

Science

Quarter 1 - Module 6B:

Changes in Materials that are Harmful in the Environment



Science – Grade 4

Alternative Delivery Mode

Quarter 1 - Module 1: Identify Changes in Materials that are Harmful in the Environment
First Edition, 2020

Republic Act 8293, section 176 states that: No copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for the exploitation of such work for profit. Such agency or office may, among other things, impose as a condition the payment of royalties.

Borrowed materials (i.e., stories, songs, poems, pictures, photos, brand names, trademarks, etc.) included in this book are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use these materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

Published by the Department of Education – Division of Valencia City

Schools Division Superintendent: Rebonfamil R. Baguio

Development Team of the Module	
Authors:	Nonah Grace D. Alesna
Editor:	Jimbo Russel C. Agbayani, EPS
Editor:	Janette L. Bejona
Reviewers:	Maritel L. Agbayani, PSDS Desiree Rose Q. Allaba Fabrienne Isa M. Cabanao
Illustrator:	Dandy C. Batusin
Layout Artists:	John Rimmon I. Taquiso
Management Team:	
Chairperson:	Rebonfamil R. Baguio <i>Schools Division Superintendent</i>
Co-Chairperson:	Eugene I. Macahis, Jr. Asst. Schools Division Superintendent
Members:	Jayvy C. Vegafria, CID Chief ES Jimbo Russell C. Agbayani, EPS – Science Analisa C. Unabia, EPS – LRMS Joan Sirica V. Camposo, Librarian II Israel C. Adrigado, PDO II

Printed in the Philippines by:

Department of Education - Division of Valencia City

Office Address: Lapu-lapu Street, Poblacion, Valencia City 8709

Telefax: (088) 828-4615

Website: deped-valencia.org

4

Science

Quarter 1 - Module 6B:

Changes in Materials that are Harmful in the Environment

This instructional material was collaboratively developed and reviewed by educators from public schools. We encourage teachers and other education stakeholders to email their feedback, comments, and recommendations to the Department of Education at region10@deped.gov.ph.

We value your feedback and recommendations.

What This Module is About

This module is intended for Grade Four pupils like you. The activities provided are specially designed so that you will learn at a pace that is appropriate for you. It is expected that you will understand and learn more about some changes in the materials which are harmful to the environment.

Discover, explore and have fun in learning through this module. Develop awareness of the things around you and be a productive member of your community.



Notes to the Teacher

Dear Teacher,

This is a self-paced module with various activities to be done at home by the learners. Provided that clear and careful instructions must be given to the learners to ensure safety and avoid misconceptions in performing the activities.



What I Need to Know

Materials around us change. There are changes in materials that are good for the environment. However, there are also changes in materials that damage our environment.

What changes do you observe on some things around you? Why do changes occur? How do changes in materials affect the environment? These are some of the questions that will be answered in this module.

At the end of this module, you will be able to:

1. identify changes in materials that are harmful to one's environment
2. describe the harmful effects of such changes in the materials to the environment, and
3. suggest ways of preventing/minimizing the harmful effects of changes in the materials to the environment

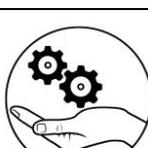
Time duration: 4 days

How to Learn from this Module

To achieve the objectives cited above, you are to do the following:

- Take your time reading the lessons carefully.
- Follow the directions and/or instructions in the activities and exercises diligently.
- Answer all the given tests and exercises.

Icons of this Module

	What I Need to Know	This part contains learning objectives that are set for you to learn as you go along the module.
	What I Know	This is an assessment as to your level of knowledge to the subject matter at hand, meant specifically to gauge prior related knowledge
	What's In	This part connects the previous lesson with that of the current one.
	What's New	An introduction of the new lesson through various activities, before it will be presented to you
	What is It	These are discussions of the activities as a way to deepen your discovery and understanding of the concept.
	What's More	These are follow-up activities that are intended for you to practice further in order to master the competencies.
	What I Have Learned	Activities designed to process what you have learned from the lesson
	What I Can Do	These are tasks designed to showcase your skills and knowledge gained, and applied into real-life concerns and situations.
	Post Assessment	This assessment evaluates your level of mastery in achieving the learning objectives
	More Activities	Activities designed to increase the strength of your skills and knowledge gained and tends to induce repetitions of actions / learning



What I Know

Multiple Choice: Choose the letter of the correct answer.

1. These practices are harmful to the environment EXCEPT ONE?
 - A. Using paper bags when going to the market.
 - B. Dumping garbage in any vacant place.
 - C. Throwing plastic bottles into the river.
 - D. Burning of pieces of cellophane that cannot be used.

2. When water is polluted, which could be the result?
 - A. Fishes are poisoned and killed.
 - B. Plants get to grow healthy.
 - C. Water is only safe for animals to drink.
 - D. It is safe for adults but harmful to children.

3. Which is the best way to prevent/minimize water pollution?
 - A. Avoid throwing garbage near water resources.
 - B. Digging garbage pit near water resources.
 - C. Open sewage system near the river.
 - D. Throwing garbage anywhere.

For item number 4, study the picture below.



4. Which is/are harmful effects to the environment due to the cutting down of trees.

- A. Loss of habitat
 - B. Soil erosion
 - C. Both a & b
 - D. Does not affect the environment
5. Plastic is commonly used as a soft drinks container. What material can you use as a substitute for plastic?
- A. Empty cans
 - B. Empty glass bottles
 - C. Old shoes
 - D. Used paper
6. Which of the following changes in the materials are useful to the environment, EXCEPT ONE.
- A. Burning the garbage to save time and effort.
 - B. Burying the garbage.
 - C. Planting trees in the garden.
 - D. Sell old newspaper.
7. Which of the following happens when soil is polluted?
- A. Growing of plants is not possible.
 - B. Plants get healthier.
 - C. Soil is rich in nutrients.
 - D. Water is safe for drinking.
8. In his class, Mr. Zee told his pupils to reuse paper instead of throwing it in the bin. How will they do it?
- A. Give it to their classmate.
 - B. Keep the used paper inside the bag.
 - C. Never mind the advice of Mr. Zee.
 - D. Use it as a scratch paper in solving mathematical problems.
9. Changes in the environment _____.
- A. are all beneficial
 - B. do not affect people
 - C. are all harmful
 - D. sometimes harmful and sometimes beneficial

10. The following changes in the materials are useful to the environment EXCEPT;
- A. Using old newspaper in wrapping gifts
 - B. Using eco bag when buying groceries
 - C. Using pesticides in killing insects
 - D. Using both sides of the bond paper when writing.
11. Some materials are normally useful even after serving its original purpose. What will you do to an empty canister at home?
- A. Burn it.
 - B. Make it a trash bin.
 - C. Place it inside the cabinet.
 - D. Use instead of plastic to place your meal for lunch.
12. What would be the harmful effect if the trees in the forest were cut and not replaced?
- A. The soil would be eroded.
 - B. It would become fertile.
 - C. There would be more rocks.
 - D. There would be more soil.
13. Oscar's father is a farmer. He used to cut down plenty of trees to replace it with corn. What could be the harmful result of cutting trees?
- A. New trees were grown.
 - B. More fresh air to breath
 - C. Soil erosion/flooding may happen
 - D. Many animals will have their habitat
14. The YES-O Club hold on to their advocacy to plant trees on the areas were rampant cutting of trees was done due to *kaingin* system in their barangay. What are the harmful effects of bald mountains and there is no reforestation?
- A. Denuded mountains provide fresh air.
 - B. Native animals love to stay in the denuded mountains.
 - C. Soil erosion is prevented.
 - D. Water levels are severely affected.

15. When the surrounding air is blanketed with smoke from factories and motored vehicles. What is a harmful effect?

- A. The air becomes polluted.
- B. The air becomes fresh.
- C. The air becomes unpolluted.
- D. The air becomes clean.

B. Write the effects of these changes in the environment. Choose from the choices below and write in your notebook.

AIR POLLUTION	WATER POLLUTION
SOIL POLLUTION	

- _____ 1. Waste materials from mining are thrown into the rivers.
- _____ 2. Smoke from vehicles
- _____ 3. Throwing of garbage into the river
- _____ 4. Using of aerosols at home
- _____ 5. Using of insecticides and pesticides in farms

Lesson

1

Identify Changes in Materials that are Harmful in the Environment

We are surrounded by many things around us. These objects we see are called matter. You will discover that these different materials undergo different changes. You will study various changes and ways or activities which have harmful effects on the environment.

Week 10

Day 1



What's In

It's color time!

Do you still remember the good effects of changes in materials to the environment? Answer the exercise that follows:

Directions: Color the star GREEN if the change in material is useful in the environment and RED if it has a harmful effect on the environment.

1. burning garbage
2. cooking food
3. making hollow blocks out of sand and cement
4. making medicine
5. vehicles that produce black smoke



What's New

Change! For Better or Worse?

Study the pictures below. Identify the following changes in the materials. Write your answer in the answer sheet.



1. What are the changes which occurred to the materials?

2. Were the changes in the materials harmful?

3. In what ways are these changes become harmful?

Week 10

Day 2



What is It

There are many changes in the things around us which made our lives easy and convenient. However, together with comfort it brings are its harmful effects to the environment.

Can you identify some changes that you see around you? Are they useful? Are they harmful? Do the activities and find out.

Activity 1: Experiment time!

What you need:

Match box

a piece of paper

Tablespoon of ash

a glass of clean water

What to do:

Light a match and burn a piece of paper. Wait and let the paper turn into ash. Set aside and let it cool. Put a tablespoon of ash in the clean water, observe.

Answer these questions in your answer sheet.

1. Where did the ash come from?
2. What happened to the water after you put the ash?
3. Did the color change? Why do you think so?
4. Is the water still safe for drinking? Is it good for your health?
5. What will possibly happen if you drink the water with ash? Why?
6. Imagine if people continuously throw waste materials to the river/sea. What harmful effects these activities bring to the environment?
7. Can these activities also affect humans and animals? Why?

Activity 2: Take a Look!

Look at the picture below. Then, answer the questions that follow.



Answer these questions in your answer sheet.

1. What can you see in the picture?
2. What do you see flying over the garbage?
3. Why is the person covering her nose?
4. What good effects does this give us?
5. Imagine yourself living near a dumpsite. What will possibly happen to you, if you are continuously exposed to it? How will it affect you?
6. What will happen to the soil if garbage is continuously dumped on it? What harmful effects does this activity bring to the environment?

Activity 3: Let's Investigate!

Study the consequence map using the words or pictures and arrows that show environmental changes brought about by the following human activities.

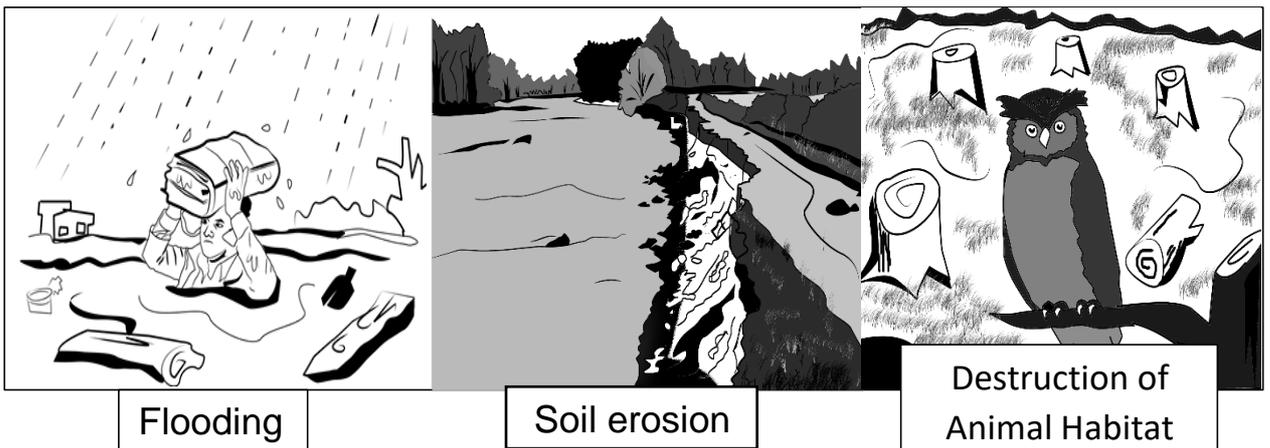
A.



Cause



Effects



1. What changes in our environment are brought about by deforestation? _____

2. How do these activities affect the quality of the soil?

3. How do these changes take place?

4. What effects do they have on humans and animals?

B.



Improper waste disposal

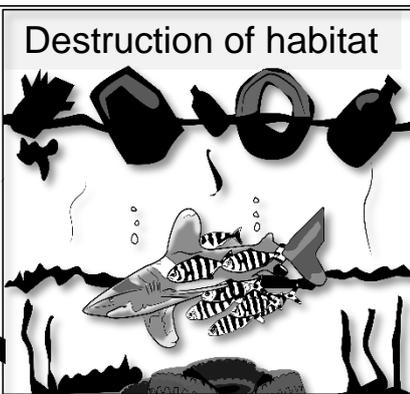
Cause



Effects



Water pollution



Destruction of habitat



A person suffering from lung cancer

1. What changes in our environment are brought about by improper waste disposal? _____

2. How did these changes take place? Why?

3. Are these changes useful or harmful? Why?

4. How did improper waste disposal affect the quality of water?

5. What effects does improper waste disposal have on humans, animals and in the environment?

Learning Circuit!

Certain changes in materials are harmful to the environment. Changes are harmful if it causes pollution to the land, water and air.

Pollution is the addition of harmful substances to land, water and air which are harmful to both humans and animals.

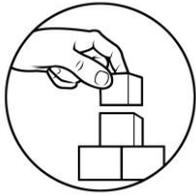
Improper waste disposal like the dumping of wastes such as empty bottles, plastics, and detergents from our homes pollutes air, land and water. Cigarettes and vehicles emit harmful gases that are not visible with our bare eyes. Smoke from the burning of oil, coal and wood can also cause air pollution. The chemicals released by factories and vehicles mixed up in the atmosphere that harms people and other living things that are harmful to health.

Soil pollution happens when improper waste disposal is practiced. It also occurs when farmers use too much weed killers and insecticides on their farms. These help us harmful insects. However, continuous use affects the acidity and quality of soil to support plant life.

When chemicals and toxic wastes from factories and ships spill into water pollution happens. Too much garbage in water results in a low level of oxygen which affects fishes and other aquatic animals and plants.

Pollution is a serious problem. Something should be done about it. You and your family can help prevent or minimize pollution. You can plant trees. It helps increase oxygen. It absorbs carbon dioxide in the air and releases oxygen. It also prevents flooding and soil erosion. In going to school, you can ride a take a bicycle or go for a walk, instead of riding a vehicle.

To keep our environment safe and clean, people are encouraged to apply the 5R's of Waste Management: Reduce, Reuse, Recycle, Repair and Rot.



What's More

Let's Go Further!

A. Directions: What kind of pollution is described in each sentences? Choose the letter of the best answer.

A. Air pollution B. Water pollution C. Soil pollution

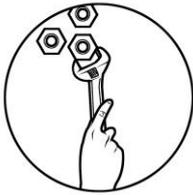
- _____ 1. Minimal harvest of vegetables.
_____ 2. Red tide is affecting the northern coast of the country.
_____ 3. The smell of garbage is suffocating the villagers.
_____ 4. Mine tailing are thrown in rivers.
_____ 5. Kerosene is thrown in empty spaces near the junk shop.

B. Directions: What do you think will be the result of the different human activities? Choose the answer inside the box. Write the letter of the correct answer.

A. Animals will lose their homes	B. Houses will collapse	C. Fishes will be poisoned
D. People will get sick	E. There will be flash-floods	F. Temperature becomes hot
G. Crops will not grow		

- _____ 1. Buildings and many factories release smoke.
_____ 2. Building pigpens near water sources.

- _____ 3. Conducting small and big scale mining near residential areas
- _____ 4. Cutting of trees in the community.
- _____ 5. Deforestation of forest and other wildlife sanctuaries.
- _____ 6. Dumping of garbage in bodies of water.
- _____ 7. Kaingin system in forest areas.
- _____ 8. Throwing of waste chemicals in to the soil.



What I Have Learned

Let's Fill it Up!

Directions: Fill in the missing words. Write your answers in your answer sheet.

1. _____ (Improper, Proper) waste disposal like, 2. _____ (picking, dumping) of wastes such as empty bottles, plastics, and detergents from our homes 3. _____ (pollutes, cleans) air, land and water. Cigarettes and vehicles emit 4. _____ (harmful, useful) gases which are not visible with our bare eyes. Smoke from the burning of oil, coal and wood can also cause 5. _____ (land pollution, air pollution). 6. _____ (Soil pollution, Air pollution) also occur when farmers use too much 7. _____ (weed killers, organic fertilizer) and insecticides on their farms. Seas, oceans and other bodies of water become polluted when chemicals and toxic wastes from factories and ships spill into the water.



What I Can Do

Better Ways, Better Days!

Directions: Answer the following questions concisely. Write your answers in your answer sheet.

1. Some people prefer to use styrofoam for food packing. What would be the effect of this? What other ways can you think of?

2. Describe how you dispose of your garbage in your house. Do you think it is proper or could it lead to pollution? Suggest ways to improve your garbage disposal practices.



Post Assessment

How Much Did You Learn?

A. Directions: Write the effects of these changes in the environment. Choose from the choices below and write in your notebook.

AIR POLLUTION	WATER POLLUTION
SOIL POLLUTION	

- _____ 1. Mine tailing are thrown in rivers.
- _____ 2. Smoke from vehicles.
- _____ 3. Throwing of garbage into the river.
- _____ 4. Using of aerosols.
- _____ 5. Using of insecticides and pesticides.

B. Directions: Choose the letter of the correct answer.

1. Which of the following materials can be considered harmful to the environment?
 - A. Kitchen left-overs
 - B. Fruit peelings
 - C. Used papers
 - D. Used syringe

2. What would be the harmful effect if the trees in the forest were cut and not replaced?
 - A. It would become fertile.
 - B. The soil would be eroded.

- C. There would be more rocks.
 - D. There would be more soil.
3. Oscar's father is a farmer. He used to cut down plenty of trees to replace it with corn. What could be the harmful result of cutting trees?
- A. Many animals will have their habitat
 - B. More fresh air to breath
 - C. New trees were grown.
 - D. Soil erosion/flooding may happen.
4. The YES-O Club hold on to their advocacy to plant trees on the areas that were cut because of the *kaingin* system in their barangay. What are the harmful effects of bald mountains if not replaced through reforestation?
- A. Denuded mountains provide fresh air.
 - B. Native animals love to stay in the denuded mountains.
 - C. Soil erosion is prevented.
 - D. Water levels are severely affected.
5. When the surrounding air is blanketed with smoke from factories and motored vehicles, the harmful effect of this would be...
- A. The air becomes polluted.
 - B. The air becomes fresh.
 - C. The air becomes unpolluted.
 - D. The air becomes clean.
6. The materials are harmful to the environment except one?
- A. Using paper bags when going to the market.
 - B. Throwing garbage properly.
 - C. Throwing plastic bottles into the river.
 - D. Using pesticides on the farm.
7. When water is polluted, which could be the result?
- A. Fishes are poisoned and killed.
 - B. Plants get healthier.
 - C. Water is safe for drinking.

- D. It will attract more tourists.
8. How can you prevent/minimize water pollution?
- A. Avoid throwing garbage near water resources.
 - B. Cut down trees.
 - C. Throwing garbage anywhere.
 - D. Practice improper waste disposal.
9. Plastic is commonly used as a soft drinks container. What material can you use as a substitute for plastic?
- A. Empty cans
 - B. Empty glass bottles
 - C. Old shoes
 - D. Used paper
10. Materials made of paper are harmless but they become sources of carbon dioxide when burned. How will you dispose of your used paper?
- A. Burn it.
 - B. Put it inside your bag and use for cooking
 - C. Put it in the box for recycling.
 - D. Throw it outside the room.
11. Which of the following changes in the materials are harmful to the environment?
- A. Dumping of the garbage along the streets.
 - B. Throwing garbage properly.
 - C. Using paper bags when going to the market.
 - D. Reusing plastic containers.
12. When soil is polluted, which could be the result?
- A. Growing of plants is not possible.
 - B. Plants get healthier.
 - C. Soil is rich in nutrients.
 - D. Water is safe for drinking.

13. Some materials are normally useful even after serving its original purpose. What will you do to an empty canister at home?

- A. Burn it.
- B. Make it a trash bin.
- C. Place it inside the cabinet.
- D. Use instead of plastic to place your meal for lunch.

14. Changes in the environment _____.

- A. are all beneficial
- B. does not affect people
- C. are all harmful
- D. sometimes harmful and sometimes beneficial

15. The following changes in the materials are useful to the environment, EXCEPT

- A. Using old newspaper in wrapping gifts
- B. Using eco bag when buying groceries
- C. Using pesticides in killing insects
- D. Using both sides of the bond paper when writing.



Additional Activities

Slogan Making

Make a slogan on a bond paper on how we can prevent water pollution.

Congratulations for working diligently with this module. Try to share your experience with your teacher or elder brother or sister at home.



Answer Key

What I Know	1. A	2. A	3. A	4. C	5. B	6. A	7. A	8. D	9. D	10. C	11. D	12. A	13. C	14. D	15. A	B.	1. WATER POLLUTION	2. AIR POLLUTION	3. WATER POLLUTION	4. AIR POLLUTION	5. SOIL POLLUTION
-------------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	----	--------------------	------------------	--------------------	------------------	-------------------

What's In	1.	2.	3.	4.	5.

What's New	1. The changes occurred in the materials are change in size, shape and a new material has been formed.	2. Yes, because it emits harmful chemicals.	3. It can affect human and animal health.
------------	--	---	---

What is it? (Answers may Vary) (Experiment Time)	1. The ash came from the paper. 2. The color and quality of the water changed. 3. The color of the water changed because the ash has been mixed. 4. If we drink water with ash, we may suffer from stomach ache and diarrhea. Because the water has been contaminated. 5. If waste materials are continuously thrown to the rivers, the water is not safe anymore for human and animal consumption. 6. Yes it can affect humans and animals. It can cause sicknesses and diseases and may result to loss of animal habitat.
Activity 2	1. A girl covering her nose near a garbage can. 2. Flies are flying over the garbage. 3. The girl is covering her nose because the garbage smells bad. 4. No. It only harm us humans. 5. If I were living near a dumpsite, I will possibly get sick because of the dirty surrounding. 6. If soil is continuously dumped with garbage, the soil will be polluted. It may affect the quality of soil and plant growth.
Activity 3	A. 1. The effects of deforestation are flood, soil erosion, topsoil is washed away and destruction of habitat. 2. These changes take place because of the human activities which damaged the law of nature. 3. Deforestation affect the quality of soil because during heavy rains topsoil is washed away. 4. Deforestation affect humans because their homes are flooded with water during heavy rains. Animals are also affected because their habitats are devastated. B. 1. The effects of improper waste disposal are water pollution and destruction of animal habitat. 2. These changes take place because of the improper waste disposal practices of humans. 3. No. These changes are harmful to the environment, animals and humans. 4. Improper waste disposal practice of humans contaminates water resources making it not suitable for human and animal consumption. 5. When the water is polluted, it may affect the health of humans and animals habitats will be devastated.

What's More
A.
1. SOIL POLLUTION
2. WATER POLLUTION
3. AIR POLLUTION
4. WATER POLLUTION
5. SOIL POLLUTION
B.
1. D
2. C
3. B
4. F
5. A
6. C
7. E
8. G

What I Have Learned
1. Improper
2. Dumping
3. Pollutes
4. Harmful
5. Air pollution
6. Soil pollution
7. Weed killers

What I Can Do (Answers may Vary)
1. The effect of using Styrofoam in packing food is it will just add up to the garbage dumped in the land fill. Instead of using Styrofoam, you may use box made of paper. It is biodegradable and eco-friendly.
2. We dispose our garbage by segregating them according to their properties. I think our family is practicing proper waste disposal.

Post Assessment	A.	1. WATER POLLUTION	2. AIR POLLUTION	3. WATER POLLUTION	4. AIR POLLUTION	5. SOIL POLLUTION
-----------------	----	--------------------	------------------	--------------------	------------------	-------------------

Post Assessment	B.	1. D	2. B	3. D	4. D	5. A	6. A	7. A	8. A	9. B	10. C	11. D	12. A	13. D	14. D	15. C
-----------------	----	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------

Reference:

- Abutay, L. R., Bonao, D. C., Crucis, E. B., Eslabra, J. C., Gramaje, E. T., Guadamor, M. H., . . . Zape, J. S. (n.d.). *Science 4 Teacher's Guide* (Philippines, Department of Education, Department of Education-Instructional Materials Council Secretariat). Manila, NCR: Lexicon Press.
- Abutay, L. R., Bonao, D. C., Crucis, E. B., Eslabra, J. C., Gramaje, E. T., Guadamor, M. H., . . . Zape, J. S. (n.d.). *Science 4 Learners Material* (Philippines, Department of Education, Department of Education-Instructional Materials Council Secretariat). Manila, NCR: Lexicon Press.
- Llarinas, J.F. & E. Pelobello. *Into the Future: Science and Health Grade 5 Textbook*. Diwa Scholastic Press Inc.,1999.
- Lozada, B.A. & A.T. Mendoza. *Science for Daily Use Textbook for Grade 4*. Jica Enterprises, 2011
- “LR Portal.” Accessed July 7, 2020.
<https://lrmds.deped.gov.ph/list/kto12/subject/536?page=2>.

For inquiries and feedback, please write or call:

Department of Education – Division of Valencia City

Lapu - Lapu Street, Poblacion, Valencia City 8709

Telefax: (088) 828 - 4615