3

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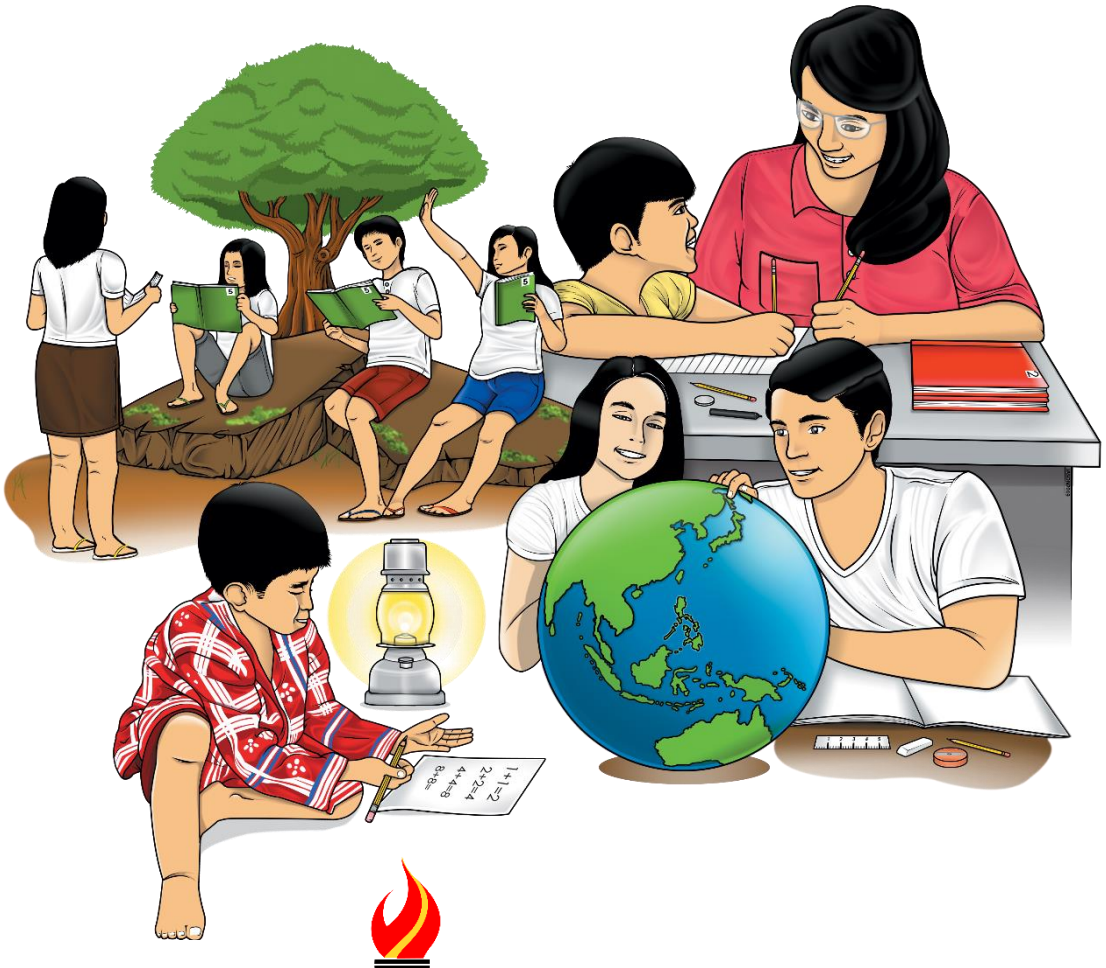
Science

Quarter 1 – Module 2
Changes in Materials



ALTERNATIVE DELIVERY MODE
ADM

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

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3

Science

Quarter 1 – Module 2:
Changes in Materials

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Introductory Message

For the facilitator:

Welcome to the Science 3 Alternative Delivery Mode (ADM) Module on **Changes in Materials!**

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you as teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into 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.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Science 3 Alternative Delivery Mode (ADM) Module on Changes in Materials!

The hand is one of the most symbolized part of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time.

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 *What I Need to Know*	This will give you an idea of the skills or competencies you are expected to learn in the module.
 *What I Know*	This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module, but if you got 50%-99% you will proceed with the module.
 *What's In*	This is a brief drill or review to help you link the current lesson with the previous one.

 *What's New*	In this portion, the new lesson will be introduced to you in various ways such as a story, a song, a poem, a problem opener, an activity or a situation.
 *What is It*	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
 *What's More*	This comprises activities for independent practice to strengthen your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 *What I Have Learned*	This includes questions or blank sentence/paragraph to be filled in to process what you have learned from the lesson.
 *What I Can Do*	This section provides an activity which will help you transfer your new knowledge or skill into real life situations.
 *Assessment*	This is a task which aims to evaluate your level of mastery in achieving the learning competency.
 *Additional Activities*	In this portion, another activity will be given to you to enrich your knowledge or skill on the lesson learned. This also tends retention of learned concepts.

Answer Key This contains answers to all activities in the module.

At the end of this module you will also find:

References This is a list of all sources used in developing this module

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

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:

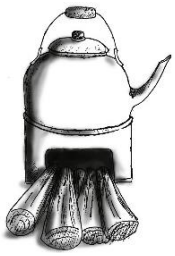
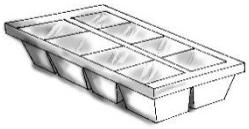
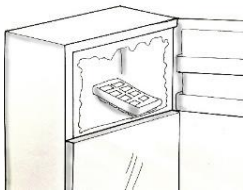
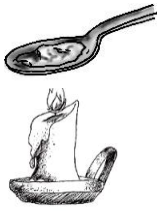
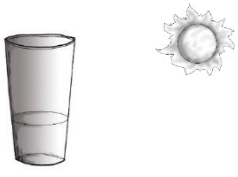
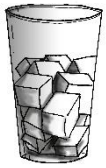
- Lesson 1 – Changes from Solid to Liquid
- Lesson 2 – Changes from Liquid to Solid
- Lesson 3 – Changes from Liquid to Gas
- Lesson 4 – Changes from Solid to Gas

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 		√	liquid
2 			
3 			
4 			
5 			
6 			

Lesson 1

Changes in Materials from Solid to Liquid

IMPORTANT QUESTION

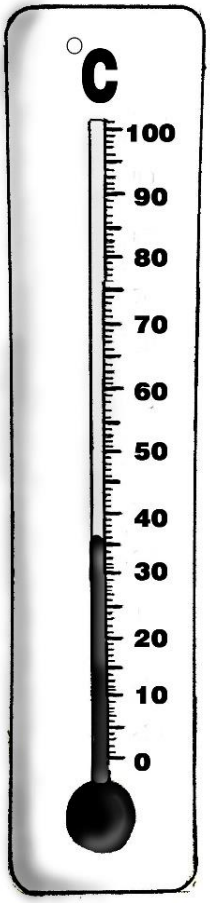
How does matter change from one state to another?

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 materials?

Temperature is the degree of hotness or coldness of a 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

What's In

In Lesson 1 of this module, you will learn 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.

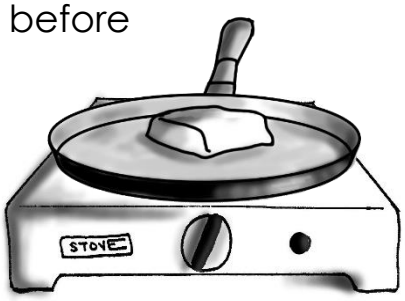
Try doing experiments using crayons, chocolate, or cheese. And always use safety measures.

What's New

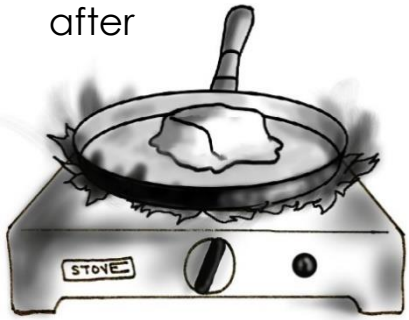
Question:

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

before



after

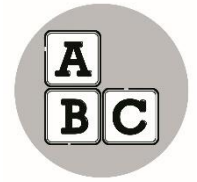


Look at the butter on the frying pan before it is heated. Is it a solid? What happens to it after it is heated?

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** or **liquefaction**.

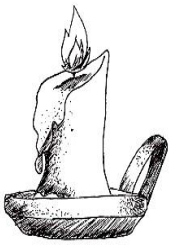


What's More

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. Sugar becomes liquid when heated.
_____3. Crayon will still be solid 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 a separate sheet of paper.

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 if Emma will not eat her ice cream 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 this statement. Solid materials like _____ can be changed into _____ by _____.

Assessment

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

1. The process of changing solid into liquid is called _____.
   a. decreasing
   b. heating
   c. increasing
   d. melting

2. There are some solids that can be changed into liquids by simply exposing them to _____.
   a. Cold air
   b. Moonlight
   c. sunlight
   d. moisture

3. The following materials can be changed into liquid except _____.
   a. Ice cream
   b. Margarine
   c. ice cubes
   d. sugar

4. Which of the following materials melts when heated?
   a. Milk powder
   b. Salt
   c. white sugar
   d. wax

5. What is the other word for melting?
   a. Cooling
   b. changing
   c. Heating
   d. liquefaction

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?

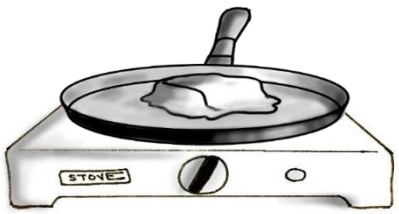
2. The oil is hardened inside the bottle. You want to use it for cooking. What will you do?

Lesson 2

Changes in Materials from Liquid to Solid

What's In

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



This is the melted butter. In Activity1, 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.

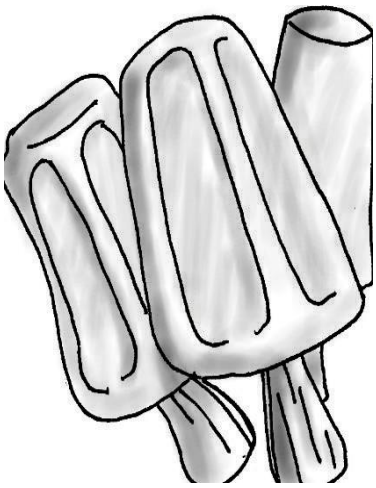
What's New

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?

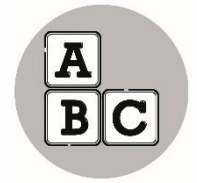
2. What happens to liquid when its temperature is decreased very low?

What is It

You have read in the poem that the popsicles 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. Oil solidifies when left in an open space with cold temperature.
_____2. Melted margarine will not harden anymore even when put inside the refrigerator.
_____3. Your juice 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: Paste a picture that shows a change of liquid into solid. Tell 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 correct answer. Do this in your notebook.

1. The process of changing liquid into solid is called _____.
   a. decreasing
   b. freezing
   c. increasing
   d. cooling

2. There are some liquids that can be changed into solids by simply exposing them to _____ temperature.
   a. cold c. warm
   b. medium d. average

3. The following materials can be changed into solid except _____.
   a. ice cubes c. melted cheese
   b. oil d. water

4. Which of the following materials hardened when placed in a freezer?
   a. chocolate c. orange juice
   b. butter d. water

5. What is the other word for freezing?
   a. cooling c. solidification
   b. melting 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 there were some liquids that can change into solids. In this lesson, you will learn that there are some liquids that can change into gases.

Question:

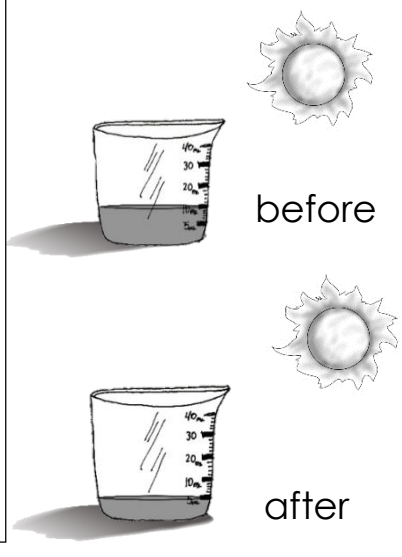
What would happen to liquid when heated or exposed to sunlight after some time?

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 liquids 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 correct answer. Do this in your notebook.

1. You play with your friends and you sweat too much. What form 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. It became_____.
   a. Solid b. liquid c. gas d. liquid and gas

3. Your mother is cooking your favorite soup. What happens to the soup if it keeps boiling after 30 minutes?
   a. decrease b. increase c. remains the same d. cooled

4. What do you call to the water that has turned into gas during evaporation?
   a. air b. ice c. water vapor

5. What do you call to the process of changing liquid to gas?
   a. evaporation b. melting c. 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 **evaporating**.

What I Can Do

Directions: Read the situation below. Write your reflection in a 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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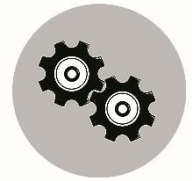
Questions:

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

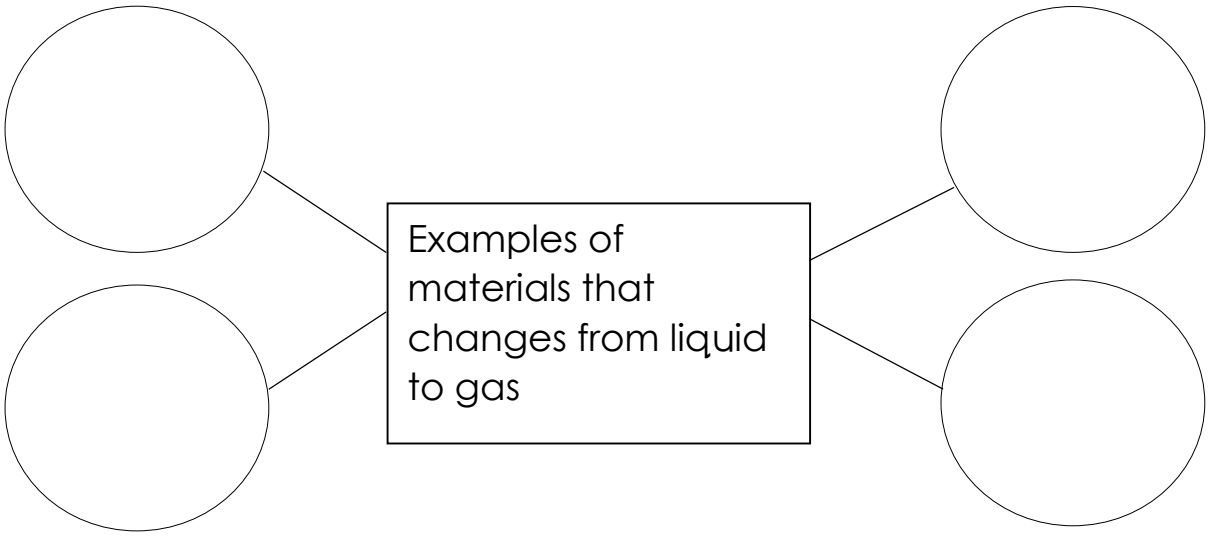
Directions: Identify the change in materials that takes place in each sentence. Put (√) if the change is from liquid to gas. Put (x) if it is not. Write your answer on the blank. Do this in your notebook.

_____ 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 missing information in the circles. Write your answer inside the circles. Do this in your notebook.



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.

Lesson 4	Changes in Materials from Solid to Gas

What's New

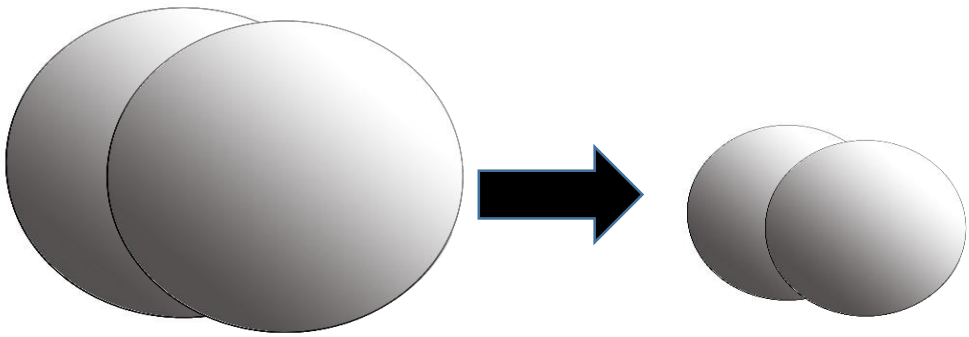
Question:

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 too that after a week or two they become smaller in size.

Why do you think this happened to the mothballs?



Naphthalene balls

What is It

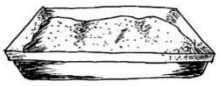
With the help of air and heat of the environment, part of the moth ball has evaporated or turned into ga*s*. The same happens to solid air fresheners. They become smaller after some time because they evaporated into the air.

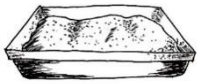
The process of changing solid into gas without going through the liquid phase is called **sublimation**. Can you give other example of materials which undergo sublimation?

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 **sublimating.**

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.

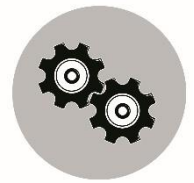
4. Fill in the chart below.

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 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

_____

_____

_____

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

_____

_____

_____

Answer Key

What I know

1. √ Gas
2. √ Gas
3. √ Liquid
4. √ Solid
5. √ solid

What's More

Lesson 1: Activity 1

1. false
2. false
3. false
4. true
5. true

Lesson 1: Activity 2

1. melts
2. melts
3. melts
4. melts
5. melts

What I Can Do

Lesson 1

1. A
2. B
3. Ice cream, liquid melting

Lesson 2

- Answers may vary depending on observation

Lesson 3

- Answers may vary depending on observation

Lesson 4

- Answers may vary

What's More

Lesson 2

1. True
2. False
3. True
4. True
5. False

Lesson 3

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

Lesson 4

- answers may vary

Assessment

Lesson 1:

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

Lesson 3:

1. √
2. X
3. √
4. √
5. X

Lesson 2:

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

Lesson 4:

1. √
2. X
3. √
4. √
5. x

Additional Activities

Lesson 1:

- Answers may vary

Lesson 2:

- Answers may vary

Lesson 3:

- Answers may vary

Lesson 4:

1. Temperature affects the states of materials.

2. Always practice safe ways of handling hot or cold objects.

References

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