



What Is This Module About?

Did you hear of the Payatas tragedy in July 2000? Heavy rains caused a landslide in a dump site in Quezon City, causing the death of hundreds of people who lived near it.

This tragedy awakened many Filipinos to the fact that we are facing a very serious problem—pollution. It made us realize that pollution doesn't just make our environment smelly and dirty, it can also lead to loss of lives.

In this module, you will learn the different causes and effects of pollution. You will also find out how you can help fight and prevent pollution.

This module is divided into three lessons. These are:

Lesson 1 – *Air, Land and Water*

Lesson 2 – *Whatever Happened to Our Environment?*

Lesson 3 – *The Pollution-Fighting Force*



What Will You Learn From This Module?

After studying this module, you should be able to:

- ◆ discuss the importance of the environment and its three components—air, land, and water;
- ◆ explain the causes and effects of air, water and land pollution; and
- ◆ demonstrate activities to fight pollution in your home and community.



Let's See What You Already Know

Before you start studying this module, take this simple test first to find out what you already know about this topic.

A. Encircle the letter of your answer.

1. _____ is the result of using and throwing away materials that damage the air, land and water around us.
 - a. Environment
 - b. Pollution
 - c. Atmosphere
 - d. Life
2. _____ pollution can cause many respiratory diseases.
 - a. Water
 - b. Land
 - c. Air
 - d. None of the above
3. _____ wastes can be broken down into very small particles by tiny organisms.
 - a. Biodegradable
 - b. Nonbiodegradable
 - c. Renewable
 - d. Nonrenewable
4. Many _____ wastes can be reused or recycled.
 - a. biodegradable
 - b. nonbiodegradable
 - c. renewable
 - d. nonrenewable
5. _____ cause bodies of water to clog.
 - a. Solid wastes
 - b. Chemicals
 - c. Fishes
 - d. Fertilizers

B. Write **True** in the blank if the sentence is correct or **False** if it is wrong.

- _____ 1. Taking care of the environment is the duty of the government and not of the people.
- _____ 2. Air, land and water pollution can cause serious illnesses.
- _____ 3. Organic fertilizers and pesticides are good for the environment because they do not contain poisonous chemicals.
- _____ 4. Pollution is a natural process, so there's nothing we can do to prevent it.
- _____ 5. Reduce, reuse and recycle are the three Rs of solid waste management.

Well, how was it? Compare your answers with those in the *Answer Key* on page 32.

If all your answers are correct, very good! This shows that you already know much about the topic. 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 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 with Lesson 1.

Air, Land and Water

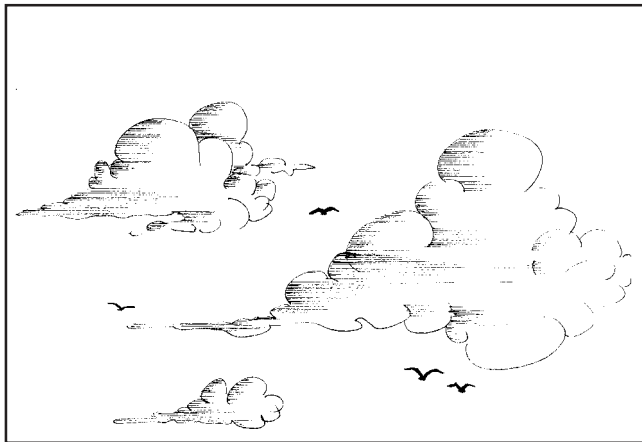
Look around you and observe the environment. Don't you just love to breathe the air? Or take a walk in the green fields? Surely you enjoy swimming in the river or sea, right? Well, almost everybody does. In this lesson, you will learn more about our environment and its three components — air, land and water.



Let's Try This

In the drawings below, the three components of the environment are shown. Can you identify each one? Write your answers on the lines.

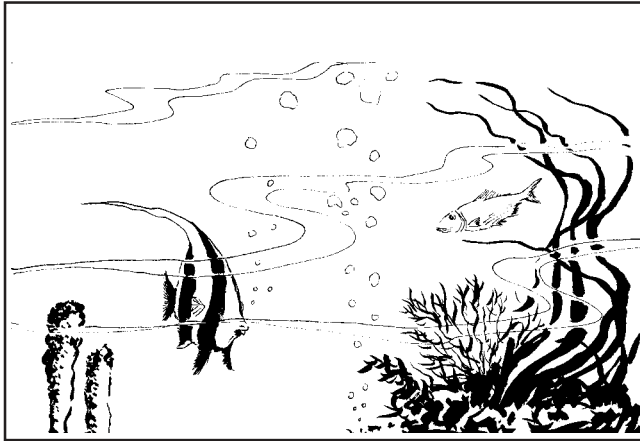
1.



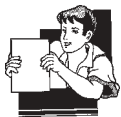
2.



3.



Did you finish writing your answers? Check your answers with those in the *Answer Key* on page 32.



Let's Learn

The **environment** is everything that surrounds and affects us. Its three components are **air**, **land** and **water**.

Land is the solid part of the surface of the earth. It is where we build houses or grow crops. Look at the picture of the land environment on page 4. It is where man, plants and animals live.

Water is the liquid part of the surface of the earth. Do you know that $\frac{3}{4}$ of the earth's surface is water? Examples of bodies of water are seas, oceans, creeks, rivers, brooks and streams. Which of these do you have in your community?

Air is all around us. It is the combination of invisible and odorless gases. We inhale air, and when we exhale it, plants use it to survive and perform important functions.

Without air, land and water, life would not be possible on earth.



Let's Try This

Each of the three components has several uses. Can you list some of them? Write the uses under each of the components.

AIR

Example: breathing

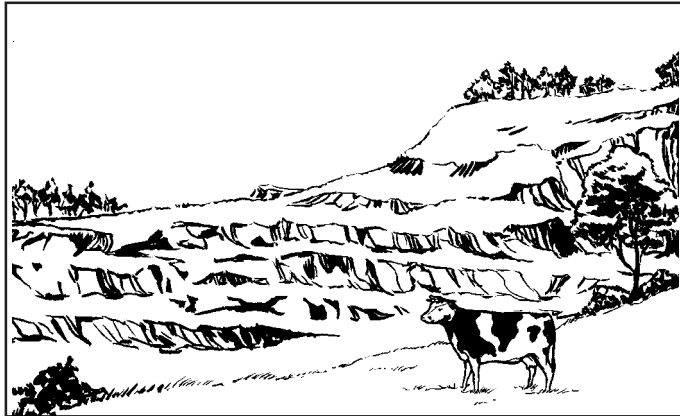
1. _____
2. _____
3. _____



LAND

Example: planting

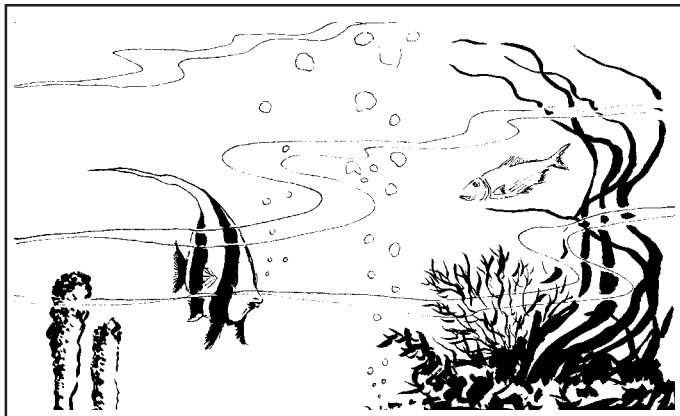
1. _____
2. _____
3. _____



WATER

Example: drinking

1. _____
2. _____
3. _____



After answering the test, check your answer with those in the *Answer Key* on page 32.



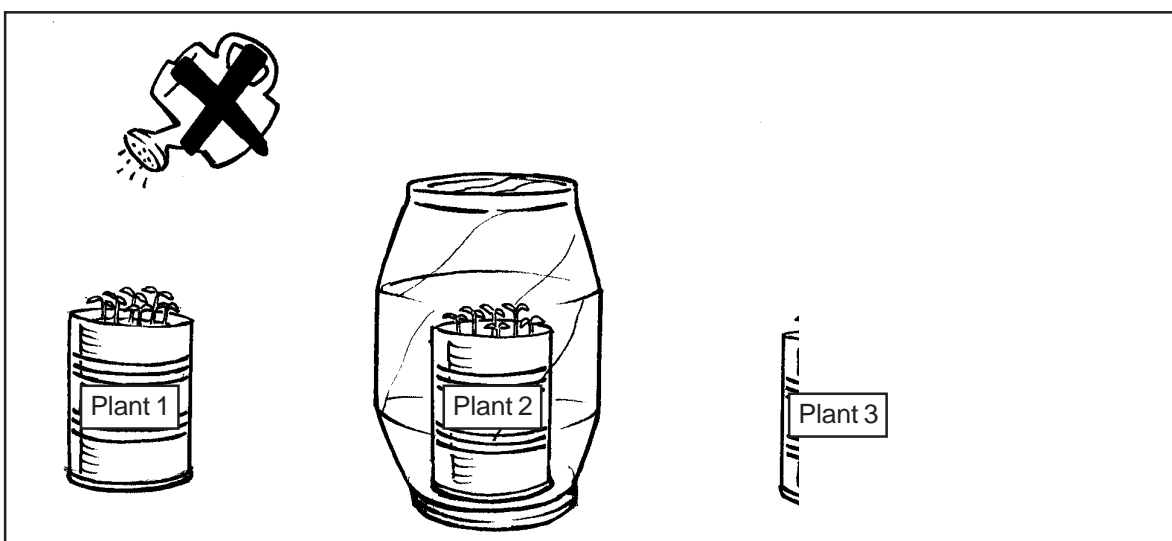
Let's Try This

In this activity, you will perform a simple experiment that will demonstrate the importance of the three components of the environment. You should do this at home by yourself or with the help of some family members or friends.

Prepare the following materials for this experiment:

- ◆ 1 plastic or glass jar
- ◆ 3 milk cans
- ◆ 1 plastic sheet
- ◆ mungo seeds

1. Label the three cans as: Plant 1, Plant 2 and Plant 3.
2. Fill the three cans with the same kind of soil, then plant the mungo seeds in each of them.
3. Water them regularly.
4. When they have grown about an inch from the soil, do the following:
 - a. Do not water the plants in the first can.
 - b. Cover the plants in the second can with a big plastic or glass jar.
 - c. Pull out the plants from the soil in the third can. Put them instead in a plastic sheet.
5. Wait for two to three days and then see how your plants are.





Let's Think About This

1. What happened to the plants? Describe them below.

Plant 1: _____

Plant 2: _____

Plant 3: _____

2. What can you conclude from what happened? Do you think that mongo plants can survive without air, land and water? Explain your answer.

3. If air, water or land is taken away from you, do you think you can still live? Explain.

After writing down your answers, compare your answers with those in the *Answer Key* on pages 32–33.



Let's Remember

- ◆ The environment is everything that affects and surrounds us.
- ◆ The three components of the environment are air, land and water.
- ◆ Air, land and water are important for humans and other living organisms to live.

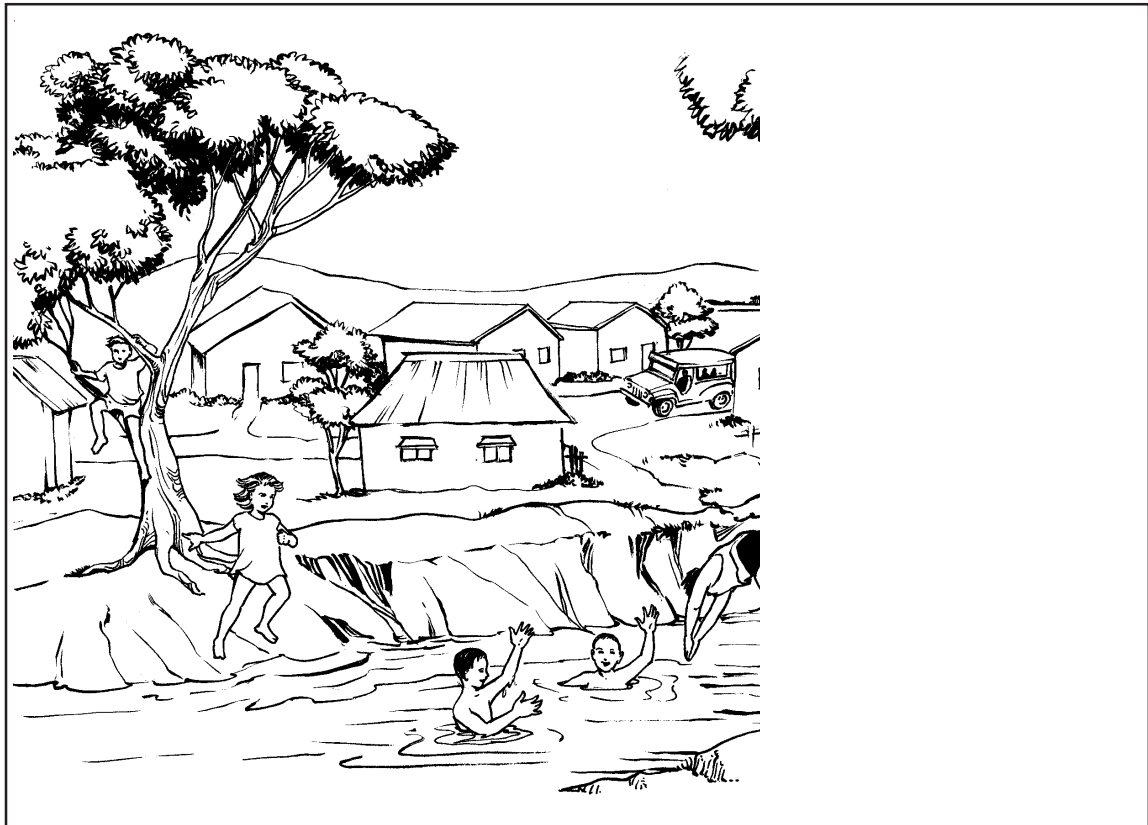
Whatever Happened to Our Environment?

Do you often hear your elders talk about how clean and beautiful the environment used to be? Over the years, there really have been a lot of changes in the air, water and land around us. Many of these changes have been brought about by pollution. In this lesson, you will find out what causes pollution and how it affects the people and environment as well.

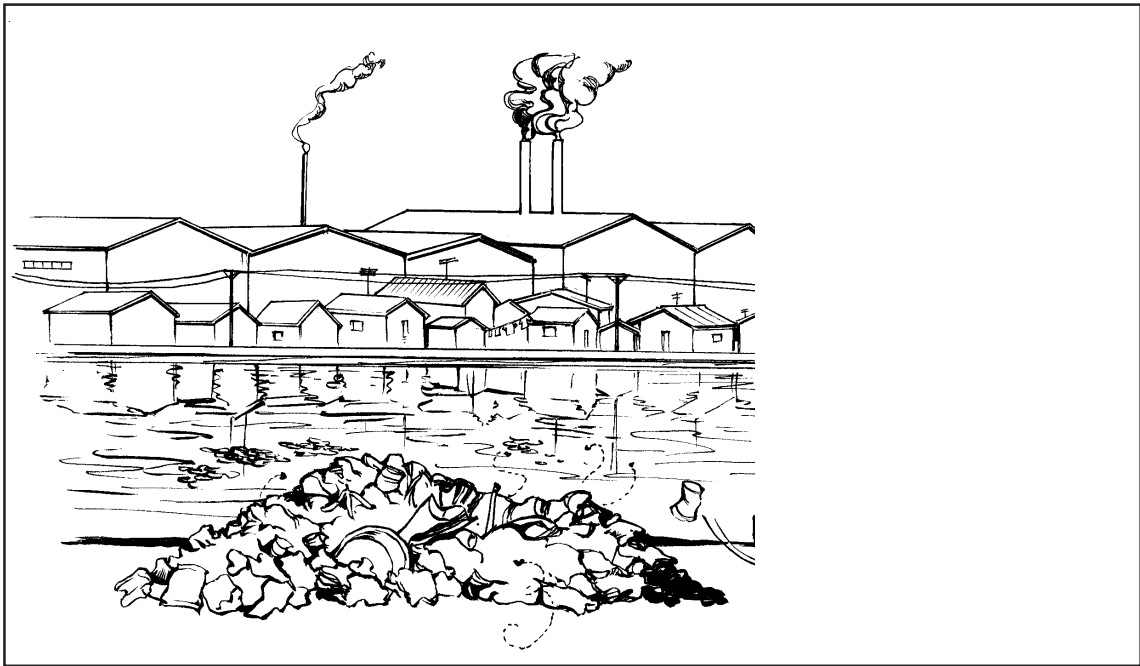


Let's Study and Analyze

Study the following pictures. The first one shows how a certain place looked like 30 years ago. The second one shows how it looks like at present.



Picture 1



Picture 2

Answer the following questions.

1. Describe Picture 1.

2. Describe Picture 2.

3. What changes happened to the community?

4. What do you think the people did that polluted the community?

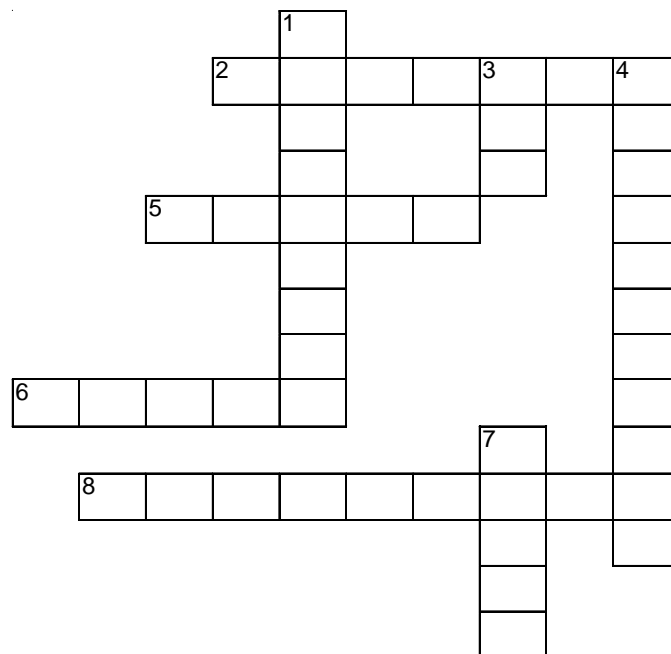
After answering the questions compare your answers with those in the *Answer Key* on page 33.



Let's Think About This

Look at the box below. In it, you can find words that describe or relate to the pictures you studied. Refer to the numbered clues to answer the crossword puzzle. Choose the correct words from the box.

pollution	flies	river
environment	garbage	air
factories	smoke	



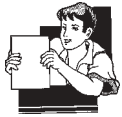
Across

2. wastes produced by households
5. released by factories and vehicles into the air
6. insects that feed on wet and smelly garbage
8. happens when we throw away things that damage the environment

Down

1. manufacturing plants that release black smoke into the air
3. the combination of invisible and odorless gases
4. everything that surrounds and affects us
7. a large body of flowing freshwater

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



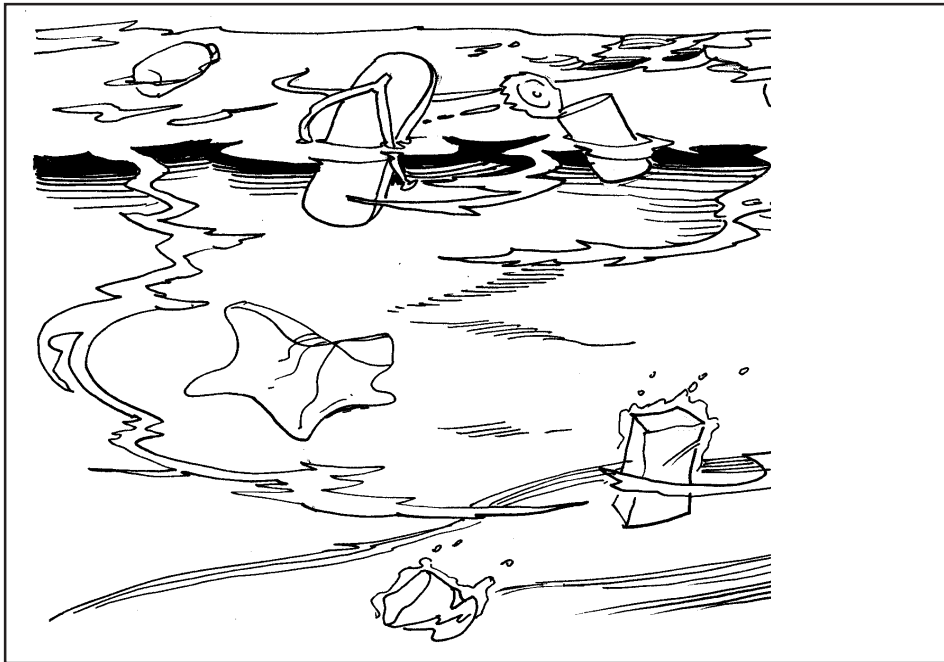
Let's Learn

Look at the pictures again on pages 9–10. Do you experience the same problems illustrated in the second community (Picture 2)? These problems are all caused by pollution.

Pollution is what happens to the environment when we use and throw away things that damage the air, land and water around us. Pollution occurs in many ways. We usually classify it according to the part of the environment that it affects. So, we have air, land and water pollution. Let's discuss them one by one.

Water Pollution

Look at the picture below. It shows an example of water pollution.



What do you think will happen to the fish and other living things found in this polluted body of water?

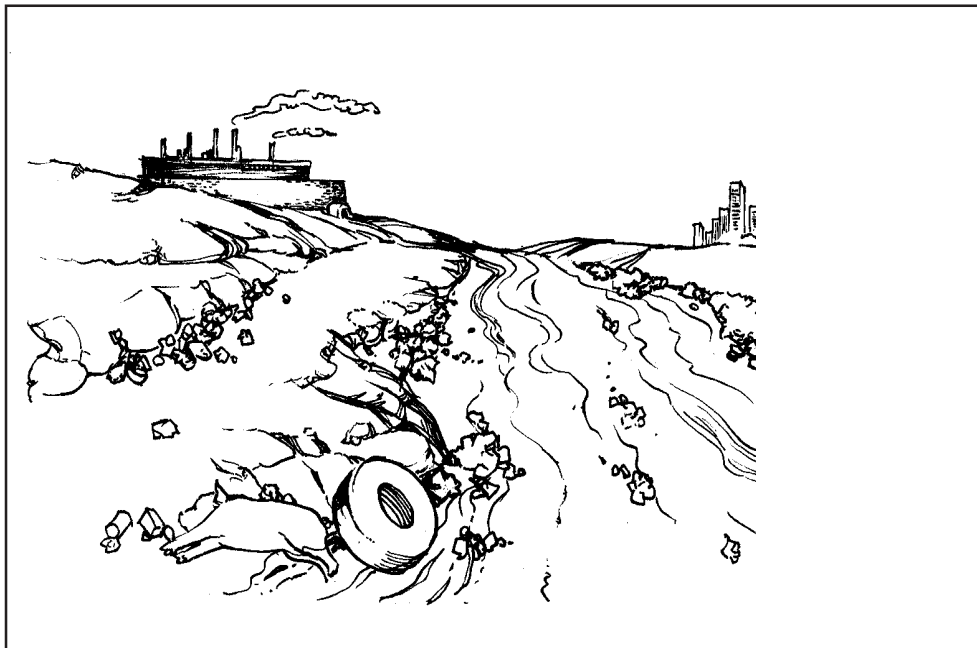
If you answered that the fish will become sick and probably die, you are correct. This can happen when the water they live in becomes polluted.

The following are common sources of water pollution:

Waste Discharges

Do you know that the wastes coming from our kitchens and toilets end up in bodies of water such as rivers, lakes, streams and seas? There are also many other people as well as factories that release their wastes into these bodies of water.

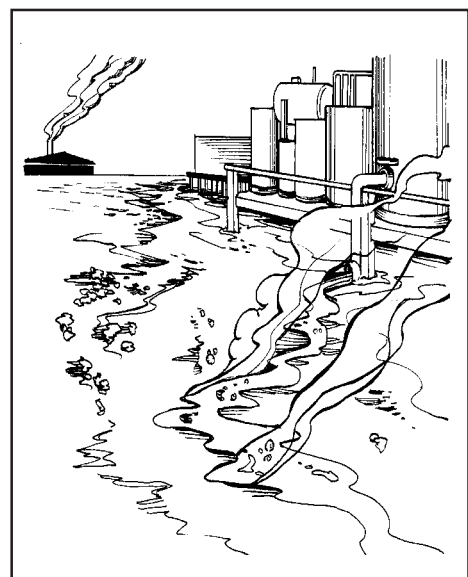
When water is clogged with wastes, rainwater has nowhere to go anymore. This causes floods that claim many lives and often leave many people homeless.



Heat

Raising the temperature of water also leads to water pollution. This type of pollution is called **thermal pollution**.

Power plants use water in order to cool its equipment. This water is called a **coolant**. When it gets hot, it is discharged into nearby rivers. Many organisms in the water die because they cannot stand high temperatures. Thermal pollution also causes a body of water to dry up.

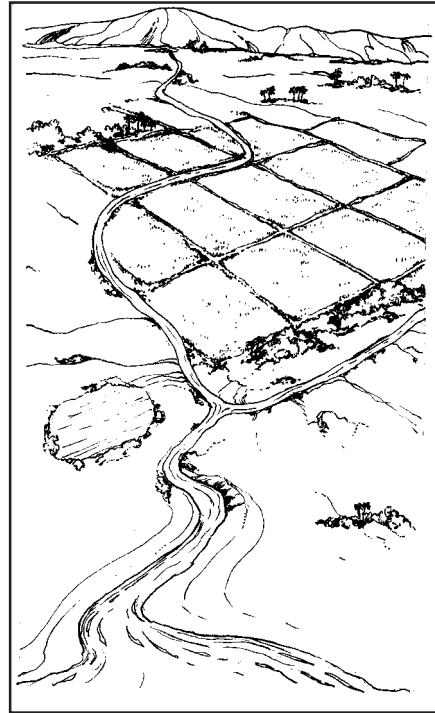


Chemicals

Do you use pesticides or fertilizers for your plants? If yes, do you know that they too cause water pollution?

Some of the pesticides or fertilizers go down to the soil. This is what we call **pesticide** or **fertilizer residue**. When it rains, the rainwater carries some of the soil and the residues along with it. The rainwater then goes to the different bodies of water.

Sometimes, the wastes released by factories into the water also contain poisonous chemicals. This is another serious cause of water pollution.

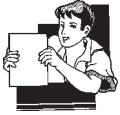


Let's Try This

Be a water pollution detective! Is there a body of water in or near your community? Is it a river, lake, stream, canal, brook or sea? Go out and investigate this body of water. Is it clean or dirty? If the water is dirty, find out the sources of pollution. List your findings in the box.

Body of water: _____	
Location: _____	
Is the water clean? _____ Yes _____ No	
If the water is dirty, what are the sources of pollution?	
_____ sewage	_____ pesticides
_____ fertilizers	_____ wastes from factories
_____ garbage	_____ heated water
_____ other chemicals	

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



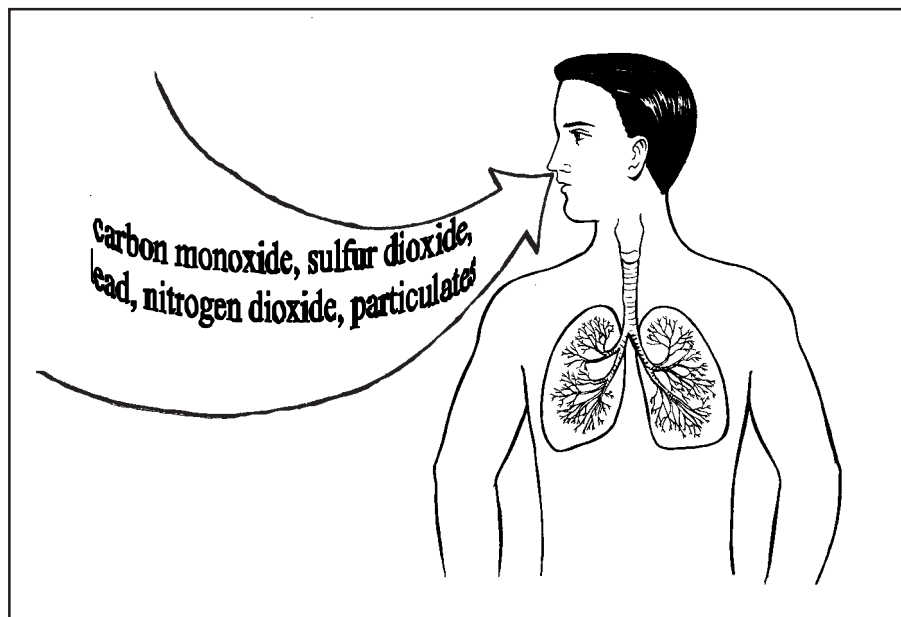
Let's Learn

After learning about water pollution, let us now study another type of pollution—air pollution.

Air Pollution

The air around us becomes polluted when we release harmful materials into the atmosphere in big amounts. These materials are usually gases, very tiny or fine solid particles and droplets of liquids.

When you breathe in polluted air, these are the things that enter your lungs:



Carbon monoxide: a colorless, odorless gas. When it enters the body, it robs the brain cells of oxygen. This can lead to brain damage.

Sulfur dioxide: a foul-smelling gas that can irritate the nose and skin and cause respiratory ailments.

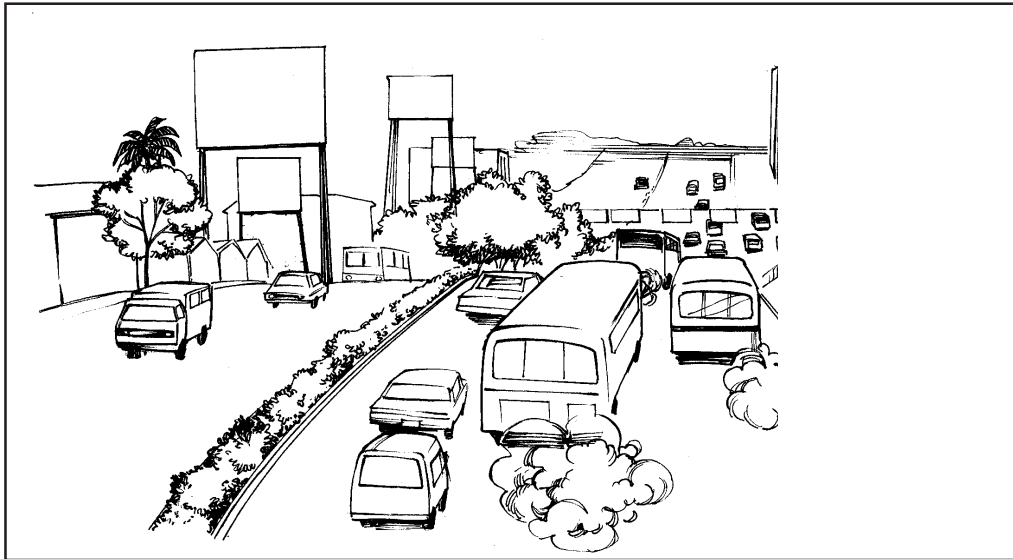
Lead: a heavy metal which causes cancer and brain damage.

Nitrogen dioxide: causes serious lung damage with delayed effects. It also causes shortness of breath and chest pains.

Particulates: very tiny particles that are a mixture of solids and liquids. Examples are dust, fumes and mists. These have been linked to various respiratory ailments, including asthma.

Where do these harmful materials come from? There are two kinds of sources of air pollution. These are:

1. **Mobile sources** — These are sources that are free to move from one place to another. So, they can pollute any area they pass by. Vehicles such as cars, trucks, buses and jeepneys are the main mobile sources of air pollution. Harmful materials are released when the fuel inside a vehicle's engine is not completely burned.



2. **Stationary sources** — These are sources of air pollution that are located in one place. Power plants and most manufacturing industries or factories use chemicals and fuels. When burned, these release poisonous substances into the air.



Do you know that . . .

The top five killer diseases in the Philippines are air pollution-related? These diseases are heart, pulmonary and cardiovascular diseases, tuberculosis and cancer. According to some studies, 70% to 90% of these diseases are caused by mobile sources of air pollution.



Let's Try This

Now it's time for you to be an air pollution detective. You need to bring a watch with you. Stand beside a main road in your community and count the vehicles that pass by which emit thick, black smoke. Do this for 10 minutes. You can time yourself with the watch. Record the number in the box below.

Also check if there are any factories or power plants in your area. Record the number of these factories or plants in the box below. Check which of these release a lot of smoke into the air.

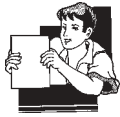
Number of vehicles that emitted black smoke in 10 minutes: _____

Number of factories/plants in your area: _____

Number of factories/plants that emit black smoke: _____

Based on your investigation, do you think your neighborhood suffers from air pollution? _____

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



Let's Learn

Another kind of pollution that we should understand clearly is land pollution.

Land Pollution

Land becomes polluted when it is filled with solid wastes. These are wastes that cannot be broken down easily into very tiny pieces, either by mechanical force (such as pressing or compacting) or by the action of bacteria.

There are two kinds of wastes — biodegradable and nonbiodegradable wastes. **Biodegradable wastes** are those which can be broken down easily and used by bacteria. Examples are leftover food, peelings of fruits and vegetables, and animal wastes or manure. **Nonbiodegradable wastes** are those which cannot be broken down by bacteria. Examples are styrofoam, plastics, and metals. Now, can you tell which among your wastes are biodegradable and nonbiodegradable?

These wastes are not only an ugly sight. They are also sources of food of the flies that carry different kinds of contagious diseases.



Let's Try This

Now it's time for you to be a land pollution detective. Take a walk around your neighborhood. Observe if there are piles of uncollected garbage. If there are, what are their effects on your community? List them below.

Based on what you found out, does your community have a land pollution problem? _____

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



Let's See What You Have Learned

Match the items in Column A with those in Column B by writing the letters of the correct answers in the blanks.

Column A

- ____ 1. Pollution that results from raising the temperature of water
- ____ 2. Wastes that cannot be broken down easily into small particles
- ____ 3. Has been linked to the top five killer diseases in the country
- ____ 4. An internal organ of the human body which is most affected by air pollution
- ____ 5. A heavy metal which can cause brain damage

Column B

- a. lead
- b. biodegradable
- c. thermal pollution
- d. lungs
- e. nonbiodegradable wastes
- f. air pollution
- g. heart

Compare your answers with those in the *Answer Key* on page 35. Did you get all the correct answers? If you did, that's very good! You are now ready to move on to the next lesson. If you had some mistakes, that's okay. Just study the parts that you did not understand. Afterwards, read the lesson summary below and then proceed to the next lesson.



Let's Remember

- ◆ Pollution is caused by the use and disposal of materials that can damage the air, land and water around us.
- ◆ There are three kinds of pollution: air, land and water pollution.
- ◆ Water pollution is caused by waste discharges, heat and chemicals.
- ◆ There are two kinds of sources of air pollution: mobile and stationary. Both kinds release poisonous substances into the air such as lead, nitrogen dioxide, carbon monoxide, sulfur dioxide and particulates, which can cause serious diseases.
- ◆ Land pollution is caused by large amounts of solid wastes. Solid wastes include nonbiodegradable materials that cannot be broken down easily into very tiny pieces.

The Pollution-Fighting Force

You found out in Lesson 2 the causes and effects of pollution. Do you agree that pollution is a serious problem that we need to solve? I'm sure you do! But you shouldn't think that the whole situation is hopeless. There are a lot of things that you and I can do to help. Even small steps are important and will count a lot in solving the pollution problem.

In this lesson, you will find out what you can do to help fight and prevent pollution in your home and community.



Let's Read

Read the short article below.

Environmental Army

S3R2 which stands for "Save Silang-Santa Rosa River" was a river cleanup campaign. The 27-kilometer river was divided into three zones to make monitoring easy. These three zones are Silang, Biñan and Santa Rosa. Different sectors of the community, the townspeople and the Environmental Army joined the cleanup.

The Environmental Army is composed of 270 fishermen and 70 recruits from the towns along the Bay up to Biñan. Armed with shovels and rakes, the Environmental Army, led by Valeriano Gutierrez, worked during the three-day cleanup period and "harvested" 900 sacks of waste weighing approximately 45,000 kilos or 45 tons.

The project's Information and Education Committee, on the other hand, is in charge of teaching the communities different practices like waste segregation and composting to help keep the river clean.

S3R2 is an example of how communities can come together for faster and more positive results. In its own way, it is a form of people power.

Source: Nuyda, Doris Gaskell. "To clean a river." *Philippine Daily Inquirer*. October 8, 1999.



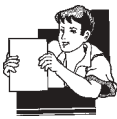
Let's Think About This

Answer the following questions about the article you just read.

1. What was the purpose of the S3R2 Project?

2. What steps were taken by the people to clean up the Silang-Santa Rosa River?

Finished? If so, compare your answers with those in the *Answer Key* on page 35.



Let's Learn

There are many ways by which we can fight and prevent pollution. Just look at the people of Silang, Biñan and Santa Rosa, Laguna. They have taken the first step toward cleaning the Santa Rosa River. Would you like to become a pollution fighter like them?

Here's a list of things you can do:

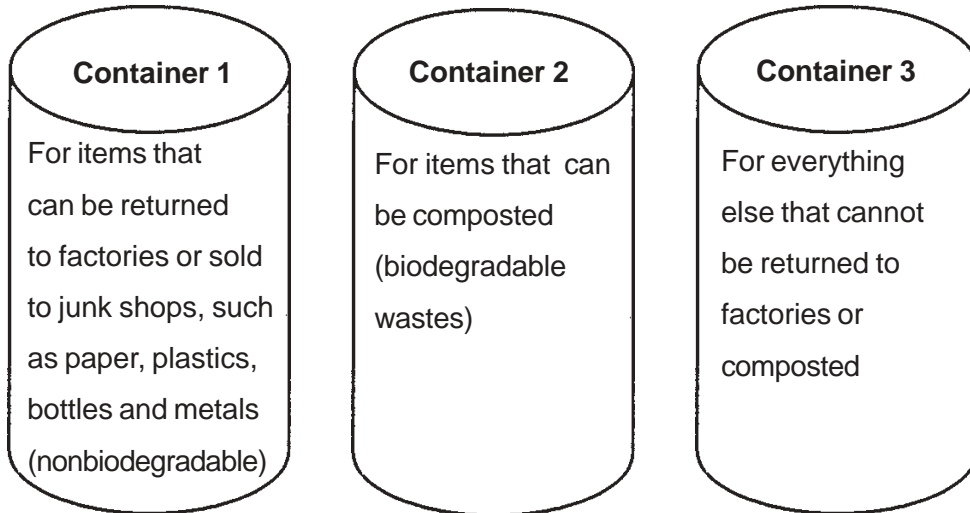
1. *Reduce, reuse and recycle.*

These are the three Rs of good waste management. How do you start reducing, reusing and recycling your wastes? First, you need to classify or separate your wastes into biodegradable and nonbiodegradable. Then you should separate each kind from the other. You can sell the non-biodegradable wastes to junk shops, or you can reuse them. For more information on recycling, you can read another NFE A&E module entitled ***Recycling***.

You can also make compost from biodegradable wastes. Composting is an and easy profitable way of disposing of your wastes. For more information on composting, you may read another NFE A&E module entitled ***Composting***.

2. *Watch where you throw your garbage.*

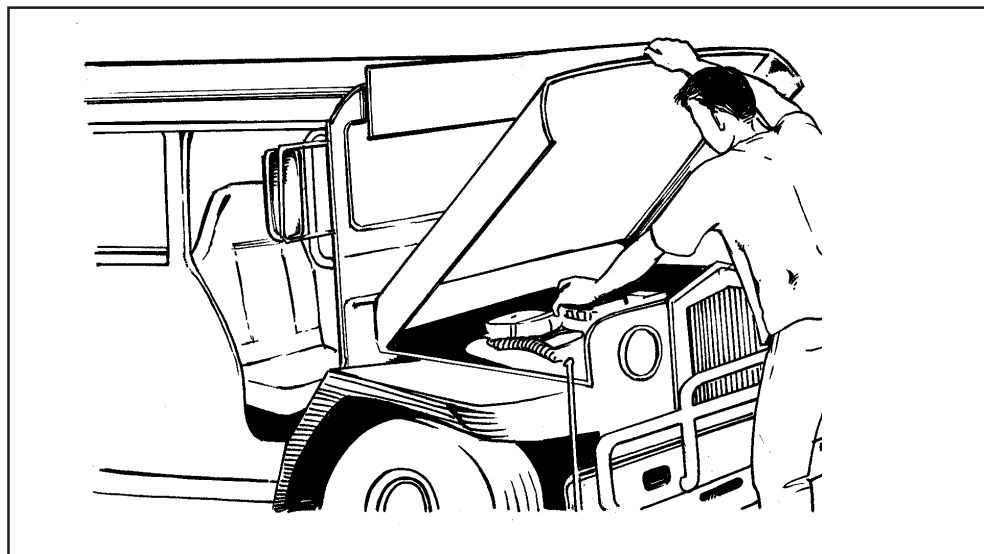
Even if you separate your wastes, the effort won't count much if you just throw them wherever you want. Remember that garbage belongs to the trash can. Have three containers for your wastes:



3. *Say no to smoke!*

- a) Smoke-belching (releasing large amounts of smoke) is a violation not just of the law but also of everyone's right to breathe clean air.

So if you own a vehicle or drive one for a living, make sure that its engine is always clean. This way, it won't release so much smoke when you use it.

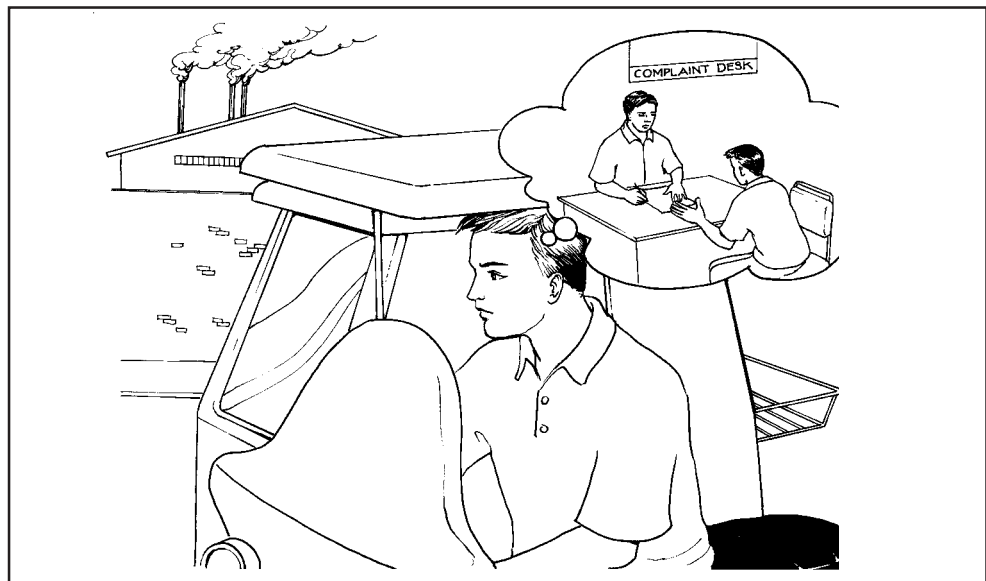


If you see smoke-belching vehicles, report them to the Land Transportation Office (LTO)—the government agency that goes after these vehicles.

- b) Use unleaded gasoline as fuel so your vehicle won't release lead into the air.



- c) Watch out for factories and industrial plants that release pollutants into the air. Don't think twice about reporting them to the Department of Environment and Natural Resources (DENR). The DENR will require these polluters to clean up their stacks to stop releasing pollutants.



4. *Think organic.*

You have learned that fertilizers and pesticides also cause water pollution. If you are a farmer or you grow plants, why don't you try making your own organic fertilizer and pesticide? For more information about this topic, you may read another NFE A&E module entitled ***How to Grow Your Own Vegetable Garden.***

Do you think you can do all these things? Of course you can! If you do that, you'll be a certified pollution fighter!



Let's Review

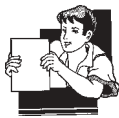
Fill in the blanks with the correct answers.

1. What are the three Rs of good waste management?
 - a. _____
 - b. _____
 - c. _____
2. How many containers should you have to separate your garbage?

3. What kind of gasoline should you use so you won't release lead into the air? _____
4. What government agency goes after smoke-belching vehicles?

5. You can make organic _____ and _____ for your plants.

Now, check your answers with those in the *Answer Key* on page 35.



Let's Learn

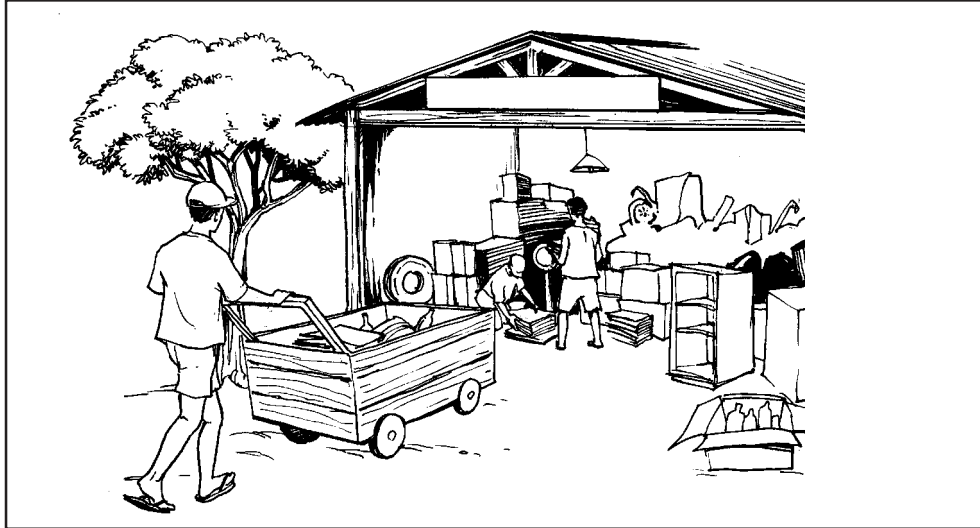
Being a certified pollution fighter, it is your responsibility to help your community prevent pollution. Look at the list below and see what you can do for your community.

1. *Start a composting project in your community.*

You can ask your barangay or town leaders to create a community composting project. Composting not only disposes of garbage but it also produces a material called **humus**. This can be used as a fertilizer.

2. *Sell used papers, plastics, bottles and metals.*

You can build a *bodega* in your neighborhood to store these wastes first. Then, you can sell them to junk shops or factories that buy back these materials. You can then distribute the earnings among the members of the community. Or you can also use the money for other community projects.



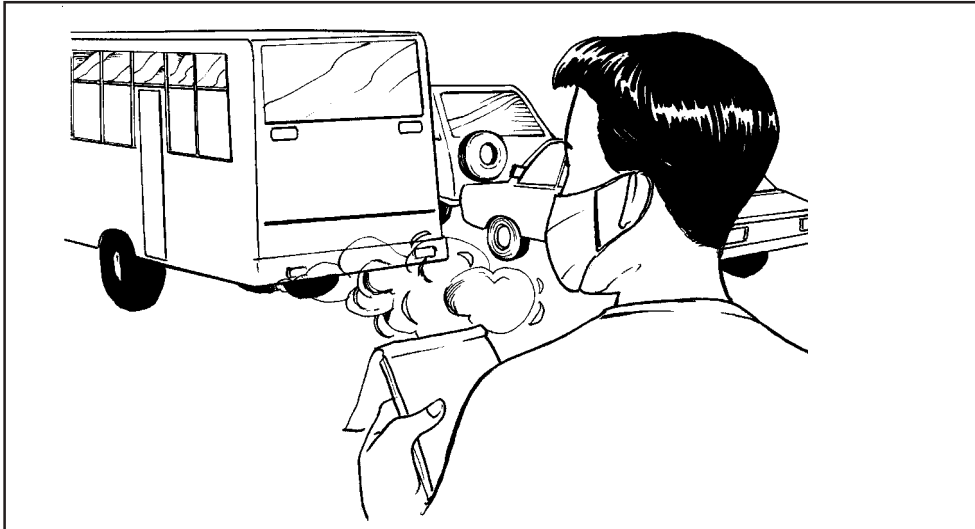
3. *Organize a water cleanup in your community.*

If you have a polluted body of water in your community, you can call on your neighbors to join forces and clean up the water. Consult your barangay leaders and the local DENR office on how to go about this cleanup project.



4. *Watch out for smoke belchers!*

Inform your neighbors about the dangers of air pollutants. Organize a committee that will guard against smoke-belching vehicles and factories that emit black smoke. Coordinate with the LTO and the DENR on the steps that you can take against these air polluters.



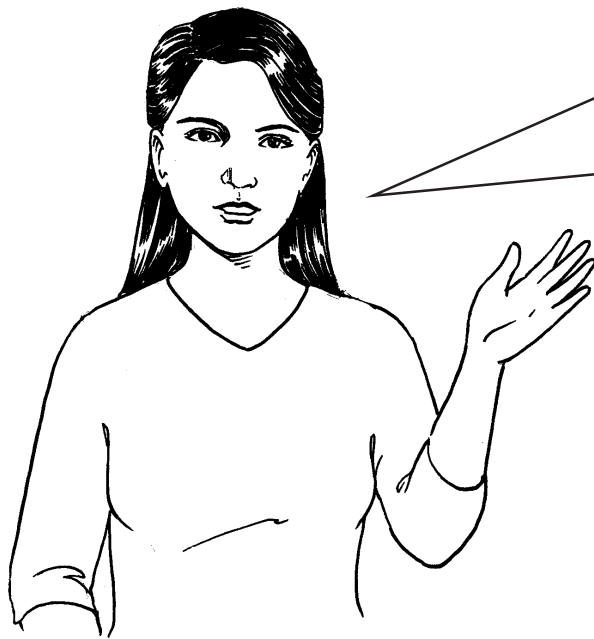
Let's Try This

Do you remember your findings when you investigated your community for air, land and water pollutions? Why don't you go over your findings again? Then try to think of ways to help solve the pollution problem in your community. List them below.

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

? Let's See What You Have Learned

Read the following and answer the questions below.



Hi, I'm Rica. I live in Barangay Mbalihalas. Garbage collectors come to our barangay only once a week. Because of this, we have to endure the smell of garbage in our area six days a week. The piles of garbage do not only look ugly and smell bad, they also have been causing diseases, especially among children. Some of my neighbors have resorted to dumping their garbage in the creek that runs through our barangay. Our barangay leaders seem helpless about the situation. What can we do?

1. Can you help Rica and her neighbors? List some of the things they can do to deal with their garbage problem.

2. Do you recommend that they continue dumping their garbage in the creek? Why or why not?

When done, you can check your answers with those in the *Answer Key* on page 36.



Let's Remember

- ◆ Everyone can prevent and fight pollution.
- ◆ You can prevent pollution in your home by:
 - practicing the three Rs of waste management—reducing, recycling and reusing
 - throwing your garbage in the proper containers
 - watching out for smoke belchers
 - using organic fertilizers and pesticides for your plants.
- ◆ You can help prevent and fight pollution in your community by doing the following:
 - organizing a composting project, selling reusable and recyclable wastes
 - initiating a water clean-up
 - setting up an air pollution watchdog group

You have almost reached the end of this module. Congratulations! Your persistence and eagerness to learn have paid off. Did you learn a lot from this module? Did you have fun reading it?

On the next page is a summary of the module's main points to help you remember them better.



Let's Sum Up

This module tells us that:

- ◆ Pollution is a serious problem caused by our use and disposal of things that damage the environment.
- ◆ There are three main kinds of pollution: air, land and water pollution.
- ◆ Water pollution is caused by chemicals, heat and waste discharges. Air pollution is caused by mobile sources (vehicles) and stationary sources (power plants and factories). Land pollution is caused by too many solid wastes.
- ◆ All three kinds of pollution have effects that not only harm the environment but can also harm people.
- ◆ Everyone can join in the effort to fight and prevent pollution by practicing good waste management, being watchful against smoke-belching vehicles and disposing of wastes properly.



What Have You Learned?

A. Identify each word defined by the clue. Then find the words in the puzzle below. They may be written vertically, horizontally or diagonally.

- _____ 1. Happens to the environment when we use and throw away things that damage the air, water or land around us.
- _____ 2. Everything that surrounds and affects us
- _____ 3. Releasing large amounts of smoke
- _____ 4. Wastes that can be broken down easily by bacteria
- _____ 5. The process of turning biodegradable wastes into soil fertilizer

E	N	S	T	K	X	Q	T	X	I	Z
N	H	R	M	W	Y	Z	P	W	R	X
V	G	B	I	O	D	E	G	R	A	D
I	F	Q	R	A	K	F	U	Q	Z	M
R	N	W	G	Q	H	E	K	P	J	N
O	Z	P	H	P	K	A	B	Y	M	T
N	Y	K	M	L	P	J	T	E	P	G
M	L	I	Y	A	W	E	W	K	L	U
E	T	L	Q	U	L	Q	E	E	Q	C
N	L	V	J	K	Q	I	H	K	G	U
T	P	E	X	O	M	P	F	L	K	W
Q	H	D	C	O	M	P	O	S	T	I
M	R	J	E	H	Z	K	E	R	T	Z
X	W	U	L	V	O	M	L	P	E	S

B. What would you do if you were in the situations given below?

Explain your answer.

1. You are walking on the street when a jeepney passes by emitting black smoke.

I would _____

2. You see your neighbor burning garbage in her backyard.

I would _____

3. The river that runs through your town is clogged with garbage.
I would _____

4. A factory in your neighborhood often releases a smelly odor out of its stack.
I would _____

5. Another factory in your neighborhood dumps its wastes into the river from which you and your neighbors catch fish for a living.
I would _____

Compare your answers with those found in the *Answer Key* on pages 37–38.

If you got a score of:

- 8–10 Very good! You learned a lot from this module. You can now proceed to study the next one.
- 6–7 Good! You just need to go back to the parts that you did not understand.
- 0–5 You need to study the whole module again.



Answer Key

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

- A. 1. **b**
2. **c**
3. **a**
4. **b**
5. **a**
- B. 1. **False.** Taking care of the environment is everybody's job and not just the government's.
2. **True**
3. **True**
4. **False.** Most of the sources of pollution are the products of people's activities. So, people can do a lot to fight and prevent pollution.
5. **True**

B. Lesson 1

Let's Try This (pages 4–5)

1. AIR
2. LAND
3. WATER

Let's Try This (page 6)

The following are possible answers.

AIR	LAND	WATER
1. inflating tires	1. building houses	1. cleaning the house
2. inflating balloons	2. transporting goods	2. watering the plants
3. traveling	3. raising animals	3. bathing

You may have thought of other uses not listed here. You should discuss your answers with your Instructional Manager for additional feedback.

Let's Think About This (page 8)

1. Plant 1: When I stopped watering the plants in the first can, they all dried up.
Plant 2: When I covered the second can with a glass jar, the leaves also dried up.

Plant 3: When I transferred the plants from the third can to a plastic sheet, they all dried up and died just like the plants in the first and second cans.

2. Based on what happened in the experiment, I think that mongo plants will not grow without water, air or soil. This is because they cannot make their own food without the nutrients that they get from the water and soil. They also need carbon dioxide which is present in the air and exhaled by humans and animals.
3. I don't think that I will be able to live if water, air or land is taken away from me. If there is no air, I won't be able to breathe. I would die as well if I had no water to drink. If I didn't have any food to eat, which I get from the animals and plants, I would also die.

C. Lesson 2

Let's Study and Analyze (pages 9–10)

The following are sample answers only. You might have different answers to the questions. Discuss your answers with your Instructional Manager for additional feedback.

1. Picture 1 shows a rural community where only few houses are built. The children enjoy swimming in the stream and climbing the trees. There are trees all over the community.
2. Picture 2 shows a young boy playing near the polluted stream. A pile of garbage with flies around it is just beside him. There are factories that release thick smoke into the air. Also, there are too many houses built in the area.
3. The stream where children used to swim became very dirty. The area became crowded with houses and factories. Now there are no more trees and the garbage is piling up in the street.
4. The people cut the trees down and used the space to build houses and factories. These factories release thick smoke into the air and wastes into the stream. The households throw their garbage on the streets as well as in the stream.

Let's Try This (page 18)

Answers will depend on your observations and findings. The following is a sample answer. Your own answer might be different. Discuss it with your Instructional Manager for additional feedback.

Yes, there are uncollected piles of garbage in our community. They are an ugly sight and they give off a foul smell. There are also flies that feed on them. I think that they might cause some illnesses.

Let's See What You Have Learned (page 19)

1. **c** - thermal pollution
2. **e** - nonbiodegradable wastes
3. **f** - air pollution
4. **d** - lungs
5. **a** - lead

D. Lesson 3

Let's Think About This (page 21)

1. The purpose of the S3R2 Project was to clean up the Silang-Santa Rosa River in Laguna.
2. First, the people divided the river into three zones. Then, they organized different sectors of the communities concerned to participate in the cleanup. A committee was also formed to educate the people about proper waste management.

Let's Review (page 24)

1. a. reduce
b. reuse
c. recycle
2. three
3. unleaded gasoline
4. The Land Transportation Office or LTO
5. fertilizer and pesticide

Let's Try This (page 26)

Answers will depend on your previous findings. The following are sample answers:

Our community suffers from water pollution. I will inform my neighbors about the dangers of water pollution and seek their participation in cleaning up the water.

Our community suffers from air pollution. I will report to the LTO and the DENR all smoke-belching vehicles and factories that emit pollutants. I will ask my neighbors to do the same. I will encourage my neighbors who have their own vehicles to clean their engines regularly. I will also discourage my neighbors from burning their wastes.

Our community suffers from land pollution. I will practice the three Rs of waste management by separating the biodegradable from nonbiodegradable wastes. I will put my garbage in separate containers. I will reuse or sell plastics, papers, glasses and metals. I will compost my biodegradable wastes. I will then encourage my neighbors to do the same.

Let's See What You Have Learned (page 27)

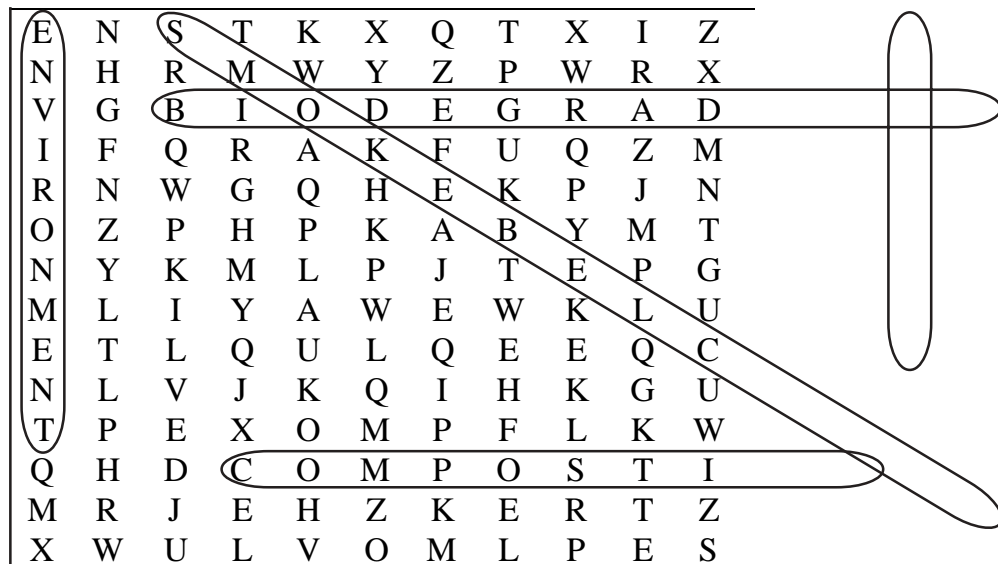
The following are possible answers to the questions. Your answers might be different. You can discuss them with your Instructional Manager for additional feedback.

Rica and her neighbors can do the following things:

1.
 - a. Clean up the creek to avoid diseases that come from the polluted water.
 - b. Consult the DENR for ways on how to get rid of the piles of uncollected garbage.
 - c. Start separating their wastes. Reuse and recycle the nonbiodegradable and compost the biodegradable to reduce their wastes.
2. No, because when the creek gets clogged, it might cause flood because the rainwater has nowhere to go to. The fish in the creek will also die and their water will be unsafe for drinking.

E. What Have You Learned? (pages 30–31)

- A. 1. pollution
2. environment
3. smoke-belching
4. biodegradable
5. composting



B.

The following are sample answers only. You may have different answers, which you can discuss with your Instructional Manager for additional feedback.

1. I would take down the plate number of the jeepney and report it immediately to the LTO. The LTO will go after the jeepney and require its owner to always check its engine so as to avoid smoke-belching which releases harmful chemicals into the air. After all, it is everyone's right to breathe in clean air.
2. I would tell my neighbor not to burn her garbage. I will inform her that burning wastes adds to air pollution and it can release poisonous chemicals into the air.
3. I would call on my neighbors to help clean up the river. I would also tell them that if the bodies of water are clogged, it might cause flood when heavy rains come. Also, the fish that live in the river will die so that there will be a decrease in our food supply. When we continue to throw our wastes into the river, our water will not be safe for drinking.

4. The factory releases harmful chemicals into the air which the people breathe in. Because of this, the people might suffer from cardiovascular and lung problems. I would report the factory to the DENR, so that it will stop polluting the air.
5. If this continues, it is not only the livelihood of the people that will be affected. The chemicals that the factory releases poison the fish as well as the people that eat them. I would also report this factory to the DENR which will order it not to dump its wastes into the river. If the factory does not obey, the DENR will close it down.



Glossary

- Atmosphere** The air around us
- Bacteria** Very tiny organisms that can be found in the soil
- Biodegradable** Can be broken down by bacteria into very tiny pieces
- Brook** A small stream
- Cancer** A malignant tumor in the body caused by the uncontrolled multiplication of cells or tissues
- Cardiovascular** Relating to the heart and blood vessels
- Chemicals** Substances that can be used for various purposes
- Circulate** To move around freely
- Clogged** Blocked with things, making movement very difficult
- Compost** A mixture of decomposed biodegradable matter that is used to nourish soil
- Contagious** Capable of infecting another person from direct or indirect contact with a sick person
- Contaminate** To pollute
- Coolant** A liquid, usually water, that is used to cool heated equipment
- Creek** A small stream, larger than a brook and smaller than a river.
- Dispose** To get rid of; to throw away
- Dump site** A place where garbage and other wastes are deposited
- Environment** Everything, including living and nonliving things, that surround us
- Fertilizer** A substance that can improve the quality and the yield of plants
- Fuel** Any material that releases energy when burned
- Garbage** Wastes produced by households
- Inflate** Fill with air
- Lake** A large body of water surrounded by land
- Loose** Not held together tightly or compactly
- Mobile** Movable

Nonbiodegradable Can not be broken down by bacteria

Pesticide A substance used to get rid of tiny animals and weeds that harm plants

Pollution The condition that arises when the environment is damaged by materials used and thrown away by people

Power plant An industrial plant that generates electricity from different sources of energy

Pulmonary Relating to the lungs

Rake A long-handled garden tool with a comb-like part at the end, used for gathering leaves together

Reduce To make smaller

Residue What remains of something or is left over, when the greater part has been used up

Respiratory Anything that has to do with breathing

River A large body of flowing freshwater that usually deposits into lake or sea

Sea A great expanse of saltwater

Sewage Waste that is carried by liquid and passes through the drain

Shovel A tool with a deep-sided blade, for lifting and carrying loose material

Smoke belching The act of sending out smoke in large quantities

Solid wastes Wastes that are not easily broken down into tiny pieces

Staple A major component of a community's diet

Stationary Not moving or not changing

Stream A very narrow body of water

Thermal pollution Pollution that results from an increase in temperature

Tuberculosis An infectious disease that affects the lungs

Waste A material that is no longer needed and is hence thrown away

Weeds Plants that have no specific use and which block the growth of other plants



References

- Steehler, J. *Sources of Air Pollution*. <<http://www2.roanoke.edu/Chemistry/Jsteehler/HNRS301/Poll.../AirPollution-Sources.htm>> October 24, 2000, date accessed.
- Encyclopædia Britannica. *Pollution*. <<http://www.britannica.com/bcom/eb.htm>> October 24, 2000, date accessed.
- Why Files. *Air Pollution*. 2000. <<http://www.whyfiles.org/030/air-pollution/air2.htm>> October 24, 2000, date accessed.
- Ochoa, Tes B. *Hold your breath!* 1999. Philippine Daily Inquirer. <<http://www.inquirer.net>> October 27, 2000, date accessed.
- Nuyda, Doris Gaskell. *Ways to dispose of solid waste*. 1999. Philippine Daily Inquirer. <<http://www.inquirer.net>> November 2, 2000, date accessed.
- Tejero, Constantino. *Ways and means to handle waste*. 2000. Philippine Daily Inquirer. <<http://www.inquirer.net>> October 26, 2000, date accessed.