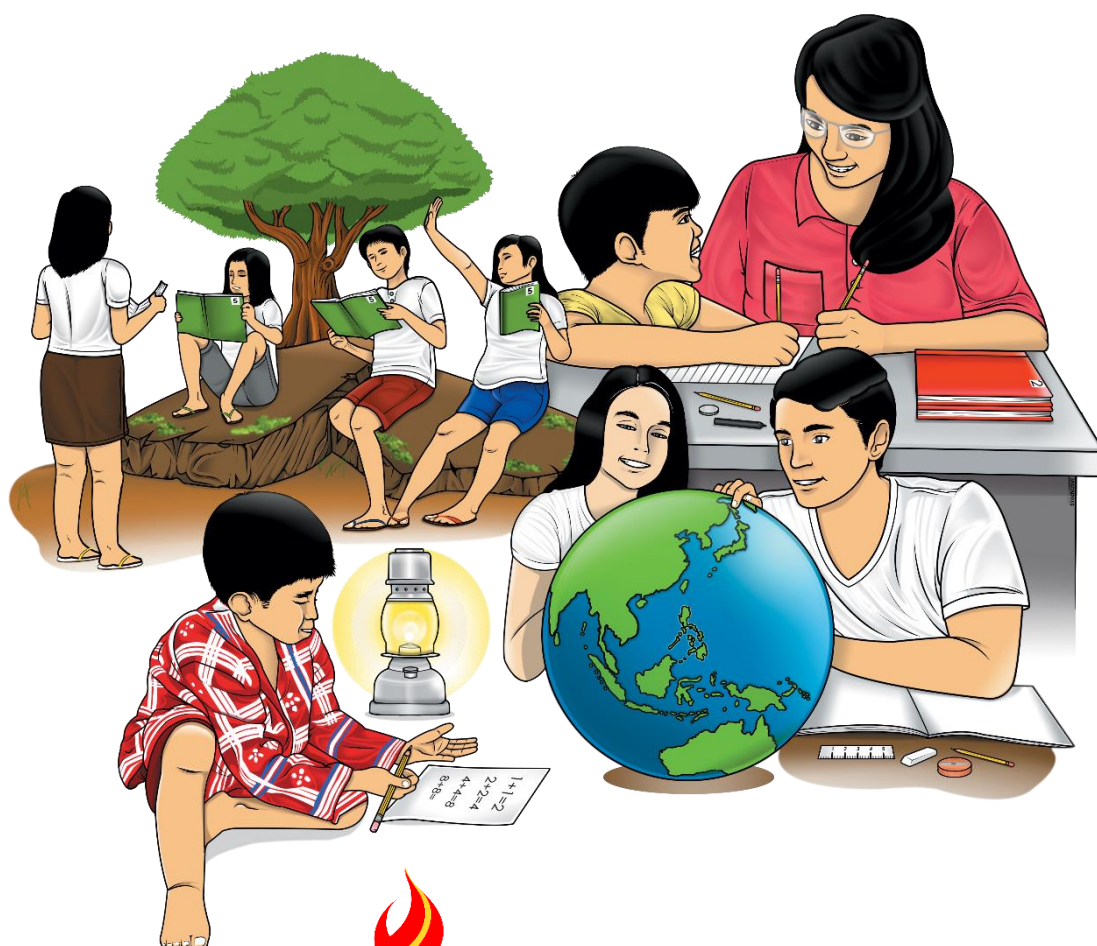


# Science

## Quarter 1 – Module 2

### Changes in Materials



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**Science – Grade 3**  
**Alternative Delivery Mode**  
**Quarter 1 – Module 2: Changes in Materials**  
**First Edition, 2020**

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# Science

## Quarter 1 – Module 2: Changes in Materials

## 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.

Thank you.



## *What I Need to Know*

This module was designed and written with you in mind. It is here to help you master the skill in describing the changes in materials based on the effects of temperature, **(S3MT-Ih-j-4)**. The scope of this module allows it to be used in many different learning situations. The language used recognizes the different vocabulary level of students. The lessons are arranged to follow the standard sequence of the course but the order in which you read them can be changed to be similar with the textbook you are now using.

The module is divided into four lessons, namely:

- Lesson 1 – Changes from Solid to Liquid
- Lesson 2 – Changes from Liquid to Solid
- Lesson 3 – Changes from Liquid to Gas
- Lesson 4 – Changes from Solid to Gas





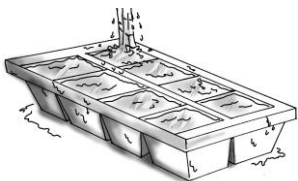
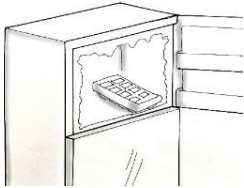

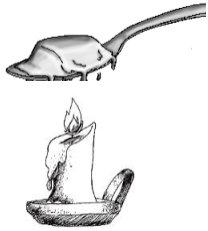

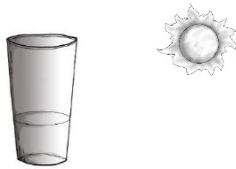
After going through this module, you are expected to be able to:

1. explain what happens to some solid materials like butter when heated;
2. discover what happens to liquid materials like water when frozen;
3. discover what happens to water when heated or when the temperature is increased; and
4. find out what happens to a naphthalene ball when placed under the heat of the sun.



## What I Know

Directions: Tell whether there is a change in the material before and after exposure to high or low temperature. Put (x) if there is none. Put (✓) if there is. Then, write **solid**, **liquid**, or **gas** for the changed material. The first one is done for you. Do this in your notebook.

Before	After	Was there a change in material?	How did it change?
1 		✓	solid to liquid
2 			
3 			
4 			
5 			

6



## Lesson

# 1

## Changes in Materials from Solid to Liquid

### IMPORTANT QUESTION

How does matter change from one state to another?

There are changes that take place in materials. Some solids can change into liquids. Liquids can change into solids. Solids and liquids can change into gases.

How do these changes occur in

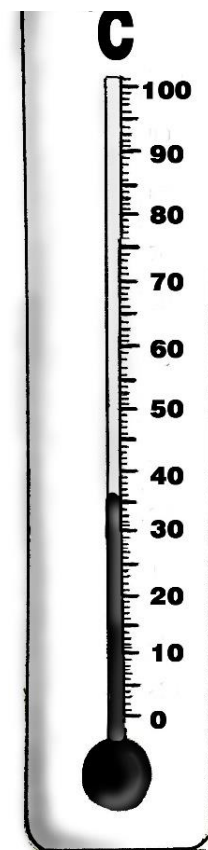
Temperature is the  $\Delta$  materials?  
material measured in a definite scale.

This is a thermometer. It measures the temperature of an object. Remember how the doctor used this to get your temperature when you have fever?

Low temperature indicates coldness, while high temperature indicates hotness.

The temperature can increase or decrease. When it is increasing, this process is called heating. When it is decreasing, this process is called cooling.

Temperature of a material can be described through the unit degree Celsius ( $^{\circ}\text{C}$ ).





## *What's In*

In the Lesson 1 of this module, you learned that there are some solids that can become liquids when exposed to heat.



### *Notes to the Teacher*

A substance can change from a solid into a liquid. This is due to an increase of temperature. When this happens, a material changes its form, shape and texture.

Try doing experiments using crayons, chocolate, or cheese. Always observe safety measures.

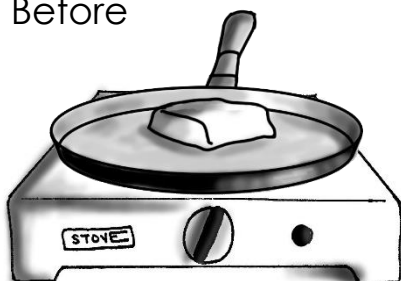


## *What's New*

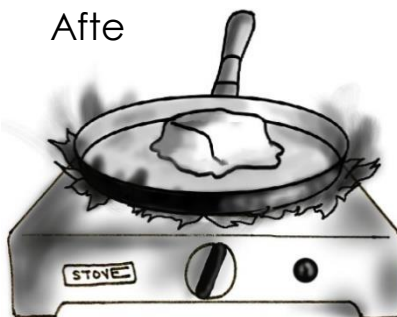
Question:

How does solid change into liquid? Study the butter being heated below.

Before



After



Look at the butter on the frying pan before it is heated. Is it solid? What happens to it after it is heated?

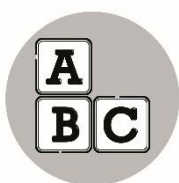




## *What is It*

When butter is heated on the frying pan, it melts because it is exposed to heat, thus its temperature increases. Butter is an example of a solid. When heated, it becomes liquid.

There are some solid materials that can be changed into liquids by heating or exposing them to sunlight or warm air. Ice cream, ice cubes and butter melt and change into liquids when left in an open place where there is sunlight and warm air. This process is called **melting**.



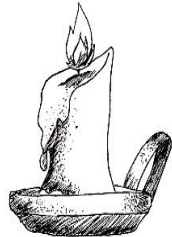




## *What's More*

Activity 1: Read each item carefully. Write **True** or **False** on the space provided. Do this in your notebook.

- \_\_\_\_\_ 1. When ice is cooled, it melts.
- \_\_\_\_\_ 2. Flour becomes liquid when heated.
- \_\_\_\_\_ 3. Crayon will become liquid when heated.
- \_\_\_\_\_ 4. Candles will melt when lighted.
- \_\_\_\_\_ 5. When you hold an ice cube, it will melt  
in your hands.

Activity 2: Observe the materials below. What could possibly happen to each material? Write melts or not in the second column. Do this in your notebook.

Materials	Result (melts or not)
1 	
2 	
3 	
4 	
5 	



## *What I Have Learned*

- ✓ Phase change can happen when the temperature of the material is increased.
- ✓ Melting happens by increasing the temperature of the materials.
- ✓ Solids can be changed into liquids by **melting**.



## *What I Can Do*

Directions: Read the dialog below. Answer the following questions.

Write your answer in your notebook.



One fine morning, two kids bought an ice cream.

Joel: Mmmmm, the ice cream is so sweet!

Emma: Yes, I know but my teeth hurt.

Joe: So what will you do?

Emma: Hmm, I will eat this after an hour.

Vendor: Oh dear, you should eat your ice cream right away, because if you don't, your ice cream will melt.

Emma: Right! I think I have to eat it when my toothache goes away.

Questions:

1. What will happen to Emma's ice cream when not eaten right away?
  - a. The ice cream will melt.
  - b. The vendor will walk away.
  - c. Joel will get angry.
  - d. The ice cream will dry.
2. What change in material will take place if the ice cream is not eaten right away?
  - a. liquid to solid
  - b. solid to liquid
  - c. liquid to gas
  - d. no change at all
3. Complete the statement.  
Solid materials like ice cream can be changed into \_\_\_\_\_ by melting.



## *Assessment*

Directions: Analyze each item carefully. Choose the letter of the best answer. Write your answer in your notebook.

1. What process refers to the changing of solid into liquid?
  - a. decreasing
  - b. heating
  - c. increasing
  - d. melting
2. Which of the given factors can turn solid to liquid?
  - a. Cold air
  - b. Moonlight
  - c. sunlight
  - d. moisture
3. Which of the following materials CANNOT be changed into liquid?
  - a. ice cream
  - b. margarine
  - c. ice cubes
  - d. marble

4. Which of the following materials melts when heated?

- |                |                |
|----------------|----------------|
| a. milk powder | c. coffee bean |
| b. wax         | d. salt        |

5. Which factor causes melting?

- |          |             |
|----------|-------------|
| a. water | c. heat     |
| b. light | d. moisture |



### *Additional Activities*

A. Analyze and answer each question carefully. Write your answer inside the box. Do this in your notebook.

1. What do you think will happen to a chocolate if left under the sun?

2. The oil is hardened inside the bottle. You want to use it for cooking. What will you do?

## Lesson

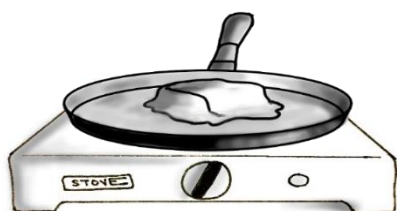
# 2

## Changes in Materials from Liquid to Solid



### *What's In*

In the previous lesson of this module, you have learned that there are some materials that can change from solid into liquid.



This is the melted butter. In Activity 1, you have learned that the butter is solid. When we heated it, it melted and became liquid.

Question:

What would happen to the melted butter if left in the pan for an hour without the application of heat especially under a cold weather?



### *Notes to the Teacher*

Changes in materials from liquid into solid are caused by lowering of temperature until reaching the freezing point of the materials.

Some liquids when cooled down readily freeze and solidify. Some need very low temperature to do so. When this happens, the liquid material changes its form, shape and texture.



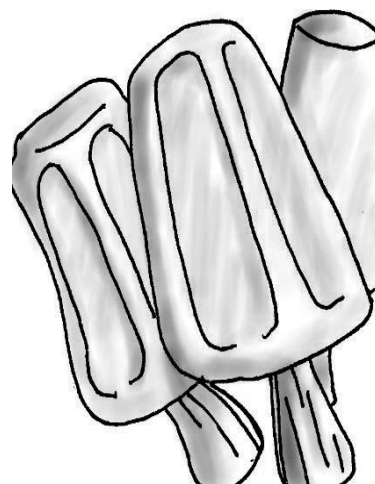
## *What's New*

### Magic Popsicle

by Arlyn B. Lim

Today, my mom shows me a magic.  
Milk and water she stirs and mixes,  
Put it in a container with a popsicle stick,  
Place inside our freezer then I wait.

Happy and excited about what it tastes  
The magic popsicle after sixty minutes,  
Wow! The liquid mix freezes.  
No, it is not a magic because liquid  
When cooled becomes solid!



Direction: In a separate sheet of paper, write your reflection by answering the following questions.

1. Why do we need to put the mixture of milk and water inside the freezer?
2. What happens to liquid when it is cooled to even lower temperatures?

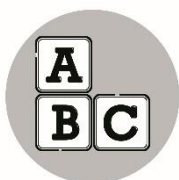


## *What is It*

You have read in the poem that the mixture of milk and water become solid after placing it in the freezer for sixty minutes. From liquid, it hardens and becomes solid. This process is called **freezing** or **solidification**.

There are liquid materials that can be changed into solids by freezing. If you will place the water, melted cheese and ice cream in the freezer, they will harden and turn into solids after a few hours. This happens because they have reached their freezing point.

Some melted materials can be hardened without the use of freezer. By simply exposing any melted materials to open spaces with cold temperature, it will solidify after a few hours, thus allowing solidification to happen.



## *What's More*

Read each item carefully. Write **True** if the statement is correct and **False** if it is not. Write your answers in your notebook.

\_\_\_\_\_ 1. Cooking oil solidifies when left in an open space with cold

temperature.

\_\_\_\_\_ 2. Melted margarine will not harden anymore even when placed

inside the refrigerator.

\_\_\_\_\_ 3. A juice drink will solidify when placed in the freezer.

\_\_\_\_\_ 4. Water will solidify when placed inside the refrigerator.

\_\_\_\_\_ 5. Soft drinks will not solidify when put in a freezer.





## *What I Have Learned*

- ✓ Phase change can happen when the temperature of the material is decreased.
- ✓ Freezing happens by decreasing the temperature of the materials.
- ✓ Liquids can be changed into solids by **freezing**.



## *What I Can Do*

Directions: Draw or paste a picture that shows a change of liquid into solid. Explain the process on how the liquid becomes solid. Write this in 2-3 sentences in your notebook.

Paste a picture here of a liquid changing into solid.



## *Assessment*

Directions: Analyze each item carefully. Choose the letter of the best answer. Do this in your notebook.

1. What is the process of changing liquid into solid?
  - a. decreasing
  - b. freezing
  - c. increasing
  - d. cooling

2. At which temperature do most liquids solidify?
  - a. low temperature
  - b. high temperature
  - c. average temperature
  - d. room temperature
3. Which of the following materials CANNOT be changed into solid?
  - a. ice cubes
  - b. oil
  - c. melted cheese
  - d. water
4. Which of the following materials will harden when placed in a freezer?
  - a. chocolate
  - b. butter
  - c. orange juice
  - d. margarine
5. What is the other word for freezing?
  - a. cooling
  - b. melting
  - c. solidification
  - d. heating



### *Additional Activities*

A. Read and answer each question carefully. Write your answers on the spaces provided. Do this in your notebook.

1. What do you think will happen if you place the cooking oil in an air-conditioned room?

---

---

2. What will you do if you see a melted ice cream on the table?

---

---

## Lesson 3

# Changes in Materials from Liquid to Gas



### *What's In*

In the previous lesson, you have learned that most liquids can change into solids. In this lesson, you will learn that there are some liquids that can change into gases.

Question:

What would happen to liquid when heated or exposed to sunlight after some time?

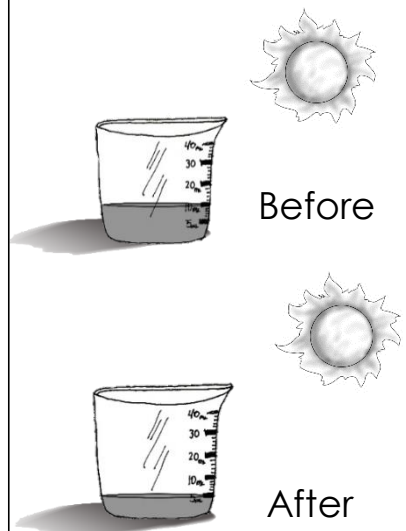


### *What's New*

Directions: Read the story below. Then answer the following questions. Do this in your notebook

John, a Grade 3 pupil from Sta. Ana Elementary School was curious on what will happen to water when placed under the sun for a certain length of time. So, he decided to do an experiment.

One day, he filled a container with 10 ml. of water. Then, he put the container under the heat of the sun within 30 minutes. After 30 minutes, he observed that the level of the water became less and dropped into 5 ml.



Questions:

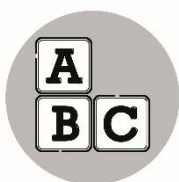
1. Was there any change in the volume of the water after 30 minutes?
2. How much volume of the water has been lost?
3. What do you think happened to the water that has been lost?
4. What is the effect of the heat of the sun to the water?



### *What is It*

The process of changing liquid into gas is called **evaporation**.

When water is boiled or heated, its volume slowly decreases since some part of it turn into gas which is called **water vapor** that rises to the air. This is why water becomes less after it boils. Same thing happens when you pour acetone in an open container. After some time, you will not see the acetone anymore. This is because it has already evaporated or turned into gas.



## What's More

Directions: Read each sentence carefully. Choose the letter of the best answer. Do this in your notebook.



1. You play with your friends and you sweat too much. What state of matter is sweat?  
a. gas                      b. liquid                      c. solid                      d. solid and gas
2. After playing, your sweat dried out eventually after a few minutes. What happened to your sweat? It became \_\_\_\_\_.  
a. Solid                      b. liquid                      c. gas                      d. liquid and gas



3. Your mother is cooking your favorite soup. What will happen to the soup if it keeps boiling for 30 minutes?  
a. It will decrease.                      c. It will increase.  
b. It will remain the same.                      d. It will cool.
4. What happens to the liquid water during evaporation?  
a. It becomes ice.                      c. It becomes water vapor.  
b. It becomes solid.                      d. It stays as liquid water.
5. What is the process of changing liquid to gas?  
a. condensation                      c. melting  
b. evaporation                      d. solidifying



## *What I Have Learned*

- ✓ Phase change can happen when the temperature of the material is increased.
- ✓ Evaporating happens by increasing the temperature of the materials.
- ✓ Liquids can be changed into gases by



## *What I Can Do*

Directions: Read the situation below. Write your reflection in 2-3 sentences using the guide questions below. Do this in your notebook.

Last Saturday, Gina washed her clothes and hanged it outside under the sun. After 8 hours, she got all the clothes, folded it and kept it in the wardrobe.



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Questions:

1. What do you think happened to the wet clothes after 8 hours?
2. What do you think happened to the water that disappeared?
3. What was the effect of the heat of the sun to the water?
4. What change in material took place?



## Assessment

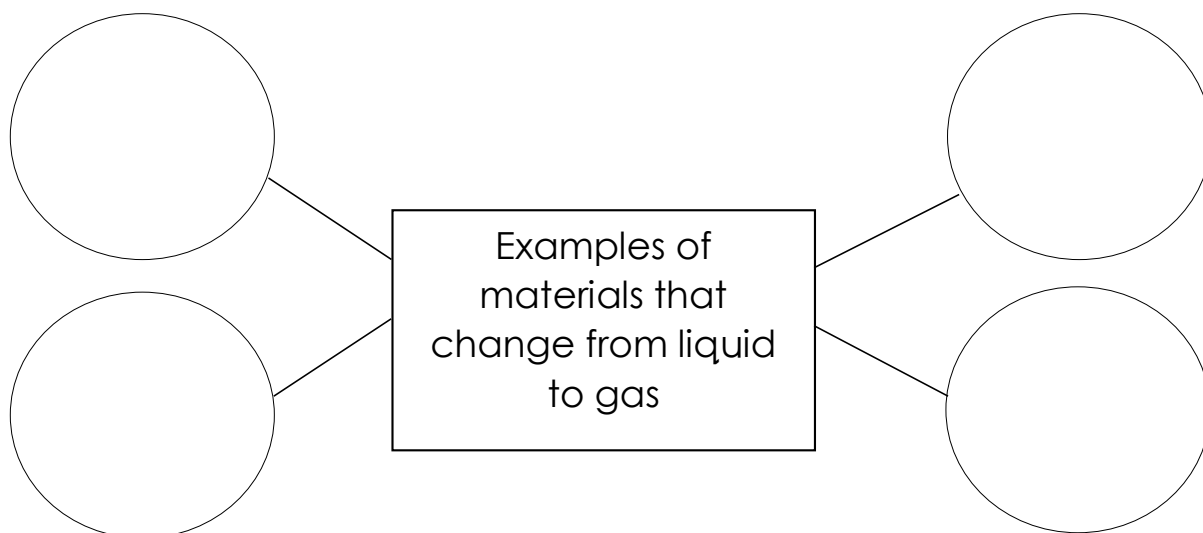
Directions: Identify the change in materials that takes place in each sentence. Put (✓) if the change is from liquid to gas. Put (x) if it is not. Write your answer on the blank. Do this in your notebook.

- \_\_\_\_\_ 1. Water changes to water vapor upon boiling.
- \_\_\_\_\_ 2. Oil hardens when placed in a refrigerator.
- \_\_\_\_\_ 3. Drops of alcohol dries on the hands after a few minutes.
- \_\_\_\_\_ 4. Bottle of acetone empties itself after some time left uncovered.
- \_\_\_\_\_ 5. Butter melts when heated in a pan.



## Additional Activities

Complete the diagram by filling out the needed information in the circles. Write your answer inside the circles. Do this in your notebook.



## Lesson

# 4

## Changes in Materials from Solid to Gas



### *What's In*

In the previous lesson, you have learned that there are liquid materials that can change into gas.

In this lesson, you will learn that there are also solid materials that can be turned into gas without passing the liquid state.

How do you think this will happen?



### *Notes to the Teacher*

Changes in materials from solid into gas happen when some solids become smaller over time. But in this phase change, no liquid is formed.



### *What's New*

Question:

What would happen to some solids when exposed to sunlight or warm air?

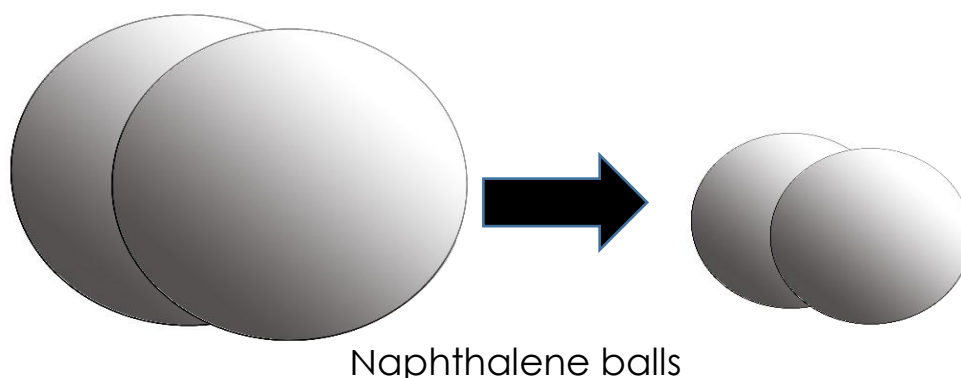
Have you seen a naphthalene ball? Naphthalene balls are



also called mothballs since they are used to ward off moths and other fabric pests living in your closet. It is white in color, looks like a marble and is solid.

Does your mother put mothballs in your closet? If yes, maybe you also have observed that after a week or two they become smaller in size.

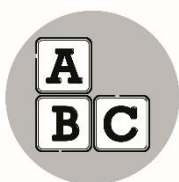
Why do you think this happened to the mothballs?



### *What is It*

With the help of air and heat of the environment, part of the moth ball has evaporated or turned into gas. The same happens to solid air fresheners. They become smaller after some time because they evaporated into the air.



The process of changing solid into gas without going through the liquid phase is called **sublimation**. Can you give other example of materials which undergo sublimation?



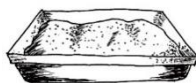
## *What's More*

Read and analyze the story. Answer the questions that follow. Write your reflections in your notebook.

Ms. Batis, a Grade 3 teacher, demonstrated an experiment about changing solid to gas for her science class.

First, she got a piece of moth ball  and wrapped it in a piece of cloth . Then, she pounded and put it in a saucer plate.

Next, she placed the pounded moth balls under the heat of the sun. Afterwards, the whole class noticed that the pounded moth balls became less.



Questions:

1. What happened to the pounded moth balls left under the sun after 30 minutes?
2. Was there any liquid form of pounded moth balls on the saucer plate?
3. What do you think happened to the pounded moth balls that disappeared?
4. What was the effect of the heat of the sun to the moth ball?



## *What I Have Learned*

- ✓ Phase change can happen when the temperature of the material is increased.
- ✓ Sublimating happen by increasing the temperature of the materials.
- ✓ Solids can be changed into gases by



## *What I Can Do*

Directions: Read and follow the instructions carefully. Do this in your notebook.

1. Interview a family member or a neighbor about bathroom air fresheners.
2. Ask them what happens to the bathroom air fresheners after being exposed for one week.
3. Draw a bathroom air freshener before and after it is exposed.
4. Fill in the chart below.

Material	Before	After
bathroom air freshener		



## Assessment

Directions: Identify the change in materials that takes place in each sentence. Put (✓) if the change is from solid to gas. Put (x) if it is not. Write your answer on the blank. Do this in your notebook.

- \_\_\_\_\_ 1. Bathroom air freshener becomes smaller after some time of exposing  
it to air.
- \_\_\_\_\_ 2. Bottle of acetone empties itself after some time left uncovered.
- \_\_\_\_\_ 3. Dry ice becomes smaller after some time of exposure.
- \_\_\_\_\_ 4. Car air freshener hanged inside cars changed directly into vapor without melting.
- \_\_\_\_\_ 5. Your wet hair dries after some time.



## Additional Activities

Directions: Familiarize the letter codes for each number. Try to interpret the hidden messages. Write your answer on the spaces provided. Do this in your notebook.

1 – A	2 – B	3 – C	4 – D	5 – E
6 – F	7 – G	8 – H	9 – I	10 – J
11 – K	12 – L	13 – M	14 – N	
15 – O	16 – P	17 – Q	18 – R	
19 – S	20 – T	21 – U	22 – V	
23 – W	24 – X	25 – Y	26 – Z	

1.      20 5 13 16 5 18 1 20 21 18 5      1 6 6 5 3 20 19      20 8 5  
          19 20 1 20 5              15 6              13 1 20 5 18 9 1 12 19

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2.      1 12 23 1 25 19              16 18 1 3 20 9 3 5              19 1 6 5  
          23 1 25 19              15 6              8 1 14 4 12 9 14 7  
          8 15 20              15 18              3 15 12 4  
          15 2 10 5 3 20 19

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## Answer Key

<p><b>Lesson 1</b></p> <p><b>What I know</b></p> <p>1. Item has been answered</p> <p>2. ✓ Liquid to gas</p> <p>3. ✓ Liquid to solid</p> <p>4. ✓ Solid to liquid</p> <p>5. ✓ Liquid to gas</p> <p>6. ✓ Solid to liquid</p> <p><b>What's More</b></p> <p>Activity 1</p> <p>1. false</p> <p>2. false</p> <p>3. true</p> <p>4. true</p> <p>5. true</p> <p>Activity 2</p> <p>1. melts</p> <p>2. melts</p> <p>3. melts</p> <p>4. melts</p> <p>5. melts</p> <p><b>What I Can Do</b></p> <p>1. A</p> <p>2. B</p> <p>3. liquid</p> <p><b>Assessment</b></p> <p>1. D</p> <p>2. C</p> <p>3. D</p> <p>4. B</p> <p>5. C</p> <p><b>Additional Activities</b></p> <p>(possible answers)</p> <p>1. The chocolate will melt.</p> <p>2. Put the bottle with oil inside in a container with hot or warm water.</p>	<p><b>Lesson 2</b></p> <p><b>What's New</b></p> <p>(possible answers)</p> <p>1. We need to put the mixture of milk and water inside the freezer to solidify the mixture.</p> <p>2. Liquid becomes solid when cooled to even lower temperatures.</p> <p><b>What's More</b></p> <p>1. true</p> <p>2. false</p> <p>3. true</p> <p>4. true</p> <p>5. false</p> <p><b>What I Can Do</b></p> <p>(possible answer)</p> <p>The liquid turns into solid when cooled in even low temperatures. This happens because it has reached its freezing point. This process is called freezing.</p> <p><b>Assessment</b></p> <p>1. B</p> <p>2. A</p> <p>3. A</p> <p>4. C</p> <p>5. C</p> <p><b>Additional Activities</b></p> <p>(possible answers)</p> <p>1. The cooking oil will solidify.</p> <p>2. I will place it in the freezer.</p>	<p><b>Lesson 3</b></p> <p><b>What's New</b></p> <p>1. yes</p> <p>2. 5 ml</p> <p>3. Liquid water changed into gas and evaporated</p> <p>4. The sun heated the water which caused it to evaporate.</p> <p><b>What's More</b></p> <p>1. B</p> <p>2. C</p> <p>3. A</p> <p>4. C</p> <p>5. B</p> <p><b>What I Can Do</b></p> <p>(possible answers)</p> <p>1. The clothes become dry.</p> <p>2. Water evaporated. The sun heated the liquid water.</p> <p>3. Liquid turned to gas. (evaporation)</p> <p><b>Assessment</b></p> <p>1. /</p> <p>2. X</p> <p>3. /</p> <p>4. /</p> <p>5. X</p> <p><b>Additional Activities</b></p> <p>(possible answers)</p> <p>1. Boiling water</p> <p>2. Alcohol exposed to air</p> <p>3. 50 ml acetone left uncovered</p> <p>4. Gasoline left in an open container</p>	<p><b>Lesson 4</b></p> <p><b>What's More</b></p> <p>1. It became less.</p> <p>2. There was none.</p> <p>3. Some pounded moth balls evaporated.</p> <p>4. The sun heated the moth ball which turned it to gas.</p> <p><b>Assessment</b></p> <p>1. /</p> <p>2. X</p> <p>3. /</p> <p>4. /</p> <p>5. X</p> <p><b>Additional Activities</b></p> <p>1. Temperature affects the states of materials.</p> <p>2. Always practice safe ways of handling hot or cold objects.</p>
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