



5

Science

First Quarter



PIVOT **4A** **LEARNER'S MATERIAL**

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The Editors

Science

Grade 5

Regional Office Management Development Team: Job S. Zape, Jr., Romyr L. Lazo, Ma. Leonora M. Natividad, Fe M. Ong-Ongowan, Lhovie A. Cauilan, Jayson Orosco

Schools Division Office Development Team: Josephine Natividad, Anicia J. Villaruel , Joanne D. San Miguel, Joylet D. Martinez, Renante M. Bataanon, Marivel J. Pabellosa, Joey L. Jader, Dr. Anicia J. Villaruel, Roy O. Natividad, Aira Mae M. Jimena, Sayre M. Dialola, Elizalde L. Piol,

Science Grade 5
PIVOT IV-A Learner's Material
First Quarter
First Edition, 2020

Published by: Department of Education Region IV-A CALABARZON
Regional Director: Wilfredo E. Cabral
Assistant Regional Director: Ruth L. Fuentes

PIVOT 4A CALABARZON

Guide in Using PIVOT Learner's Material

For the Parents/Guardian

This module aims to assist you, dear parents, guardians, or siblings of the learners, to understand how materials and activities are used in the new normal. It is designed to provide the information, activities, and new learning that learners need to work on.

Activities presented in this module are based on the Most Essential Learning Competencies (MELCs) in Science as prescribed by the Department of Education.

Further, this learning resource hopes to engage the learners in guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

You are expected to assist the child in the tasks and ensure the learner's mastery of the subject matter. Be reminded that **learners have to answer all the activities in their own notebook.**

For the Learners

The module is designed to suit your needs and interests using the IDEA instructional process. This will help you attain the prescribed grade-level knowledge, skills, attitude, and values at your own pace outside the normal classroom setting.

The module is composed of different types of activities that are arranged according to graduated levels of difficulty—from simple to complex. You are expected to **answer all activities on separate sheets of paper** and submit the outputs to your respective teachers on the time and date agreed upon.

PARTS OF PIVOT LEARNER'S MATERIAL

	Parts of the LM	Description
Introduction	What I need to know	The teacher utilizes appropriate strategies in presenting the MELC and desired learning outcomes for the day or week, purpose of the lesson, core content and relevant samples. This allows teachers to maximize learners awareness of their own knowledge as regards content and skills required for the lesson.
	What is new	
Development	What I know	The teacher presents activities, tasks , contents of value and interest to the learners. This shall expose the learners on what he/she knew, what he /she does not know and what she/he wanted to know and learn. Most of the activities and tasks must simply and directly revolved around the concepts to develop and master the skills or the MELC.
	What is in	
	What is it	
Engagement	What is more	The teacher allows the learners to be engaged in various tasks and opportunities in building their KSA's to meaningfully connect their learnings after doing the tasks in the D. This part exposes the learner to real life situations /tasks that shall ignite his/ her interests to meet the expectation, make their performance satisfactory or produce a product or performance which lead him/ her to understand fully the skills and concepts .
	What I can do	
	What else I can do	
Assimilation	What I have learned	The teacher brings the learners to a process where they shall demonstrate ideas, interpretation, mindset or values and create pieces of information that will form part of their knowledge in reflecting, relating or using it effectively in any situation or context. This part encourages learners in creating conceptual structures giving them the avenue to integrate new and old learnings.
	What I can achieve	

Properties of Materials

Lesson

This lesson will help you to discover and understand the properties of materials and their uses. The lessons include activities that will guide you to use the properties of materials and determine whether they are useful or harmful.

Properties are distinctive characteristics that describe an object or material. These properties of materials determine their uses and importance. These properties may be observed directly or indirectly.

Go to your kitchen. Observe the materials found in the kitchen. Can you name some materials? Look at the picture below. Can you tell the uses of each materials found in the kitchen?



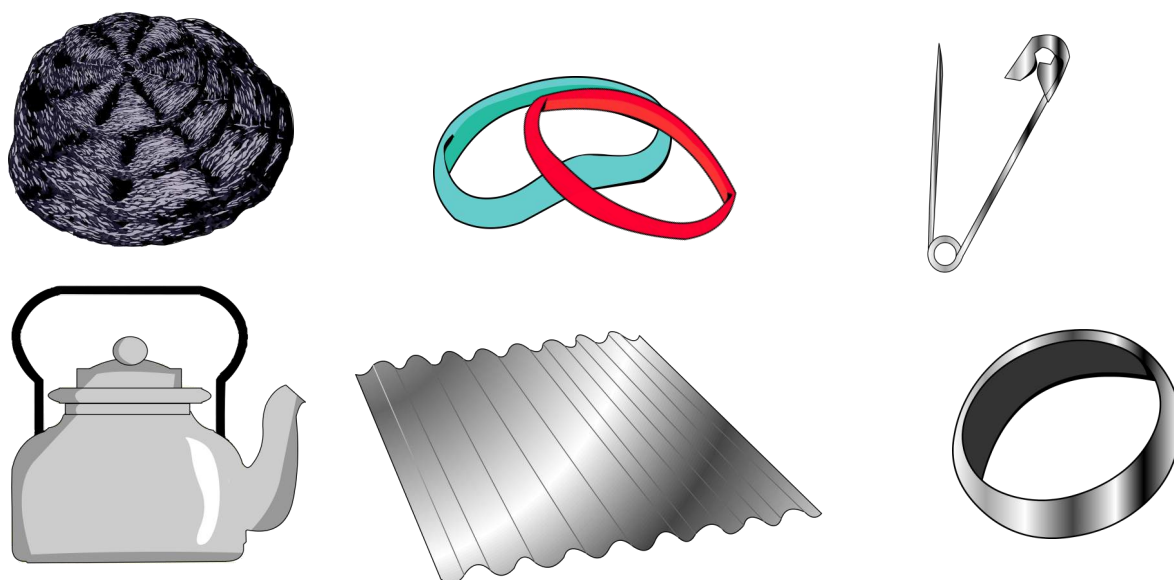
Each materials have their own characteristics which tell about their properties. You can classify them based on their shared qualities and properties like texture, color, and hardness . These are called **physical properties**.

Let`s observe teapot, plates, cups and saucers. What characteristics do they share in common? If you say they are made up of **ceramics**, you are right. Its property shows that it is hard, rigid, waterproof and resistant to heat. These properties make them a good material for holding hot liquids. There are also some plates, cups and saucers that are made from **plastics**. Plastics are also durable but once, it is deformed, the deformation remains. They are also durable. **Durability** is the ability of the materials to withstand wear, pressure or damage. Unlike plastic materials, rubber bands are **elastic**. When force is applied on it, it returns to its original size and shape after the force is removed. This property is

elasticity. Rubber is durable, elastic and can resist heat. This makes rubber an excellent material in making tires for land vehicles.

Try to help your mother scrub the steel sink using steel wool or wire sponge. The sink and steel wool are made up of stainless steel. They are important because the sink is used to hold water when you wash things. They are also tough, easy to clean and strong. Some materials like fork, spoon, and knife are also made from stainless steel. You may cook rice in an aluminum pot or in a rice cooker. Aluminum is used in making cook wares like kettle, rice cooker, casserole and frying pan because it is a good thermal conductor, does not rust, and has light weight. These properties are important for every day use in cooking foods.

Look at the materials found inside the box? What are their characteristics? When choosing materials for specific use, don't forget to consider their characteristics and their properties.



Your prior knowledge about the characteristics of solid, liquid and gas will help you determine their properties and uses in your everyday life. You can describe a metal kettle by saying that it is strong and **durable**. A metal is also **malleable**. This property, **malleability**, means that a metal can be hammered and formed into sheets which can be used for a variety of different purposes.

The performance of some solid materials considers their response to external forces. **Hardness** is a measure on the amount of force that an object can withstand. **Tough** materials like block of wood will not break easily in contrast to materials that are **brittle** like egg shells.

Plastics are flexible, durable and resilient that's why they are good materials for storage containers. But they are extremely resistant that they persist for hundreds of years. Do you know that plastic water bottle can persist for 450 years and disposable diapers for 500 years.

Some materials found at home like the power cord of the rice cooker or extension wires are made from copper wires. These materials are good conductors of electricity. The **electrical conductivity** is the ability of metals to conduct heat and electricity. Hard materials like woods can be used to make tables, chairs and walls of the house. They are also durable and tough.

Useful and Harmful Materials at Home

Some materials found at home can either be useful or harmful because of their physical and chemical properties depending on how the materials are used. Chemical properties are observed indirectly and become evident only when the material undergoes a chemical reaction or chemical change. They have harmful effects on people, animals plants and in the environment if they are not used properly. Soaps, detergents, rubbing alcohol, and bleaching substances are good cleaning agents and antiseptics. Medicines, vitamins and minerals are very useful for your health and maintain immunity against some diseases but if the medicines are not taken in proper dosage, they may harm your health. Excessive intake of soft drinks, processed foods like hotdogs, sweet and salty foods like ice creams and noodles are harmful to your health. They can cause poor nutrition and imbalance of nutrients in the body. Examine the label of sardines and noodles below.



The label shows presence of sodium. Salt or sodium chloride is common in processed foods. If taken in excess, this may accumulate in your organs and may damage your kidney.

LPG (Liquefied Petroleum Gas) or simply propane or butane, is a flammable mixture of hydrocarbon gases used as a fuel in heating appliances and vehicles. However, an extra care and assistance from elders are required when you open it because it may cause fire.

To learn more, you can start doing the learning tasks in the next pages. Write your answers in your notebook. Enjoy learning!

Learning Task No. 1: Using the given objects presented in the table, write as many characteristics or properties as possible to describe each object.

Object	Characteristic (s) or Properties
1. chopping board	
2. plastic plates	
3. glass	
4. rubber band	
5. steel knife	

hard	magnetic	strong
clear	corrosive	smooth
conductor	elastic	transparent
durable	malleable	water and heat resistant

Learning Task No. 2: Match the materials in Column A with their uses in Column B.

Column A

1. knife
2. wood
3. cloth
4. metal pot
5. ceramic cup
6. muriatic acid
7. powder detergent
8. mirror
9. bath soap
10. electrical wires

Column B

- A. reflects the existing light
- B. cooking foods
- C. conducts electricity
- D. removes dirt in soiled clothes
- E. cleans the toilet bowl
- F. holds hot liquid
- G. food preparation or cutlery
- H. chairs and tables
- I. blanket
- J. personal hygiene

D

Learning Task No. 3: Read the properties of materials below. Identify the property of materials described in each sentence.

1. The physical property of metals that defines their ability to be hammered, pressed, or rolled into thin sheets without breaking.
2. Ability of the materials to conduct electricity.
3. This refers to the ability of the material to withstand wear, pressure or damage.
4. The physical property of a material associated with the ability to be hammered thin or stretched into wire without breaking.
5. It is the measure of the resistance to localized plastic deformation induced by either mechanical indentation.

Learning Task No. 4: Classify the uses/importance of each materials listed inside the box. Answers may be stated in any order. Write your answer in your notebook.

soap	charcoal	chopped woods	rice cooker
sugar	tea pot	detergent powder	toothpaste
water	vinegar	rice grains	radio
Liquefied Petroleum Gas (LPG)	alcohol	salt	electric fan

Food/ food preparation	Cleaning/ hygiene	Cooking/heating	Gadget/ appliances
1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

E

Learning Task No. 5: Read the selection below. Answer the guide questions at the end of the story.

Lady`s Finger for Sale

by: May Natividad


During lockdown in CALABARZON in March 2020, Joram, a Grade 5 pupil together with Joram and Hannah, decided to plow the vacant lot in the backyard using a hoe. They planted lady`s finger, a vegetable plant locally known as okra. They water the plants everyday using empty tin cans. They spray chemical fertilizers every 4 to 6 weeks after watering the plants. It took 10 to 12 weeks when okra plants become ready for harvesting.

They harvested the lady`s fingers and decided to sell them among their neighbors in the community. They earned several coins and gave them to their mother. They also set aside some pieces of okra for cooking. The planting and selling of lady fingers were good experiences that Joram and his family enjoyed during quarantine period.



Guide Questions:

1. Name three metal objects/materials mentioned in the story.
2. What is the use/importance of these materials ?
3. What chemical substances were used after watering the plants?
4. Are these chemical fertilizers useful or harmful in the environment?
5. What are the importance of selling lady`s fingers in the community?

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- PIVOT 4A CALABARZON

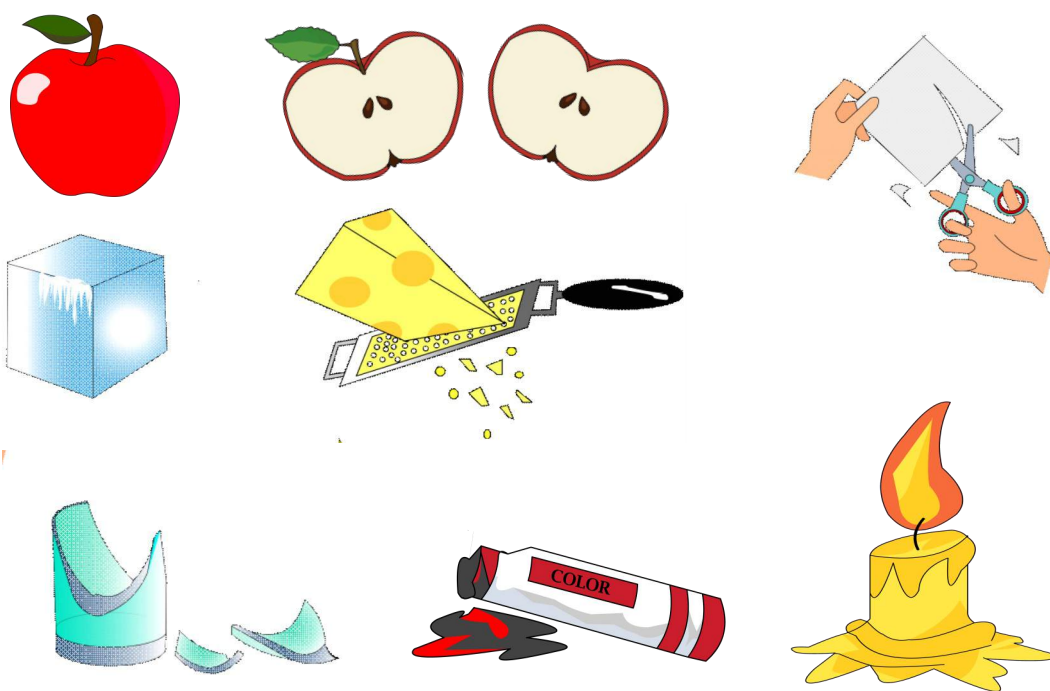
Changes in Materials

Lesson

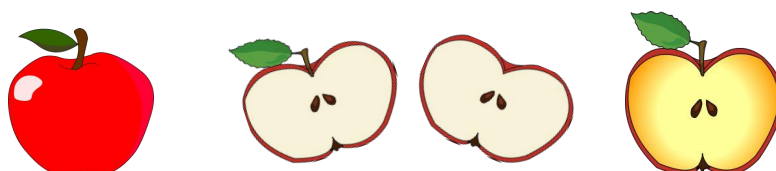
In this lesson, you will investigate changes that happen in materials under the two conditions which are the (1) presence or lack of oxygen and (2) application of heat.

In the previous lesson, you discovered that properties of materials tell about their uses or importance, or whether they are useful or harmful. When these materials combine with other substances, they will undergo changes in their properties. There are two ways by which materials change. **Physical change** happens when the materials change in shape or size but the substances or particles making up the materials are still the same. These changes are directly observed like when you cut or slice an apple. There are changes in shape and size of an apple but the material is still the same. Aside from cutting, there are also other processes that cause changes in the materials. These include bending, dissolving, freezing, boiling, shredding and melting. The breaking of glass into pieces is also an example of physical change. Change in the state of matter from solid to liquid or from liquid to gas is also an example of

The pictures below show the different processes that cause physical change. Examine each picture below. What do you think will happen to its properties after each process ?



You can explore chemical change by observing an apple. If you have an apple at home, cut it into two and expose it to oxygen in the air. If the apple is not available at home, observe the picture above that shows the uncut and cut apple. What did you observe in its color after cutting the apple and exposing it to oxygen after five minutes?



If you observed that it changes from whitish to brownish color, then it undergoes chemical change. The oxygen which is introduced in the surface of the apple releases the free radicals in an oxidation process. This turns apple into brown color. The material undergoes **chemical change**. There are substances in an apple that combine with oxygen and cause the browning of apple.



Metals such as iron rust when exposed to oxygen. Rusting occurs when the surface of the metals or its alloys, such as steel, will corrode in the presence of water. Water is a compound that is made up of oxygen and hydrogen. The presence of oxygen causes rusting of iron. The process of rusting is a combustion reaction similar to the creation of fire. If it is left in contact with oxygen, iron will react with oxygen to form rust. Rusting is the common term for corrosion of iron and its alloys. Can you explain why the presence of water in contact with iron forms rust? Let us find out in doing the activities in the next pages.

There are other processes that cause chemical changes . These are burning, cooking, rusting, and rotting. Cooking and burning involves the application of heat. These causes the materials to change in their state and composition. When this happens, a new substance and different properties or products are formed. Some evidences of chemical change are the production of heat and light, formation of bubbles, or formation of a precipitate or solid within a solution.

In the succeeding activities, you will discover more about changes in materials when exposed to the presence oxygen or absence of oxygen. Materials undergo chemical change also when heat is applied. So, enjoy reading the lessons and investigate these changes by doing the activities in this lesson independently. Remember, be careful and ask assistance from elders whenever necessary. In answering the activities, write your answers in your notebook.



Learning Task No. 1: Presence and Absence of Oxygen

In investigating the changes that happen in materials under the condition that there is presence or absence of oxygen, you will need the following materials :

- | | |
|------------------------------------|------------------------------|
| 1 piece apple (eggplant or potato) | any vitamin C tablet |
| 3 clear glass/bottle | 500 ml or 2 glasses of water |
| Chopping board | knife |

Note: Conduct an experiment in the kitchen or in an available place that is safe to keep the experimental set up, clean, safe and manageable. Follow the steps below.

Prepare the materials.

1. Label each glass with a marker or write in a paper Glass A-with water, Glass B- with Vitamin C placed under each glass. This will help you monitor which glass will undergo changes in color in the presence or absence of oxygen. See the illustration below.

GLASS A-with water

GLASS B-with water + Vitamin C
tablet

2. Cut an apple (eggplant or potato) into two slices using a knife in a chopping board. (Seek help from elder brother or sister to set up this experiment. *This will create bonding between you and your elder member of the family.*)
3. Pour 3/4 full of water in each pre-labeled glass.
4. Put one slice of apple or eggplant in each glass or bottle.
5. Crush Vitamin C tablet. Put it in the second glass.
6. Observe what happened in the material after 48 hours.
7. Write your observations in your notebook.

Table 1. Investigating Material

Material	Observations	
	Glass A	Glass B
freshly cut apple/eggplant/potato		
apple/eggplant/potato (material) after 48 hours		

Guide Questions:

1. What is the color of the freshly cut apple/eggplant/potato in Glass A and Glass B?
2. What is the color of the apple/eggplant/potato after 48 hours in Glass A and Glass B?
3. What is the effect of exposing the slice of the material in oxygen in glass A and in Glass B after 48 hours?
4. What is the effect of putting Vitamin C (*Vitamin C acts as antioxidant that prevents further oxidation of apple/eggplant*) in an apple/eggplant in Glass B?

Glass A after 48



Glass B after 48



Learning Task No. 2: Application of Heat

In this activity, you will investigate what will happen to materials when they are heated. You will need the following materials as follows:

matchstick 1 pc candle (if not available, use a crayon or both)
pot holder 1 pc spoon

Note: Conduct an experiment in the kitchen or in an available place that is safe to keep the experimental set up, clean, safe and manageable space. Be careful in lighting a matchstick and hot objects. Seek help from elder member of the family to set up this experiment. This will create bonding between you and elder member of the family.)

1. Observe the properties of the samples before heating.
2. Crush the materials (candle and/or crayons) and put it in a spoon.
3. Using a match stick, light the candle and heat the spoon containing the crushed materials. (Use pot holder to hold the spoon while heating).
4. Observe what happens to the lighted candle.
5. Put off the lighted candle carefully by blowing air on it.
6. Let the heated material (s) stand for 2-3 minutes.
7. What happened to the heated materials when they cooled off?
8. Write your observations in the table below.

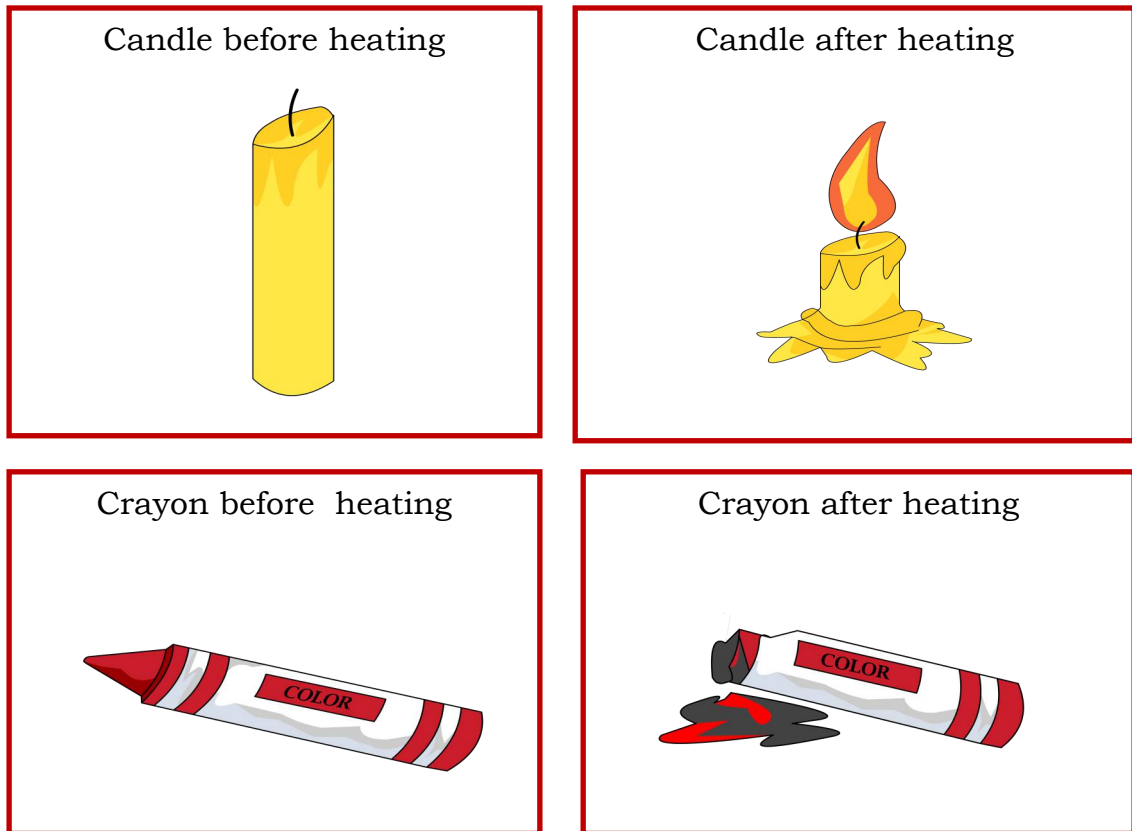
Table 2. Investigating crayons and candle when heated

Materials	Property before heating	Property after heating
Crayon		
candle		

Guide Questions:

1. What are the properties of crayon and candle before the materials are heated?
2. What happened to the materials when they are heated?
3. What change took place?
4. Describe the changes that happen in the materials when they are heated.
5. What change in phase happened when crayons and candle are heated?

6. Describe the changes that happened in the materials when they cooled after 3 to 5 minutes.
7. What change in phase happened when crayons and candle melted?



8. Are there new products formed after each changes?
9. Let the materials sit for 2 minutes.
10. Observe what happened to crayons and candles after letting them sit for 2 minutes.
11. Copy Table 3 in your notebook. Complete the table.

Table 3. Investigating candles and crayons after heating

Materials	Observation after 2 minutes
Crayon	
candle	

12. What change in the material happened after letting the material stand in 2 minutes?
13. What do you call this process that happened in crayons and candles where its liquid phase turned into solid?
14. What caused this change in the materials? Is there any new material formed?
15. Draw your observations in the box .

Crayon after heating

Crayons after cooling

Candle after heating

Candle after cooling

Learning Task No. 3: Investigating ice cubes when heated

In this activity, you will investigate what will happen to materials when they are heated. You will need the following materials:

3 pcs of ice cube clear glass

1. Get ice cubes from refrigerator. (*Seek help from elder member of the family*)
2. Put 3 pcs of ice cubes in a glass.
3. Let it sit for 3 to 5 minutes.
4. Observe what happened to the ice cubes when exposed to heat or at room temperature.
5. Write your observations in table 4.

Note: If you do not have available ice cubes at home, look at the pictures of ice cubes below after exposing them to heat.

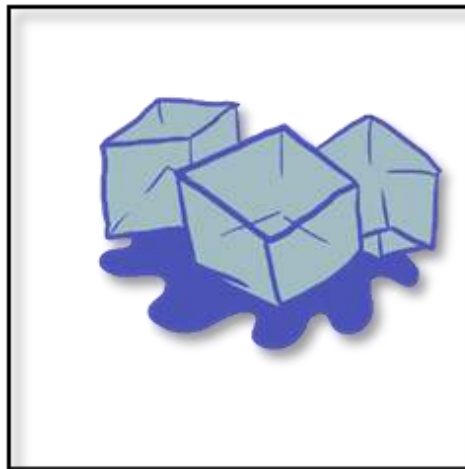


Table 4. Investigating ice cubes when heated

Material	Before exposure to heat	After exposure to heat
Ice cubes		

Guide Questions?

1. What are the properties of ice cubes before letting them sit for 3-5 minutes in a room temperature? (*Room temperature is higher than the temperature in the refrigerator. Thus, heat is absorbed by ice cubes.*)
2. What happened to the ice cubes when they are exposed to heat?
3. What change in phase happened when ice cubes are heated?
4. Describe the changes that happen in ice cubes when they are heated?
5. What do you call this process of changing solid into liquid?
6. Are there new products formed when ice cubes melt?
7. Draw your observations before and after heating.

Ice cubes before heating

Ice cubes after heating

How did you find the previous activities? Did you appreciate the role of Vitamin C in preventing the oxidation of materials? Remember, the presence or absence of oxygen cause changes in the materials. Vitamin C acted as antioxidant that prevents the apple to turn brown in color. This way, the apple will keep its good appearance. Now, you understand why apple and eggplants turn brown or showed discoloration when exposed to oxygen.

Heat causes the materials to change in their properties also. It will change state from solid to liquid which is called melting. When ice cubes melted, the heat present in the environment was absorbed by the ice cubes. But when the heat was absorbed by the lighted candle and crayon, they changed state from liquid to solid. This is caused by the process of cooling.

Applying Heat on the Materials

E

Learning Task No. 4: Examine the pictures below. Write three to five words to describe each picture. Use the concepts that you have learned in the previous activities.

Picture A



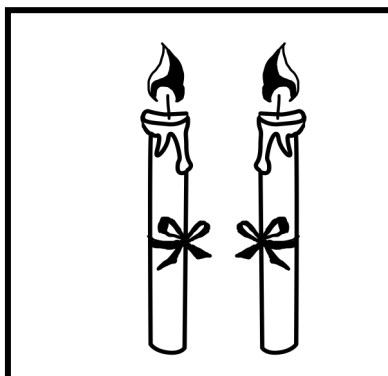
Picture A

Picture B



Picture B

Picture C



Picture C

In this activity you will understand why there is a need to safekeep our metal utensils and other metal objects at home to prevent from rusting.

Learning Task No. 5: Investigating the rusting of iron

You will need the following materials:

2 pcs of iron nails small dry cloth (Cloth A) small wet cloth (Cloth B)
(if nails are not available, you can use any sample of material made from)

1. Place one dry and wet cloth near the window.
2. Put 1 pc of new nail (or any material made from iron) in each cloth.
3. Let the nail in the cloth stand for 48 hours.
4. From time to time, sprinkle water in cloth B to keep the cloth moist while checking cloth A that it is dry.
5. Observe what will happen to the nails or materials made from iron after 48 hours.
6. Write your observations in table 4.

Table 4. Investigating materials when heated

Material	Dry cloth	Wet cloth
iron nail		
iron nail after 48 hours		

7. Draw your observations in the box below.

Iron nail (or any iron made material) in dry cloth before exposure to air/oxygen

Iron nail(or any iron made material) in wet cloth before exposure to air/oxygen

Iron nail (or any iron made material) in dry cloth after 48 hours exposure to air/oxygen

Iron nail (or any iron made material) in wet cloth after 48 hours exposure to air/oxygen

Guide Questions:

1. What are the properties of iron nails before exposure to oxygen?
2. What happened to the materials when they are exposed to oxygen?
3. What change took place?
4. Describe the changes that happen in iron nails when they are exposed in oxygen.
5. What do you call the process of exposing the iron nails placed in wet cloth after 48 hours that resulted to change in appearance of iron nails?
6. Are there new products formed after each changes?

Learning Task No. 6: Reflective Journal Writing

In your journal, write at least three (3) sentences of your reflection about the following scenario.

Scenario A- Jolo`s mother is always giving a *reminder to everyone in the family to keep the LPG tank closed at all times after using* .

I understand that _____

_____.

I realized that _____

_____.

Scenario B

Hannah observed that the sun is very hot. She helped her grandmother to hang the washed clothes under the heat of the sun.

I understand that _____

_____.

I realized that _____

_____.

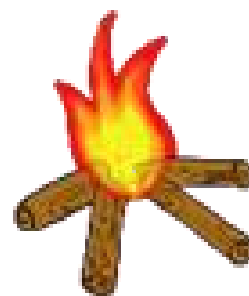
Learning Task No. 7:

Examine the picture below. Cite at least three (3) importance/uses of oxygen and/or heat as shown in the given materials.

Importance/Uses

1. _____
2. _____
3. _____

Picture A



Importance/Uses

1. _____
2. _____
3. _____

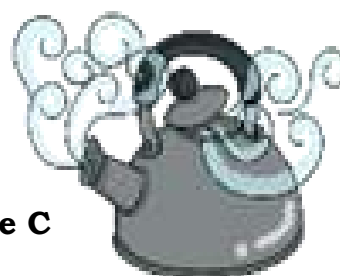
Picture B



Importance/Uses

1. _____
2. _____
3. _____

Picture C



A

Learners Task No. 8: Choose the letter of the BEST correct answer.
Write the answers in your notebook.

1. What change will happen to the slices of potato if they will be exposed to oxygen in the air?
A. Color will change from brown to white C. The color will not change
B. Color will change from white to brown D. No changes in color

2. What causes the rusting of iron nails or iron made materials in a wet cloth?
A. presence of heat C. presence of oxygen
B. absence of heat D. absence of oxygen

3. When the candle was lighted, it melted into liquid and became solid again after few seconds or in a minute. What causes these changes?
I. presence of heat II. presence of oxygen
III. absence of heat IV. absence of oxygen
A. I, II and III C. I and II
B. I and IV D. All of the above

4. The candles melted by the application of heat. What change took place when solid candles became liquid?
A. chemical C. no change
B. mechanical D. physical

5. Which situation shows the presence of oxygen in a material?
I. Lighting of a candle III. Combustion of engines
II. burning of fuels IV. putting off a lighted candle
A. I, II and III C. I and II
B. I and IV D. All of the above

6. The eggplant/apple in the experiment turned its color from white to brownish. Which statement is NOT TRUE?
- A. The presence of oxygen caused change in its color.
 - B. The absence of oxygen caused change in its color.
 - C. The color of an apple/eggplant changed when it is exposed to oxygen in the air.
 - D. There is oxidation that happened when apple/eggplant was sliced and exposed in the air.
7. Water is the primary cause of rust because water contains ____?
- A. Oxygen
 - B. Chloride
 - C. carbon
 - D. hydrogen
8. Joram noticed that when he mopped the floor using wet rugs, the moist in the floor disappeared after few minutes. What is the reason why the floor became dry?
- A. presence of heat
 - B. absence of heat
 - C. presence of water
 - D. absence of temperature
9. When physical change in materials happened, there is_____.
- I. formation of new product or material
 - II. no formation of new product or material
 - III. formation of new shape
 - IV. formation of new color
- A. I, III and IV
 - B. II only
 - C. III and IV
 - D. II, III and IV
10. Hannah observed that the left over foods on the table became watery, spoiled and had foul odor after 48 hours. What caused this change in the material?
- I. presence of heat
 - II. absence of heat
 - III. presence of oxygen
 - IV. absence of oxygen
- A. I and II
 - B. II and III
 - C. I and III
 - D. II and IV

Designing a product out of local , recyclable, solid and/or liquid materials in making useful products

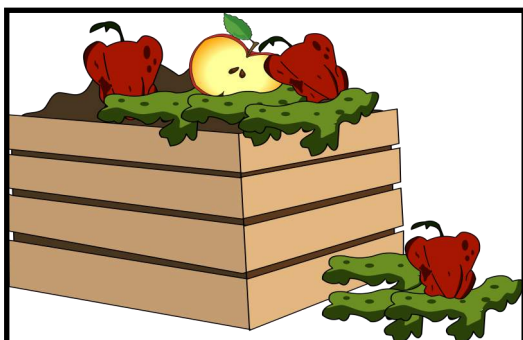
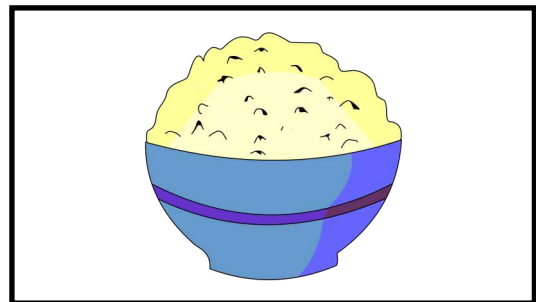
Lesson

I

Congratulations! You've already accomplished understanding the concepts and acquiring skills in determining the uses of properties that tell whether materials are useful and/or harmful. You have also investigated the materials under the effects of the two conditions where there is presence or absence of oxygen and the application of heat on materials.

I hope you enjoyed learning all these activities while staying at home for your good health and safety. Are you ready in the next journey as a scientist? I hope so!

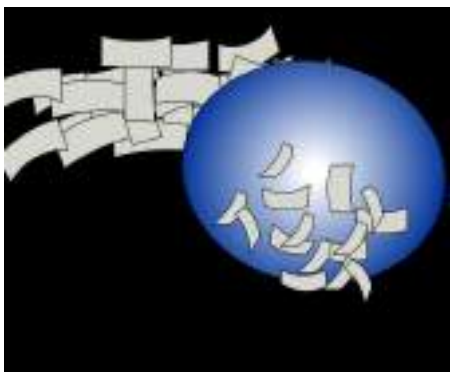
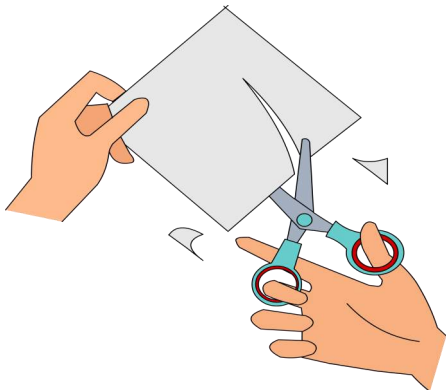
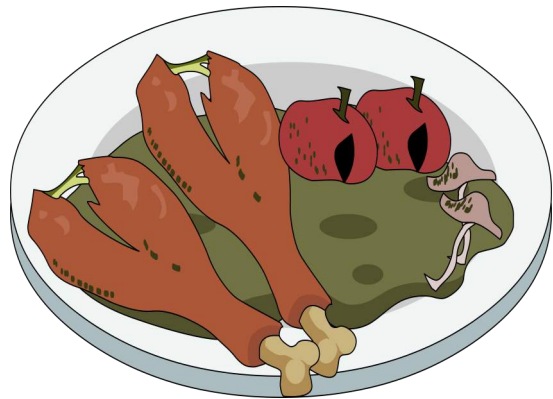
You can do better in the learning tasks designed for you in this lesson. You can still go back to the properties of the different materials around you or those that can be found at home and in your local community. This will help you to recognize the importance of recycle, reduce, reuse, recover and repair in waste management. These skills will enable you to ***design products out of local, recyclable solid and/or liquid materials in making useful products.*** Let us start by looking at the pictures of waste materials found in the kitchen and at home. Examine each picture. Can you recognize the process or way by which you can help to save the environment at home and in the community through waste management?



Do you have empty bottles of vinegar, fish sauce or soy sauce in your kitchen ? If you say yes, can you reuse them?

Waste management is the process by which materials that have been used, broken, disposed, and are no longer in good conditions are managed in a way that they can be reused, reduced, recycled, recovered and repaired. These 5Rs in waste management are very important specially in this time of pandemic that our way of living has been adversely affected by community quarantine at different levels. If you will reduce, reuse, recycle, recover and repair materials that have been considered as waste, you can contribute a lot in your environment.

Examine the pictures below. What will you do to show concern for these materials found at home?



Another way to manage waste in the environment is to reduce the use of plastics. Plastics are non-biodegradable. You learned in the previous lesson that plastics can live for hundred of years. Thus, you need to reduce the use of plastics. It is better to bring ecobag for storage and keeping of grocery items. Another way to reduce plastics is to have own tumbler that can be used to limit the use of plastic bottle for drinking.

Plastics are also good materials to recycle. Recycle is reusing the same material to make a new product. Plastic bottles can be recycled as flower vase or pencil holder. Do have computer or any gadget at home? If yes, there are times that these gadgets or appliances at home are damaged or lose some of its parts. Of course it is not practical to dispose these materials because they can still be recovered by looking for replacement material that are available in the market , hardware or in other stores. If your dress or clothes lost some buttons or have been damaged by wear and tear of materials, you seek the help of your mother to repair these materials. The pictures below can give you idea to create your own product out of these local materials or used items found at home.



Reusing items at home instead of buying new ones can help to reduce waste. In the kitchen, it is better to replace all the single-use eating utensils like styrofoam cups, water bottles, and paper plates with compostable or reusable alternatives. You can also bring your own bag in grocery stores. In storing foods, durable plastic containers are very practical. Instead of using disposable batteries in running appliances or gadgets, rechargeable batteries are recommended.

Repair is to fix something that is broken , damaged, split or not working properly. Example of repairs that you can do at home are sewing the cut or holes in the pocket of your pants, You can seek help from elders to repair some leak in the faucets, electrical appliances, and cracks in the walls of your house.

To reuse some waste in the kitchen, you can collect some materials that can be prepared as organic fertilizers in your garden. This is called composting. Composting is one way to reuse organic material that may otherwise may end up in a landfill.

In the next pages of this lesson, you will be doing activities that will help you design useful products that come from these local materials found at home.

In designing useful products , there are some steps and tips that you may follow to come up with rewarding results of your genuine effort and skills making new products out of local and used materials.

Steps and tips when designing a new product out of local and used materials at home:

1. Determine the available local materials that are largely available at home or in your nearby places and community.
2. Study the properties of these local materials or used, broken, damaged or repairable materials.
3. Create new products that are useful out of these materials by adding some aesthetic sense on them by watching videos, TV, or looking for some references that may guide you in creating new materials.
4. As much as possible seek help from elders to enjoy doing your activities in reducing, reusing, recycling, recover and repair of materials to design local products that are useful out from these waste materials.

To guide you in designing local products in the succeeding learning tasks, you will be using the rubrics given below .

Criteria	Outstanding (10)	Satisfactory (5 points)	Fair (3 point)
Content (40%)	-write up for procedures are clear, concise, simple, easy to follow and complete -the product involves reuse, reduce, recover, repair and/or recycle -meet the needs of the situation	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Creativity (20%)	-the product/output is largely appealing, striking creativity, neat/ presentable, unique and shows originality	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Usability/ Function-ality (20%)	-durable, appropriateness of usage, addresses the problem/issues	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Cost effectiveness of Materials Used (20%)	-least cost of materials, -locally available - shows recycling and upcycling of waste properly	Lacks 1 indicator for success	Lacks 2 or more indicator for success

Learning Task No.1:

Steps:

1. Visit your cabinet or closet.
2. Look for some used t-shirts or clothes that have holes or broken buttons or lock.
3. Use thread and needle to repair the holes or put some buttons whenever missing in your clothes.
4. Show your repaired t-shirts, shorts or clothes to your mother and/or teacher.

Guide Questions:

1. How did you find doing the activity?
2. Did you seek help from elders? If yes, why?
3. What will you do next if you see some missing buttons or there are holes in your shorts or t-shirts?

D

In the succeeding activities, you will use the **GRASPS Model** by Wiggins and McTighe in designing product out of local materials. Here is a guide on how you will achieve your results in designing new product.

GRASPS is an acronym for:

Goal – states the problem or challenge that you will resolve.

Role – explains who you are in the scenario and what you are being asked to do.

Audience – your target audience are for whom solving the problem is for, who you need to convince of the validity and success of your solution for the problem.

Situation – provides the context of the situation and any additional factors that could impede the resolution of the problem.

Product, Performance, and Purpose – explains the product or performance that needs to be created and its larger purpose.

Standards and Criteria for Success – dictates the standards that must be met and how the work will be judged by the assumed audience.

Learning Task No. 2:

1. Using the rubrics in the previous activity, design your own product from any of the available materials at home that you have recovered which are no longer in use.
2. Write your own simple and easy steps to follow on how to make a recyclable materials .
3. Present your work to your parents or teachers for evaluation.



Learning Task No. 3:

Materials and Tools:

empty glass jar, old papers/calendars with decorations, glue, colored paper (yellow, green, orange, black), scissors, tea light candles.

Steps:

1. Use glue to coat and wrap in your favorite colored paper into the outside of an empty jar.
2. Cut strips of green colored paper . Glue them around the top half of the jar.
3. Cut red and orange colored paper into circles. Glue them around the top half of the jar .
4. Cut two flower shapes in yellow colored paper. Stick them to the front and back of the jar opposite each other.
5. Cover the lip of the jar with a strip of green colored paper. Glue it to finish it off.
6. Place a tea light inside the jar. You are now ready to light them (*seek help from adult in this step*).

I understand that _____
_____.

I realized that _____
_____.



Learning Task No. 4: Read the GRASPS Model below in developing your own product. Use the rubrics below.

Goal - there are a lot of left over foods, old and used paper bags, papers, plastic bottles, plastic sachets of shampoo, candy wrappers and other waste that accumulate in your garbage bin everyday.

Role – your role can be like a gardener or recycler.

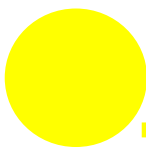
Audience – your output/project will be designed for the benefit of your family while staying at home during this quarantine period.

Situation – This school year, going to school is not allowed because of pandemic. Thus, home quarantine is declared in Luzon starting March 17, 2020 to prevent the spread of the virus causing Covid 19. While at home, you must help some members of your family to produce a home-grown vegetables as alternative supply of food.

Product/process/performance – your skills developed in determining the properties of materials will help you to design your own product or performance-based output to achieve the goal stated above.

Standards - you will use the rubrics to exhibit the best output (100/100)

Criteria	Outstanding (10)	Satisfactory (5 points)	Fair (3 point)
Content (40%)	-write up for procedures are clear, concise, simple, easy to follow and complete -the product involves reuse, reduce, recover, repair and/or recycle -meet the needs of the situation	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Creativity (20%)	-the product/output is largely appealing, striking creativity, neat/presentable, unique and shows originality	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Usability/ Functionality (20%)	- durable, appropriateness of usage, addresses the problem/issues	Lacks 1 indicator for success	Lacks 2 or more indicator for success
Cost effectiveness of Materials Used (20%)	-least cost of materials, -locally available -shows recycling and upcycling of waste properly	Lacks 1 indicator for success	Lacks 2 or more indicator for success



Key to Correction

Weeks 1 to 2

Learning Task No. 1:

1. durable, hard
2. Clear, smooth, transparent
3. Clear, transparent, hard, smooth
4. smooth, elastic
5. Water and heat resistant, malleable, durable

Learning Task No. 2

1. G	4. B	7. D	10. C
2. H	5. F	8. A	
3. I	6. E	9. J	

Learning Task No. 3:

1. Malleability
2. Electrical conductivity
3. durability
4. ductility
5. hardness

Learning Task No. 4:

1. Sugar	4. rice grains
2. Water	5. salt
3. Vinegar	6. soap

Learning Task No. 5:

1. hoe, tin cans, & coins
2. Garden tools/for gardening
3. Chemical fertilizers
4. Harmful
5. Income/coins/money
6. Food source/vegetable food
7. Useful

Learning Task No. 6

1. C	4. A
2. B	5. D
3. C	

Learning Task No. 5:

7. cotton buds	14. chopped woods
8. alcohol	15. rice cooker
9. toothpaste	16. television set
10. dipper	17. rice cooker
11. LPG	18. laptop
12. charcoal	19. electric fan
13. tea pot	20. radio

Weeks 3 to 5

Learning Task No. 1:

Table 1

Glass A and B-materials are white in color before exposure to oxygen

Glass A became brownish in color while Glass B became whitish

Guide Questions:

1. white in color in both Glass A and B
2. Brown in glass A while white in glass B
3. It changes its color in Glass A but not in Glass B
4. It prevents browning in color of the material
5. Glass A-brown color of apple Glass B has white color of apple or eggplant

Learning Task No. 2:

Table 2.1. shows that candle and crayons are hard but brittle, with distinct color and shape before heating; After heating the crayons and color became liquid, and solidified with new shape but still with the same color

Answers to Guide Questions:

1. hard but brittle, with definite shape, color and texture
2. brown in glass A and brownish color in glass B
3. It changed its color in glass A but not in glass B
4. It prevents browning of color in the material
5. Glass A brownish color and Glass B white color (prevents oxidation)

Learning Task No. 3:

Table 3

Ice cubes are solid in shape before exposure to heat and became liquid after exposure to heat

Answers to Guide Questions:

1. solid, colorless
2. Ice cubes melted
3. Physical change
4. It changed in phase from solid to liquid
5. Melting
6. No
7. Draw the observation where ice cubes became liquid water

Learning Task No. 4:

Answers may vary but must include:

Picture A-heat, or, liquid to gas, physical change, for cooking

Picture B-melting, heat, solid to liquid, physical change, foods

Picture C-heat, hot, foods, melting, light

Learning Task No. 5:

Drawing or illustration of iron nails in dry cloth showed no rusting; while iron nails in wet cloth rusted

Iron nails before and after exposure to oxygen in dry cloth did not change in color, and has no rust; while iron nail in wet cloth rusted after 48 hours

Weeks 6 to 8

Learning Tasks 1 to 4

Refer to the rubrics on page 35 to assess the outputs.

Learning Task No. 1 Answers in the Guide Questions may vary. This may include concepts on recycling or re-designing products out of wasted local materials.

Learning Task No. 7

Picture A

1. cooking,
2. Heating, boiling water
3. Source of heat when cold

Picture B

1. Food
2. Hot soup
3. Chemical energy

Picture C

1. boiling of water
2. Heating
3. Steaming

Learning Task No. 8

1. B
2. C
3. C
4. D
5. A
6. B
7. A
8. A
9. D
10. C

Answers to Guide Questions:

1. solid, hard, with smooth edges in both dry and wet cloth.
2. solid and hard but iron nail in wet cloth showed rusting of iron
3. physical change

Learning Task No. 6:

1. Scenario A-answers may vary but must include answers that
2. I understand that LPG is a flammable gas that is poisonous and can cause fire accidentally if not safe kept properly

I realized that I need to close that LPG tank after using it to prevent accidents of fire and leaking of flammable gas

Scenario B- answers may vary but must include that I understand that the heat of the sun caused that drying of wet clothes easily and in most practical and economical way

I realized that heat caused drying of wet clothes and it is also important to help grandmother in hanging the wet clothes

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For inquiries or feedback, please write or call:

Department of Education Region 4A CALABARZON

Office Address: Gate 2 Karangalan Village, Cainta, Rizal

