



- JANUARY**
Makugiton
- FEBRUARY**
Mahiguimaon
- MARCH**
Matinabunon
- APRIL**
Matinahuron
- MAY**
Mahapday og Malimpyo
- JUNE**
*Maabik og Masunod sa
Oshatlong Oras*
- JULY**
Maantigo og Maabilidad
- AUGUST**
*Maginhuhunon
para sa Urban*
- SEPTEMBER**
Madagiroton
- OCTOBER**
Matinud-anon
- NOVEMBER**
Masaligan
- DECEMBER**
Maalampon

4



SCIENCE

Quarter 3 - Module 6 Describing How Heat Travels



Name of Learner: _____

Grade & Section: _____

Name of School: _____

Science – Grade -4
Support Material for Independent Learning Engagement (SMILE)
Quarter 3 – Module 6: Describing How Heat Travels
First Edition, 2021

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Lesson 6

Describing How Heat Travels through Different Phases of Materials



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 understand and **describe how heat travels (S4FE-III-f-g-4)**, and part of the activities shows the three ways of heat transfer through different phases of materials. The scope of this module permits it to be used in many different learning situations. This module is about;

Lesson: Describing How Heat Travels through Different Phases of Materials

Objective: Describe how heat travels in solid, liquid and gas materials.



What's In

In the previous grade, you have learned about the different sources and uses of heat and the proper ways of handling hot objects. Can you still recall them? Answer the activity below.

Activity 1: Think About It

Directions: Write **FACT** if the statement is true and **BLUFF** if not. Write your answer on the space provided before each number.

- _____ 1. The Sun is the main source of light and heat of Earth.
- _____ 2. Burning wood, burning gas, and electrical equipment or appliances such as ovens and flatirons are some other examples of sources of heat.
- _____ 3. Gas stove is use for pressing clothes.
- _____ 4. We can get burned by objects that produce heat and objects that are hot.
- _____ 5. It is not important to use heatproof gloves or cloths when holding hot pots and pans



What's New

Activity 2: Find Me Game

Directions: Look for as many words as you can that are related to our lesson in the crossword puzzle. The words are looped vertically, horizontally and diagonally. Some words are formed backward. Encircle the words you find.

M	Q	R	A	D	I	A	T	I	O	N	Y	G	J	I
T	R	A	V	E	L	S	G	U	O	P	K	R	S	N
S	C	O	N	V	E	C	T	I	O	N	O	E	W	S
C	I	W	Z	H	F	V	T	K	T	R	S	P	X	U
I	E	X	N	C	T	C	I	P	F	A	X	H	A	L
T	D	L	I	L	U	Y	B	S	H	G	J	I	T	A
S	L	P	S	D	J	P	H	P	T	C	Z	D	U	T
A	R	Z	N	Y	Q	M	E	T	A	L	S	W	R	O
L	J	O	S	V	G	X	A	Z	O	P	A	N	O	R
P	C	O	N	D	U	C	T	O	R	S	T	M	P	S



What is it

The sun emits heat that has lessened in intensity when it reaches Earth after traveling through a great distance. **Heat** is a form of energy and it is very important in our life. It keeps us warm; it cooks our food and does a lot of other things.

Heat travels through different phases of materials. It travels through **solid**, **liquid** and **gas**. It transfers from a hot to a cold object. This transfer may occur in three ways.

Heat Travels By Conduction

Heat can travel through solids by conduction. **Conduction** is the transfer of heat through direct contact.



<https://images.app.goo.gl/74p6p68a54FTZm1S7>

The illustration above shows conduction. The heat from hot water travels to the ladle by direct contact. The water and the ladle are composed of small particles called **molecules**. Heat makes the molecules in the object to move faster. The fast movements of the water molecules make the cooler ladle move

fast, too. As the fastmoving particle collide with the slow-moving particles, energy is transferred. As a result, more molecules move fast. This movement of water molecules continue until heat is spread uniformly throughout the materials.

Materials that transfer heat easily are called **conductors**. Metals like aluminum, iron, steel and copper are examples of conductors of heat. Plastic is an **insulator**, or a material that does not transmit, conduct, or allow heat to pass through. Some insulators are wood, plastic and ceramic.

Heat Travels By Convection

The illustration below shows convection.



<https://images.app.goo.gl/fStpKYyHN5unRAJ19>

When you boil water in a pan, the heated water molecules near the bottom of the pan expand and become less dense. The colder and more dense molecules at the top start to sink, forcing the hotter and less dense ones to rise. When air is heated, it expands and become lighter. The colder and heavier air goes down and pushes the hotter and lighter air upward. This happens continuously while the water boils, resulting in a form of heat transfer called **convection**.

Convection is the transfer of heat by the movement of the heated parts of a liquid or gas.

Heat Travels By Radiation



<https://troopresources.scouting.org/campfires/>

When you stand before a bonfire or a stove you feel warm. The heat from the bonfire traveled in waves through space to your body. Your body absorbs the heat so it will become warm. This method of heat transfer is called **radiation**.

Radiation is the transfer of heat through space.



What's More

Activity 3: Choose Me Not

Directions: Identify which type of heat transfer is taking place.

Write **Conduction**, **Convection** or **Radiation** in the blank spaces to show the type of heat transfer.

1. _____



boiling of mungo beans in a pan

2. _____



drying of clothes under the heat of the sun

3. _____



heating the iron

4. _____



swimming at the beach

5. _____



warming of nail over the lighted candle



What I Have Learned

Activity 4: Replace Me

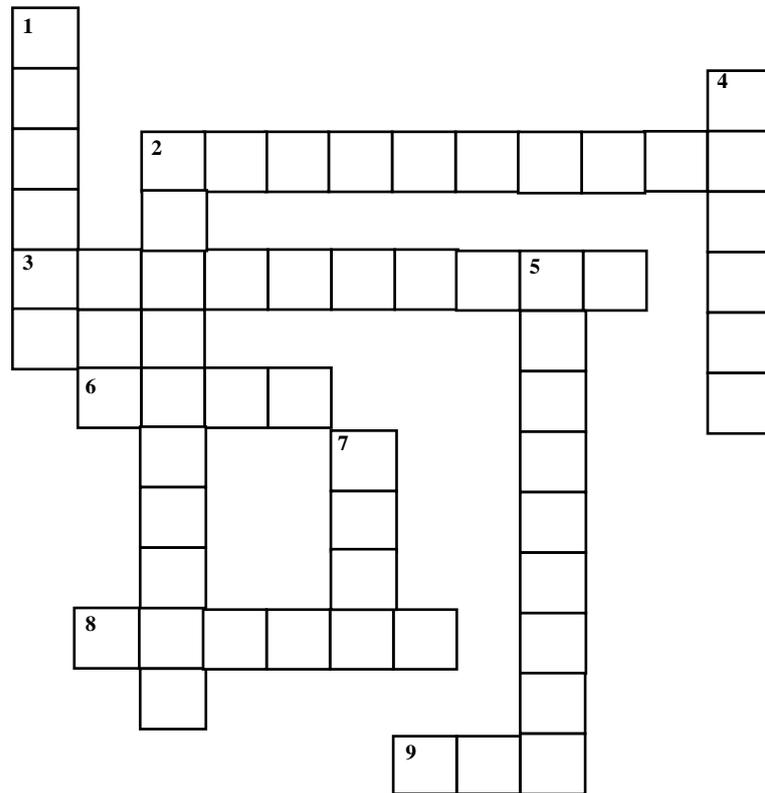
Directions: Write the word that is equivalent to the symbol to complete the meaning of the sentence/concept. Write the equivalent word on top of each symbol.

- ,  and  are all forms of energy.
- Heat travels through different  of materials.
- Heat can move from one object to another in three different ways:
,  and .
- Metals are good .
- Many cooking utensils have parts that are made with 
 such as rubber,  and plastic for safety purposes.

Symbol	Word	Symbol	Word
	phases		insulators
	conduction		wood
	convection		heat
	radiation		light
	conductors		sound

Activity 5: Guessing Time

Directions: Solve the puzzle. Use the clues below.



Down

1 Heat can be transferred through _____ contact by the heat source and the body receiving the heat.

2 Heat transfer by the movement of heated parts of liquid or gas.

4 Heat is a form of _____

5 Heat transfer through space is called _____.

7 Heat transfer from a hot to a _____ object.

Across

2 Heat transfer through direct contact is called _____.

3 Materials that transfer heat easily are _____.

6 A form of energy that keeps us warm

8 Heat can travel through _____ in conduction

9 The greatest source of heat



Assessment

Direction: Encircle the letter of the best answer.

1. How does heat travels?
 - A. from bottom to top
 - B. from cold to hot
 - C. from hot to cold
 - D. from side to side
2. What energy transfer is shown through direct contact of the heat source and the body receiving the heat?
 - A. conduction
 - B. convection
 - C. heat
 - D. radiation
3. Which of the following materials are good conductors?
 - A. ceramics
 - B. metals
 - C. plastics
 - D. wood
4. What do you call a material through which heat passes slowly or not at all?
 - A. conductor
 - B. conduction
 - C. insulator
 - D. molecule
5. What happens to the temperature when the particles move faster?
 - A. The temperature can't be taken.
 - B. The temperature goes higher.
 - C. The temperature goes lower.
 - D. The temperature stays the same.
6. What may happen to a solid material when it continuously exposed to heat?
 - A. It may become heavier.
 - B. It may decrease in volume.
 - C. It may expand.
 - D. It may melt.
7. Which of these activities show heat transfer by radiation?
 - A. boiling egg
 - B. heating the wire
 - C. lighting the room with a bulb
 - D. refrigeration
8. Which of the following does **NOT** show transfer of heat energy?
 - A. boiling water in a kettle
 - B. cutting paper in small pieces
 - C. lighting a room with a fluorescent lamp
 - D. placing a spoon in a cup of hot coffee

9. When one uses an exhaust fan, what kind of heat transfer is demonstrated?
- A. conduction
 - B. convection
 - C. conductor
 - D. radiation
10. Which type of heat transfer is happening when the Sun warms your face?
- A. conduction
 - B. convection
 - C. energy
 - D. radiation



Additional Activities

Activity 6: Observe Me

General Directions: Read and follow the specific instructions below. Do this activity with the supervision of your parents or guardians.

Specific Instructions:

1. Choose one of the following activities that you observe in your home.
 - A. Making coffee or milk
 - B. Cooking rice or viand
 - C. Watching TV or shows in cellular phones
2. After choosing one activity, observe how heat is being transferred.
3. Write your observation in three sentences only.

Criteria	Excellent (5)	Good (4)	Satisfactory (3)
Accuracy of Observation	All three observations are very accurate	Only 2 out of 3 observations are correct	Only 1 out of 3 observations are correct
Appropriateness of Words Used	The terms used to describe the activity chosen pertaining to heat transfer are very appropriately used	The terms used to describe the activity chosen pertaining to heat transfer are appropriately used	The terms used to describe the activity chosen pertaining to heat transfer are somewhat appropriately used

Answer Key-Gr4Q2W6 Science

Activity 1: Think About It

1. FACT
2. FACT
3. BLUFF
4. FACT
5. BLUFF

Activity 2: Find Me Game

1. Radiation
2. Travels
3. Plastics
4. Conduction
5. Conductors
6. Heat
7. Metals
8. Phases
9. Insulators
10. Convection

Activity 3. Choose Me Not

1. Convection
2. Radiation
3. Conduction
4. Radiation
5. Conduction

Activity 4: Replace Me

- Heat, light and sound
- phases
- conduction, convection and radiation
- conductors
- insulators, wood

Activity 5: Guessing Time

Down

- 1 Direct
- 2 Convection
- 4 Energy
- 5 Radiation
- 7 Cold

Across

- 2 Conduction
- 3 Conductors
- 6 Heat
- 8 Solids
- 9 Sun

Assessment

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

Additional Activities

Activity 6: Observe Me

Answers may vary

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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, Subanonos, 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
Zamboanguenos, 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 centuries 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."