

The Importance of Viruses and Bacteria

Key Words

decomposer:	living thing that breaks down organisms into materials that can be reused by other living things
nitrogen-fixing bacteria:	bacteria that take nitrogen from the air and form nitrogen compounds
antibiotic:	drug used to treat diseases caused by bacteria
vaccine:	drug that helps the body protect itself from disease

Key Ideas

Viruses and bacteria can impact other organisms because viruses and bacteria can cause disease. But some types of bacteria are so important that other living things could not survive without them.

What do you think of when you hear the word bacteria? Many people think of germs and illness. Many types of bacteria do cause disease or even death. But some types of bacteria are so important that other living things would die without them. One kind of bacteria lives inside your body and helps you digest food. Other kinds of bacteria are also useful. For example, certain foods, such as yogurt, are made using bacteria.

Helpful Bacteria. One of the most important jobs of bacteria is to break down dead organisms. Some bacteria are decomposers. A **decomposer** (dee-kuhm-POHS-er) is a living thing that breaks down dead organisms into materials that can be reused by other living things. Think about walking through a forest. Leaves, branches, and other plant matter cover the ground. Without bacteria and other decomposers, there would be so much dead matter piled up that you would not be able to walk between the trees.

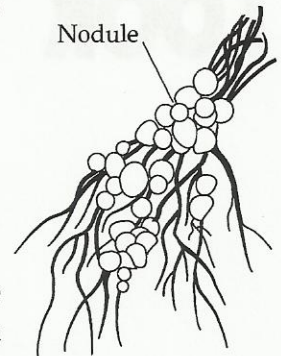


1. What is a decomposer? _____

Another type of bacteria allows plants to grow. Plants need nitrogen to grow. Although nitrogen is present in the air, it is not in a form that plants can use. Plants can use only nitrogen compounds. **Nitrogen-fixing bacteria** (NY-truh-juhn-FIKS-ing bak-TIR-ee-uh) form nitrogen compounds from nitrogen in the air. These nitrogen-fixing bacteria live in soil and in the roots of some types of plants. See Fig.19-1.

Fig. 19-1

Nitrogen-fixing bacteria live in nodules on the roots of some plants.



2. How do nitrogen-fixing bacteria help plants to grow?

Harmful Bacteria. While some kinds of bacteria are helpful, others are harmful. Some types of bacteria cause food poisoning. These bacteria can live in food that has not been correctly prepared or stored.

Other kinds of bacteria can cause serious diseases such as tetanus, scarlet fever, whooping cough, strep throat, or tuberculosis. These diseases easily spread from person to person. In the past, diseases caused by bacteria were hard to prevent and treat. But today drugs called **antibiotics** (an-ty-by-AHT-ihks) are used to treat many diseases caused by bacteria. Most antibiotics work by keeping the bacteria from growing. Some prevent the bacterial cell wall from forming.



3. What is an antibiotic? _____

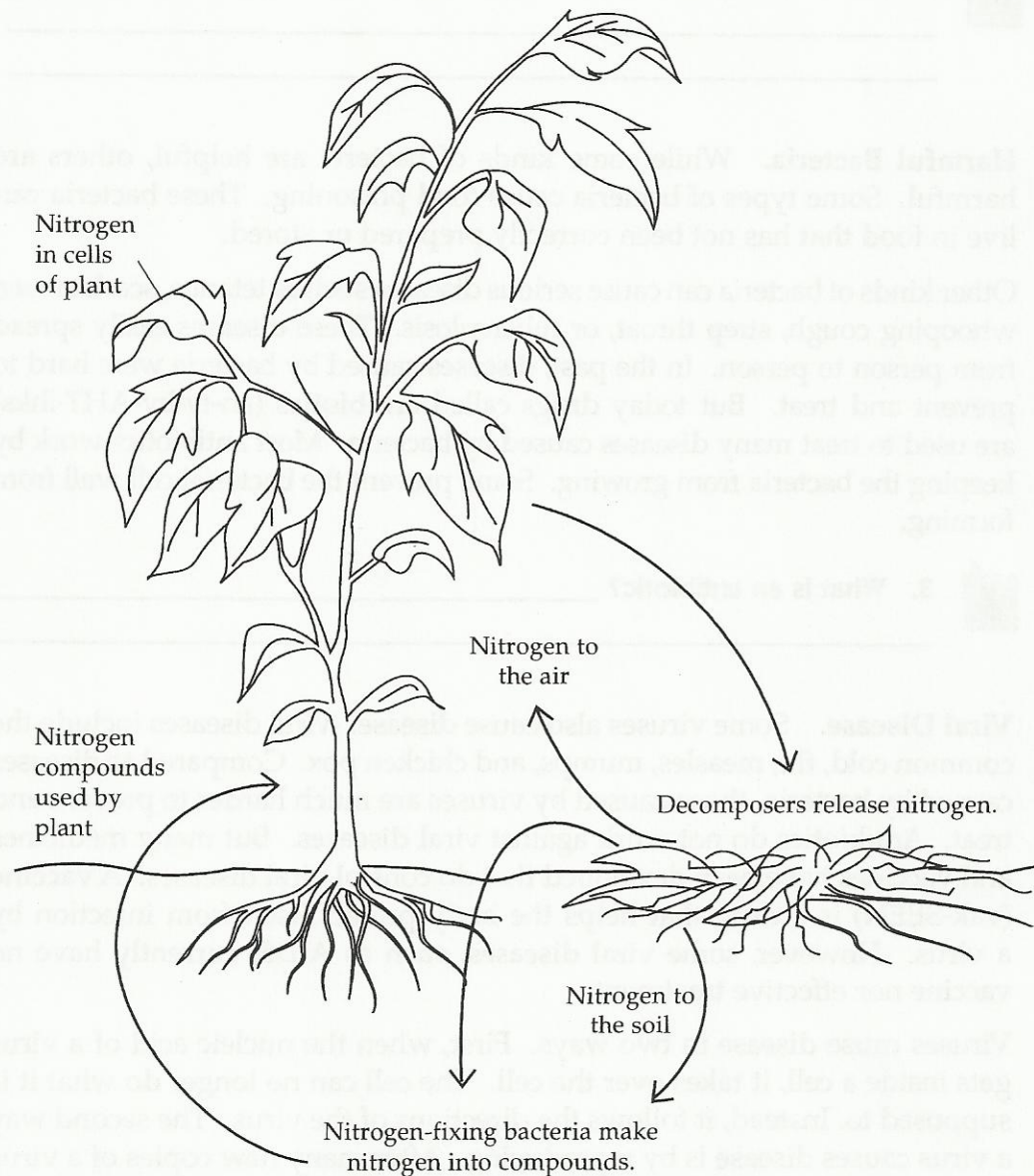
Viral Disease. Some viruses also cause disease. Viral diseases include the common cold, flu, measles, mumps, and chicken pox. Compared to diseases caused by bacteria, those caused by viruses are much harder to prevent and treat. Antibiotics do not work against viral diseases. But many medicines and vaccines have been developed that do control viral diseases. A **vaccine** (vak-SEEN) is a drug that helps the body protect itself from infection by a virus. However, some viral diseases, such as AIDS, currently have no vaccine nor effective treatment.

Viruses cause disease in two ways. First, when the nucleic acid of a virus gets inside a cell, it takes over the cell. The cell can no longer do what it is supposed to. Instead, it follows the directions of the virus. The second way a virus causes disease is by reproducing. After many new copies of a virus form inside a cell, the new viruses burst out of the cell, and the cell is destroyed.

**TAKE
ANOTHER
LOOK**

Nitrogen-fixing bacteria change nitrogen from the air into a form plants can use. When plants die, the nitrogen stays in their cells. Decomposers break down the plant cells and release the nitrogen into the air and soil. Two different types of bacteria, nitrogen-fixing bacteria and decomposers, make nitrogen available to plants. Together these bacteria recycle nitrogen, as shown in Fig. 19-2.

Fig. 19-2



Check Your Understanding

Complete the paragraph by adding the correct words.

One way bacteria are helpful is by breaking down dead organisms. Bacteria that do this are called (4)_____. Nitrogen-fixing bacteria form nitrogen compounds that can be used by (5)_____. Harmful bacteria can cause (6)_____. Drugs used to treat bacterial infections are called (7)_____. A (8)_____ is a drug used to protect against infection by a virus.

9. What are two ways in which bacteria are helpful? _____

10. Why are decomposers important? _____

11. What do nitrogen-fixing bacteria do? _____

12. What does a vaccine do? _____

13. What can antibiotics do? What can they not do?

14. Explain two ways viruses cause diseases. _____

