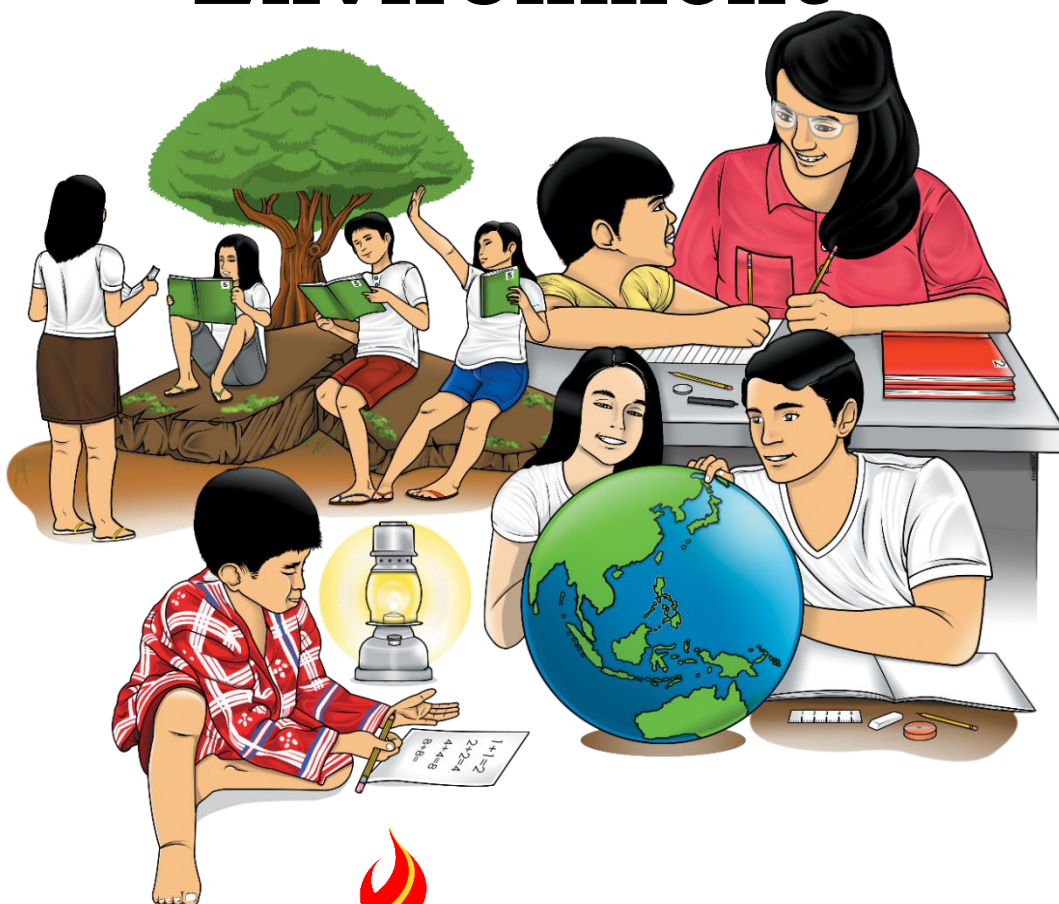


Science

Quarter 1 – Module 4: “Changes in Materials that are Useful and Harmful to one’s Environment”



Science – Grade 4
Alternative Delivery Mode
Quarter 1 – Module 4: “Changes in Materials that are Useful and Harmful to one’s Environment”
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Science

Quarter 1 – Module 4: “Changes in Materials that are Useful and Harmful to one’s Environment”

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.



What I Need to Know

Different materials in the environment change. The consequences or effects of such changes may either be beneficial or harmful to the environment. This lesson is designed to help you better understand the changes in different materials and their effects to the environment. The activities will help you use the process skills for you to become more aware of the things that are happening in your surroundings.

This module will focus on:

- Lesson 1 – changes in the materials that are useful or harmful to the environment; and
- Lesson 2 – the harmful effects of the changes in the materials to the environment.

After going through this module, you are expected to:

1. identify changes in the materials that are useful and harmful to the environment;
2. describe the harmful effects of the changes in the materials to the environment; and
3. suggest some ways of preventing/minimizing the harmful effects of the changes in the materials to the environment.



What I Know

A. Directions: Draw a happy face (😊) if the following statements show **useful** changes in the materials in the environment, and a sad face (☹) if the changes brought in the materials are harmful to one's environment.

- _____ 1. burning of tires
- _____ 2. growing of new trees
- _____ 3. increase in soil fertility
- _____ 4. increase in food production
- _____ 5. cutting fabric made into clothes
- _____ 6. cutting of cloth made into handkerchief
- _____ 7. empty plastic bottles dumped into rivers
- _____ 8. changing wood into charcoal for cooking
- _____ 9. increasing supply of water to towns and cities
- _____ 10. cutting and shaping of pieces of wood into chair

B. Directions: Write **YES** if the statement is correct and **NO** if it is not. Write your answer in your notebook.

- _____ 1. Avoid buying disposable items.
- _____ 2. Donate or sell reusable items.
- _____ 3. Buy items in refillable containers.
- _____ 4. Cutting down of trees brings good effects to the environment.
- _____ 5. Do not throw away newspaper or used writing pads. Sell them or bring them to paper mills which can turn them into usable paper again.

What a good try!

Lesson

1

“Changes in the Materials that are Useful or Harmful to the Environment”

Different materials are found in the environment. They undergo changes in their properties to suit the needs of the people. Some of its changes may be harmful or useful.

How do materials undergo changes? How do these changes affect us? In this module you will learn the possible changes on different materials, whether they will be useful or harmful.



What's In

A. Directions: Analyze the statement carefully. Write **TRUE** if the statement is correct, and **FALSE** if it is not. Write your answers on your science notebook.

1. Some solid materials completely dissolve in liquid materials.
2. Solid materials cannot be mixed/combined with liquid materials.
3. All solid materials spread out evenly in the liquid materials, but some do not.
4. Some solid materials settle at the bottom of the container, while others stay within the liquid.
5. When mixed with liquid, some solid materials changed their size, shape and color but some do not.

B. Directions: Describe what will happen if you combine the following mixtures. In your Science notebook, write **CM** for completely mixed and **NCM** for not completely mixed.

- | | | |
|----------------------|---|-------|
| 1. flour and oil | - | _____ |
| 2. water and salt | - | _____ |
| 3. sugar and alcohol | - | _____ |

- 4. vetsin and vinegar - _____
- 5. detergent powder and water - _____

That's good! Keep on Trying!
I knew you could do it!



What's New

To proceed to the other activities, you have to perform the different exercises below. Record your answers in your Science notebook in table form as shown in this module.

Activity 1: “Changes in Materials: Useful or Harmful”

Directions: Identify whether such changes in the materials listed in column 1 in the given table are useful or harmful to the environment by putting a check mark (✓) on the proper column.

Changes in the Materials	Effect of the changes of the materials to the environment	
	Useful	Harmful
cutting of trees		
burning of old tires		
burning of plastics		
shaping of woods into tables		
throwing of toxic waste into rivers and land		
cutting of piece of cloth into handkerchief		

Activity 2. "I CAN..."

Set A

What to Do:

1. Examine the pictures below.
2. Copy the table in your notebook as shown in this module.
3. Identify each material whether it is harmful or useful to the environment.



empty container
of milk



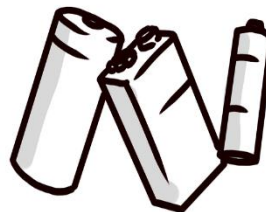
broken bulb



empty container
of shampoo



empty container of
pesticide/insecticide



used batteries

Illustrated by: Jotham D. Balanzo

Useful Materials	Harmful Materials

Based on the activities, answer the following questions briefly. Write your answers in your Science notebook.

Guide Questions:

1. From the activity *1 and 2*, *what* are the materials that are useful and harmful?
2. What are the changes in the materials that are useful to the environment? What made them useful to the environment?
3. What are the changes in the materials that are harmful to the environment? What made them harmful to the environment?

Superb! Good remembering!

I like that!

***What is It*****Points to Remember:**

Some changes in the materials are useful or harmful to the environment. Changes are harmful if they cause pollution to the water, land, and air. Large forest areas have been carelessly destroyed through deforestation. Deforestation causes the downgrading of our natural environment. This downgrading of our environment leads to the destruction of wildlife, occurrence of destructive floods, massive soil erosion, incidence of devastating drought, and global warming.

Some of the useful changes in materials are as follows: cutting of piece of cloth to be made into handkerchief, cutting of fabric to be made into clothes, cutting and shaping pieces of wood/lumber into chair, changing wood into charcoal for cooking. On the other hand, some of the harmful changes include burning of old tires and other plastic materials/ trash, throwing of kerosene and detergents into the sewage, etc.

When the material (soil/land) is dumped with garbage of any kind such as empty bottles, plastics, toxic wastes, chemicals from factories, and others, the soil/land becomes polluted. Polluted land serves as breeding places for flies, cockroaches and rats. These pests carry germs that cause diseases, hence hazardous to one's health. Growing plants is not also possible in polluted land.

When the material (i.e. water in the river) is dumped with garbage of any kind such as empty bottles, plastics, waste materials from houses, and other industrial and chemical wastes from factories, the river becomes polluted. If we drink water contaminated with germs, we are likely to get sick/diseases. Polluted water also kills living organisms, i.e. fish, water plants, etc.

When the surrounding air is blanketed with smoke from factories and motorized vehicles, ashes and other dust particles, the air becomes polluted. Polluted air causes skin itchiness, lung infections, cancer and other respiratory diseases.

Some changes in the materials are harmful to the environment. It may pollute land, water and air. To keep our surroundings clean and to prevent or minimize pollution in our environment, people are encouraged to do the 5R's (Reduce, Re-use, and Recycle, Repair and Rot)

Burning of garbage such as plastic materials, rubber, and other waste are harmful also to the environment. Many items in household garbage when burned release dangerous toxic chemicals. To prevent/minimize the effect of burning of garbage/wastes, waste segregation should be done, and the 5R's should be practiced.

Cutting down trees is also harmful to the environment. It affects the quality of air that we breathe. It causes a rapid change in temperature (the temperature rises to a sometimes uncomfortable level). In addition, when trees are cut down, rain level is severely affected (since moisture in the air could not be retained by the trees). This, in turn, changes weather patterns, which leads to other environmental concerns. Cutting down of trees also causes soil erosion. To solve the problem on deforestation, planting of trees (reforestation) should be done.



What's More

Activity 1: "I Can Tell"

Directions. Identify the following pictures whether they are useful or harmful to the environment. Write your answer in your Science notebook.



Illustrated by: Jotham D. Balonzo


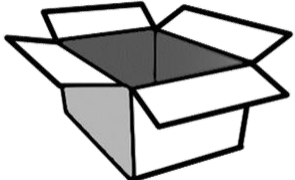

Great! You almost got it!



For better understanding of the lesson, please work on the next activity.

Activity 2. "I Can Do Something"

What to Do:

1. Given are the pictures of different materials present in the community.
2. Make a table in your notebook similar to the table shown in this module.
4. Based on the pictures in column 1, think of the change you can make out of the given materials.
5. Describe whether such changes in the materials are useful or harmful to the environment by putting a checkmark (✓) on the proper column.

Pictures of the Materials	Can be changed into...	Harmful to the environment	
		Y	N
 empty bottles of insecticides			
 Box			
 empty bottles			

 <p>tin cans</p>			
 <p>rubber tires</p>			

Illustrated by: Jotham D. Balonzo



What I Have Learned

Directions: Choose the right word that would fit to the given statement. Answers can be repeated. Write your answers on your Science notebook.

reduce re-use recycle repair
 useful harmful pollution rot

I learned that:

- Changes in the materials can be _____ or _____.
- Changes will be harmful if they cause _____ to water, air and land.
- To keep our environment clean, people are encouraged to apply the 5R's of Waste Management: _____, _____, _____, _____ and _____.



What I Can Do

Directions: Choose **any one** in the given questions or statements. Answer the questions briefly in one or two sentences. Write your answers in your Science notebook.

- a. As a child, how can you help prevent pollution of water and air in your community?
- b. If you are you going to dispose harmful waste materials found at home, what safety measures are you going to do to spare you from harm?
- c. You have some pigs. Mother asks you to clean the pig pen. How will you clean it to avoid pollution?

GREAT! I knew you could do it!



Assessment

Directions: Carefully examine the statement of the changes in the materials. Identify whether such changes in the materials are useful or harmful to the environment by putting a checkmark (✓) on the proper column. Do this in your Science notebook.

Changes in the materials	Useful to the environment	Harmful to the environment
1. Cutting a piece of cloth to be made into handkerchief		

2. Burning of old tires and other plastic materials.		
3. Growing plants in the backyard		
4. Dumping of wastes at the vacant lot		
5. Cutting of lumber into chairs and tables		
6. Selling of bottles, paper and cardboard materials		
7. Using eco bag or native baskets instead of plastic bags at grocery store		
8. Making a compost pit/bin in the yard for your biodegradable materials		
9. Recycling of old notebooks		
10. Repairing of furniture		
11. Using old tires as flower Pots		
12. Cutting down trees		
13. Throwing of detergents into the river		
14. Spraying of spray net/ aerosol		
15. Turning waste plastic into different cases		

CONGRATULATIONS! You outdid yourself today!



Additional Activities

Directions: Choose only one activity. Do this in your Science notebook.

1. Make a poster on how you will be able to help inform people in your community about the preservation of the environment.
2. Collect any materials found in your community and try to make new product out of it, applying the knowledge of recycling.

Lesson

2

“Harmful Effects of the Changes in the Materials to the Environment”

There are so many changes in the materials that we use every day but we don't know the result of such changes to our environment. Have you ever tried buying grocery items in the market? What did you do to the plastic bags after you unpacked all items you bought?

In the previous lesson, you have learned that there are some changes in the materials that are useful and harmful to the environment. In this lesson you will be focusing more on the harmful effects of the changes of the materials to the environment. Get ready to activate your science process skills and have fun.



What's In

Directions: Identify if the following changes in the materials are **useful** or **harmful**. Do this in your notebook.

- _____ 1. burning of old tires
- _____ 2. shaping pieces of wood into chair
- _____ 3. throwing of kerosene and detergents into the sewage
- _____ 4. turning empty plastic bottles into beautiful flower vase
- _____ 5. cutting piece of cloth to be made into handkerchief

You are doing a good job!
Keep working on to reach the top.



What's New

Directions: Perform the different activities indicated in this module. Write your answers on your Science notebook.

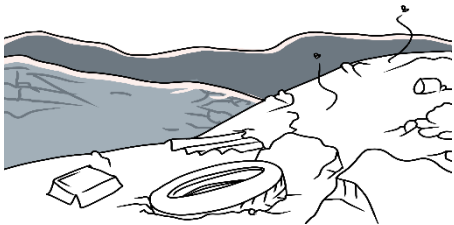
Activity 1: “What are the Harmful Effects of the Changes in the Materials to the Environment?”

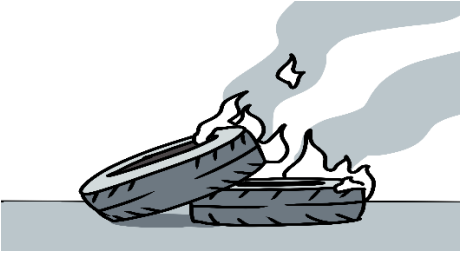

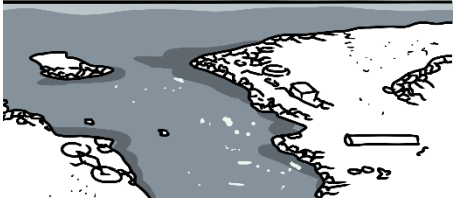
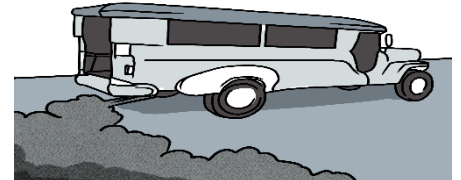

What you Need:

1 piece long size bond paper

What to Do:

1. Study the pictures on the table shown below.
2. Describe what is shown in each of the given pictures. Write your answers on column 2.
3. Describe also its harmful effect to the environment by filling up column 3.
4. Enumerate some ways of preventing/minimizing its effect to the environment by filling up column 4.

Picture showing changes in the material	What does the picture show	What is its effect to the environment?	What can people do to prevent/ minimize its harmful effect to the environment?
1. 			

<p>2.</p> 			
<p>3.</p> 			
<p>4.</p> 			
<p>5.</p> 			
<p>6.</p> 			

Illustrated by: Jotham D. Balonzo

Guide Questions:

1. What does each picture show?
2. What is its effect to the environment?
3. What can people do to prevent/minimize its effect to the environment?

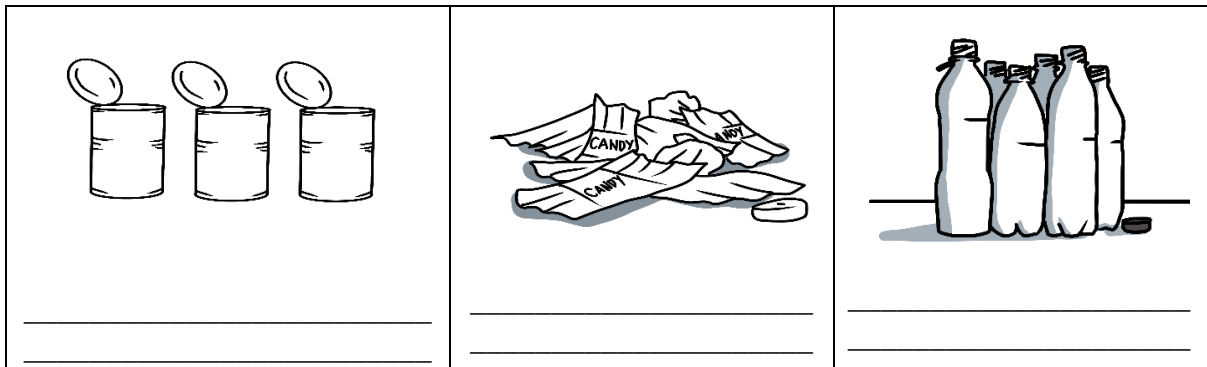
Activity 2: “Describe the Harm it Brings”

Directions: Describe the harmful effects of change in the materials to the environment. Write your answers in your science notebook.

1. burning of old tires- _____
2. cutting of trees- _____
3. throwing of garbage into the river- _____
4. throwing of factory wastes into bodies of water- _____
5. burning of plastic wastes- _____

Activity 3: “Good suggestions”

Directions: What changes in the following materials can you make to prevent their harmful effects to the environment? Write your answers in your Science notebook.



Illustrated by: Jotham D. Balonzo

Fantastic activity!
You are doing well. Keep it up.



What is It

Points to Remember:

5R's of Responsible Waste Management

1. Reduce

- Buy items in refillable containers
- Use cloth bag/eco bag/paper bag/native baskets instead of plastic bag, when you buy groceries.
- Avoid buying disposable items or single use products such as batteries, razors, utensils, plates, cups, etc.

2. Reuse

- Donate or sell re-usable items.
- Use both sides of paper when printing and re-use as scratch paper, gift wrapper, etc.
- Consider the potential life span or durability when buying new products.
- Buy durable food/storage containers and reuse them instead of using foil and plastic bags/wrap.

3. Recycle

- Do not throw away used newspaper or used writing pads. Sell them or bring them to paper mills which can turn them into usable paper again.
- Used bottles, tin cans, and rubber tiles can be recycled into useful materials.

4. Repair

- Have appliances, office equipment, lighting fixtures, and automotive parts repaired instead of buying new ones.
- Have an old furniture reupholstered or refurbished instead of buying new ones.

5. Rot

- Set up a compost pile to compost your yard trimmings.
- Make a compost pit/bin in the yard for your biodegradable materials such as fruits, vegetables, coffee grinds etc.

Spectacular! You have just about mastered it.



What's More

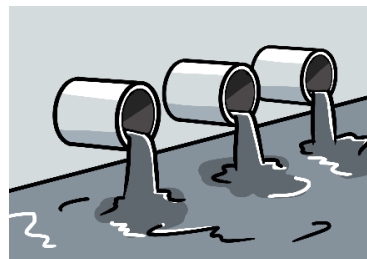
Directions: Match the following pictures to their corresponding effects. Write the letter of the correct answers in your notebook.

Activity 1: "Match My Effects"

___1.



___2.



___3.



___4.



___5.



Illustrated by: Jotham D. Balanzo

- It affects the quality of the air that we breathe. It causes rapid change in temperature.
- Polluted land serves as breeding places for flies, cockroaches, rats which carry germs that cause diseases.
- The smoke and toxins from the household garbage that enter the air also contribute to the greenhouse effect and global warming.
- When the surrounding air is blanketed with smoke from factories and motorized vehicles, the air becomes polluted and

can cause skin itchiness, lung infections, cancer, and other respiratory diseases.

e. The river becomes polluted and can cause diseases to fish, water plants and even humans.

Activity 2: “What can be done?”

Directions: Choose from the box some ways to be done to prevent/minimize the harmful effects to the environment.

- | |
|---|
| a. waste segregation
b. buy items in refillable containers
c. recycle items that can be used again
d. plant trees
e. make a compost pit |
|---|

- ___ 1. burning plastics
- ___ 2. cutting down of trees
- ___ 3. buying disposable items
- ___ 4. dumping of garbage on a vacant lot
- ___ 5. throwing of fruit and vegetable peelings



What I Have Learned

Directions: Choose the right word that would fit to the given statement. Write your answers on your Science notebook.

- | | | |
|---------|----------|--------------|
| harmful | throwing | cutting down |
| burning | 5R's | pollution |

I learned that:

Changes in the materials can bring 1. _____ effects to the environment. Some of these changes are 2. _____ of

trees, 3. _____ of plastics, 4. _____ of garbage and factory wastes into the river, etc. To minimize/prevent the harmful effects of these changes 5. The _____ of Responsible Waste Management is highly encouraged to apply.



What I Can Do

Directions: Answer the question briefly. Write your answer in your Science notebook.

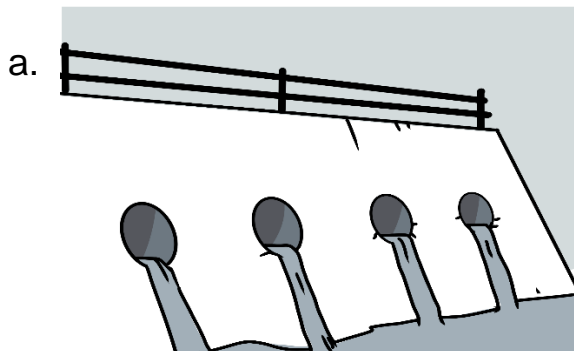
You and your friend are drinking bottled water while walking home one day. You noticed that after your friend drank the water, he threw the bottle to the sidewalk. What will you say to your friend and what will you suggest to avoid harmful effects of throwing garbage like that in the sidewalk?

YES! You did it!



Assessment

A. Directions: Identify two harmful effects that the following pictures might have to the environment. Write your answers in your notebook.



1. _____

2. _____

Illustrated by: Jotham D. Balanzo

b.



3. _____

4. _____

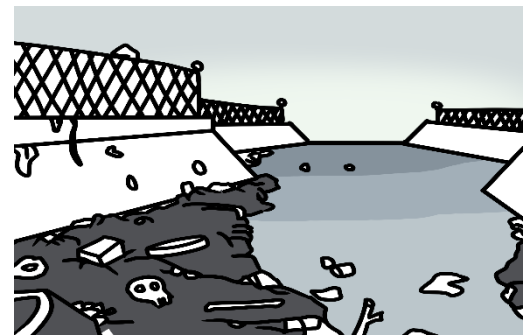
c.



5. _____

6. _____

d.



7. _____

8. _____

e.



9. _____

10. _____

Illustrated by: Jotham D. Balonzo

B. Directions: Choose the correct answer from the box and write it in your notebook.

reduce	reuse	recycle	repair	rot
--------	-------	---------	--------	-----

- _____ 1. Buy items in refillable items.
- _____ 2. Donate or sell re-usable items.
- _____ 3. Used bottles, tin cans, rubber tires can be recycled into useful materials.
- _____ 4. Have an appliance, office equipment, lighting fixtures, and automotive parts repaired instead of buying new ones.
- _____ 5. Make a compost pit/bin in the yard for your biodegradable materials such as fruits, vegetables, coffee grinds, etc.

You're a winner! You are on top of it.



Answer Key

LESSON 1

Useful Materials	empty container of milk empty container of shampoo
Harmful Materials	broken bulb used battery empty container of pesticides/insecticides.

ACTIVITY 2: "I Can"

Changes in the material	shaping of woods into tables	✓
	burning of plastics	✓
	cutting of piece of cloth into handkerchief	✓
	burning of old tires	✓
	throwing of toxic waste into rivers and land	✓
	cutting of trees	✓
Effect of the changes of the materials to the environment	Useful	
	Harmful	

ACTIVITY 1: "Changes in Materials: Useful or Harmful"

What's New



1. CM 2. CM 3. CM 4. NCM 5. CM
1. FALSE 2. TRUE 3. TRUE 4. TRUE 5. TRUE


What's In



1. ☹️	6. ☹️	11. ☹️
2. ☹️	7. ☹️	12. ☹️
3. ☹️	8. ☹️	13. ☹️
4. ☹️	9. ☹️	14. ☹️
5. ☹️	10. ☹️	15. ☹️

What I Know






What is It

Answers to Guide Questions:

1. Useful materials: empty containers of milk and shampoo
Harmful materials: broken bulb, used battery, empty containers of pesticides/insecticides
2. Useful changes in materials: shaping of woods into tables and cutting a piece of cloth into handkerchief
These changes in materials are useful to the environment because they are changed into another useable form instead of throwing them.
3. Harmful changes in materials: burning of plastics, burning of old tires, throwing of toxic waste into rivers and land, and cutting of trees
These changes in materials are harmful to the environment because they can harm people's lives as well as other wildlife.




What's More

ACTIVITY 1: "I Can Tell"

1. useful
2. harmful
3. useful
4. harmful


ACTIVITY 2: "I Can Do Something"

Pupils' answers may vary.




What I Have Learned

- useful, harmful
- pollution
- reduce, reuse, recycle, repair, rot




What I Can Do

Pupils' answers may vary.



Assessment

<ol style="list-style-type: none"> 1. useful 2. harmful 3. useful 4. harmful 5. useful 	<ol style="list-style-type: none"> 6. useful 7. useful 8. useful 9. useful 10. useful 	<ol style="list-style-type: none"> 11. useful 12. harmful 13. harmful 14. harmful 15. useful
---	--	---



Additional Activities

Pupils' answers may vary.

LESSON 2

What's In

1. YES
2. NO
3. YES
4. YES
5. YES

What I Know

6. YES
7. NO
8. YES
9. NO
10. YES

What's In

1. useful
2. harmful
3. useful
4. harmful
5. useful

What's New

ACTIVITY 1: "What are the Harmful Effects of the Changes in the Materials to the Environment?"

Picture showing changes in the material	What does the picture show?	What is its effect to the environment?	What can people do to prevent/minimize its harmful effect to the environment?
Picture 1	dumping of waste materials	harmful	answers may vary
Picture 2	burning of old tires	harmful	answers may vary
Picture 3	cutting of trees	harmful	answers may vary
Picture 4	throwing waste materials into the river	harmful	answers may vary
Picture 5	smoke belching vehicles	harmful	answers may vary
Picture 6	black smoke from factories	harmful	answers may vary

Answers to Guide Questions:


1. changes in the materials
2. harmful
3. Be responsible and practice proper waste management

ACTIVITY 2: "Describe the Harm it Brings"

1. air pollution, people become sick
2. temperature rises, soil erosion, flooding
3. water pollution, living organisms in the water will be affected, etc.
4. water pollution, living organisms in the water will be affected, etc.
5. air pollution, people will get sick


ACTIVITY 3: "Good Suggestions"

Pupils' answers may vary.

What is It 

Answers to Guide Questions:

1. flood, landslide, soil erosion, land, water and air pollution, etc.
2. Pupils' answers may vary
3. practice 5R's of Waste Management , clean- up drive, tree planting activity


What's More 

ACTIVITY 1: "Match My Effects"


1. b
2. e
3. d
4. c
5. a

ACTIVITY 2: "What can be done?"


1. a
2. d
3. e
4. c
5. b

What I Have Learned 

1. harmful
2. cutting down
3. burning
4. Throwing
5. 5 Rs

What I Can Do 

Pupils' answers may vary.


Assessment 

A.

1. The river becomes polluted
2. Polluted water also kills living organisms, such as fish and water plants.
3. It affects the quality of the air we breathe.
4. soil erosion, flooding, etc
5. water pollution
6. people become sick, living organisms in the water will be affected and might die, etc.
7. water pollution
8. dangerous to living organisms, etc
9. greenhouse effect and global warming
10. pose health risk for people with asthma, etc.

B.

1. reduce
2. reuse
3. recycle
4. repair
5. rot

Additional Activities 

Pupils' answer may vary.

References

Department of Education. (2015) Science 4, Learner's Materials. Pasig City: Instructional Materials Secretariat (DepEd-IMCS): 5th Floor Mabini Building.,DepEd Complex Meralco Avenue, Pasig City Philippines 1600.

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