



Republic of the Philippines  
**Department of Education**  
Regional Office IX, Zamboanga Peninsula



6



# SCIENCE

## Quarter 3 - Module 4 Heat and Energy Transformations



Name of Learner: \_\_\_\_\_

Grade & Section: \_\_\_\_\_

Name of School: \_\_\_\_\_

JANUARY

*Makugihon*

FEBRUARY

*Mohigugmaon*

MARCH

*Matinabangon*

APRIL

*Matinahuron*

MAY

*Mahapsay og Matimpyo*

JUNE

*Maabtik og Masunod sa  
Ohsaktong Oras*

JULY

*Maantigo og Maabilidad*

AUGUST

*Maginhuhunahunon  
Para sa Uban*

SEPTEMBER

*Madaginoton*

OCTOBER

*Matinud-anon*

NOVEMBER

*Masaligan*

DECEMBER

*Maalampon*

**Science – Grade 6**  
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# Lesson 4

## Heat and Energy Transformations



### *What I Need to Know*

This module was designed and written in a way that suits your understanding and needs. It is here to help you master the MELC: ***Demonstrate how sound, heat, light and electricity can be transformed (S6FEIIIId-f-2)***. The scope of this module permits it to be used in many different learning situations. This module is about;

Lesson 2: Heat and Energy Transformations

Objective: Demonstrate how heat energy can be transformed

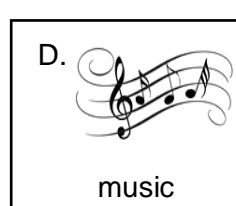
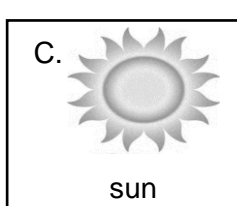
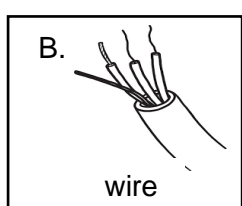
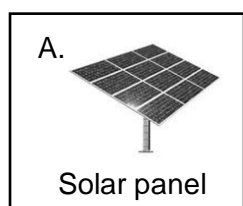
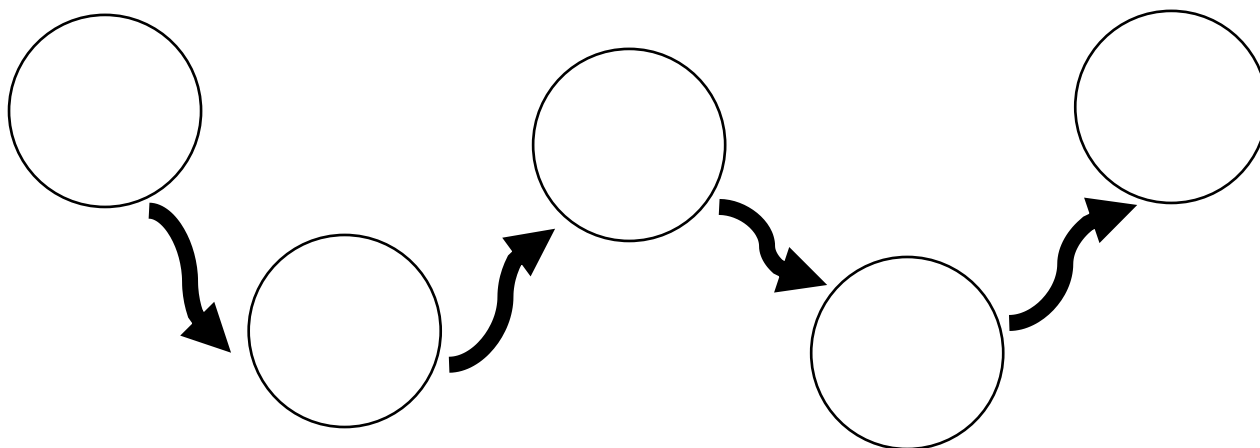


### *What's In*

Before you proceed to study this module find out first how much you already knew about the topic. Answer the activity below.

#### Activity 1: The Flows

**Directions:** Put the correct objects in sequence on how to use the energy in sunshine to make music.  
Write the letter on each circle.



All matter is made up of tiny particles which are in constant motion. Their constant movement produces energy. The sum of the energies from the moving molecules in an object is its thermal energy. This thermal energy can be transferred to another object. The energy in transit is called **heat**. When heat is absorbed, it turns into thermal energy.



## What's New

### Activity 2: Do and Tell

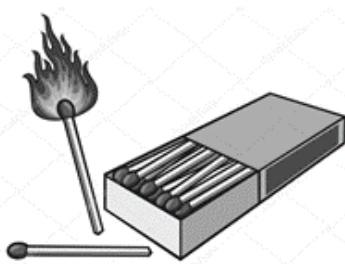
**Directions:** Do the activity and answer the questions.  
(Do it with adult/parent supervision)

You will need:

Match box  
Matchstick

Do the following:

Strike the matchstick to the rough portion of the box. Let it burn for a while, then observe what happen. Be careful.



1. What kind of energy is stored in the matchstick?

---

2. What happen to the matchstick when you strike it to the rough surface of the box?

---

3. When the matchstick burn what is produce?

---

4. Was there energy transformation?

---

5. Why do you say so?

---



## What is it

**Heat or Thermal energy** is the result from the rapid movement of molecules in matter (solid, liquid and gas). Heat energy can be transferred from one object to another. The transfer or flow due to the difference in temperature between the two objects is called heat. Note that the heat flow is determined by temperature. Heat always moves from an object of high temperature to an object of lower temperature. Heat flow will stop once the two objects are of the same temperature.

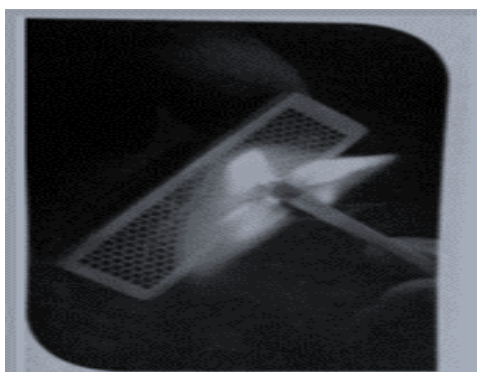
Your body temperature is higher than that of your surroundings because of the continuous oxidation or burning of the food that you eat that provides your body with energy. This heat keeps you alive and moving. The heat energy that comes from the plants or food that you eat is released in the form of mechanical energy and then as heat again.

At home, heat energy is used in cooking. What happens when you boil water in a whistling kettle? What sound do you hear when the water boils? The kettle whistles when the water boils. The heat causes the molecules in the steam to move rapidly and push the steam out through the small opening in the kettle, thus creating a whistling sound. Sound is also produced when you boil water in a casserole. The cover moves up and down because of the rapid movement of the molecules caused by the heat, thus producing rhythmic sound. These processes demonstrate the change from heat energy to sound energy.



The steam from boiling water pushes the air out through the whistle.

In Activity 2, the fuel from the matchsticks also produces heat. Striking a stick on the rough side of a matchbox cause friction, which produces heat. This heat burns the stick and it transformed into light that can brighten the surroundings. Heat energy is very useful for burning, which is later changed into other forms of energy for various applications.



Igniting a matchstick shows the transformation of fuel to heat energy and then to light energy.



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

Now that you have learned the concepts of the lesson, it is time for you to try another series of activities!

### **Activity 3: Check me!**

**Directions:** Put a check (/) on the blank before the number if the following situation demonstrate heat energy transformation and cross (X) if not.

- \_\_\_\_\_ 1. Drying hair using hair dryer.
- \_\_\_\_\_ 2. A piece of scissor is inside the box.
- \_\_\_\_\_ 3. Mother use to iron clothes.
- \_\_\_\_\_ 4. A wet rug on the table.
- \_\_\_\_\_ 5. Letting the water flow from the faucet.
- \_\_\_\_\_ 6. Drying clothes under the sun.
- \_\_\_\_\_ 7. A microwave oven cooks food in a short time.
- \_\_\_\_\_ 8. Crushing the ice.
- \_\_\_\_\_ 9. A boy throws a ball against a fence.
- \_\_\_\_\_ 10. Boiling water in a casserole.



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

### **Activity 4: Fill me!**

**Directions:** Choose how heat energy transformed in the following materials. Write the letter of your answer on the blank before the number.

- \_\_\_\_\_ 1. solar panel and lamp
- \_\_\_\_\_ 2. Electricity and piano
- \_\_\_\_\_ 3. Lighted charcoal and kettle with water
- \_\_\_\_\_ 4. oven toaster and bread
- \_\_\_\_\_ 5. solar panel and calculator




- \_\_\_\_\_ 6. Food and human body
- \_\_\_\_\_ 7. Electricity and iron
- \_\_\_\_\_ 8. Matchstick and wood
- \_\_\_\_\_ 9. Dry cell and flashlight
- \_\_\_\_\_ 10. Gasoline and car engine

- A. light energy - electrical energy - heat energy
- B. heat energy - electrical energy – mechanical energy
- C. electrical energy - heat energy
- D. electrical energy - light energy - heat energy - chemical energy
- E. chemical energy - electrical energy - heat energy - mechanical energy
- F. electrical energy – heat energy – sound energy
- G. chemical energy – light energy – heat energy
- H. chemical energy – light energy – heat energy – chemical energy
- I. heat energy – sound energy
- J. chemical energy – heat energy – mechanical energy



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

### **Activity 5: Think before you heat**

**Directions:** Draw a sun  if the situation shows heat energy transformation and **X** if not.

- \_\_\_\_\_ 1. John is in the camping site. He feels so cold. He gathers woods and build the fire.
- \_\_\_\_\_ 2. Anna wants to eat hot bread. She puts the bread on the refrigerator.
- \_\_\_\_\_ 3. Liza's favorite dress is very crumpled. She gets an electric iron to remove the crumpled.
- \_\_\_\_\_ 4. Lance wants to drink hot milk. He went to the refrigerator to get water.
- \_\_\_\_\_ 5. A group of boy scouts use battery operated flashlight for their lamp during nighttime.



# Assessment

**Directions:** Read the following questions carefully. Encircle the letter of the best answer.

1. What form of energy do plants give you when you eat them?
  - A. heat
  - B. light
  - C. sound
  - D. electrical
2. Which of the following activities shows a change from heat to sound energy?
  - A. ironing clothes
  - B. boiling of water
  - C. roasting a chicken
  - D. lighting ordinary candle
3. What sequence of energy transformation takes place when you switch on a lamp?
  - A. electrical - heat energy - light energy
  - B. heat energy - electrical energy - light energy
  - C. electrical energy - light energy - heat energy
  - D. light energy - heat energy - electrical energy
4. What form of energy can cause the soup in a pot to boil?
  - A. heat
  - B. light
  - C. sound
  - D. electrical
5. What happens when heat is absorbed by an object? It turns into \_\_\_\_\_ energy.
  - A. sound
  - B. kinetic
  - C. thermal
  - D. mechanical
6. What happens when a spoon absorbs heat? Its molecules \_\_\_\_\_.
  - A. vibrate faster
  - B. vibrate gently
  - C. stop vibrating
  - D. vibrate slower
7. If an object is getting colder, what happens to its thermal energy?
  - A. decreases
  - B. increases
  - C. rapidly increasing
  - D. remains the same
8. What energy transformation is shown in a burning matchstick?
  - A. mechanical energy – light energy
  - B. electrical energy – mechanical energy
  - C. heat energy – light energy – sound energy
  - D. chemical energy – heat energy – light energy
9. Which sequence of energy transformation takes place when you switch on an electric fan?
  - A. electrical energy – light energy – sound energy
  - B. heat energy – mechanical energy – sound energy
  - C. mechanical energy – electrical energy – heat energy
  - D. electrical energy – mechanical energy – heat energy
10. Which of the following electrical appliances changes electrical energy to kinetics, sound, and heat energy?
  - A. iron
  - B. calculator
  - C. hair dryer
  - D. rice cooker





## ***Additional Activities***

**Directions:** Write on the line the correct sequence on how heat energy transformation happens in each of the following:

1. firecrackers

---

2. flashlight

---

3. flat Iron

---

4. electric bulb

---

5. oven toaster

---

## ***Answer Key-Gr6Q3W4 Science***

### *What's In*

Activity 1: The Flows

- 1.C**
- 2.A**
- 3.B**
- 4.E**
- 5.D**

### *What's New*

Activity 2: Do and Tell

Answers may vary

### *What's More*

Activity 3: Check Me

- 1. /**
- 2. X**
- 3. /**
- 4. X**
- 5. X**
- 6. /**
- 7. /**
- 8. X**
- 9. X**
- 10. /**

### *What I Can Do*

Activity 5: Think Before You Heat

- 1.** 
- 2. X**
- 3.** 
- 4. X**
- 5.** 

### *What I have Learned*

Activity 4: Fill me

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

### *Assessment*

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

# References

## **Web Sources**

Solar Panel Isolated stock illustration. Illustration of ecology  
<https://images.app.goo.gl/31GTjwLBZGt1KJbf7>

An explanation about using classical music in the classroom. It doesn't make you smarter but the health benefits ar... | Music notes art, Music clipart, Music symbols  
<https://images.app.goo.gl/ajY8E1unQ2D3de4m9>

Sun Illustration Clip Art - Royalty Free – Go Graph  
<https://images.app.goo.gl/jTn1KRtNthR8N51D9>

JENSEN Portable Stereo CD Cassette Recorder with AM/F  
<https://images.app.goo.gl/hMFfm2exnmwRMHVw6>

wire clipart black and white - Clip Art Library  
<https://images.app.goo.gl/D6L4Tf6JP42NtQNs8>

Match box template stock cliparts, Royalty Free matchbox  
<https://images.app.goo.gl/1ZX2AqMgV8d7tBNq7>

Boiling Kettle HD Stock Images | Shutterstock  
<https://images.app.goo.gl/FdNEK4Ck7w1jKv3s6>

## **Printed References**

San Pablo, Jovita H.,Cupcupin, Rosalinda M., Real-Life Science K to 12 Curriculum Compliant, Published and Distributed by Abiva Publishing House, Inc since 1936

Coronel, Carmelita C., Abracia, Norma M. Ed. D., Science and Health Teachers Manual For Grade Six, Published and Printed by SD Publication, Inc.

Jacinto, Lerma P., Science and Life New Edition Grade Six Published by Salesiana Publisher, Inc.

Sarte, Evelyn T.,Garcia, Ednaliza R., Lopez, Eliza A., Dela Cruz, Mar Jean G., Arradaza, Harold A., Science Beyond Borders Textbook 6, Published by Vibal Group, Inc.

Sarte, Evelyn T.,Garcia, Ednaliza R., Lopez, Eliza A., Dela Cruz, Mar Jean G., Arradaza, Harold A., Science Beyond Borders Teacher's Manual 6, Published by Vibal Group, Inc.

## Region IX: Zamboanga Peninsula Hymn – Our Eden Land

Here the trees and flowers bloom  
Here the breezes gently Blow,  
Here the birds sing Merrily,  
The liberty forever Stays,

Gallant men And Ladies fair  
Linger with love and care  
Golden beams of sunrise and sunset  
Are visions you'll never forget  
Oh! That's Region IX

Cebuanos, Ilocanos, Subanons, Boholanos, Ilongos,  
All of them are proud and true  
Region IX our Eden Land

Here the Badjaos roam the seas  
Here the Samals live in peace  
Here the Tausogs thrive so free  
With the Yakans in unity

Hardworking people Abound,  
Every valleys and Dale  
Zamboangueños, Tagalogs, Bicolanos,

Region IX  
Our..  
Eden...  
Land...

### My Final Farewell

Farewell, dear Fatherland, clime of the sun caress'd  
Pearl of the Orient seas, our Eden lost!,  
Gladly now I go to give thee this faded life's best,  
And were it brighter, fresher, or more blest  
Still would I give it thee, nor count the cost.

On the field of battle, 'mid the frenzy of fight,  
Others have given their lives, without doubt or heed;  
The place matters not-cypress or laurel or lily white,  
Scaffold or open plain, combat or martyrdom's plight,  
T is ever the same, to serve our home and country's need.

I die just when I see the dawn break,  
Through the gloom of night, to herald the day;  
And if color is lacking my blood thou shalt take,  
Pour'd out at need for thy dear sake  
To dye with its crimson the waking ray.

My dreams, when life first opened to me,  
My dreams, when the hopes of youth beat high,  
Were to see thy lov'd face, O gem of the Orient sea  
From gloom and grief, from care and sorrow free;  
No blush on thy brow, no tear in thine eye.

Dream of my life, my living and burning desire,  
All hail ! cries the soul that is now to take flight;  
All hail ! And sweet it is for thee to expire ;  
To die for thy sake, that thou mayst aspire;  
And sleep in thy bosom eternity's long night.

If over my grave some day thou seest grow,  
In the grassy sod, a humble flower,  
Draw it to thy lips and kiss my soul so,  
While I may feel on my brow in the cold tomb below  
The touch of thy tenderness, thy breath's warm power.

Let the moon beam over me soft and serene,  
Let the dawn shed over me its radiant flashes,  
Let the wind with sad lament over me keen ;  
And if on my cross a bird should be seen,  
Let it trill there its hymn of peace to my ashes.

Let the sun draw the vapors up to the sky,  
And heavenward in purity bear my tardy protest  
Let some kind soul o 'er my untimely fate sigh,  
And in the still evening a prayer be lifted on high  
From thee, O my country, that in God I may rest.

Pray for all those that hapless have died,  
For all who have suffered the unmeasur'd pain;  
For our mothers that bitterly their woes have cried,  
For widows and orphans, for captives by torture tried  
And then for thyself that redemption thou mayst gain

And when the dark night wraps the graveyard around  
With only the dead in their vigil to see  
Break not my repose or the mystery profound  
And perchance thou mayst hear a sad hymn resound  
'T is I, O my country, raising a song unto thee.

And even my grave is remembered no more  
Unmark'd by never a cross nor a stone  
Let the plow sweep through it, the spade turn it o'er  
That my ashes may carpet earthly floor,  
Before into nothingness at last they are blown.

Then will oblivion bring to me no care  
As over thy vales and plains I sweep;  
Throbbing and cleansed in thy space and air  
With color and light, with song and lament I fare,  
Ever repeating the faith that I keep.

My Fatherland ador'd, that sadness to my sorrow lends  
Beloved Filipinas, hear now my last good-by!  
I give thee all: parents and kindred and friends  
For I go where no slave before the oppressor bends,  
Where faith can never kill, and God reigns e'er on high!

Farewell to you all, from my soul torn away,  
Friends of my childhood in the home dispossessed!  
Give thanks that I rest from the wearisome day!  
Farewell to thee, too, sweet friend that lightened my way;  
Beloved creatures all, farewell! In death there is rest!

### I Am a Filipino, by Carlos P. Romulo

I am a Filipino—inheritor of a glorious past, hostage to the uncertain future. As such I must prove equal to a two-fold task—the task of meeting my responsibility to the past, and the task of performing my obligation to the future.

I sprung from a hardy race, child many generations removed of ancient Malayan pioneers. Across the centuries the memory comes rushing back to me: of brown-skinned men putting out to sea in ships that were as frail as their hearts were stout. Over the sea I see them come, borne upon the billowing wave and the whistling wind, carried upon the mighty swell of hope—hope in the free abundance of new land that was to be their home and their children's forever.

I am a Filipino. In my blood runs the immortal seed of heroes—seed that flowered down the centuries in deeds of courage and defiance. In my veins yet pulses the same hot blood that sent Lapulapu to battle against the first invader of this land, that nerved Lakandula in the combat against the alien foe, that drove Diego Silang and Dagohoy into rebellion against the foreign oppressor.

The seed I bear within me is an immortal seed. It is the mark of my manhood, the symbol of dignity as a human being. Like the seeds that were once buried in the tomb of Tutankhamen many thousand years ago, it shall grow and flower and bear fruit again. It is the insignia of my race, and my generation is but a stage in the unending search of my people for freedom and happiness.

I am a Filipino, child of the marriage of the East and the West. The East, with its languor and mysticism, its passivity and endurance, was my mother, and my sire was the West that came thundering across the seas with the Cross and Sword and the Machine. I am of the East, an eager participant in its spirit, and in its struggles for liberation from the imperialist yoke. But I also know that the East must awake from its centuried sleep, shake off the lethargy that has bound his limbs, and start moving where destiny awaits.

I am a Filipino, and this is my inheritance. What pledge shall I give that I may prove worthy of my inheritance? I shall give the pledge that has come ringing down the corridors of the centuries, and it shall be compounded of the joyous cries of my Malayan forebears when first they saw the contours of this land loom before their eyes, of the battle cries that have resounded in every field of combat from Mactan to Tirad Pass, of the voices of my people when they sing:

"I am a Filipino born to freedom, and I shall not rest until freedom shall have been added unto my inheritance—for myself and my children and my children's children—forever."