Name _____ Class _____ Date _____

SECTION 1 Disease

BEFORE YOU READ

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

- What causes disease?
- How can we protect ourselves from disease?

National Science Education Standards
LS 1f

What Causes Disease?

All your life, you've probably had adults tell you to wash your hands or to cover your mouth when you sneeze. What is all the fuss about? They tell you to do these things to stop the spread of *disease*. When you have a disease, your body cannot function the way that it should.

STUDY TIP

Outline As you read, make an outline of this section. Be sure to answer the questions asked in each heading and define unfamiliar terms.

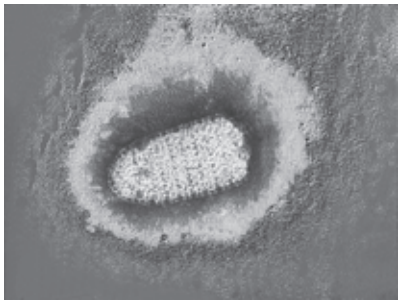
INFECTIOUS DISEASE

Many diseases, such as a cold, or the flu, can be passed from one living thing to another. This called an **infectious disease**. In other words, you can "catch" an infectious disease. Infectious diseases are caused by **pathogens**. Pathogens can be bacteria, fungi, worms, proteins, or viruses. *Viruses* are tiny particles that depend on living things to reproduce. ☑

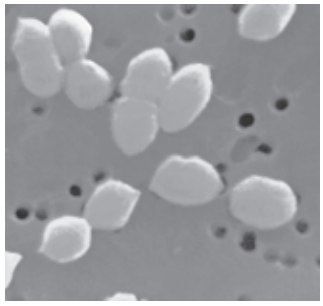
READING CHECK

1. Identify What cause infectious diseases?

_____



This virus causes rabies.



These bacteria, called *Streptococcus*, can cause strep throat.

STANDARDS CHECK

LS 1b Disease is the breakdown in structures or functions of an organism. Some diseases are the result of intrinsic failures of the system. Others are the result of damage by infection by other organisms.

2. Compare How are infectious diseases different from noninfectious diseases?

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NONINFECTIOUS DISEASE

Some diseases, such as cancer or heart disease, cannot be passed from person to person. These are called **noninfectious diseases**. Some noninfectious diseases are caused by genes. Others can be caused by lifestyle choices, such as smoking, lack of exercise, and a high-fat diet. Avoiding harmful habits may help you avoid noninfectious diseases.

How Do Pathogens Move Between People?

Pathogens can pass from one person to another in many different ways. Being aware of how pathogens are passed can help you stay healthy.

AIR

Some pathogens travel through the air. A single sneeze can release thousands of droplets of moisture. These droplets can carry pathogens.

A sneeze can force thousands of droplets carrying pathogens out of your body at up to 160 km/hr. That's more than the speed limit on most highways!

OBJECTS

You probably already know that if you drink from a glass used by sick person, you can become infected too. Pathogens can also be carried on objects such as doorknobs, keyboards, combs, or towels. A sick person may leave pathogens on anything he or she touches.

PERSON TO PERSON

People can transfer pathogens directly. You can become infected by kissing, shaking hands, or touching sores on an infected person.

ANIMALS

Some pathogens are carried by animals. For example, people can get a fungus called ringworm by touching an infected cat or dog. Ticks carry bacteria that cause Lyme's disease and Rocky Mountain spotted fever.

FOOD AND WATER

Food and water can contain pathogens. Most drinking water in the United States is safe. However, pathogens can enter the public water supply.

Foods such as meat, fish, and eggs that are not cooked enough can contain harmful bacteria or parasites. Because pathogens grow in food, it is important to wash all cooking surfaces and tools well.

Critical Thinking

3. Infer Why do you think it is important to cover your mouth and nose when you cough or sneeze?

Math Focus

4. Calculate You catch a cold and return to school sick. Your friends don't have immunity to the virus. On the first day, you expose five people to the virus. The next day, each of those friends passes on the virus to five more people. If this same pattern continues, how many people will be infected after 5 days?

Say It

Discuss When was the last time you were sick? How do you think you got sick? Were your friends, siblings, or other people in your class sick at the same time? Talk about these questions with a partner.

How Can We Protect Ourselves From Disease?

Pathogens such as bacteria and viruses are everywhere. So how can we protect ourselves from them?

PASTEURIZATION

Milk and other dairy products can carry certain types of pathogens. To destroy pathogens, dairy products and other foods are treated by a process called *pasteurization*. This method was invented by the French scientist Louis Pasteur. It uses heat to kill bacteria. ☑

READING CHECK

5. Complete In pasteurization, bacteria are killed with _____.

Juices, shellfish, and dairy products, such as milk, are all pasteurized to kill pathogens.

TAKE A LOOK

6. List Name three types of foods that are pasteurized.

_____

_____

_____

VACCINES

A *vaccine* is a substance that helps your body to resist a disease. The ability to resist an infectious disease is called **immunity**. Vaccines contain pathogens that have been killed or treated so they can't make you very sick. The vaccine is enough like the pathogen to help your body develop a defense against the disease.

Critical Thinking

7. Compare What is the difference between a vaccine and an antibiotic?

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ANTIBIOTICS

Doctors can treat bacterial infections, such as strep throat, with antibiotics. An *antibiotic* is a substance that kills bacteria or slows their growth.

Antibiotics do not affect viruses. This is because antibiotics only kill living things. Viruses are not considered to be alive because they cannot reproduce on their own. Although antibiotics do not destroy viruses, scientists are working to develop antiviral medications.

Name _____ Class _____ Date _____

Section 1 Review

NSES LS 1f

SECTION VOCABULARY

immunity the ability to resist an infectious disease	**noninfectious disease** a disease that cannot spread from one individual to another
infectious disease a disease that is caused by a pathogen and that can be spread from one individual to another	**pathogen** a microorganism, another organism, a virus, or a protein that causes disease

1. Explain Why are food products, such as milk, pasteurized?

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2. Compare Complete the table below to compare infectious and noninfectious diseases.

Type of disease	What causes it?	Can it be passed from person to person?
Infectious		
Non-infectious		

3. Apply Concepts Can you get a vaccine for a noninfectious disease? Explain your answer.

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4. List Name five ways that you could come into contact with a pathogen.

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5. Apply Concepts The common cold is caused by a virus. Should your doctor give you an antibiotic to help you fight a cold? Explain your answer.

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