

# Communicable Diseases

## Chapter Preview

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### ▲ Working with the Photo

Preventing the spread of disease is a worldwide concern. Scientists spend many hours studying diseases in labs.

**Do you know some ways to prevent the spread of disease?**

# Start-Up Activities



## Before You Read

What do you know about STDs? Answer the Health eSpotlight question below and then watch the online video. Keep a record of your answers.



## Health eSpotlight



### The Truth About STDs

Learning the facts about sexually transmitted diseases (STDs) can help you avoid them. What is the best way for teens to avoid getting STDs?

Go to [glencoe.com](http://glencoe.com) and watch the health video for Chapter 18. Then complete the activity provided with the online video.

## FOLDABLES® Study Organizer



## As You Read

Make this Foldable® to help you record main ideas about the causes of communicable diseases. Begin with a plain sheet of 11" × 17" paper.

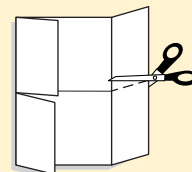
**1** Hold the paper like a placemat. Fold the short sides inward so they meet in the middle.



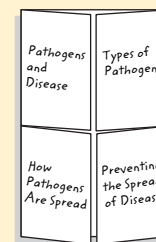
**2** Fold the top to the bottom.



**3** Open and cut along the inside fold lines. This makes four tabs.



**4** Label the tabs as shown.



Under the appropriate tab, summarize what you learn about pathogens and how to prevent communicable diseases from spreading.

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Health Inventory for Chapter 18.

# Lesson 1

## Preventing the Spread of Disease

### Guide to Reading

#### Building Vocabulary

Fold a sheet of paper in half, lengthwise. As you read this lesson, write each new term on the left side of the fold and its definition on the other side.

- disease (p. 478)
- communicable disease (p. 478)
- pathogens (p. 478)
- infection (p. 478)
- viruses (p. 479)
- bacteria (p. 479)
- fungi (p. 479)
- protozoa (p. 479)
- vector (p. 480)
- hygiene (p. 480)

#### Focusing on the Main Ideas

In this lesson, you will learn to

- **name** some causes of communicable diseases.
- **explain** how germs are spread.
- **describe** how to protect yourself against pathogens.

#### Reading Strategy

**Organizing Information** Create a table like the one shown below. As you read, describe how pathogens spread in the first column. In the second column, describe ways you can prevent spreading pathogens.

Pathogens	
How Pathogens Spread	Preventing the Spread of Pathogens

**FOLDABLES** Study Organizer Use the Foldable® on p. 477 as you read this lesson.

### Quick Write

How do you think people catch colds? Explain your answer.



### Common Diseases

You wake up with a runny nose and your eyes itch. Your throat is sore, you sneeze and cough, and your head aches. You have a cold. A cold is one kind of disease. A **disease** is *any condition that interferes with the proper functioning of the body or mind.*

A cold is a **communicable disease**, a disease that can be passed to a person from another person, animal, or object. The agents that cause communicable diseases are called pathogens. **Pathogens** are *disease-causing organisms that are so small they can only be seen through a microscope.* Pathogens are also known as germs. When germs enter your body, you can develop an infection. An **infection** is *a condition that occurs when pathogens enter the body, multiply, and cause harm.* **Figure 18.1** shows several kinds of pathogens and the diseases they cause.



▼ FIGURE 18.1

## COMMON PATHOGENS AND DISEASES THEY CAUSE

All communicable diseases are caused by pathogens. **What type of pathogen causes chicken pox?**

Pathogens	Diseases
Bacteria	Pink eye, pertussis (whooping cough), strep throat, tuberculosis, Lyme disease, most foodborne illnesses, diphtheria, bacterial pneumonia, cholera
Viruses	Colds, influenza, hepatitis, chicken pox, measles, mumps, mononucleosis, herpes, HIV/AIDS, fever, polio, rabies, viral pneumonia
Fungi	Athlete's foot, ringworm
Protozoa	Dysentery, malaria

### Types of Pathogens

Not all pathogens are alike, yet they can all cause diseases. As shown in Figure 18.1, there are four common pathogens:

- **Viruses** (VY·ruh·suhz) are *the smallest pathogens*. Viruses cause common diseases, such as colds and the flu. Most viral infections *cannot* be treated and cured with antibiotics.
- **Bacteria** are *tiny one-celled organisms*. Certain bacteria can be helpful. Bacteria that live in your digestive tract help you digest food. Other bacteria are harmful. They can cause diseases, such as strep throat and pneumonia. Most bacterial infections *can* be treated and cured by antibiotics.
- **Fungi** (FUHN·jy) are *organisms that are more complex than bacteria but cannot make their own food*. They are primitive life-forms that feed on organic materials. They thrive in warm, moist environments. Fungi cause ringworm and athlete's foot.
- **Protozoa** (proh·tuh·ZOH·uh) are *one-celled organisms that are more complex than bacteria*. Malaria is a disease caused by a protozoa that can live in mosquitoes. If an infected mosquito bites a person, the protozoa transfers into the body through the skin.



#### Reading Check

**Compare** How are bacterial infections different from viral infections?

- ▼ One way in which communicable diseases can be spread is through touch. **What is another way in which communicable diseases are spread from person to person?**





▲ When you immediately wash glasses, plates, or other utensils after using them, you keep bacteria from growing. **Is it important to use warm, soapy water when you wash dishes? Why or why not?**

## How Do Pathogens Spread?

Disease can occur when pathogens enter the body. Here are common ways pathogens are spread:

- **Direct contact with others.** Pathogens can spread directly from one person to another. For example, you can pick up a virus or bacteria by shaking hands with or kissing an infected person. Some pathogens are spread through sexual contact.
- **Indirect contact with others.** Pathogens can enter your body by sharing drinking glasses or eating utensils with an infected person. Pathogens can also be spread by contaminated needles used for tattoos, body piercings, and drug injection.
- **Contact with contaminated food and water.** Some pathogens infect people through contaminated food or water. Food that is improperly stored or undercooked provides an environment where pathogens can multiply. Illnesses people get from pathogens in food are called *foodborne illnesses*.
- **Contact with animals or insects.** Animals and insects can spread pathogens. *An organism, such as an insect, that transmits pathogens* is called a **vector**. For example, the bite of a tick can spread the virus that causes Lyme disease. Mosquitoes infected with the West Nile virus can spread that virus to birds, horses, and humans through their saliva.



**Recall** What are four ways that pathogens are spread?

## How to Keep Pathogens from Spreading

There is no way to completely avoid pathogens. However, you can help protect yourself from them by practicing good personal **hygiene**, or *cleanliness*. Here are some other actions you can take to help prevent the spread of pathogens:

- Eat nutritious foods. Get enough physical activity and rest.
- Avoid close contact with people infected with a communicable disease, especially if they are still contagious.



# Health Skills Activity

## Practicing Healthful Behaviors

### Keep Your Hands Clean!

One of the best ways of stopping pathogens from entering your body or spreading to others is to wash your hands frequently. Practice washing your hands thoroughly using the following steps:

1. Use warm water to wet your hands, and then apply soap.
2. Vigorously rub your hands together, scrubbing your whole hand for 30 seconds or more.
3. Rinse your hands thoroughly. Use a paper towel to turn off the water in public restrooms.
4. Use a clean towel or paper towel to dry your hands. In a public restroom, use a paper towel to open the door when you leave.



### With a Group

Create a poster encouraging students to wash their hands regularly. Include the handwashing steps listed above. With permission from school administrators, hang your poster in a school restroom or hallway.

- Never share eating or drinking utensils.
- Do not share toothbrushes or other personal hygiene items.
- Wash your hands thoroughly in warm, soapy water, especially before eating and after using the bathroom, playing with pets, or handling garbage.
- Avoid touching your mouth, nose, and eyes. Do not bite your nails.
- Handle and prepare food safely, especially poultry and fish. Wash vegetables and fruits and cook meat thoroughly.
- Wipe counters thoroughly with a clean sponge or cloth. Wash or replace the sponge or cloth frequently. If these items are dirty or overused, they can actually spread more germs than they remove.
- Keep your environment clean. Empty trash frequently. Keep trash cans clean.



### Reading Check

**Identify** Name five habits you can practice to keep yourself safe from pathogens.



## Helping Others Stay Healthy

You may be carrying pathogens and not even know it. When you come in contact with other people, these pathogens can easily spread. You can help protect the people around you from the spread of pathogens. Here are some healthful behaviors to practice:

- If you are ill, stay home from school and other public places. Avoid close contact with others.
- When you sneeze, cover your mouth and nose, and turn your head away from others. Wash your hands immediately.
- Do not share eating utensils, drinking glasses, toothbrushes, or other personal items.
- If a health care professional prescribes medicine for you, follow the directions exactly. Take all medicine that is prescribed.
- Again, prepare and store food safely. Wash vegetables and fruits and cook meat thoroughly. Always wash your hands before handling food.

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 1.



### Reading Check

**Explain** Give three suggestions for protecting others from the pathogens you could spread.



## Lesson 1 Review



### After You Read

**Review this lesson for new terms, major headings, and Reading Checks.**

### What I Learned

1. **Vocabulary** Define *infection*. Use it in a sentence.
2. **Identify** What is a communicable disease?
3. **Give Examples** What are four types of pathogens? Give an example of a disease caused by each kind.
4. **Describe** What are some ways that pathogens can be spread by indirect contact?

6. **Apply** Brendan is coughing and sneezing at school. What should Brendan do to help prevent the spread of pathogens? Explain your answer.

### Applying Health Skills

7. **Practicing Healthful Behaviors** Think of four behaviors that you can practice to help stop the spread of pathogens. Create a plan to practice two of these behaviors during the next week. Follow the plan and write a paragraph describing the results.

### Thinking Critically

5. **Analyze** Why do you think it is important for teens to practice good personal hygiene?

## Lesson 2

# The Body's Defenses Against Infection

## Guide to Reading

### Building Vocabulary

As you read this lesson, write each new term and its definition in a list. Then draw three or four circles. Within each circle, group related terms together.

- immune system (p. 483)
- immunity (p. 483)
- inflammation (p. 484)
- lymphatic system (p. 485)
- lymphocytes (p. 485)
- antigen (p. 486)
- antibodies (p. 486)
- vaccine (p. 486)

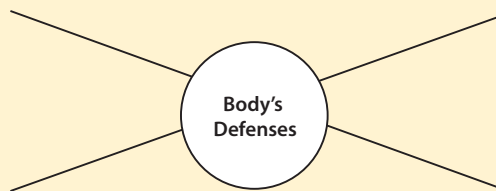
### Focusing on the Main Ideas

In this lesson, you will learn to

- **name** the body's first line of defense against pathogens.
- **describe** how the immune system functions.
- **explain** how antibodies protect the body.
- **practice** behaviors that keep your immune system healthy.

### Reading Strategy

**Sequencing** Draw a concept map that shows different ways your body works to defend itself from pathogens entering your body. Use Figure 18.2 on p. 484 as a guide.



## Your Body Defends Itself

Pathogens are everywhere. They are in the air you breathe, the water you drink, and on objects you touch. Most bacteria, viruses, and other pathogens never get the chance to make you sick. Your body has natural barriers between you and pathogens. Your body's five major barriers to pathogens are shown in **Figure 18.2**.

These barriers are your body's first line of defense. If a pathogen gets past them, your body's immune system responds. Your **immune** (i·MYOON) **system** is a combination of body defenses made up of the cells, tissues, and organs that fight off pathogens and disease. Your immune system has two main responses—the nonspecific response and the specific response. Together these responses provide **immunity**—your body's ability to resist the germs that cause a particular disease.

### Reading Check

**Explain** What is the function of the immune system?

### Quick Write

Think about a time you were ill and had a fever. How does a fever help your body fight an infection?





▼ FIGURE 18.2

## THE FIVE MAJOR BARRIERS

Barriers help keep pathogens out of your body. **Which barrier protects you from pathogens that might enter your body through your mouth?**

### •Tears

cover and protect the eye from dust and pathogens. As they flow, tears carry foreign material away from the eye. Tears contain chemicals that kill pathogens.

### •Mucous Membranes

are the soft skin that lines the nose, mouth, eyes, and other body openings. They are coated in a sticky material called mucus (MYOO-kuhs) that traps pathogens. When you cough, sneeze, or clear your throat, the pathogens trapped in the mucus are expelled.

### •Saliva

washes germs away from your teeth. It contains chemicals that kill pathogens trying to enter through your mouth.

### •Skin

provides a tough, outer protective surface that keeps pathogens from entering your blood. If you get a cut, burn, or scrape, pathogens can get past this barrier.

### •Stomach Acid

is a gastric juice produced by the lining of your stomach. It kills many of the pathogens that make it past the saliva and mucous membranes of your mouth.



## Nonspecific Immune Response

When pathogens enter your body, the immune system reacts with a nonspecific immune response. This response begins with inflammation. **Inflammation** is the body's response to injury or disease, resulting in a condition of swelling, pain, heat, and redness. The brain sends signals telling white blood cells to rush to the affected area and destroy the pathogens. Circulation to the area slows down.

With inflammation, the body starts producing a protein called *interferon* (in·ter·FIR·ahn) to stimulate the body's immune system. If pathogens multiply and spread, your body temperature may rise and cause a fever. A higher body temperature makes it harder for pathogens to reproduce. A fever also signals the body to produce more white blood cells to destroy the pathogens.



### Reading Check

**Explain** How does the body first respond to invading pathogens?



# Health Skills Activity

## Practicing Healthful Behaviors

### Keeping a Healthy Immune System

Good health habits can keep your immune system healthy. A healthy immune system means your body is better able to fight off infection. Commit to these habits to keep your immune system in top condition!

- Follow a healthful eating plan. Eat plenty of vitamin-rich fruits, vegetables, and whole grains.
- Participate in regular physical activity.
- Learn to manage stress in healthy ways.
- Get plenty of sleep. Rest strengthens your body's defenses.
- Avoid tobacco, alcohol, and other drugs.
- Drink plenty of water.
- Bathe and shower regularly.
- Get regular checkups from a health care professional.

### On Your Own

Using print or online resources, research other good health habits that can help you look and feel your best.

## Specific Immune Response

Some pathogens can survive the body's nonspecific response. When this happens, the body sets in motion a specific immune response. Each specific response is customized to attack a particular pathogen and its toxins. Our immune system can "recognize" pathogens it has already battled. Once our immune system creates a specific response, cells from that response are ready to attack when the pathogen reappears. As a result, the second response is much quicker than the first.

### The Lymphatic System

The **lymphatic** (lim·FA·tik) **system** is a secondary circulatory system that helps the body fight pathogens and **maintains** its fluid balance. The fluid circulating in the lymphatic system is called *lymph* (LIMF). The white blood cells in the lymphatic system are called **lymphocytes** (LIM·fuh·sytes). There are two main kinds of lymphocytes: B cells and T cells. B cells form in the bone marrow. T cells develop in the thymus gland.

### Academic Vocabulary

**maintains** (meyn TEYNS) (verb) continues or keeps up. *Simon maintains his health by participating in a variety of physically challenging activities.*



▲ Vaccinations protect the body against certain communicable diseases. **How do vaccines help fight pathogens?**



*Macrophages* (MA·kruh·fay·juhzh) are also found in the lymph. Their purpose is to attach themselves to invading pathogens and destroy them. Macrophages surround foreign substances and destroy them. Macrophages help the lymphocytes recognize the invader and prepare for future attacks.

## Antibodies and Antigens

Lymphocytes react to *antigens*. An **antigen** is *any substance released by invading pathogens*. The immune system responds to these antigens by producing antibodies. **Antibodies** are *proteins that attach to antigens, keeping them from harming the body*. B cells produce a specific antibody for each specific antigen. If the same type of pathogen invades the body again, these antibodies are ready to attack.

T cells either stimulate the production of B cells or attack pathogens directly. There are two main types of T cells: helper cells and killer cells. Helper cells activate the production of B cells. Killer cells attach to invading pathogens and destroy them.

## Immunity

Everyone is born with a natural immunity. Even before a baby is born, the mother's antibodies pass from her body to her developing fetus. After a baby is born, antibodies are passed on to the baby through the mother's milk. However, these immunities last for only a few months. Then the baby's immune system becomes active, and produces antibodies on its own to fight pathogens.

Immunity also develops when a vaccine is used. A **vaccine** (vak·SEEN) is *a preparation of dead or weakened pathogens that causes the immune system to produce antibodies*. They help the immune system make antibodies for certain diseases. This process is called immunization.

Vaccines have been developed for many diseases, such as polio, measles, and chicken pox. Some vaccinations, such as those for hepatitis B, must be given in a series over a span of a few months. Others, such as the tetanus shot, must be given repeatedly during your lifetime. To keep your body healthy, it is important to keep vaccinations current. **Figure 18.3** provides the vaccination schedule for many common vaccines. Remember that vaccinations protect not only you but also those around you!

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 2.



**Explain** How does your immune system react to a vaccination?

▼ FIGURE 18.3

## VACCINATION SCHEDULE

This table lists common vaccines and the ages at which each vaccine is given. **At what ages is the vaccine for polio given?**

Vaccine	Recommended Ages for Vaccine
Hepatitis B	Birth, 1–2 months, 6–18 months
DTaP: diphtheria, tetanus, pertussis (whooping cough)	2, 3, 4, and 15–18 months, 4–6 years, 11–12 years
HiB ( <i>H. influenzae</i> type b)	2, 4, and 12–15 months
IPV: Polio	2, 4, and 6–18 months, 4–6 years
MMR: measles, mumps, rubella	12–15 months; 4–6 years
Varicella: chicken pox	12–23 months
Hepatitis A	12–23 months
Human Papillomavirus	(3 doses) 11–12 years (females)

Source: CDC, 2007.

## Lesson 2 Review

### After You Read

Review this lesson for new terms, major headings, and Reading Checks.

#### What I Learned

- Vocabulary** Define the term *antigen*. Name two types of white blood cells your immune system produces to fight antigens.
- Recall** What is the lymphatic system? How does it protect your body against disease?
- Explain** What is the body's first line of defense against pathogens?

#### Thinking Critically

- Analyze** How does fever help fight an infection?
- Evaluate** How do vaccines help protect the health of the community?

#### Applying Health Skills

- Decision Making** A teen wakes up with a cold yet wants to go to school to take final exams. Use the decision-making process to help the teen make a healthy decision.

## Lesson 3

## Common Communicable Diseases

## Guide to Reading

**Building Vocabulary**

As you read, write each term on one side of an index card and its definition on the other. Use the cards to quiz yourself on the definitions.

- contagious period (p. 489)
- mononucleosis (p. 489)
- hepatitis (p. 490)
- tuberculosis (p. 491)
- pneumonia (p. 491)
- strep throat (p. 491)

**Focusing on the Main Ideas**

In this lesson, you will learn to

- **explain** what causes colds and how they can be treated.
- **identify** some common communicable diseases.
- **describe** the symptoms of some common communicable diseases.

**Reading Strategy**

**Predicting** Look at the main headings, figures, and captions in the lesson. Predict what kind of information you think you might learn.

**Quick Write**

List your symptoms if you had a cold or the flu. What actions could you take to prevent others from catching your disease?

**Colds**

The common cold occurs more frequently than any other communicable disease. Colds are caused by hundreds of different viruses, and can be spread by direct or indirect contact.

You can help treat a cold by getting plenty of rest and drinking lots of fluids. Some over-the-counter (OTC) medicines can help relieve your symptoms. You should stay at home for at least 24 hours after your cold symptoms appear. This is when your cold is most contagious, meaning it is easily spread to others. Anyone who comes in contact with cold viruses can become infected. That is why it is so important to take an active role in preventing the common cold.

**Reading Check**

**Recall** Why is it important to stay home at least the first 24 hours after becoming infected with a cold virus?

- ◀ Cold germs spread quickly and easily. **How can you help stop the spread of cold viruses to others?**



## The Flu

Influenza, or “the flu,” is another common communicable disease. Flu symptoms include fever, chills, fatigue, headache, muscle aches, and respiratory problems. Like the cold, the flu can be spread through both direct and indirect contact.

The flu is caused by one of three main types of influenza viruses, each with several different strains. Every year, certain strains of the flu virus spread more quickly than others. Scientists try to anticipate which strains will spread fastest so that they create enough flu vaccines for the following year. Most strains of the flu are relatively harmless, but some can be serious.



### Reading Check

**Compare** How are the flu and the common cold similar?

▲ Eating healthy foods can help your body fight off communicable diseases such as the flu. **What other choices can you make that will help keep you healthy?**



## Other Common Communicable Diseases

Every communicable disease has a contagious period. The **contagious period** is the length of time that a particular disease can be spread from person to person. Quite often, the contagious period includes a length of time before the infected person starts to show symptoms. Chicken pox, measles, and mumps all have specific contagious periods. Several communicable diseases and their contagious periods are listed in **Figure 18.4** on the next page. Other common communicable diseases are described below.

### Mononucleosis

**Mononucleosis** (MAH·noh·nook·klee·OH·sis), or “mono,” is a viral disease characterized by a severe sore throat and swelling of the lymph glands in the neck and around the throat area. Mono most commonly infects teens and young adults. Known as “the kissing disease,” it is spread through contact with the saliva of an infected person. Mono is also spread through sharing contaminated eating utensils and drinking glasses.



### Reading Check

**Define** What is a contagious period?



### Connect To... Social Studies

#### Fighting Disease

Diseases have shaped the lives of many famous athletes and historical leaders throughout the world. For example, United States President Franklin D. Roosevelt continued to lead our nation after contracting polio.

**Research the life of a famous person who had to fight disease. Write a brief report. Tell about the disease and how this person prevailed.**



▼ FIGURE 18.4

## COMMON COMMUNICABLE DISEASES

This figure shows the symptoms, contagious periods, and vaccines for several communicable diseases. **Which diseases have similar symptoms? What are those symptoms?**

Disease	Symptoms	Contagious Period	Vaccine
Chicken pox	Itchy rash, fever, muscle aches	One to five days before symptoms appear to when spots crust over	Yes
Pneumonia	High fever, chest pain, cough	Varies	For some types
Rubella	Swollen lymph nodes, rash, fever	Seven days before rash starts to five days after	Yes
Measles	Fever, runny nose, cough, rash	Three to four days before rash starts to four days after	Yes
Mumps	Fever, headache, swollen areas in neck and under jaw	Seven days before symptoms to nine days after	Yes
Whooping cough	Fever, runny nose, dry cough (with a whooping sound)	From inflammation of mucous membranes to four weeks after	Yes
Tuberculosis	Fever, fatigue, weight loss, coughing blood	Varies	Yes

### Hepatitis

**Hepatitis** (hep-uh·TY·tis) is a viral disease of the liver characterized by yellowing of the skin and the whites of the eyes. Other symptoms might include loss of appetite, weakness, lack of energy, fever, headaches, and a sore throat. Hepatitis A, B, and C are three different virus types.

Hepatitis A is common in areas with poor sanitation. It is spread through food or water that has been contaminated by human waste. People can also become infected if the virus enters the body through an open wound.

Hepatitis B and C are most commonly spread through contact with contaminated blood or other body fluids. Vaccines can protect people from contracting hepatitis A and B. Medications can help treat people infected with hepatitis C.



## Tuberculosis

**Tuberculosis** (too-ber-kyuh-LOH-sis), or TB, is a *bacterial disease that usually affects the lungs*. Since TB can spread easily through the air, people are tested periodically to see if they have the disease. Sometimes people who test positive for TB show no symptoms. Even without symptoms, they can still spread the disease to others.



## Pneumonia

**Pneumonia** is a *serious inflammation of the lungs*. Symptoms include fever, chills, and difficulty breathing. People infected with other diseases are especially vulnerable to pneumonia. This infection can be spread through direct or indirect contact. A virus or bacteria can cause pneumonia. Pneumonia caused by a bacteria can be treated with antibiotics.

- ▲ Getting a blood test will determine if a person has mononucleosis.  
**What are the symptoms of mono?**

## Strep Throat

**Strep throat** is a *sore throat caused by streptococcal bacteria*. Strep throat produces a red and painful throat, fever, and swollen lymph nodes in the neck. It might also cause headaches, nausea, and vomiting. It is spread through direct or indirect contact with an infected person. Left untreated, strep infections can spread to other areas of the body. Fortunately, strep throat is caused by a bacteria and can be treated with antibiotics.

**Go Online**  
Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 3.



# Lesson 3 Review

## After You Read

Review this lesson for new terms, major headings, and Reading Checks.

### What I Learned

1. **Vocabulary** Define *mononucleosis*.
2. **Give Examples** What are two examples of how someone might become infected with hepatitis A?
3. **List** Name two symptoms of strep throat.
5. **Evaluate** If someone has symptoms such as a fever and fatigue, how will that person know when to seek help from a health care professional?

### Thinking Critically

4. **Analyze** Why are hospital patients often at risk for developing pneumonia?

## Applying Health Skills

6. **Practicing Healthful Behaviors** Write a short article describing healthful behaviors teens can use to control the spread of disease. Include a list of some common communicable diseases and how they are spread.



For more Lesson Review Activities, go to [glencoe.com](http://glencoe.com).



## Lesson 4

## Sexually Transmitted Diseases

## Guide to Reading

**Building Vocabulary**

As you read this lesson, write the term below and its definition in your notebook.

- sexually transmitted diseases (STDs) (p. 492)

**Focusing on the Main Ideas**

In this lesson, you will learn to

- identify** common STDs and the problems they cause.
- state** how to protect yourself from STDs.
- explain** why abstinence until marriage is the best way to avoid getting an STD.

**Reading Strategy**

**Organizing Information** Create a chart listing each STD described in this lesson, its symptoms, and treatment.

**Quick Write**

Write a paragraph about why it is important for teens to avoid sexual activity.

**What Are STDs?**

**Sexually transmitted diseases (STDs)** are infections that are spread from person to person through sexual contact. They are sometimes called sexually transmitted infections (STIs). In the United States, STDs are a major health problem for teens. Each year, one-quarter of all new cases of STDs appear among 15- to 19-year-olds. One in four sexually active teens has an STD, although many do not even know it. However, STDs are completely preventable. This lesson will help you learn more about STDs, their causes, and how to avoid them. **Figure 18.5** lists some important facts about STDs.

**Common STDs**

STDs can cause serious health problems if left untreated. Anyone who suspects he or she may have an STD should see a doctor right away. Some common STDs are described below:

- Chlamydia** (kluh·MI·dee·uh) is a bacterial STD that may affect the reproductive organs, urethra, and anus. Chlamydia can be treated with antibiotics. It is a “silent” disease because in many cases there are no symptoms. Symptoms can include genital discharge and pain when urinating. If left untreated, chlamydia can seriously damage the reproductive organs in both males and females, leading to infertility.



▼ FIGURE 18.5

## WHAT YOU SHOULD KNOW ABOUT STDs

Learning the facts about STDs can help you avoid them. **What is the best way for teens to avoid getting STDs?**

- Most STDs are spread only through sexual contact.
- You cannot tell if someone has an STD by his or her appearance.
- Most STDs have either very mild or no symptoms.
- Many STDs can be treated and cured, but early diagnosis is important.
- Because treatments for STDs vary, they must be accurately identified.
- STDs can recur because the body does not build up an immunity to them.
- STDs can cause sterility, blindness, deafness, and birth defects.

- **Genital herpes** (HER·peeZ) is a viral STD that produces painful blisters on the genital area. This STD is transmitted by skin-to-skin contact that can occur without having sexual intercourse. It results in periodic outbreaks of painful blisters or sores on the genitals. Herpes can be passed on to another person even when the blisters are not present. Although there is no cure, medicines are available to lessen the outbreaks.
- **Genital warts** are growths or bumps in the genital area caused by certain types of the human papillomavirus (HPV). This STD is also transmitted by skin-to-skin contact. Genital warts can be treated, but there is no cure for HPV infection. These infections are the most common type of STD in the United States. Like genital herpes and chlamydia, HPV is often a silent disease. Some strains of HPV are linked to the cause of cervical and skin cancers. A vaccine has recently been developed to protect females against these strains of the HPV virus.
- **Trichomoniasis** (TREE·koh·moh·NI·ah·sis) is an STD caused by the protozoan *Trichomonas vaginalis*. Trichomoniasis can be treated and cured with medications. The disease may be silent, but symptoms can include discomfort during urination, genital discharge, and irritation or itching in the genital area.



Careers for the 21<sup>st</sup> Century

### Epidemiologist



Epidemiologists are medical detectives. They study what causes diseases and how to prevent diseases from spreading. Some epidemiologists work in hospitals and labs. Epidemiologists will always be in demand because diseases are a reality, all over the world. If you are interested in becoming an epidemiologist, you should study communicable diseases, how they affect the body, and how the diseases are spread.

**What kind of skills does an epidemiologist need? Go to Career Corner at [glencoe.com](http://glencoe.com) to find out.**



Go Online

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 4.

▼ Group activities can help you avoid situations where you may feel pressure to engage in sexual activity. **What activities do you and your friends like to do together?**

- **Gonorrhea** (gah·nuh·REE·uh) is a bacterial STD that affects the mucous membranes of the body, particularly in the genital area. Symptoms include a thick yellowish discharge from the genitals and a burning sensation when urinating. The infection can be treated with antibiotics. Untreated, it can infect other parts of the body, such as the heart, and cause fertility problems for both women and men.
- **Syphilis** (SIH·fuh·luhs) is a bacterial STD that can affect many parts of the body. It can damage body organs, such as the brain. During the advanced stage, the disease can cause mental disorders, blindness, heart problems, paralysis, and even death. If diagnosed early, syphilis can be treated and cured with antibiotics.
- **Pelvic inflammatory disease (PID)** is a general infection of the female reproductive organs. Most females become infected with PID as a result of contracting another STD, such as chlamydia or gonorrhea. When PID is untreated, the infection may worsen over time and cause sterility.
- **HIV/AIDS** is a serious STD covered in the next lesson.



Reading Check

**Give Examples** Name three STDs that are caused by bacteria.



## Practicing Abstinence

The best way to avoid getting an STD is to abstain from sexual activity until marriage. As a teen, deciding to say no to sexual activity is one of the most important health choices that you can make.



Make a commitment to practice abstinence and demonstrate your commitment through words and actions. Choose friends who share your values and support your decisions.

Avoid being alone on a date. By participating in group activities, you can avoid the pressures of sexual activity. If you do go on a one-on-one date, communicate your limits to your date before you go out. Practice how to respond to a date who tries to pressure you into sexual activity. For example, if your date says, “If you really care for me, you would have sex with me,” you can say, “If you really care for me, you would respect my decision.”

### Reading Check

**Describe** What are some ways to avoid being pressured to engage in sexual activity?

**What Teens THINK**

**What are some fun activities teens can do with their friends?**

My friends and I like to see movies or walk to the park. We also like to go the beach together and just relax. However, I think that it matters most who you're with rather than what you do. The whole point is to have a good time.

Emma D.  
Thousand Oaks, CA

## Lesson 4 Review

### After You Read

Review this lesson for new terms, major headings, and Reading Checks.

#### What I Learned

1. **Vocabulary** Define *sexually transmitted disease*.
2. **Give Examples** What are three examples of STDs that are considered “silent diseases”?
3. **List** Name three consequences of untreated chlamydia.

#### Thinking Critically

4. **Apply** Why is abstinence until marriage the best choice for teens?

5. **Evaluate** Why is it important to immediately seek help from a health care professional if you suspect you have an STD?

#### Applying Health Skills

6. **Advocacy** Create a booklet that tells teens about the dangers of STDs. It should highlight the most common STDs, how they are spread, and their symptoms. Also include how teens can avoid getting STDs.

## Lesson 5

## HIV/AIDS

## Guide to Reading

**Building Vocabulary**

Write down each term and what you think it means. As you find the terms in this lesson, make any necessary corrections.

- HIV (human immunodeficiency virus) (p. 496)
- AIDS (acquired immunodeficiency syndrome) (p. 496)
- opportunistic infection (p. 496)
- carrier (p. 496)

**Focusing on the Main Ideas**

In this lesson, you will learn to

- **define** HIV and AIDS.
- **explain** how people become infected with HIV and develop AIDS.
- **describe** how to avoid getting HIV and AIDS.

**Reading Strategy**

**Identifying Problems and Solutions** After reading this lesson, identify ways that HIV is transmitted. Then, identify ways to prevent the spread of HIV.

**Quick Write**

List what you have heard about HIV or AIDS. Are they myths or facts?

**What Is HIV? What Is AIDS?**

**HIV (human immunodeficiency virus)** is the virus that causes AIDS. **AIDS (acquired immunodeficiency syndrome)** is a deadly disease that interferes with the body's natural ability to fight infection. HIV attacks the body's T cells. As mentioned in Lesson 2, T cells are a type of lymphocyte that help the body fight off pathogens. When the HIV virus attacks a T cell, it replaces the cell's genetic information with its own and then multiplies. As more T cells are taken over, the immune system becomes weaker.

Eventually, the body can no longer fight the pathogens that a healthy immune system would destroy. When this happens, AIDS develops. One symptom that signals the onset of AIDS is the presence of opportunistic infections. An **opportunistic infection** is an infection that rarely occurs in a healthy person. For example, many AIDS patients develop a type of pneumonia that can cause death.



A person can be a carrier of HIV, without having AIDS. A **carrier** is a person who appears healthy but is infected with HIV and can pass it to others. A person may be infected with HIV for ten years or more before starting to show symptoms of AIDS. A blood test is the only way of knowing if a person is infected with HIV. AIDS can affect men, women, and children of all ages. **Figure 18.6** shows the number of new AIDS cases diagnosed by age group in



2005. The table also shows how many total AIDS cases have been diagnosed by age group through the end of 2005. How do you think this information is used to help reduce the spread of HIV?

### How Does HIV Spread?

HIV is spread from person to person through contact with specific body fluids. These fluids are sperm, fluid from the vagina, blood, and breast milk.

One of the ways HIV spreads is through sexual contact with an infected person. Just one incident of sexual activity with an infected person can spread the virus. People who have more than one sex partner are at greatest risk.

Another way HIV is spread is through sharing needles. Many injection drug users have contracted HIV. Tattoos and body piercings can also spread HIV if performed with contaminated needles.

HIV can also be spread from mother to child. This can occur either before or after delivery, or through breast-feeding. In recent years, new drug therapies have reduced the rate of transmission of HIV to the fetus during pregnancy.



**Go Online**

#### Topic: Staying Alive

Visit [glencoe.com](http://glencoe.com) for Student Web Activities to learn more about HIV/AIDS, and what teens are doing to help stop the spread of HIV.

**Activity:** Using the information provided at the link above, create a FAQ sheet about HIV and AIDS that can be made available to teens throughout your community.

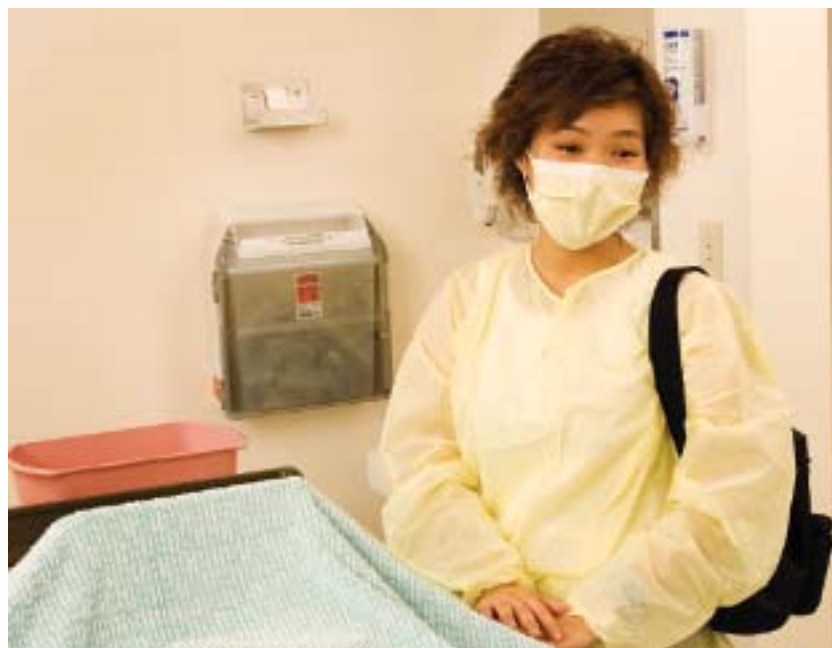
**FIGURE 18.6**

### U.S. AIDS CASES AT AGE OF DIAGNOSIS, 2005

AIDS can develop months or even years after infection with HIV. **Why would this long span of time make the spread of the disease harder to control?**

Age	Estimated # of AIDS Cases in 2005	Cumulative Estimated # of AIDS Cases, Through 2005
Under 13	58	9,089
Ages 13 to 14	66	1,015
Ages 15 to 24	2,480	40,296
Ages 25 to 34	9,374	309,048
Ages 35 to 44	16,792	374,707
Ages 45 to 54	11,230	160,662
Ages 55 to 64	3,308	47,242
Ages 65 to older	899	14,606

Source: CDC—Division of HIV/AIDS Prevention.



At one time, HIV was spread through donated blood. Since 1985, all donated blood in the United States is tested for HIV. As a result, the risk of getting HIV from a blood transfusion is extremely low.

### How HIV Is NOT Spread



False ideas and myths about how HIV is spread have circulated for many years. They have even made people **reluctant** to donate blood. It is important to be aware of these myths and to learn the facts. HIV is spread only through contact with spe-

▲ When people visit an AIDS patient in the hospital, they need to take precautions to protect the patient from infection. **Why is it necessary for these actions to be taken?**

cific body fluids. It is not spread through casual touching or any of the following ways:

- Breathing the air
- Being bitten by a mosquito
- Swimming in a pool
- Sharing utensils
- Donating blood
- Hugging or shaking hands
- Using the same shower, bathtub, or toilet as an infected person



#### Reading Check

**Recall** What are four ways that HIV is not spread?

### Academic Vocabulary

**reluctant** (ri LUHK tehnt) (*adjective*) holding back or unwilling. *Just because you feel fine doesn't mean that you should be reluctant to see your doctor for your yearly checkup.*



## Fighting AIDS

Scientists continue to work on improved medical treatments for people with HIV and AIDS. Currently, there is no cure for HIV or AIDS. However, drugs are available that slow down the progress of HIV infection. Unfortunately, many of these drugs are costly and can have serious side effects. Scientists are also working on a vaccine for HIV, but this will probably take many more years. The best weapons in the fight against HIV and AIDS are knowledge and abstinence until marriage.



#### Reading Check

**Identify** What treatment is available for people with HIV infection?



- ▶ Practicing abstinence until marriage allows you to enjoy healthful activities with your friends.  
**How can friends help you practice abstinence?**



## Preventing HIV/AIDS

HIV infection and AIDS can be prevented. There are three main ways to avoid these diseases:

- **Practice abstinence.** Abstinence is the conscious, active choice not to participate in high-risk behaviors. This includes avoiding sexual activity until marriage.
- **Avoid drugs and alcohol.** Using drugs and alcohol can impair your ability to make healthful decisions. This can lead to participation in other risky behaviors, such as sexual activity.
- **Avoid sharing needles.** Needles can carry HIV into your bloodstream. This includes needles that are used for tattoos or body piercings.

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 5.



# Lesson 5 Review

### After You Read

*Review this lesson for new terms, major headings, and Reading Checks.*

### What I Learned

1. **Vocabulary** Define *HIV* and *carrier*.
2. **Give Examples** What are two ways teens can get infected with HIV?
3. **Recall** How does HIV weaken the body's immune system?

### Thinking Critically

4. **Analyze** Why is HIV an extremely dangerous virus?
5. **Apply** Jasmine doesn't want to share tennis rackets with Mei, who has HIV.

Jasmine is afraid of getting infected with HIV. What could you tell Jasmine?

### Applying Health Skills

6. **Goal Setting** Think of how you want to avoid exposure to HIV infection, AIDS, or other STDs. Set a goal to protect yourself from these diseases. Develop a plan to help you reach your goal. Be clear and specific about the steps you will take to reach your goal.



For more Lesson Review Activities, go to [glencoe.com](http://glencoe.com).



# Building Health Skills

Accessing Information  
Practicing Healthful Behaviors  
Stress Management  
Analyzing Influences  
Communication Skills  
Refusal Skills  
Conflict Resolution  
Decision Making

## Goal Setting

Advocacy

## What Is Goal Setting?

Goal setting is a five-step plan for improving and maintaining your personal health. Some goals are easy to reach while others may be more challenging.

### The 5 Steps of the Goal-Setting Plan

**Step 1:** Choose a realistic goal and write it down.

**Step 2:** List the steps that you need to take to reach the goal.

**Step 3:** Find others, like family, friends, and teachers who can help and support you.

**Step 4:** Set checkpoints along the way to evaluate your progress.

**Step 5:** Reward yourself once you have reached your goal.

# Protect Yourself from Pathogens

Follow the Model, Practice, and Apply steps to help you master this important health skill.

## 1 Model

*Read how Jennifer uses the skill of goal setting to improve her health.*

Jennifer noticed that she was sick a lot during the school year. She thought that it had to do with her messy room. Jennifer used the skill of goal setting to clean her room and get healthy.

1. Jennifer wanted to keep her room clean for a month. (Identify a specific goal.)
2. Jennifer put her dirty clothes in the hamper. She threw out her trash and took her dirty plates to the kitchen. She vacuumed and dusted her furniture. (List the steps you will take.)
3. Jennifer asked her mom and dad for advice on the best way to clean. (Ask for help and support from others.)
4. After two weeks, Jennifer felt better and her room looked good. (Evaluate your progress.)
5. At the end of the month, Jennifer bought a new CD. (Reward yourself.)



## 2 Practice

*Help Paul use goal setting to achieve his goal of reducing the number of colds he gets each year.*

Paul likes having a clean, uncluttered room. He also likes how achieving a goal builds his self-confidence. Now Paul wants to reduce the number of colds he gets every school year. He believes that he could achieve this if he washed his hands more frequently.

1. What is Paul's goal?
2. What steps can help Paul reach his goal?
3. Who can Paul get to help him?
4. How can Paul evaluate his progress?
5. How can he reward himself for following his plan?



## 3 Apply

*Use what you have learned about goal setting to complete the activity below.*

Think of how you can better protect yourself from disease. How would you accomplish this goal? Take a piece of paper and make a reminder to post in your room. On your reminder include a plan that will help you reach your goal. Use art to illustrate how achieving your goal will improve your physical, mental/emotional, and social health.

### Self-Check

- Does my reminder contain the steps for achieving my goal?
- Did I show how my goal will improve my health?

# HANDS-ON HEALTH



## Healthy Habits

How healthy are your habits? This activity will help you find out.

### What You Will Need

- pencil and paper



### What You Will Do

Write *yes* or *no* for each statement.

- 1 I avoid sharing eating utensils or drinking glasses with others.
- 2 I avoid drinking water from streams and lakes.
- 3 I cover my nose and mouth when I cough or sneeze.
- 4 I make sure leftover food is properly stored.
- 5 I wash my hands after using the bathroom and before preparing or serving food.
- 6 When I am sick, I get medical care.
- 7 When I am sick, I avoid others during the contagious period.
- 8 I avoid sharing combs, brushes, and towels with others.
- 9 I avoid contact with people who have a cold or other communicable diseases.
- 10 I have received all the recommended vaccinations.

### Wrapping It Up

Give yourself 1 point for each *yes*. A score of 8–10 is very good. A score of 6–7 is good. A score of 4–5 is fair. If you score below 4, you need to work on improving your health behaviors.



Visit [glencoe.com](http://glencoe.com) to download quizzes and eFlashcards for Chapter 18.

**FOLDABLES® Study Organizer**

**Foldables® and Other Study Aids** Get out the Foldable® you created for Lesson 1 and any graphic organizers that you made for Lessons 1–5. Find a partner and quiz one another using these study aids.

**Lesson 1 Preventing the Spread of Disease**

**Main Idea** You can help protect yourself and others from pathogens by practicing good hygiene.

- A communicable disease is a disease that can be passed to a person from another person, animal, or object.
- The four common pathogens are viruses, bacteria, fungi, and protozoa.

**Lesson 2 The Body's Defenses Against Infection**

**Main Idea** The five major barriers that protect you from infection are tears, mucous membranes, saliva, skin, and stomach acid.

- Your immune system responds when a pathogen gets past the five major barriers of protection.
- The immune system has two main responses: the nonspecific response and the specific response.
- Vaccines help the immune system make antibodies for certain diseases.

**Lesson 3 Common Communicable Diseases**

**Main Idea** Common communicable diseases include colds, the flu, mononucleosis, hepatitis, tuberculosis, pneumonia, and strep throat.

- The contagious period is the length of time that a particular disease can be spread from person to person.

**Lesson 4 Sexually Transmitted Diseases**

**Main Idea** Chlamydia, genital warts, genital herpes, trichomoniasis, gonorrhea, syphilis, and hepatitis B are common STDs.

- STDs are diseases that are spread from person to person through sexual contact.
- The best way to avoid getting an STD is to abstain from sexual activity until marriage.

**Lesson 5 HIV/AIDS**

**Main Idea** HIV is the virus that causes AIDS.

- HIV is spread through contact with sperm, vaginal fluid, blood, or breast milk.
- HIV is not spread through casual touching, breathing the air, mosquito bites, swimming in a pool, sharing utensils, donating blood, hugging or shaking hands, or using the same shower, bathtub, or toilet as an infected person.
- Abstinence until marriage is the only sure way to protect yourself against HIV infection, AIDS, and other STDs.



## After You Read

## Health eSpotlight



Now that you have read the chapter, look back at your answer to the Health eSpotlight question on the chapter opener. What are some common STDs, and what health problems are associated with these infections?

## Reviewing Vocabulary and Main Ideas

On a sheet of paper, write the numbers 1–9. After each number, write the term from the list that best completes each statement.

- disease
- immune system
- infection
- viruses
- antibodies
- vaccine
- influenza
- contagious period
- tuberculosis
- inflammation

### Lesson 1 Preventing the Spread of Disease

1. A(n) \_\_\_\_\_ is any condition that interferes with the proper functioning of the body or mind.
2. A(n) \_\_\_\_\_ is a condition that occurs when pathogens enter the body, multiply, and cause harm.
3. \_\_\_\_\_ are the smallest kinds of pathogens.

### Lesson 2 The Body's Defenses Against Infection

4. \_\_\_\_\_ is the body's response to injury or disease, resulting in a condition of swelling, pain, heat, and redness.

5. The \_\_\_\_\_ is a combination of body defenses made up of the cells, tissues, and organs that fight pathogens in the body.
6. \_\_\_\_\_ are proteins made by B cells that bind to specific antigens.

### Lesson 3 Common Communicable Diseases

7. \_\_\_\_\_ is a communicable disease characterized by fever, chills, fatigue, headache, muscle aches, and respiratory symptoms.
8. The \_\_\_\_\_ is the length of time that a particular disease can be spread from person to person.
9. \_\_\_\_\_ is a bacterial disease that usually affects the lungs.

On a sheet of paper, write the numbers 10–15. Write **True** or **False** for each statement below. If the statement is false, change the underlined word or phrase to make it true.

### Lesson 4 Sexually Transmitted Diseases

10. Sexually transmitted diseases are infections that spread from person to person through casual contact.
11. Syphilis is a bacterial STD that can affect many parts of the body.
12. Genital herpes can be transmitted when symptoms are not present.

### Lesson 5 HIV/AIDS

13. HIV is the virus that causes AIDS.
14. You can become infected with HIV by shaking hands with an infected person.



15. Scientists have developed powerful new drugs to cure HIV infections.

## Thinking Critically

Using complete sentences, answer the following questions on a sheet of paper.

16. **Explain** Why do people who have AIDS actually die from other diseases?
17. **Interpret** Sometimes after you get a vaccination, years later you have to get more of the same vaccine. Why do you think you might need this “booster shot”?

## Write About It

18. **Personal Writing** Write a journal entry describing what factors can influence a teen’s attitude toward sexual activity. Are these influences positive or negative?



## Applying Technology

### Communicate Choices, Not Diseases

You and a partner will use Microsoft Word® and Clip Art to create a brochure that reflects your understanding of communicable diseases.

- Open a new Microsoft Word® project with a portrait view and three columns.
- Using information from one of the lessons in this chapter, select five facts and write about them.
- Use Clip Art to locate images, or take digital photos that relate to your topic.
- Add the images and text to your brochure. Make it visually appealing.
- Edit and print your brochure.
- With your principal’s permission, pass the brochure out to students.

## Standardized Test Practice

### Reading

Read the passage and then answer the questions.

During the Middle Ages, hundreds of people were killed by the bubonic plague in a very short time. The pathogen for the bubonic plague is a bacterium called *Yersinia pestis*. It lived inside fleas, which lived on rats. The rats became infected when the fleas bit them. Even uninfected fleas that bit infected rats could become infected. When the fleas jumped from rat to rat, the plague spread quickly. As the disease moved through the cities’ rat populations, the rats died off. As the number of rats decreased, more and more infected fleas started living on and biting humans. People became hosts for the bacterium. During 1347 to 1350, the bubonic plague killed one-third of Europe’s population.

### TEST-TAKING TIP

When a question asks for the main point of the passage, reread the first and last sentences. This is where the authors often place the most important information.

1. The main point of this passage is to explain how
  - A. fleas can live on rats and humans.
  - B. the plague killed so many people so quickly.
  - C. to prevent the plague from killing humans.
  - D. Europe’s population became so low.
2. Read this sentence from the passage. The pathogen for the bubonic plague is a bacterium called *Yersinia pestis*. What does *pathogen* mean?
 

A. path	C. name
B. antigen	D. germ