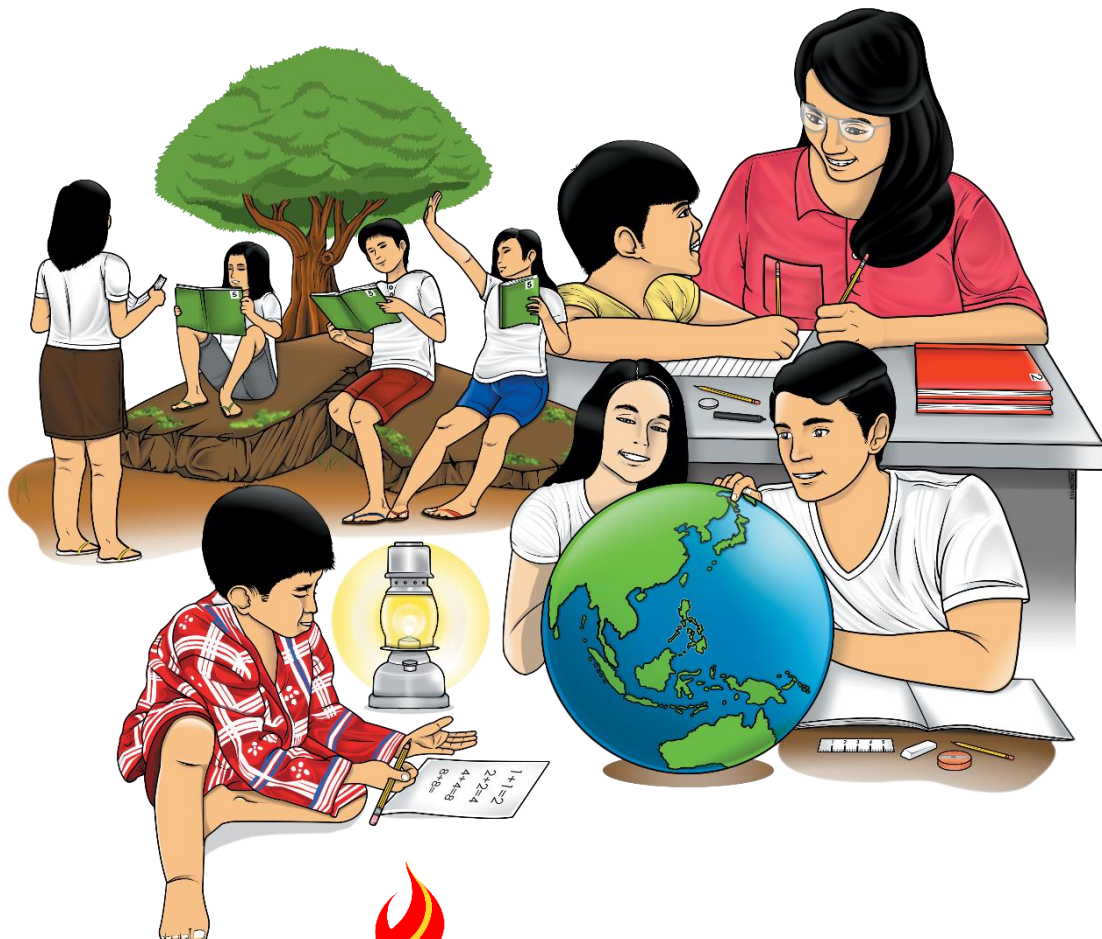


# Science

## Quarter 1 – Module 2

### Lesson 1: How Matter Changes When Applied with Heat



**Science – Grade 5**

**Alternative Delivery Mode**

**Quarter 1 – Module 2 Lesson 1: How matter changes when applied with heat.**

**First Edition, 2020**

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**5**

# **Science**

**Quarter 1 – Module 2**

**Lesson 1: How Matter Changes  
When Applied with Heat**

# Introductory Message

For the facilitator:

Welcome to **the Grade 5 Science** Alternative Delivery Mode (ADM) **Module on How Matter Changes When Applied with Heat!**

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

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 5** Alternative Delivery Mode (ADM) **Module on How Matter Changes When Applied with Heat!**

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 is composed of a 10-item activity in order to check what you already know about the lesson you are going to take. If you get all the answers correctly (100%) you may decide to skip this 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; 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 solidify 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 fill in the blanks sentences/paragraphs to process what you 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 or concerns.



### ***Assessment***

This is another 10-item 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 of the lesson learned.



### ***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***

Have you ever asked yourself how materials change? How does matter change when applied with heat? When matter is heated enough, its molecules move faster with great energy. It is like watching an ice cube in your palm that becomes smaller until it melts or a boiling water that turns into a steam. If enough heat is added, solid can become liquid and liquid change to gas.

In this lesson, you will be able to explain how matter changes when applied with heat.

*Note: Write your answers on a separate sheet.*



## ***What I Know***

A. Directions: Identify the kind of change the following activities undergo when there is an application of heat. Write whether it is ***Physical Change*** or ***Chemical Change***.

1. Burning of wood
2. Melting of candle
3. Boiling of water
4. Cooking rice
5. Frying egg

## B. Matching Type

Directions: The following pictures are activities that show application of heat. Match the pictures in Column A with their corresponding results in Column B. Choose the letter of the correct answer.

### A Pictures

1.



<https://commons.wikimedia.org/wiki/File:Charcoal-barbecue-lighters.jpg>

2.



<https://www.pexels.com/photo/barbecue-blur-charcoal-cooking-604660/>

3.



[https://en.wikipedia.org/wiki/Butter#/media/File:%C5%A0V%C3%A9dsk%C3%BD\\_kol%C3%A1%C4%8D\\_naruby\\_904\\_\(cropped\).JPG](https://en.wikipedia.org/wiki/Butter#/media/File:%C5%A0V%C3%A9dsk%C3%BD_kol%C3%A1%C4%8D_naruby_904_(cropped).JPG)

4.



[https://commons.wikimedia.org/wiki/File:Drying\\_fish\\_in\\_Oqaatsut,Gronland.jpg](https://commons.wikimedia.org/wiki/File:Drying_fish_in_Oqaatsut,Gronland.jpg)

5.



<https://www.pxfuel.com/en/free-photo-imjff>

### B Results

A. Melted butter

B. Baked rice cake

C. Barbecue

D. Charcoal

E. Dried fish



## Lesson

# 1

# How Matter Changes When Applied with Heat



## *What's In*

Directions: Based on the given physical and chemical properties of matter, identify which property is being described. Choose your answer from the words in the box.

Hardness	Elasticity	Conductivity	Biodegradability	Brittleness
----------	------------	--------------	------------------	-------------

1. Ability to break easily.
2. Ability to decomposed by microorganism.
3. Ability to let the heat and electricity to pass through.
4. Ability to be stretched and return to its original shape.
5. Ability to resist pressure that may cause deformation.



## *What's New*

Directions: The following are activities or objects where heat is applied. Draw a star ★ if it shows physical change or a half moon 🌙 if it shows chemical change.

1. Heating a handful of sugar
2. Boiling of water
3. Burning of paper
4. Drying of clothes
5. Grilling pork

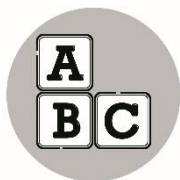


## ***What is It***

Heat, as discussed in your previous grade, is a form of energy. It is described as how high the temperature is. We use a thermometer to measure the heat. Our largest source of heat is the Sun. Heat can bring about a physical change in matter. Some solid materials melt when the heat is applied to them. A common example is a piece of melting ice taken out of the refrigerator. The ice absorbs heat from the surroundings, which will then melt after a few minutes. On the other hand, if water evaporates when it is subjected to heat. Just like when your mother hangs your wet laundry under the sun. After several minutes or hours, the clothes become dry, which means that the water in your clothes evaporated.

Heat does not only produce a physical change in materials, sometimes heating a material causes it to undergo chemical changes. The chemical changes caused by heat are irreversible. One common example of this is cooked food. The egg your mother cooked for your breakfast has undergone a chemical change.

Now, can you bring the egg back into its liquid form before it was cooked? Applying heat to the matter results in processes of physical and chemical changes. **Physical change** only happens when the appearance of the matter changes and no new material is formed. Meanwhile, **chemical change** happens when the heat is applied and the matter changes its size, shape, color, and smell, and new material is formed.



## ***What's More***

### **Activity 1**

Directions: Read the following sentences carefully. Write **True** if the situation shows how matter changes when applied with heat. Write **False** if not.

1. Melting ice cube, boiling water, and drying clothes are examples of physical changes.
2. Physical and chemical changes are results when heat is applied to matter.
3. A vanilla ice cream melts when taken out from a refrigerator for a long time.
4. Charcoal burning on the grill is an example of chemical change.
5. When heat is applied to matter or material nothing happens.

## Activity 2

Directions: Read the following questions carefully then write the letter of the correct answer.

- Which of the following is an example of chemical change when heat is applied?
  - Burning of wood
  - Cutting clothes
  - Freezing of water
  - Sharpening a pencil
- Which is TRUE about chemical change?
  - A new product is formed.
  - Chemicals change as a result of physical change.
  - The product can be changed to its original form.
  - A chemical change is more important than any other process.
- What happens when a piece of paper is burned inside a tin can?
  - A new material is formed.
  - There are no changes.
  - Both physical changes and chemical changes happen.
  - It became ashes and after a few minutes, it turns to its original form.
- What happens to the ice cube, and butter after heat is applied?
  - They melt, physical change happens.
  - They melt, chemical change happens.
  - Nothing happens to the materials.
  - All the materials dissolve in the removed air.
- What process is applied in the melting of ice cream, drying of wet clothes, and cooking of vegetables that result in physical and chemical change?
  - Boiling
  - Drying
  - Freezing
  - Heating

## Activity 3

Directions: From the given activities below, identify which shows physical change or chemical change by writing your answers using the table below as a guide.

Frying egg	Drying of wet clothes
Boiling water	Heating of white sugar
Burning paper	Melting of cone ice cream
Grilling chicken	Drying fishes under the sun
Melting chocolate	Drying wet <i>palay</i> under the sun

Physical change through the application of heat	Chemical change through the application of heat



## ***What I Have Learned***

Directions: Express your understanding of the lesson in this module by supplying the blanks in the following sentence with a word or a phrase.

I learned that \_\_\_\_\_ (1) \_\_\_\_\_ application in matter results to either \_\_\_\_\_ (2) \_\_\_\_\_ and \_\_\_\_\_ (3) \_\_\_\_\_ .



## ***What I Can Do***

Directions: Study the following objects. Determine the by-product or result when the material is applied with heat. Remember, some examples of heat sources are the Sun, burning fuel, electric heater, and human body. Caution: DO NOT place the actual materials below in direct heat like fire.



1.

rubbing alcohol

<https://www.flickr.com/photos/rutlo/3198806471>



2.

ice cubes

<https://www.flickr.com/photos/30478819@N08/46033845245>

3.



<https://www.wallpaperflare.com/assorted-color-paints-multi-colored-high-angle-view-art-and-craft-wallpaper-aofwf>

paint

4.



<https://pixabay.com/photos/kettle-bubble-glass-device-blow-2016616/>

water in the kettle

5.



<https://pngimg.com/download/4257>

chocolate bars



## Assessment

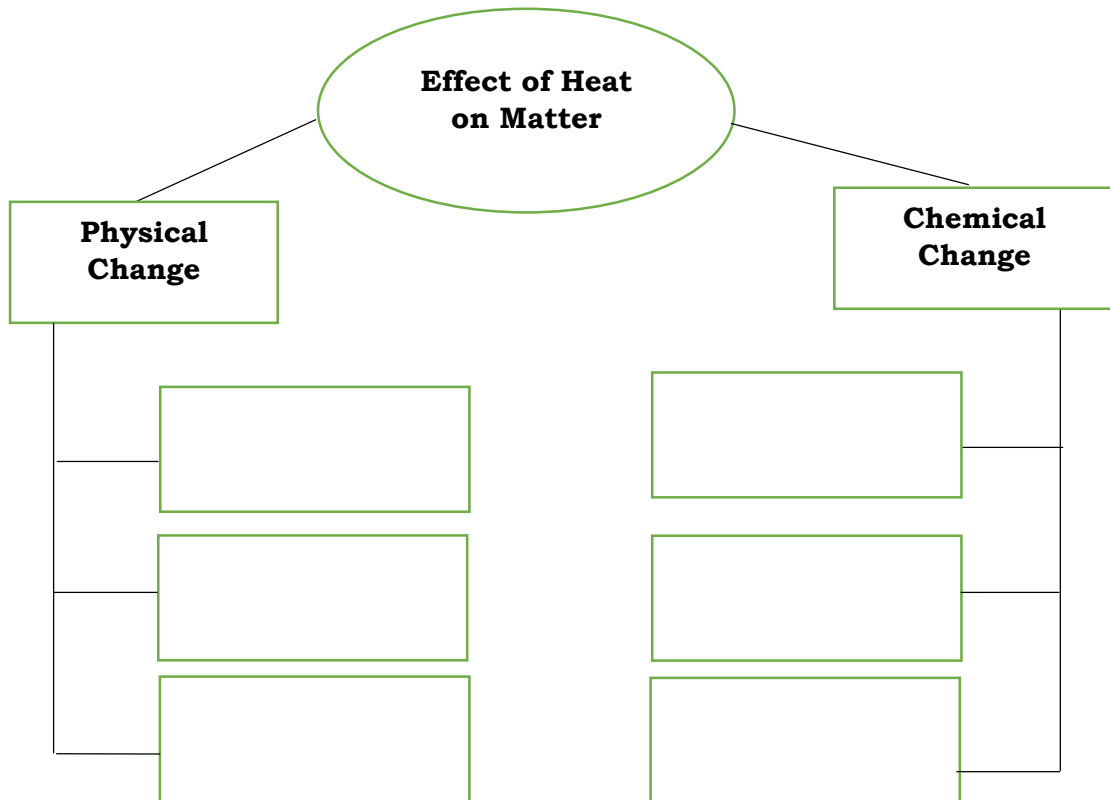
Directions: Study the following situations and identify what is likely to happen when the heat is applied to the object. Choose the answer inside the parenthesis.

1. The \_\_\_\_\_ (melting, melts) of butter when left out in a warm room is an example of \_\_\_\_\_ (chemical change, physical change)
2. An ice cream cone \_\_\_\_\_ (melting, melts) on a hot day is an example of \_\_\_\_\_. (chemical change, physical change)
3. Charcoal \_\_\_\_\_ (burns, burning) on the grill is an example of \_\_\_\_\_ (chemical change, physical change).
4. Frying an egg on a \_\_\_\_\_ (heated, heating) pan is an example of \_\_\_\_\_. (chemical change, physical change)
5. An ice \_\_\_\_\_ (melting, melts) when taken out from a refrigerator is an example of \_\_\_\_\_. (chemical change, physical change)
6. Ben likes to eat toasted marshmallow. So, his mother cooked some. \_\_\_\_\_ (Toasting, Toasted) marshmallow is an example of \_\_\_\_\_. (chemical change, physical change)
7. Burning woods change to ashes. Turning into \_\_\_\_\_ (ashes, ash) is an example \_\_\_\_\_. (chemical change, physical change)
8. A lighted candle \_\_\_\_\_ (melting, melts) on a dark night. This is an effect of applying heat to a material. It results to \_\_\_\_\_. (chemical change, physical change)
9. A spoon of white sugar was heated over a stove for 3- 5 minutes. The result was the white sugar turned into \_\_\_\_\_ (brown and black, white and black). Burnt sugar is an example of \_\_\_\_\_. (chemical change, physical change)
10. A chocolate bar was left on a \_\_\_\_\_ (cool, warm) room for a day and melted. It is an example of \_\_\_\_\_. (chemical change, physical change)



## ***Additional Activities***

Directions: Copy the following diagram and supply it with 3 examples of physical change and chemical change when the heat is applied.





# Answer Key

<p><b>What I Know</b></p> <p>A.</p> <ol style="list-style-type: none"> <li>1. Chemical change</li> <li>2. Physical change</li> <li>3. Physical change</li> <li>4. Chemical change</li> <li>5. Chemical change</li> </ol> <p>B.</p> <ol style="list-style-type: none"> <li>1. D</li> <li>2. C</li> <li>3. A</li> <li>4. E</li> <li>5. B</li> </ol>	<p><b>What's In</b></p> <ol style="list-style-type: none"> <li>1. Brittleness</li> <li>2. Biodegradable</li> <li>3. Conductivity</li> <li>4. Elasticity</li> <li>5. Hardness</li> </ol>	<p><b>What's New</b></p> <ol style="list-style-type: none"> <li>1. </li> <li>2. </li> <li>3. </li> <li>4. </li> <li>5. </li> </ol>
<p><b>What's More</b></p> <p><b>Activity 1</b></p> <ol style="list-style-type: none"> <li>1. True</li> <li>2. True</li> <li>3. True</li> <li>4. True</li> <li>5. False</li> </ol> <p><b>Activity 2</b></p> <ol style="list-style-type: none"> <li>1. A</li> <li>2. A</li> <li>3. A</li> <li>4. A</li> <li>5. D</li> </ol>	<p><b>What's More</b></p> <p><b>Activity 3</b></p> <p><b>Physical Change through application of heat</b></p> <ul style="list-style-type: none"> <li>• Drying of wet clothes</li> <li>• Drying fish under the heat of the sun.</li> <li>• Boiling water</li> <li>• Melting chocolate</li> <li>• Drying of wet palay under the sun</li> <li>• Melting of cone ice cream.</li> </ul>	<p><b>What's More</b></p> <p><b>Activity 3</b></p> <p><b>Chemical Change through application of heat:</b></p> <ul style="list-style-type: none"> <li>• Heating of white sugar</li> <li>• Burning paper</li> <li>• Frying fish</li> <li>• Grilling chicken</li> </ul> <p><b>What I have Learned</b></p> <ol style="list-style-type: none"> <li>1. heat</li> <li>2. chemical change</li> <li>3. physical change</li> </ol>



<b>What I Can Do</b>	<b>Note to the teacher:</b> <i>Answers may vary</i>
<ol style="list-style-type: none"> <li>1. The alcohol inside the bottle evaporates.</li> <li>2. The ice cube melts after.</li> <li>3. Paint warm part may dry, the paint droplets as they strike the surface and prevent good leveling. Heat part may reduce the paint viscosity and lead to sags.</li> <li>4. Boiling water</li> <li>5. Melting of chocolates</li> </ol>	

<b>Assessment</b>	<ol style="list-style-type: none"> <li>1. melting-Physical change</li> <li>2. melting-Physical change</li> <li>3. burning-Chemical change</li> <li>4. heated-Chemical change</li> <li>5. melting-Physical change</li> <li>6. toasted-Chemical change</li> <li>7. ashes-Chemical change</li> <li>8. melts-Physical change</li> <li>9. brown and black -Chemical change</li> <li>10. warm-Physical change</li> </ol>
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<b>Additional Activities</b>	<p style="text-align: center;"><b>Chemical change</b></p> <ol style="list-style-type: none"> <li>1. Toasted marshmallow</li> <li>2. Toasted bread</li> <li>3. Burning paper</li> </ol> <p style="text-align: center;"><b>Physical change</b></p> <ol style="list-style-type: none"> <li>1. Boiling water</li> <li>2. Drying clothes</li> <li>3. Cutting paper into pieces</li> </ol> <p style="text-align: center;"><i>(Answers may vary)</i></p>
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