



What Is This Module About?

Have you ever experienced feeling well one day then suddenly being taken ill the next? Do you know why this happens? This module will address this question. It is about germs and the different diseases you may get from them. The symptoms of these diseases will also be discussed.

The module has two lessons:

Lesson 1 — *What Are Germs?*

Lesson 2 — *How Can We Keep From Getting Sick?*



What Will You Learn From This Module?

After studying the module, you should be able to:

- ◆ discuss what germs and microbes are;
- ◆ describe the different kinds of germs;
- ◆ identify diseases we could get from the different kinds of microbes;
and
- ◆ describe ways to avoid getting sick from germs.



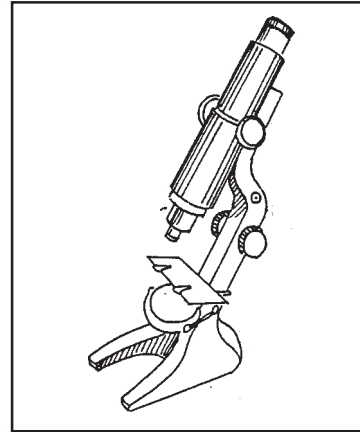
Let's See What You Already Know

Before you start studying this module, answer the following questions to determine what you know about the topic.

Encircle the letter of the correct answer.

1. What does a microscope do?

- a. It kills germs.
- b. It creates germs.
- c. It enlarges the image of germs which normally cannot be seen by the naked eye.
- d. It computes the number of microbes that make up a germ.



2. What is a microbe?

- a. A microbe is a big living thing that causes diseases.
- b. A microbe is an organism that can be seen by the naked eye.
- c. A microbe is an organism that is smaller than a germ.
- d. A microbe is a very small organism that causes people to be sick.

3. The microbe called tetanus enters our body through_____.

- a. the mouth
- b. the nose
- c. wounds or breaks in our skin
- d. the eyes

For numbers 4 to 6, encircle the letters of the correct statements.

- 4.
 - a. Flies, rats and cockroaches carry microbes that cause people to be sick.
 - b. Flies, rats and cockroaches prevent microbes from multiplying.
 - c. Flies, rats and cockroaches are kinds of microbes.
 - d. Flies, rats and cockroaches eat microbes to stay alive.
- 5.
 - a. Microbes cause illnesses.
 - b. Microbes cannot enter our body through insect bites.
 - c. Germs cannot enter our body if we take a bath every day.
 - d. Drinking alcohol will kill any germs or microbes we have in our body.

6.
 - a. Weak people can easily fight germs.
 - b. Healthy people can easily catch germs.
 - c. Healthy people have strong bodies that fight germs.
 - d. Being healthy does not increase your ability to fight germs.

For numbers 7 to 10, choose from the following list the letter of the kind of microbe being described.

- a. bacteria
 - b. protozoans
 - c. fungi
 - d. viruses
7. Microbes that are very small and cause malaria
 8. Some of these microbes are harmless, but some cause diseases.
 9. Microbes that cause athlete's foot
 10. Germs that bring illnesses like mumps and chicken pox

Well, how was it? Do you think you fared well? Compare your answers with those in the *Answer Key* on pages 33 and 34 to find out.

If all your answers are correct, very good! This shows that you already know much about the topics in this module. You may still study the module to review what you already know. Who knows, you might learn a few more new things as well.

If you got a low score, don't feel bad. This means that this module is for you. It will help you understand some important concepts that you can apply in your daily life. If you study this module carefully, you will learn the answers to all the items in the test and a lot more! Are you ready?

You may go now to the next page and begin Lesson 1.

What Are Germs?

After studying this lesson, you should be able to discuss what germs or microbes are. You should also be able to identify and define the different kinds of germs that cause diseases.



Let's Read

One Saturday, Miss Reyes and her grade four students went on a picnic. The following Monday, Maria, one of the students, did not come to class. Somebody said that she was sick. She had a headache. She also sneezed a lot because she had a cold. "Maybe she caught some germs when we went on a picnic," Miss Reyes said to her class.



What are the different kinds of germs? What damage can germs do to our health? What diseases can we get from the different kinds of microbes?

Miss Reyes told the class about the different kinds of germs. She showed them how the organisms look like under the microscope.

Generally, microbes that harm people are grouped into four:

- a) bacteria
- b) viruses
- c) protozoans
- c) fungi

Bacteria are the smallest living creatures. They can be found all around us. They eat any kind of living organism. Some are harmless, but some cause diseases in people and in animals.

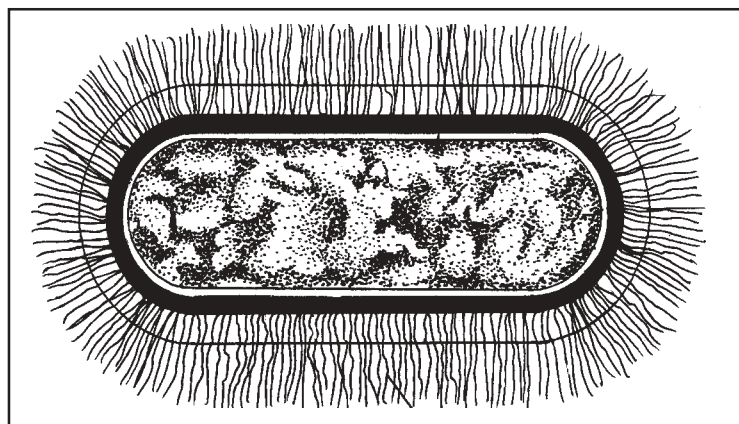
Bacteria have three different basic shapes: spherical (circular), rodlike and curved, but shapes differ from bacteria to bacteria. Here are some examples of bacteria listed on the basis of their shapes and the illnesses they can cause:

Spherical – Streptococcus pneumoniae (pneumonia), gonococcus (gonorrhoeae/gonorrhoea)

Rodlike – Bacillus cereus (bacteria that can cause diarrhea and vomiting)

Curved – Vibrio cholerae (cholera)

Here is how a bacterium looks like under a microscope:

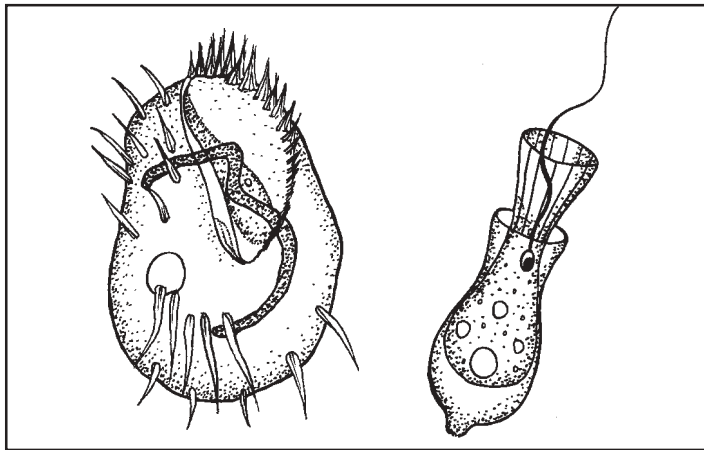


Bacterium

Protozoans are single-celled organisms that live in soil and water. They eat algae, bacteria and other protozoans. They have different sizes and shapes. Most protozoans cannot be seen by the naked eye. Some well-known protozoans are amoebae (which cause amoebiasis) and plasmodia (which cause malaria).

When a person drinks water that has amoebae or is contaminated by human or animal waste, he can be sick with amoebiasis. Flies and cockroaches can also transmit the disease.

Malaria, on the other hand, is usually transmitted through a mosquito that is called anopheles. This kind of mosquito often carries microbes, including plasmodia.

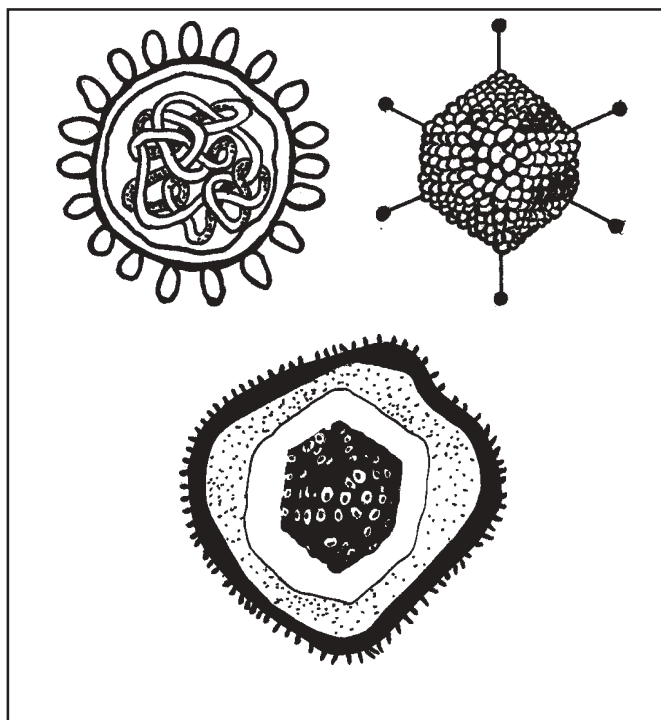


Look at the drawing of some protozoans as seen under a microscope.

Protozoans

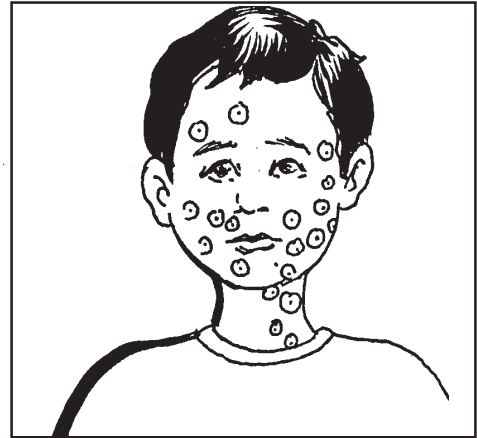
Virus is a word that means “poison.” It is a reproducing organism. It cannot live without being in the body of another organism. It is not considered as plant, animal or bacteria.

Generally, viruses come in two different shapes: rods or filaments and spheres.

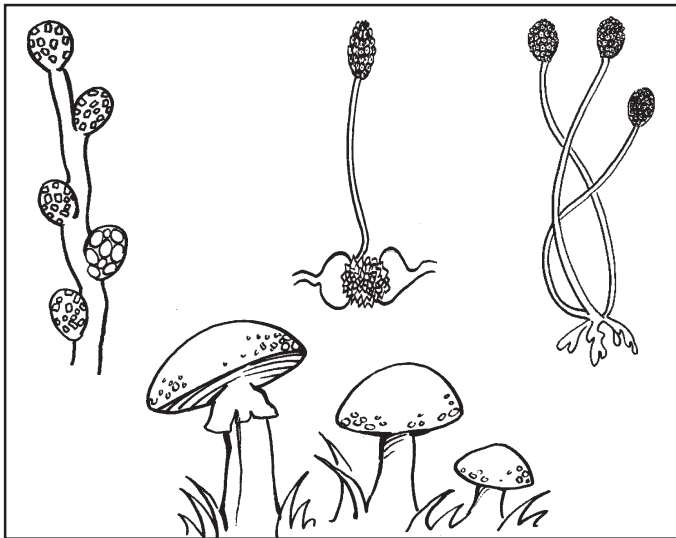


Viruses

Viruses cause diseases like chicken pox, mumps, measles and polio.



Chicken pox

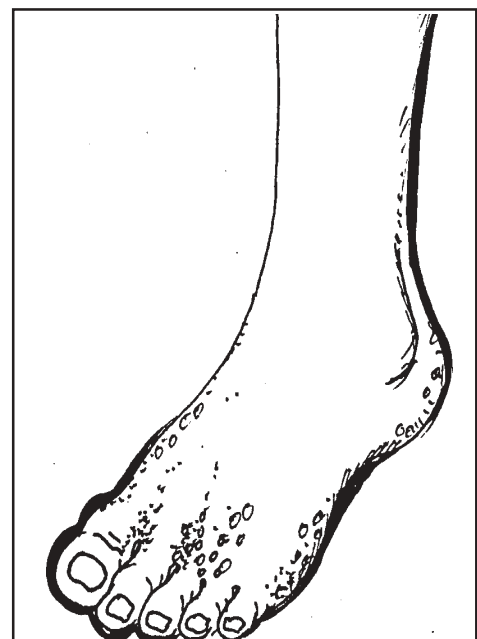


Fungi

Fungi are plant-like microbes. These germs look like molds or mushrooms under the microscope. They live in moist, dark places. Fungi can both cause and cure diseases. They absorb nutrients from living organisms in which they live.

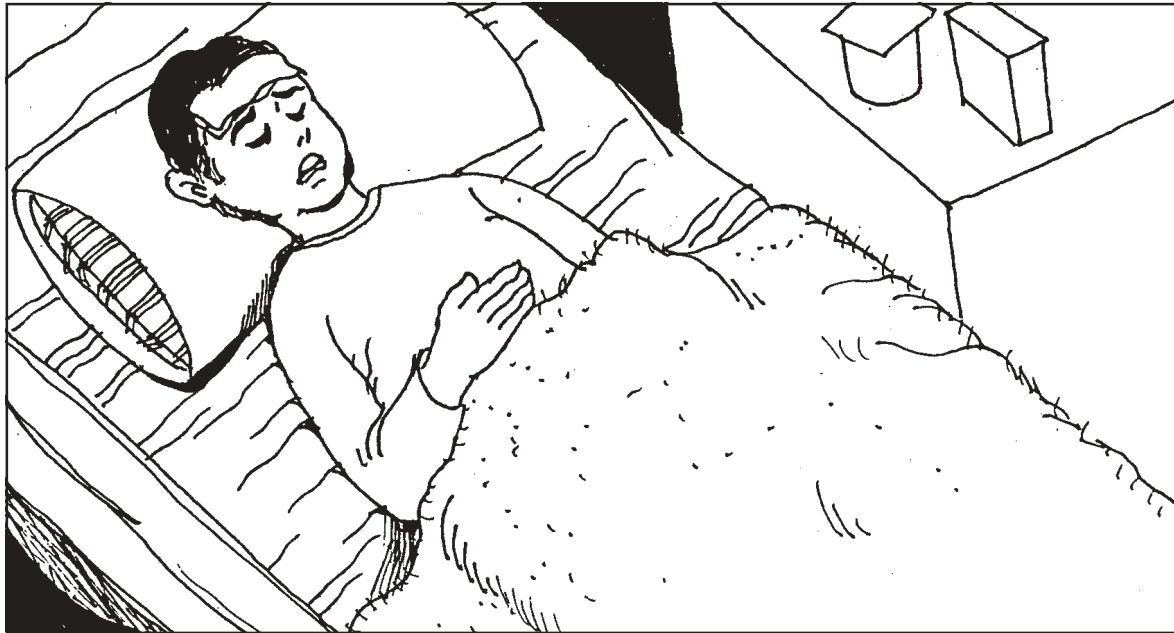
People usually get fungal infections because of poor hygiene, closed shoes, prolonged moistness of the skin, or minor wounds. Examples of diseases caused by fungi are ringworm, athlete's foot, and other skin infections.

Athlete's foot is a fungal infection characterized by severe itching between the toes, soreness, blisters and sometimes mild fluid discharge.



Athlete's foot

When microbes enter the body, they multiply. As they multiply, they give off a kind of poison. The poison causes weakening and sickness in a person.



Let's Review

Below is a list of diseases. Write in the blank the microbe responsible for each disease.

1. mumps _____
2. athlete's foot _____
3. malaria _____
4. pneumonia _____
5. polio _____

Compare your answers with those in the *Answer Key* on page 34.

Let's Learn

The table below lists the characteristics of the four microbes.

Microbe	Size and Shape	Other Characteristics
1. Bacteria	<ol style="list-style-type: none">1. spherical2. rodlike3. curved	<ol style="list-style-type: none">1. smallest living creatures2. can be found all around us3. eat any kind of living organism4. Some are harmless, while others cause diseases in people and in animals.
2. Protozoans	different sizes and shapes	<ol style="list-style-type: none">1. single-celled organisms that live in soil and water2. eat algae, bacteria and other protozoans3. most cannot be seen by the naked eye
3. Viruses	<ol style="list-style-type: none">1. rods or filaments2. spheres	<ol style="list-style-type: none">1. reproducing organisms2. cannot live without being in the body of another organism3. not considered as plants, animals or bacteria
4. Fungi	different sizes, plant-like shape	<ol style="list-style-type: none">1. can cause and cure diseases2. absorb nutrients from organisms in which they live

Now that you know the characteristics of each germ or microbe, let us see how they cause diseases in people. How do you know that you have a particular disease? What do you do to keep from catching the disease? If you have the disease already, how can it be treated?

Read on and study well the details given in the next section.



Let's Study and Analyze

The table below will help you understand microbes better. It contains examples of the diseases and illnesses different microbes cause. The table also explains how people catch these diseases/illnesses, the signs and symptoms of the diseases as well as their prevention and treatment.

Microbe	Disease/ Illness	How People Catch the Disease	Signs and Symptoms	Prevention and Treatment
Bacteria	Pneumonia	<ol style="list-style-type: none"> 1. Everyone carries pneumonia-causing bacteria in their throats. 2. When the body's resistance to illness becomes weak, the bacteria multiply and cause pneumonia. 	Fever, coughing, tiredness, chest pain, headache, loss of appetite, nausea, vomiting	<ol style="list-style-type: none"> 1. Vaccination can prevent you from having pneumonia. 2. Antibiotics prescribed by a doctor can treat the disease.
	Tetanus	<ol style="list-style-type: none"> 1. Transmitted by bacteria that live in the soil and in some animal dungs (e.g., horse dung). These bacteria also enter the body through open wounds. 2. Contracted when a person cuts himself/herself on rusty nails, tin cans, etc. 	Mild muscle spasms in the jaw, neck and face	Have yourself vaccinated with the DPT (diphtheria, pertussis, tetanus) vaccine.
	Diphtheria	Transmitted by infected persons or by carriers (persons who have the bacteria but are not sick themselves).	Sore throat, painful swallowing, vomiting, difficulty in breathing	<ol style="list-style-type: none"> 1. DPT vaccine for prevention 2. Diphtheria antitoxin for treatment
	Pertussis (or Whooping Cough)	The bacteria attack the nose, throat, trachea and bronchial tubes of the lungs.	Runny nose, severe cough, slight fever, vomiting, diarrhea, choking spells in children	<ol style="list-style-type: none"> 1. DPT vaccine for prevention 2. Taking prescribed antibiotics 3. Hospitalization for small children

Microbe	Disease/ Illness	How People Catch the Disease	Signs and Symptoms	Prevention and Treatment
	Gonorrhoea	By having sexual intercourse with an infected person	Vaginal discharge (females), painful urination and sexual intercourse, sore throat, mouth sores, tender testicles (males)	Consult a doctor immediately. He/She will prescribe the right medicine.
Protozoans	Amoebiasis	Eating contaminated food	Diarrhea, abdominal cramps, fatigue, weight loss	Anti-parasitic medicines prescribed by the doctor
	Malaria	<ol style="list-style-type: none"> 1. An anopheles mosquito gets the parasite from the blood of an infected person. 2. Protozoans multiply in the stomach of the mosquito. 3. The mosquito then bites another person. 	Chills, fever, weakness and headache	<ol style="list-style-type: none"> 1. Anti-malarial medicines prescribed by the doctor 2. Patient may require hospitalization.
Viruses	Measles (Rubeola)	Inhalation of droplets from an infected person	Sore throat, runny nose, muscle pain, fever, red eyes, rashes	<ol style="list-style-type: none"> 1. Vaccination of MMR (mumps, measles, rubella) vaccine 2. No specific treatment once measles is contracted
	Chicken pox	Inhalation of droplets from an infected person	Skin rashes, itching	<ol style="list-style-type: none"> 1. Vaccination of chicken pox vaccine 2. Soak in cool water to relieve itching
	Mumps	Inhalation of saliva droplets and direct contact with articles contaminated by a person with mumps	Face pain, neck swelling, fever, headache, sore throat	<ol style="list-style-type: none"> 1. Vaccination of MMR vaccine 2. No specific treatment once mumps is contracted
Fungi	Athlete's foot	Mold-like fungi called dermatophytes infect the feet because of poor hygiene, prolonged moistness of the skin, or minor wounds	Itching, rashes, skin redness, blisters, dry skin	<ol style="list-style-type: none"> 1. Keep feet clean and dry. 2. Wear clean and dry footwear. 3. Avoid wearing slippers, shoes or socks of others. 4. Use anti-fungal powders or creams.

Microbe	Disease/ Illness	How People Catch the Disease	Signs and Symptoms	Prevention and Treatment
	Ringworm	Mold-like fungi called dermatophytes infect the skin of any body part because of contact with an infected person/animal or with an object that an infected person has touched, and because of contact with soil	Itching	<ol style="list-style-type: none"> 1. Keep skin clean. 2. Use anti-fungal powders or creams. 3. Do not share personal items.



Let's Remember

If people are healthy, they can easily fight off germs. They will not get sick. If they are weak, they will easily catch diseases because their defenses against germs are also weak.

Words to Remember:

- Microbes or germs* – small living organisms that cause diseases.
- Microscope* – an instrument used to view microbes.
- Bacteria* – the smallest living organisms that can be found all around us. Some are harmless while others cause diseases.
- Protozoans* – single-celled organisms that live in soil and water. They eat algae, bacteria and other protozoans. Most protozoans cannot be seen by the naked eye.
- Virus* – reproducing organism that cannot live without being in the body of another organism. It is not considered a plant, animal or bacteria.
- Fungus* – a plant-like organism that can cause and cure diseases. It absorbs nutrients from living organisms in which it lives. People become sensitive to fungal infections because of poor hygiene, closed shoes, prolonged moistness of the skin, or minor wounds.



Let's Try This

Look at the skin between your toes. Do you have athlete's foot? Ask your housemates if they have athlete's foot. If any one of you has it, it is best to consult a doctor at once.



Let's See What You Have Learned

Viruses

Bacteria

Fungi

Protozoans

Write in the blank the microbe that is being described. Choose the correct answer from the words inside the box.

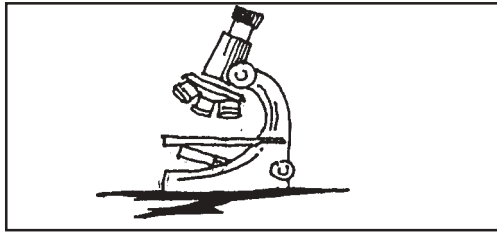
- _____ 1. Microbes that cause diseases such as cholera, pneumonia, gonorrhea, diphtheria, pertussis and tetanus.
- _____ 2. Microbes that cannot live without being in the body of another organism.
- _____ 3. These microbes cause diseases like mumps, measles and chicken pox.
- _____ 4. Plant-like organisms that multiply and infect those with poor personal hygiene.
- _____ 5. Single-celled organisms that live in soil and water and cause diseases such as malaria.

Compare your answers with those in the *Answer Key* on page 34.

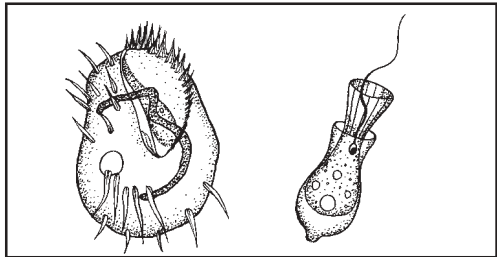


Let's Remember

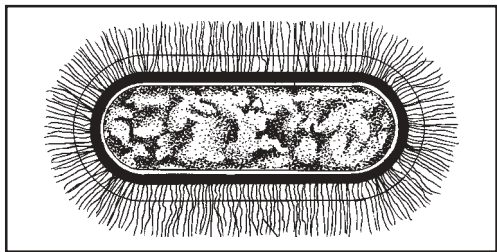
Read the following and keep them in mind:



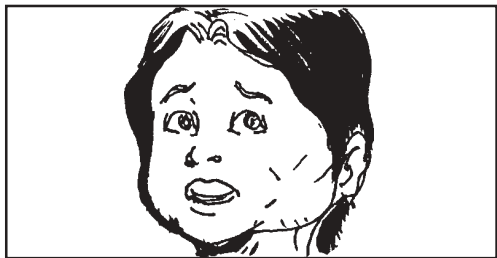
1. A *microbe* is an organism that we cannot see unless we look at it under the microscope. It is often dangerous to our health.



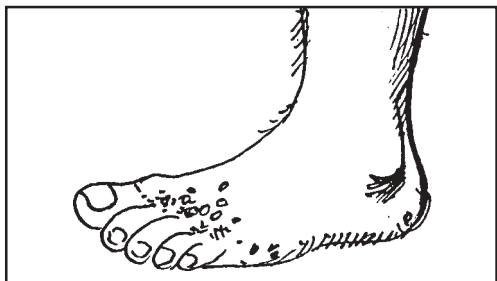
2. *Protozoans* are a type of single-celled microbes that live in soil and water. They eat algae, bacteria and other protozoans. They cause diseases such as amoebiasis and malaria.



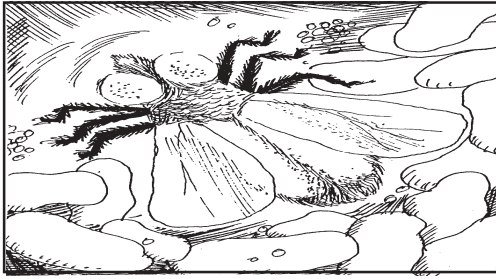
3. Another type of microbe that is the smallest living organism is called *bacteria*. They cause diseases such as cholera, pneumonia, gonorrhoea, diphtheria, pertussis and tetanus.



4. Microbes that are called *viruses* cannot live without being in the body of another organism. They cause diseases like mumps, measles and chicken pox.



5. There are microbes called *fungi* (singular: *fungus*). They eat and destroy skin cells. They cause skin diseases like athlete's foot.



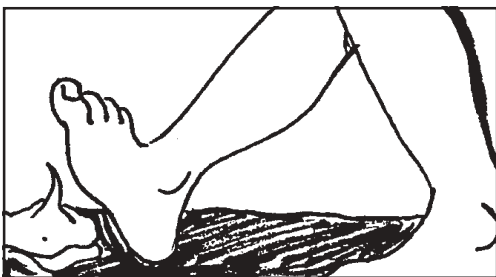
6. Flies, rats and cockroaches cause diseases because they live in dirty places and may be carriers of microbes.



7. Many microbes enter our body through the food we eat.



8. Some microbes enter our body through insect bites.



9. Some microbes enter through wounds or breaks in our skin.



10. We can easily get sick because of microbes, especially if we are not healthy and have poor hygiene.

How Can We Keep From Getting Sick?

Getting sick gives you a lot of trouble. You experience a lot of pain and discomfort. Medicines can be expensive. Sometimes, you wonder: “Why did I get sick? How can I keep from getting sick?” These questions will be answered in this lesson.

After studying this lesson, you should be able to explain why people get sick and how they can keep from being ill.



Let's Read

A picnic near a beach, swimming pool, river, or any body of water can be a lot of fun. Many people, especially children, enjoy playing and swimming in the water.



But sometimes, after a picnic, people get sick. Some catch colds or fever. Others experience stomachaches or get sore eyes.

These illnesses might have been caused by dirty picnic grounds. Flies might have landed on the food, bringing with them plenty of germs. The water in which these people swam might also have been infected by disease-causing germs.



Let's Think About This

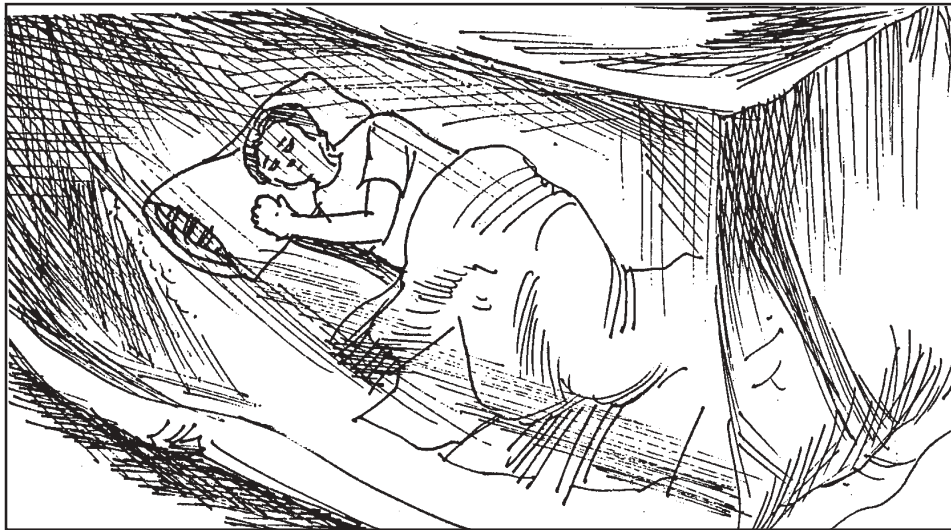
Recall the last time you got sick. What kind of disease did you have? How did you get infected with illness-causing germs?

Read on to discover the answers to these questions.

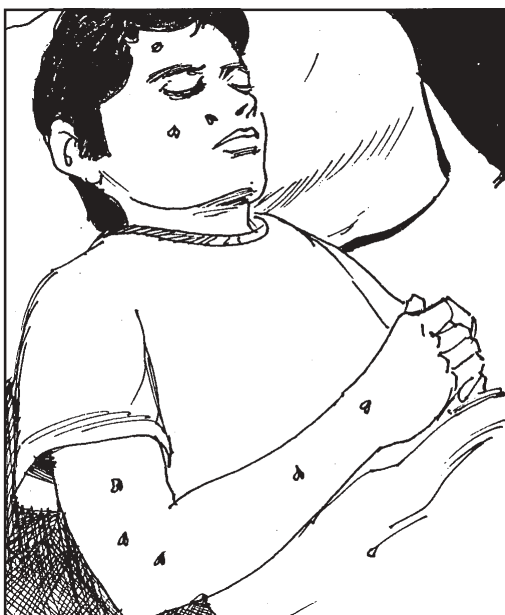


Let's Read

Do you know why we have to . . .

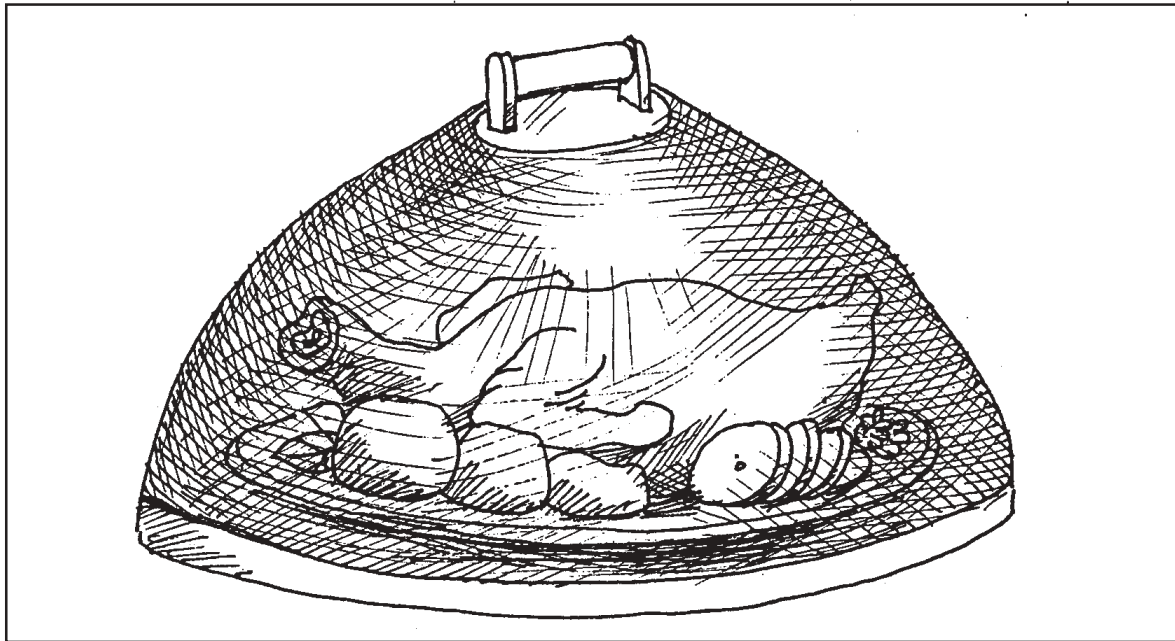


. . . sleep under mosquito nets?



It is because some mosquitoes bring malaria or dengue. If they bite us, microbes that cause these illnesses might enter our body.

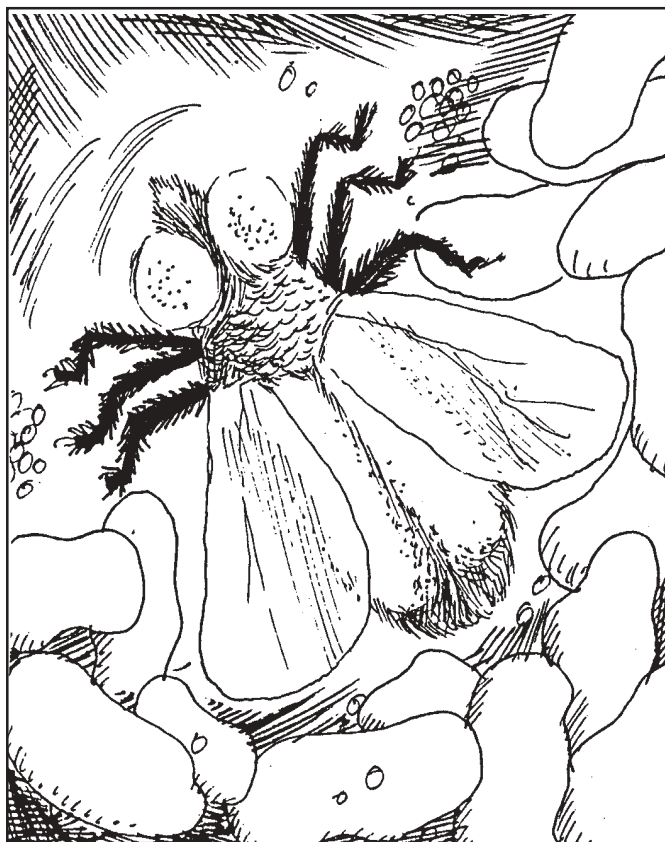
Do you know why we have to . . .



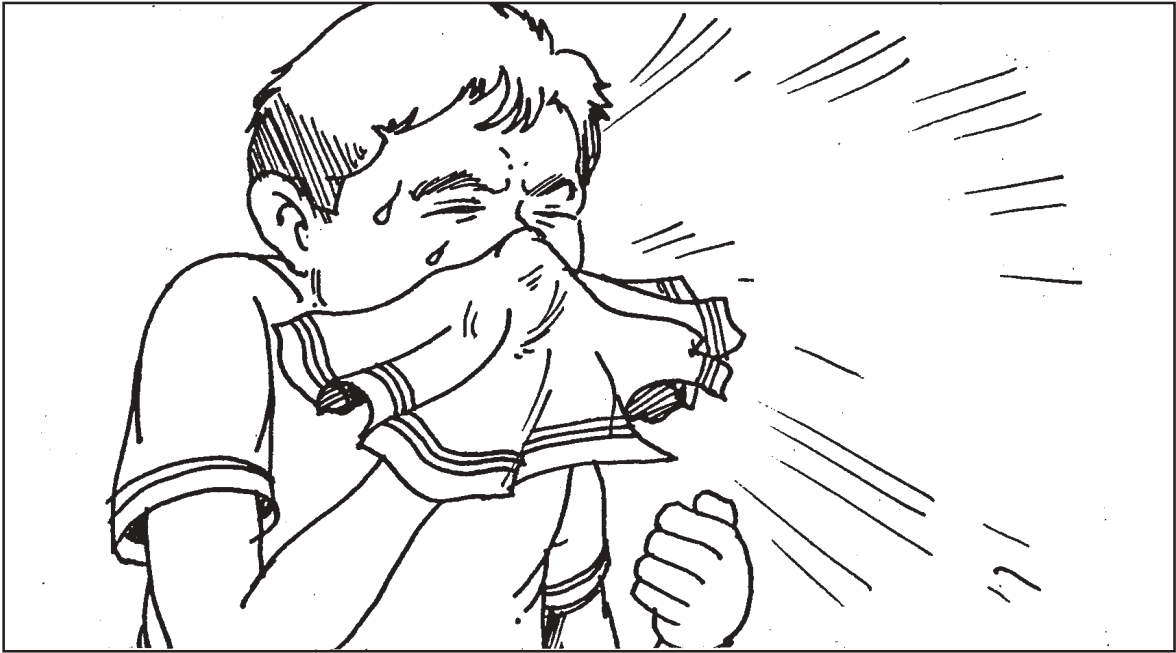
. . . cover or wrap our food?

Flies move from place to place. They often go to dirty and foul-smelling places. Microbes live in those kinds of places. Now, when a fly lands on your food, the germs on its feet and other body parts can be left on your food.

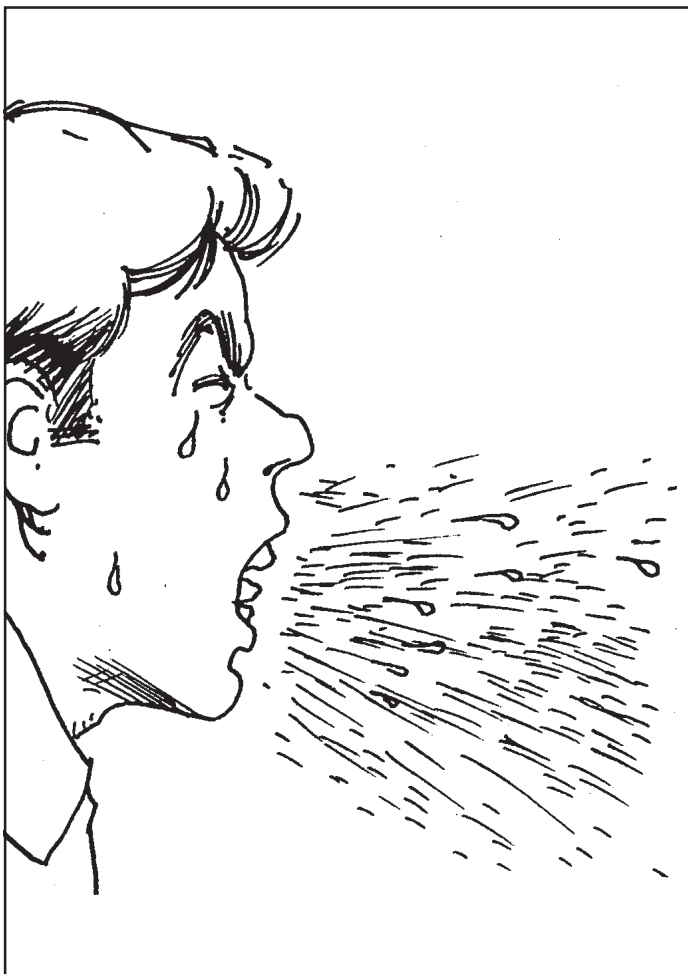
Other pests like rats and cockroaches are also attracted to food. They prefer to stay in dark places which are, more often than not, dirty. They carry with them microbes that cause illnesses to people.



Do you know why we have to . . .



. . . cover our mouths when we cough or sneeze?



If you have colds and you sneeze without covering your mouth, germs are released to the air. Other people can inhale those germs, causing them to get sick, too.

Do you know why we have to . . .

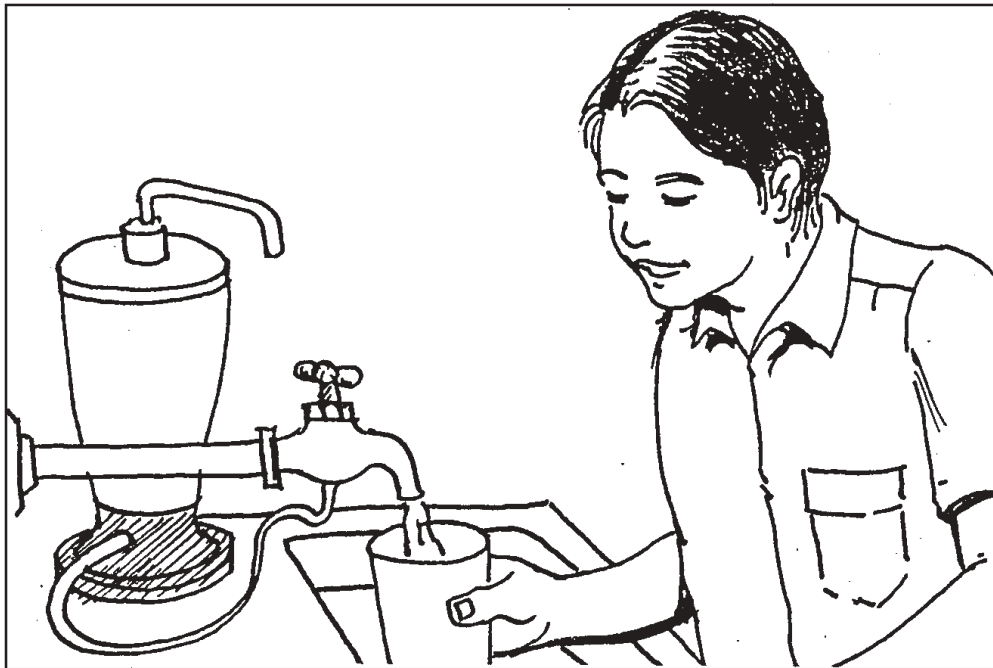


. . . be careful not to step on animal dungs?



Dungs of animals like horses or carabaos may have tetanus microbes. If you accidentally step on them, and you have a wound or break in your skin, you might get tetanus. Always wear slippers or shoes.

Do you know why we have to . . .



. . . strain our water, treat it with chlorine and boil it?

Different microbes live in dirty water. By straining, treating with chlorine and boiling the water, the microbes die. So, your drinking water will be safe from microbes.

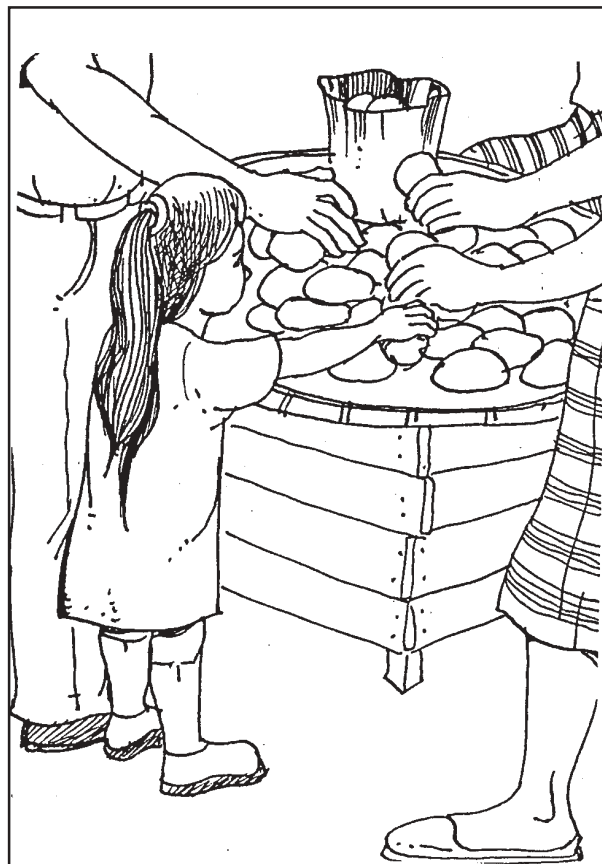


Do you know why we have to . . .



. . . wash fruits and vegetables before eating them, especially if they came from the market?

Different people touch and hold fruits and vegetables placed in different containers in the market. The containers may have microbes. The fruits and vegetables may also have microbes from infected people who touched them. If you eat the fruits or vegetables without washing them, these microbes might enter your body and make you sick.





Let's Review

1. Why do people get sick?

2. How can you keep yourself from getting sick?

Compare your answers with those in the *Answer Key* on page 35. If your answers are similar to those given, very good! If not, go back to the part of the module you did not understand and study it again.

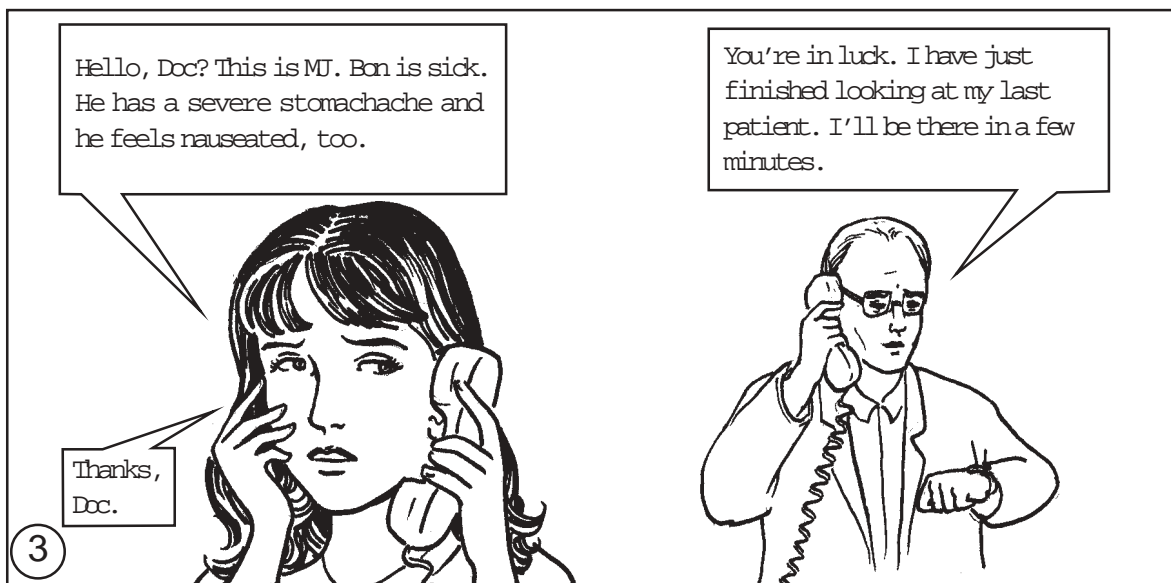
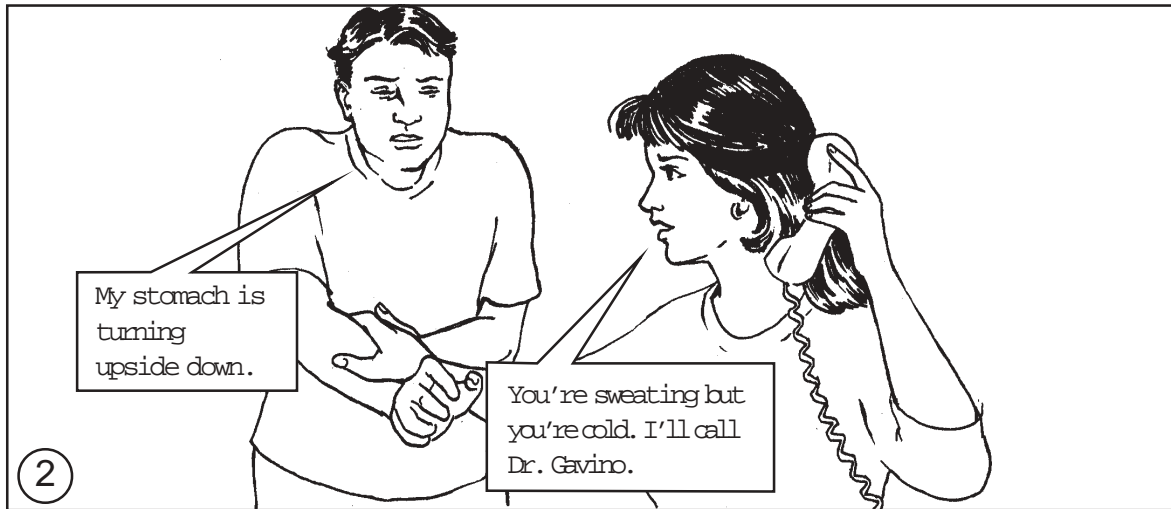


Let's Study and Analyze

People get sick because of many things. Read the following story to see how a person can get sick and how one can prevent it from happening.

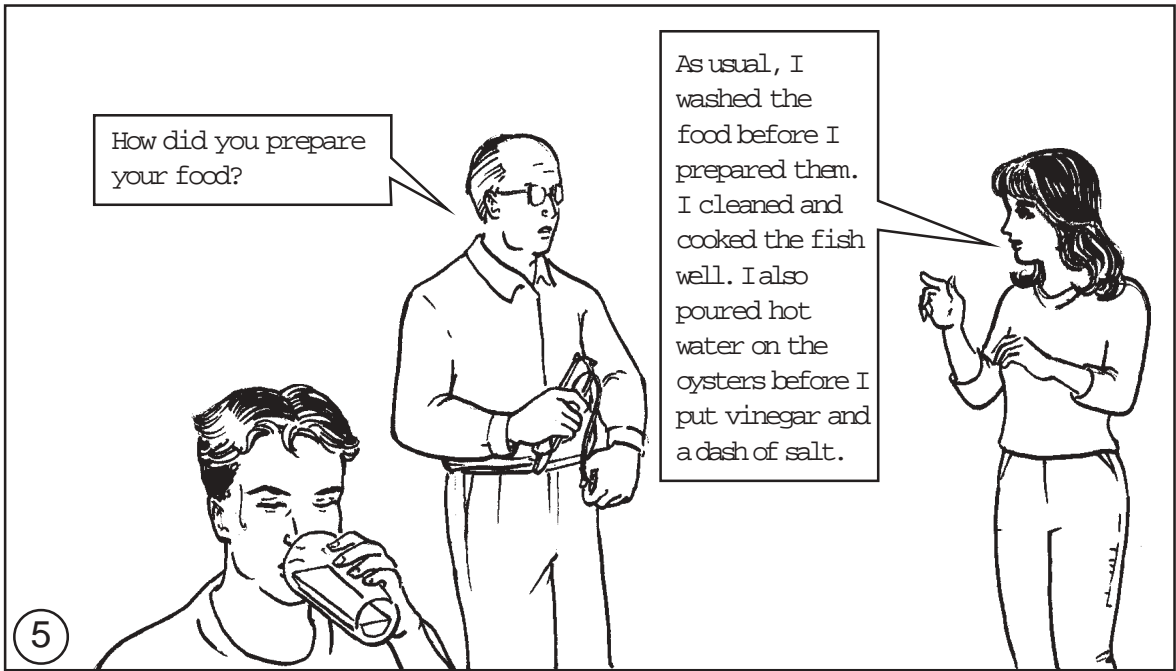
Bon and MJ were watching television at 4:00 in the afternoon when . . .



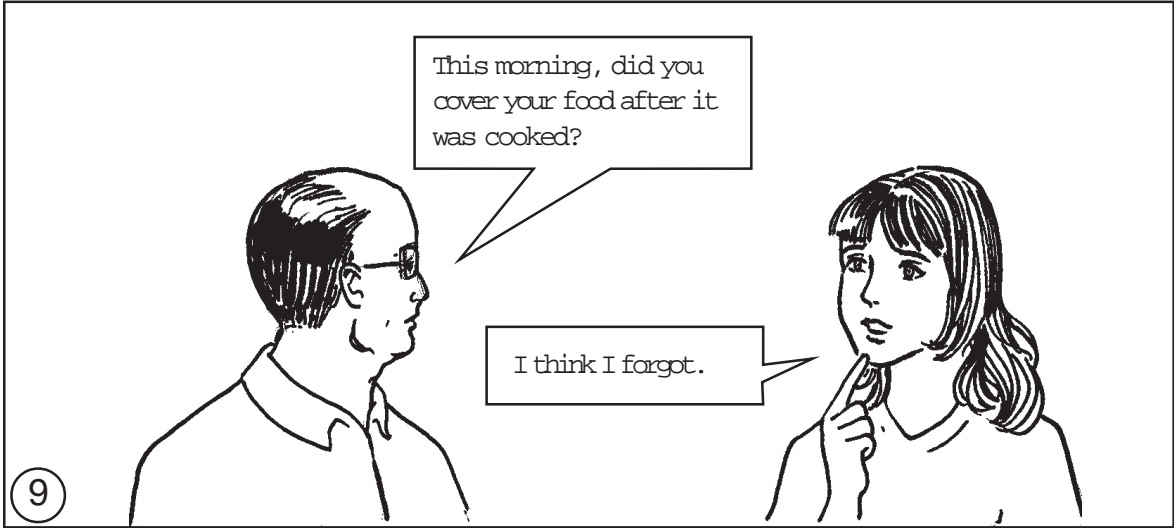
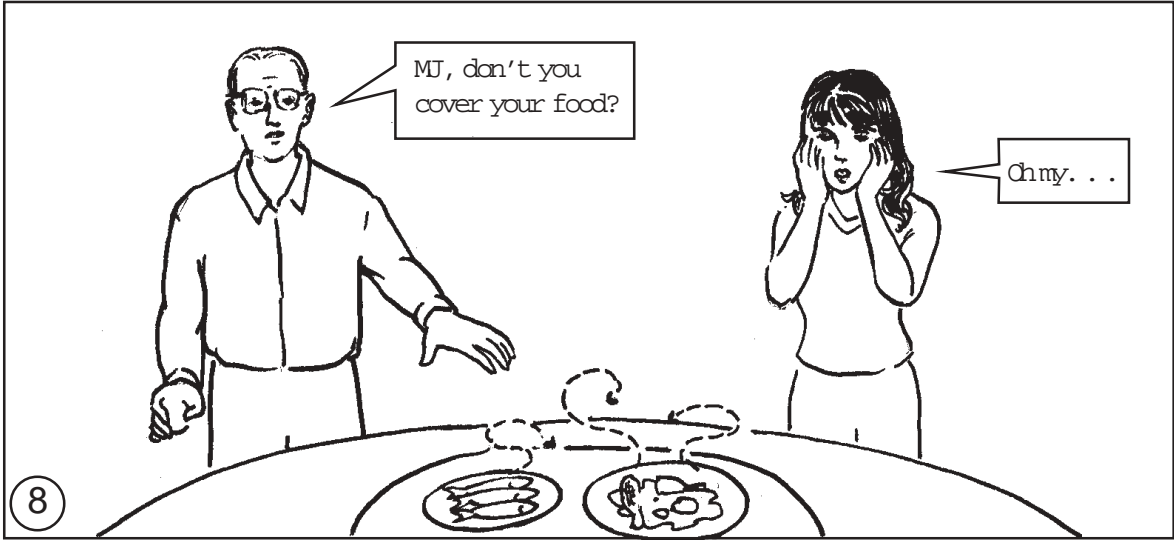


After a while, the doctor arrived.
He checked Bon for a while. Then he talked to MJ.





MJ led the doctor to the dining room. The doctor saw flies flying over the uncovered food on the table.





Let's Review

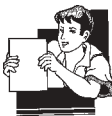
1. What do you think caused Bon's stomachache?

2. Could Bon's illness have been prevented? How?

3. What did MJ forget to do?

4. Could it have been the cause of Bon's sickness? Why or why not?

Compare your answers with those in the *Answer Key* on page 35.



Let's Learn

Microbes are everywhere. If we are not careful, we may get sick because they can easily get into our bodies. Here are some pointers on how to keep yourself from getting sick:

1. In preparing food, it is important to wash your hands, utensils and cutting board first.
2. Don't use the same plate for raw and cooked meat, except if the plates have been washed thoroughly with dishwashing detergent and water.

3. Store meat, fish and poultry inside the refrigerator or in some cool place, if they are not to be cooked yet.
4. Do not leave food that easily spoils out of the refrigerator for more than two hours.
5. If you do not have a refrigerator, buy and cook only the right amount of food that will be eaten to avoid spoiled leftovers.
6. Cook meat and fish well. If the flesh is still pinkish, it's not cooked well.



Let's See What You Have Learned

Encircle the letter of the correct answer.

1. You should use a mosquito net when going to sleep because _____.
 - a. mosquitoes, which carry malaria or dengue germs, might bite you
 - b. mosquitoes might land on and contaminate uncovered food
 - c. the net screens the air from harmful germs
 - d. microbes might bite you during the night
2. You have to cook meat and fish well to _____.
 - a. make the food more tasty
 - b. kill the microbes that multiply easily
 - c. give the food a beautiful color
 - d. make it unattractive to flies and rats
3. What is the importance of washing your hands, utensils and cutting board before preparing your meal?
 - a. To eliminate microbes that may contaminate your food and cause diseases
 - b. To bring out the flavor of the dishes you cook
 - c. To scare away diseases
 - d. To discourage flies and mosquitoes

4. How can you get tetanus?
 - a. By eating contaminated food
 - b. By shaking the hand of a neighbor suffering from tetanus
 - c. By inhaling germs released to the air by someone sneezing
 - d. By walking on the ground without slippers, especially if you have an open wound

5. What might happen if you don't cover your food?
 - a. Microbes and germs might consume all your food.
 - b. Your children might eat the food without you knowing it.
 - c. Flies, rats and cockroaches might contaminate your food, causing you to get ill.
 - d. The food might get cold.

Compare your answers with those in the *Answer Key* on page 36.



Let's Remember

1. Microbes can easily transfer from place to place or from person to person.
2. If we are not careful, germs will enter our body, causing us to get sick.
3. There are many kinds of germs. Each of them may cause different kinds of diseases.
4. Microbes are found everywhere, especially in dirty places.
5. In preparing food, everything must be clean including our hands, the utensils, the cutting board and the food to be cooked.
6. Cook meat and fish well.
7. Buy and cook only the right amount of food, especially when you don't have a refrigerator.
8. Do not leave food unrefrigerated for a long time.



Let's Sum Up

- ◆ *Microbes or germs* are small living things that cause diseases. They can only be seen through a microscope.
- ◆ There are basically four types of microbes: bacteria, viruses, protozoans and fungi.
- ◆ *Bacteria* are the smallest living creatures that eat any kind of living organism.
- ◆ *Protozoans* are a set of single-celled organisms that live in soil and water.
- ◆ *Virus* is a word that means “poison.” It is a live, reproducing organism. It cannot live without being in the body of another organism.
- ◆ *Fungi* are plant-like microbes. These germs look like molds or mushrooms under the microscope.
- ◆ When microbes enter the body, they multiply. As they multiply, they give off a kind of poison. The poison causes people to weaken and get sick.
- ◆ Here are some things you could do to keep from getting sick:
 1. Sleep under a mosquito net.
 2. Avoid stepping on animal dung.
 3. Make sure your drinking water has been strained, treated with chlorine and boiled.
 4. Wash fruits and vegetables before eating them.
 5. Wash your hands before preparing food and before eating.
 6. Wash your kitchen utensils before preparing and cooking food.
 7. Cook meat and fish well.
 8. Cook only the right amount of food to prevent spoilage.
 9. Always cover or wrap your leftover food.
 10. Store food in a cool place.
- ◆ To help keep other people from getting sick, cover your mouth when coughing or sneezing.



What Have You Learned?

Answer the questions below.

1. Why do we need a microscope to see microbes?

2. Why should you sleep under a mosquito net if your house does not have fly screens on its doors and windows?

3. Why is it a good practice to boil water or treat it with chlorine?

4. What should we do if we are about to sneeze? Why?

5. How does wearing shoes or slippers help prevent sickness?

6. Why should you wash vegetables and fruits well before eating them?

7. Why is it better to eat meat that is well cooked rather than raw or half-cooked?

8–10. Give three good practices or habits that prevent sickness apart from those already mentioned in this exercise.

Refer to the *Answer Key* on page 37 to find out if you answered the questions correctly. If you got a score of:

- 0–4 You should study the module again.
- 5–7 You need to review parts of the module that you did not understand.
- 8–10 Very good! You learned a lot from the module. You can now proceed to the next module.



Answer Key

A. Let's See What You Already Know (pages 2–3)

1. **(c)** is the correct answer. A microscope is a scientific instrument that enlarges the image of small things. Microbes such as bacteria and viruses and other objects too small to be seen by the naked eye are made to appear bigger under a microscope. A microscope may only be used for looking at small organisms and objects, not as a treatment medicine or instrument for killing germs. Neither can it be used to compute the number of microbes that make up a germ. Microbes and germs are, after all, one and the same.
2. **(d)** is the correct answer. Microbes are small living things or organisms that cause illnesses to people when they enter the body. They are too small to be seen by the naked eye. Microbes and germs are simply different terms used to refer to the same thing. One is not smaller nor made up of combinations of the other.
3. **(c)** is the correct answer because tetanus germs live in the soil. If a person is not wearing slippers and has a wound, the germs may enter the body through that opening.
4. **(a)** is the correct answer. Flies, rats and cockroaches live in dirty places, and they carry disease-causing germs. These pests help multiply and spread germs.
5. **(a)** is the correct answer because germs are microorganisms that attack our bodies' defences, causing us to get sick.

(b) is incorrect because microbes can enter our bodies through insect bites.

(c) is incorrect because even if we take a bath daily, germs can still enter our body.

(d) is incorrect. Drinking alcohol will not kill germs inside a person's body.

6. **(c)** is correct because healthy people have strong body defences that help fight off germs.
- (a) is incorrect because weak people have weak body defences that can hardly fight germs.
- (b) is incorrect because healthy people can fight off germs easily due to their strong body defences.
- (d) is incorrect. Healthy people have strong defences that increase their ability to fight germs.
7. **(b)** is correct because only protozoans can cause people to get sick with malaria.
8. **(a)** is correct because there are good bacteria that can help us in digestion and in making food like wine and bread. But there are also bad bacteria that cause us to get sick.
9. **(c)** is correct because only fungi can cause athlete's foot.
10. **(d)** is correct because only viruses can cause mumps and chicken pox.

B. Lesson 1

Let's Review (page 8)

1. virus
2. fungi
3. protozoan
4. bacteria
5. virus

Let's See What You Have Learned (page 13)

1. bacteria
2. viruses
3. viruses
4. fungi
5. protozoans

C. Lesson 2

Let's Review (page 23)

1. People, especially those with weak bodies, get sick because microbes enter and infect their bodies.
2. You can keep from getting sick by:
 - a. using a mosquito net when going to sleep
 - b. covering or wrapping food
 - c. not stepping on animal dung
 - d. wearing slippers or shoes
 - e. straining water, treating it with chlorine and boiling it
 - f. washing fruits and vegetables before eating them

You might also have identified some other ways of keeping yourself from getting sick. Show your answers to your Instructional Manager or Facilitator for additional feedback.

Let's Review (page 27)

1. Microbes may have multiplied in the food that Bon ate.
2. Yes, by:
 - a. washing the hands, utensils and cutting board before preparing the food;
 - b. covering the food after cooking and eating; and
 - c. cooking the food well.
3. She forgot to cover the food.
4. Yes, because flies, rats or cockroaches may have contaminated the food. These pests carry microbes on their bodies that can be transferred to the food. When Bon ate, the germs in the contaminated food might have entered his body, which caused him to get sick.

Let's See What You Have Learned (pages 28–29)

1. The correct answer is **(a)**. The purpose of a mosquito net is to prevent mosquitoes that cause malaria or dengue from biting you and therefore making you ill.

(b) is wrong because we do not cover food with a mosquito net.

(c) and (d) are also wrong because harmful germs and microbes are so small that they can easily pass through the mosquito net. The mosquito net, therefore, does not protect us from microbes.
2. The correct answer is **(b)**. Cooking food well kills microbes.

(a) and (c) may be true, but they are not the main reasons why we cook food.

(d) is also wrong. We do not know if cooking food makes it unattractive to flies and rats.
3. The correct answer is **(a)**. Washing our hands, utensils and cutting board with soap and water kills germs.

(b), (c) and (d) are incorrect since none of them results from washing.
4. The correct answer is **(d)**. Walking barefoot on the ground is dangerous, especially if you have a wound. Tetanus germs live on the ground.

(a), (b) and (c) are wrong answers because tetanus is not contracted through any of these means.
5. The correct answer is **(c)**. Uncovered food may attract pests, leaving it contaminated with germs.

(a) is wrong since germs do not eat food like people do.

(b) and (d) are also incorrect because covering food does not prevent children from eating it nor does it prevent food from getting cold.

D. What Have You Learned? *(pages 31–32)*

Give yourself one point for every correct answer.

1. Microbes and germs are so small for the naked eye to see. A microscope is therefore used to view them.
2. When you sleep under a mosquito net, you avoid being bitten by mosquitoes, flies and even cockroaches that carry harmful germs.
3. Boiling or treating water with chlorine helps kill microbes. This practice ensures that we drink germ-free water.
4. We should cover our mouths when we sneeze, especially if we have colds or some other disease. Covering our mouths prevents the spread of harmful germs in the air.
5. Wearing shoes or slippers helps prevent tetanus. Germs found on the ground and in animal dung cannot penetrate the skin of our feet when we have shoes or slippers on.
6. Washing fruits and vegetables well removes microbes that may be on their surface. Thus, when we eat clean food we do not take in any harmful microbes.
7. There may be germs in uncooked or raw meat. Cooking the food helps to kill these germs.
- 8–10. Any three of the following answers:
 - a. Always cover or wrap food to keep insects and flies away.
 - b. Wash your hands, utensils and cutting board first when preparing food.
 - c. Do not use the same (unwashed) plate for raw and cooked meat.
 - d. Store meat, fish and poultry inside the refrigerator or in a cool place if they are not to be cooked yet.
 - e. Do not leave food that easily spoils out of the refrigerator for more than 2 hours.
 - f. Cook and buy only the right amount of food that will be eaten, if you do not have a refrigerator.



References

“Bacteria.” *The New Encyclopaedia Britannica*, vol. 14. Chicago: Encyclopedia Britannica, Inc., 1993.

“Protozoa.” *The New Encyclopaedia Britannica*, vol. 26. Chicago: Encyclopedia Britannica, Inc., 1993.

“Virus.” *The New Encyclopaedia Britannica*, vol. 29. Chicago: Encyclopedia Britannica, Inc., 1993.

American Lung Association. *What is Pneumonia*.

<<http://www.lungusa.org/diseases/lungpneumoni.html#causes>>

November 15, 2000, date accessed.

Adam. Com. *Tetanus*. <<http://www.adam.com/ency/article/000615.htm>>

November 15, 2000, date accessed.

University of California, Berkeley, Museum of Paleontology. *Introduction*

to the Fungi <<http://www.ucmp.berkeley.edu/fungi/fungi.html>>

November 15, 2000, date accessed.

University of Nebraska, Institute of Agriculture and Natural Resources.

Insects <<http://www.ianr.unl.edu/pubs/insects/g1129.html>>

November 15, 2000, date accessed.

