strategies involve identifying situations that trigger the desire for tobacco use and developing techniques to resist temptation. Once people who use tobacco understand situations or feelings that lead them to want to use tobacco, they can respond with two techniques—stimulus control and response substitution. **Stimulus control** is trying to avoid tempting situations and managing feelings that lead to nicotine use. With **response substitution**, people respond to difficult feelings and situations using stress management, relaxation, and coping skills instead of tobacco use.

If you are trying to quit using tobacco, you can take the following steps to use self-management strategies:

1. Set a "quit date" within the next month and note that date on your calendar. Make a strong commitment to actually stop using tobacco on that date.
2. Tell friends and family members about your quit date and ask them to support your efforts. Ask people who smoke, vape, or chew tobacco not to do so around you.
3. Get rid of tobacco products and their accessories in your environment. Avoid exposure to tobacco advertisements on social media.

#### stimulus control

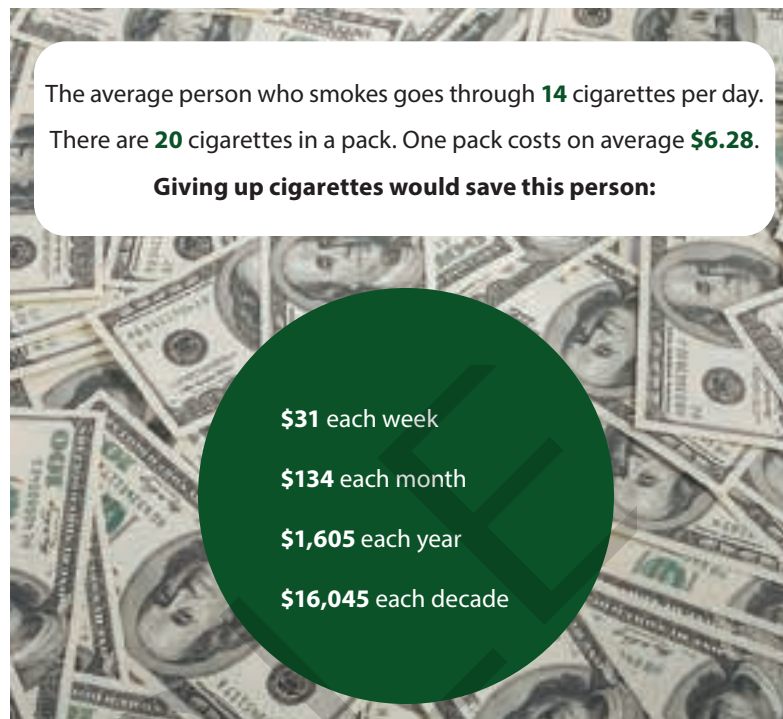
treatment for nicotine addiction that involves avoiding tempting situations and managing feelings that lead to nicotine use

#### response substitution

treatment for nicotine addiction where people practice responding to difficult feelings and situations using stress management, relaxation, and coping skills instead of tobacco use

4. Develop strategies for coping with nicotine cravings, such as getting physical activity, chewing gum, or keeping busy with other activities.
5. Develop strategies for refusing offers of tobacco products from other people.
6. Remind yourself of the benefits of quitting, including a longer life, more spending money, and increased stamina.
7. Reward yourself for quitting. Buy something with the money you saved by not using tobacco (Figure 11.17).
8. If you slip up, quickly renew your focus on the goal of quitting. Do not let one lapse lead to a return of the old behavior.

To assist and support someone showing signs and symptoms of tobacco use or misuse, you can encourage self-management strategies. You can also encourage the person to get help from a parent, other trusted adult, or school counselor.



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**Figure 11.17** Depending on the price of cigarettes in your area and how often you smoke, smoking can be a costly habit. *What would you spend \$134 on every month instead of cigarettes?*

## Lesson 11.2 Review

### Know and Understand

1. Compare and contrast the influence of a person's social relationships on tobacco use.
2. List one step your state's government has taken to reduce tobacco use.
3. Identify one effective stress-management strategy to prevent tobacco use or misuse.
4. What three methods are used to treat nicotine addiction?
5. What support is available for people who have trouble quitting nicotine?

### Think Critically

6. What role has your family and culture played in influencing whether you use tobacco?
7. Give one example of a refusal and analyze how it could help you avoid using tobacco.
8. What do you think schools and communities can do to help reduce tobacco use among teens?

### REAL WORLD Health Skills

**Access Information** Visit a local store or search online to determine the average prices of vaping devices. If an individual vapes one pod each day, how much money would the person spend on vaping for one week, one month, one year, and five years? Also include the initial cost of purchasing a vape starter kit. What other activities could you do with the money spent on vaping? Write a social media post about your findings.

## Chapter Summary

A tobacco product is any product made or derived from tobacco and intended for human consumption. One thing almost all tobacco products have in common is they contain nicotine, which is a highly addictive substance. Nicotine is also toxic and has severe effects on multiple body systems.

Cigarettes and cigarette smoke contain thousands of chemicals and toxic substances that harm the body. People who smoke have a higher risk for developing osteoporosis, ulcers, fertility issues, and gum disease. Smoking also damages the respiratory system and makes breathing more difficult.

While some people see vaping as a harmless alternative to smoking cigarettes, vaping poses several health risks. Vaping devices heat e-liquid, which is made of many chemicals, into an aerosol that people inhale. Inhaling the chemicals in aerosol can lead to respiratory conditions, including inflammation and long-term lung damage.

The harmful effects of the nicotine and carcinogens found in smokeless tobacco are the same as if they were smoked. When using smokeless tobacco, people absorb nicotine and other chemicals through their mouth tissues. This can lead to leukoplakia, oral cancer, cardiovascular disease, respiratory irritation, gum disease, and tooth decay.

Using tobacco impacts not just a person's body, but also a person's mind and social relationships. In addition, teens who use tobacco can experience serious legal consequences and may face disciplinary actions at school. Smoking and vaping can also impact the health of other people by releasing substances into the air they breathe. Exposure to secondhand and thirdhand smoke and aerosol can increase the risk of developing serious diseases and health conditions.

People's choices to use tobacco products can be influenced by their environment and experiences. You can use several skills to protect yourself from tobacco use and refuse tobacco products. These include building healthy relationships, learning strategies for managing stress, thinking critically about the media you see, and using refusal skills.

A nicotine addiction is hard to break. Treatment methods include nicotine replacement, medication, and self-management techniques. Some people need additional support to quit using nicotine. People can find this support through individual or group counseling; a school counselor, doctor, teacher, or trusted adult; telephone or online helplines with free counseling; and online resources.

## Vocabulary Activity

As a class, divide into two groups and assign each group one lesson in this chapter. In your group, review your assigned lesson and the main ideas and key terms introduced. Ask your teacher if you are not sure which ideas are most important. Create a multimedia presentation that uses text, photos and illustrations, and music to summarize the main ideas in the lesson. Use all of the key terms from the lesson in your summary. Present your interactive summary to the class and adapt your vocabulary as needed to respond to questions and clarify information. Then switch roles.

<i>aerosol</i>	<i>laryngectomy</i>	<i>secondhand aerosol</i>
<i>asthma</i>	<i>leukoplakia</i>	<i>secondhand smoke</i>
<i>carbon monoxide</i>	<i>nicotine</i>	<i>smokeless tobacco</i>
<i>carcinogens</i>	<i>nicotine replacement</i>	<i>stimulus control</i>
<i>chronic bronchitis</i>	<i>popcorn lung</i>	<i>tar</i>
<i>chronic obstructive pulmonary disease (COPD)</i>	<i>public service announcements (PSAs)</i>	<i>thirdhand smoke</i>
<i>e-liquid</i>	<i>response substitution</i>	<i>tobacco</i>
<i>emphysema</i>		<i>vaping devices</i>

## Review and Recall

Review the information in this chapter by answering the following questions.

- The addictive, toxic substance present in all tobacco products is called
  - carcinogen.
  - carbon monoxide.
  - adrenaline.
  - nicotine.
- What is the most common form of tobacco use among teens today?
- What is tolerance, and how does it drive a nicotine addiction?
- Define *adrenaline*. How does nicotine affect adrenaline and the body?
- How can tobacco use affect appearance?
- Which chemical does nicotine cause the brain to release, leading to a pleasurable sensation?
- Why are teens especially sensitive to the effects of nicotine?
- Describe how tar affects the lungs.
- Why is it difficult for scientists to study the long-term effects of inhaling the chemicals contained in vaping aerosol?
- Why is it misleading to say that the chemical flavorings in e-liquids are generally recognized as safe (GRAS)?
- Why is it difficult to eliminate thirdhand smoke and aerosol?
- What is one commonly used nicotine replacement strategy?
- Which of the following is *not* an effective self-management strategy to help stop using nicotine?
  - setting a “quit date”
  - punishing yourself if you slip up
  - asking friends and family to support your efforts
  - rewarding yourself for quitting

## Standardized Test Prep

### Reading and Writing Practice

Read the passage below and then answer the following questions.

Many teens do not realize how harmful vaping is to health. According to a survey conducted by Gallup in 2018, 82 percent of people ages 18–29 think smoking is very harmful to health. In contrast, only 22 percent considered vaping very harmful to health.

Contrary to these beliefs, research shows that vaping increases the risk a teen will smoke cigarettes. In fact, high school students who vape are seven times more likely to report smoking six months later. In addition to nicotine, which can lead to addiction, vaping e-liquids contain harmful chemicals. The number of reported lung illnesses related to vaping has been growing. Some of these illnesses have occurred in people vaping nicotine, and others have developed in people vaping marijuana. Typically, symptoms of these lung illnesses include shortness of breath and chest pain.

- Which of the following is *not* a health risk associated with vaping?
  - nicotine addiction
  - increased likelihood of smoking
  - tar in the lungs
  - shortness of breath
- Do lung illnesses related to vaping only occur in those vaping nicotine? Defend your answer.
- Which statement best describes the main point of this passage?
  - Vaping is more dangerous than smoking.
  - Most people do not know vaping is harmful.
  - Contrary to people’s beliefs, vaping can harm health in several ways.
  - Scientists are still studying the health effects of vaping.

# Chapter 11 Skills Assessment



## Critical Thinking Skills

Answer the following questions to assess your knowledge of what you learned in this chapter.

1. Why do you think vaping devices might be more appealing to teens than regular cigarettes?
2. Explain how exposure to nicotine during pregnancy can impact the developing fetus.
3. Consider the effects of tobacco use on healthy behaviors such as physical activity, nutrition, and sleep. What negative effects might tobacco use have on healthy behaviors? Explain.
4. Can you think of any places where you might frequently encounter secondhand smoke or aerosol? What are some ways you can protect yourself from it?
5. Discuss the connection between tobacco use and mental illness. Do you think people with mental illnesses are more likely to use tobacco? Do you think people who use tobacco are more likely to develop mental illnesses? Explain your answer.
6. What other behaviors and characteristics do you associate with smoking or vaping? How do you think those associations could affect your decisions?
7. Do people in your community have mostly positive or mostly negative perceptions of tobacco use? How might people's perceptions of tobacco use change in different types of communities?
8. Talk with your family to find out about relatives who have been affected by diseases associated with tobacco use. Make a list of family members, their diseases, and whether or not they used tobacco. Discuss the influence that tobacco use may have had on these family members and their health.
9. How do parents' behaviors and attitudes about tobacco influence their children's future decisions about tobacco use?
10. What are your state's laws about the use and misuse of tobacco? How do these impact you and the community?
11. Create a public service announcement (PSA) about the dangers of vaping. Make sure to include at least two of the following: short- and long-term health effects, refusal strategies, or usage statistics.
12. Research a product or medication commonly used to help people quit tobacco use. How effective do you think this product is? Explain your reasoning.
13. Over time, the health consequences of tobacco use have become better known. How do you think this information might relate to the number of people who use or used to use tobacco in different age groups? Do you think rates will change over time? Explain.



## Health and Wellness Skills

Complete the following activities to assess your skills related to health and wellness.

14. **Analyze Influences.** Friends, family, and the media can have a strong influence on whether people use tobacco. Over the last two or three days, what factors have influenced you to use or not use tobacco products, including vaping devices? Identify and list the factors you have observed. Has there been any recent national or state legislation to reduce risk factors and decrease tobacco use? Is there any new legislation you would propose to one of your local, state, or national officials? If so, what would that legislation be and how would it affect tobacco use?
15. **Access Information.** E-liquids in vaping devices contain many harmful chemicals. Using valid and reliable online and print resources, identify five chemicals commonly found in e-liquids and choose one to research. Evaluate the resources you find and use the most credible source. List other products that contain the chemical you chose and explain how this chemical can harm the body.
16. **Communicate with Others.** Peer pressure in schools can create a *social multiplier effect*, which is the concept that the behavior of peers establishes a perceived norm, which influences behavior. Because of this effect, it is difficult for people to defy the perceived norm. In small groups, research this effect and discuss how it is present in your school. Using communication skills, film a video in which you role-play ways to resist peer pressure (including the social multiplier effect) to make healthy decisions about tobacco use.

17. **Make Decisions.** List four myths you believed about tobacco use (including vaping) before reading this chapter. Then, list factual information from the chapter or other valid resources that dispels each myth. Reflect on how this newfound information will help you make healthier decisions regarding tobacco. Create a journal entry discussing your disproved myths and how they will affect your decisions.
18. **Set Goals.** Imagine one of your close friends shows signs and symptoms of tobacco use or misuse. Your friend is very stressed about school and started vaping after someone said it would help with the stress. Now, your friend needs to vape more often than before to feel the same effect. Create a script in which you assist and support your friend in setting a SMART goal to find needed help and make healthy decisions about vaping.
19. **Practice Health-Enhancing Behaviors.** Imagine that, during an after-school extracurricular activity, you go to the restroom to take a break. Two other students are in the restroom vaping. One offers you the vaping device and asks if you would like to try. Complete the dialogue that follows, using appropriate terminology and refusal skills to avoid this situation.

Student 1: "Hey, wanna take a hit? It's cotton candy flavor."

Your Response: \_\_\_\_\_

Student 2: "Don't be lame. It won't hurt you. Just try it."

Your Response: \_\_\_\_\_

Student 1: "Come on. It's safer than smoking. It's not even addictive."

Your Response: \_\_\_\_\_

Student 2: "You don't know what you're missing. Don't tell anyone we're here."

Your Response: \_\_\_\_\_

After completing the dialogue, find a partner and read and share your responses. Exchange feedback and critiques to make each response stronger.

20. **Advocate for Health.** Research some popular PSAs and choose three of your favorites. Consider why these PSAs are effective and then create your own PSA about the health effects of vaping, smoking, or using smokeless tobacco. Consider your target audience for the PSA and present it to the class.



## Hands-On Skills Activity

### Tobacco Use and Your Body

All tobacco products, including many e-liquids, deliver nicotine into the body. Nicotine is toxic and extremely harmful to a person's health. Body systems affected by nicotine include the cardiovascular, respiratory, nervous, digestive, immune, and reproductive systems. This activity will illustrate how using tobacco products can affect these body systems. For this activity, you will need craft paper, markers, pens or pencils, and reliable resources.

#### Steps for This Activity

1. Choose several classmates to work with and, as a group, choose one of the six body systems affected by nicotine. Your teacher may also assign a body system to your group.
2. **Access Information.** Using reliable resources, research the parts and pathways of your chosen body system and how nicotine affects this body system. Include whether or not nicotine's effects

are reversible once tobacco use stops. Your school's library media specialist can help you find resources, which might include books, journals, magazines, or websites. Remember to use websites with medically accurate information.

3. Draw an outline of the human body on a long, wide piece of craft paper.
4. Inside the body outline, draw and label the parts and pathways of your group's body system.
5. Outside the body outline, illustrate how nicotine affects this body system. Note whether or not the effects are reversible.
6. **Advocate for Health.** Hang your group's body poster in the hallway of your school to show other students the dangers of using tobacco. Obtain permission, if needed. You may also take a picture of your body poster and share it online. Use your poster to start a discussion with other students and support them in making positive health choices.