



- JANUARY**
Makugihon
- FEBRUARY**
Makigugmaon
- MARCH**
Matinabungan
- APRIL**
Matinahuron
- MAY**
Mahapsay og Malimpyo
- JUNE**
*Maabtik og Masunod sa
Makulitong Oras*
- JULY**
Maantigo og Maabilidad
- AUGUST**
*Maginhahanunon
para sa Urban*
- SEPTEMBER**
Madaginton
- OCTOBER**
Matinud-anon
- NOVEMBER**
Masaligan
- DECEMBER**
Maalampon

5



SCIENCE

Quarter 3 - Module 2 Materials that are Good Conductors of Heat and Electricity



Name of Learner: _____

Grade & Section: _____

Name of School: _____

Science – Grade 5
Support Material for Independent Learning Engagement (SMILE)
Quarter 3 – Module 2: Materials that are Good Conductors of Heat and Electricity
First Edition, 2021

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Lesson

1

Materials that are Good Conductors of Heat and Electricity



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 understanding why **some materials are good conductors of heat and electricity.**

After going through this module, you are expected to:

- Discuss why some materials are good conductors of heat and electricity.

(S5FE-IIIC-3)



What's In

In your lesson in Grade 4, you learned that conduction is one of the ways on how heat can be transferred to another material. Different materials differ in the way they conduct heat and electricity. Some materials are good conductors of heat while some are not. Answer Activity 1 for a quick review.

Activity 1: Quick Flashback

Directions: Determine if each material is a good conductor of heat and electricity or not. Draw a ☺ if the material is a good conductor of heat. And draw a ☆ if it is not.

_____ 1. aluminum

_____ 2. cloth

_____ 3. paper

_____ 4. steel nail

_____ 5. rock

_____ 6. cotton

_____ 7. silver bracelet

_____ 8. iron frying pan

_____ 9. Sand

_____ 10. wood



What's In



Take a few minutes to examine the pots and pans in your kitchen. What did you notice? What are these pots and pans made of? Yes, most of them are made of stainless steel or aluminum. Why do you think they are suited for cooking?

Activity 2: Search Me

Directions: Search the words that are related to good conductors and insulators. Encircle them vertically, horizontally, or diagonally. The word bank is given on the left side.

- METALS
- COPPER
- ALUMINUM
- GOLD
- SILVER
- WATER
- PLASTIC
- GLASS
- WOOD
- RUBBER

R	E	T	H	E	D	O	I	C	A
O	G	E	C	O	I	D	I	N	L
S	O	G	O	L	D	T	L	I	U
I	R	W	L	C	S	H	N	A	M
L	E	R	A	A	C	O	A	S	I
V	I	E	L	W	S	B	E	E	N
E	E	P	R	A	M	S	E	I	U
R	A	P	E	T	I	E	S	T	M
S	E	O	M	E	T	A	L	S	S
H	I	C	U	R	U	B	B	E	R

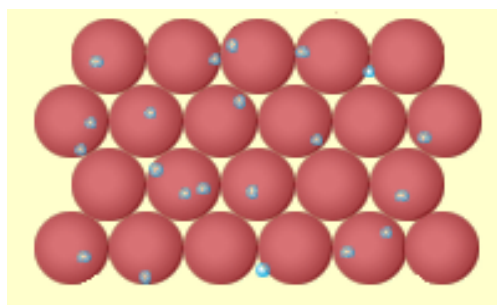


What is It

Conductors are materials that allow heat and electricity to flow freely through them, allowing heat and electricity to be transferred from the source. Most **metals** are good conductors of heat and electricity. These include **aluminum, steel, iron, tin, nickel, copper, gold, silver, and brass.**

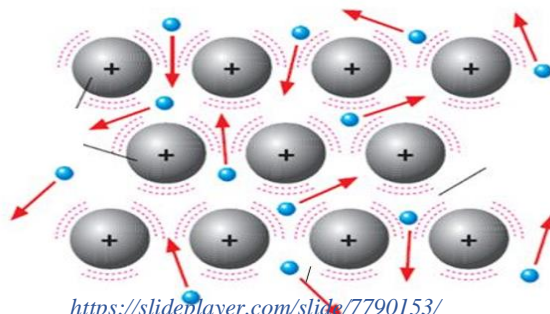
There are two reasons why metals are good conductors of heat and electricity:

1. Metals have **metallic bonds** – particles are very closely packed allowing heat to transfer very quickly



<http://resources.schoolscience.co.uk/Corus/16plus/steelch1pg1.html>
Metal ions are held together by metallic bonds

2. Metals have **delocalized electrons** – electrons are free to move around easily and carry heat from one particle to other particles.



<https://slideplayer.com/slide/7790153/>
Electrons move freely in the space between the metal ions.

Cooking pots and pans made of metals make cooking faster because they quickly allow heat transfer from the stove's flame to the food being cooked.

Not all materials are good conductors of heat and electricity. Materials that are **non-conductors** or that do not allow heat and electricity to flow through them are called **insulators**. Materials that are made of **plastic, silk, glass, leather, rubber, and wood** are insulators.

Conductors are used to distribute electricity from power stations to homes. Without these materials, electricity would not be possible to each home while insulators are used to protect us from heat and electricity.



What's More

Activity 3: Examine Me!

Directions: Examine the pictures below. Identify materials that are good conductors of heat and electricity. Put a check (✓) on the line before the number.

___ 1.  papers
<https://en.wikipedia.org>

___ 5.  gold bars
<https://www.istockphoto>

___ 2.  metal spoon
<https://www.indiamart.com>

___ 6.  Staple wires
<https://www.officewarehouse.com>

___ 3.  bamboo toothpick
<https://shopee.ph>

___ 7.  rubber bands
<https://www.indiamart.com>

___ 4.  coin
<https://en.wikipedia.org>

___ 8.  silver ring
<https://yihaojewelry.en>

Activity 4: Form Me

Directions: Unscramble the letters in **Column B** to form the word being described in **Column C**. Write your answers on the blank provided in **Column A**.

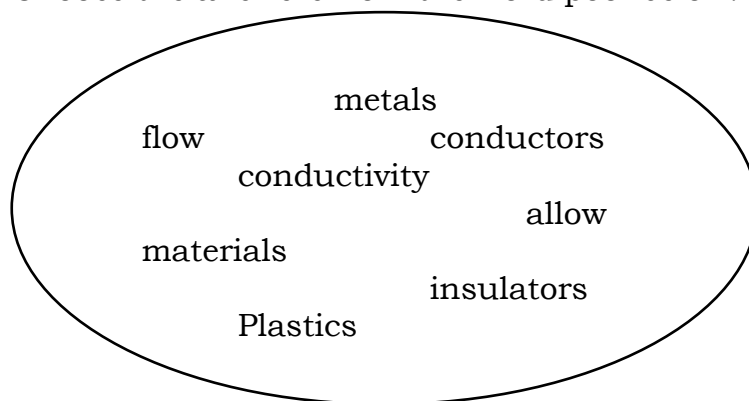
Column A	Column B	Column C
_____	1. DONTUCORC	material that allows heat and electricity to pass through
_____	2. SALEMT	good conductors of heat and electricity
_____	3. TALSICP	an insulator
_____	4. TAILSORUN	nonconductor
_____	5. UMAILMUN	material suited for cooking pots and pans



What I Have Learned

Activity 5: Fill Me In

Directions: Fill in the blanks with the correct word to complete the paragraphs. Choose the answers from the word pool below.



I learned that...

(1) _____ are materials that allow heat and electricity to flow easily through them. Some (2) _____ are good conductors heat and electricity. (3) _____ are good conductors such as copper, aluminum, gold, silver, brass, steel, and nickel.

Cooking pots and pans made of stainless steel or aluminum make cooking faster because they quickly (4) _____ heat transfer. Materials that are nonconductors or that don't allow heat and electricity to pass through are called (5) _____. These include materials that are made of plastic, silk, leather, glass, oil, and rubber.

Activity 6: True and Change

Directions: Write TRUE if the statement is correct. If false, change the underlined word to make it correct. Write the answer on the space provided

Examples:

_____ TRUE a. A piece of cloth is an insulator.

_____ Conductors b. Insulators allow heat to pass through them easily.

_____ 1. Materials made of metals are good conductors of heat and electricity.

_____ 2. Tin can is an insulator.

_____ 3. All materials are good conductors of heat and electricity.

_____ 4. Copper, which is a conductor, allows electric current to pass through it.

_____ 5. Iron is a metal which is a good conductor of heat and electricity



What I Can Do

Activity 7: Look and Write

Directions: Look around your house and list down materials that are conductors or insulators.

Conductors	Insulators
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.



Assessment

Directions: Read the questions carefully. Choose and encircle the letter of the best answer.

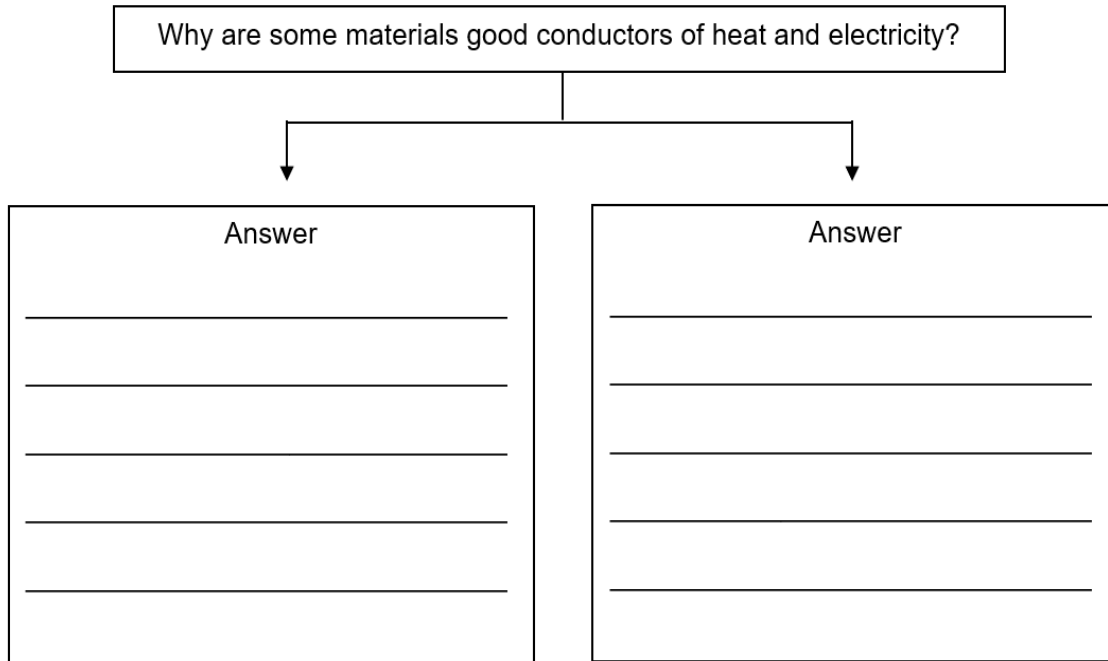
- Which materials allow flow of heat and electricity?
A. Insulators B. convectors C. conductors D. nonconductors
- Which group of materials is composed of conductors ONLY?
A. brass, gold, silver C. glass, plastic, rubber
B. aluminum, iron, rubber D. leather, iron nail, pins
- Which of these materials is an insulator?
A. Pins B. thumbtacks C. scissors D. tissue paper
- What do you call materials that are not conductors?
A. Convectors B. insulators C. protectors D. portraits
- Which is a good cooking utensil?
A. steel kettle C. rubber pan
B. plastic pan D. wooden pot
- The following statements are true **EXCEPT** one. Which is it?
A. Materials such as plastic, silk, leather, glass, and rubber are insulators.
B. Metals are good conductors while non-metals are insulators.
C. Not all materials are good conductors of heat and electricity.
D. Conductors are used to protect us from heat and dangerous effects of electricity.
- Why are cooking pots and pans commonly made of metals?
A. Metals are cheaper than other materials. C. Metals are easy to find
B. Metals make cooking faster. D. metals are shiny
- Which statement supports why metals are good conductors of heat and electricity?
A. Metals are hard and durable.
B. Particles in metals are limited to move.
C. Metals protect us from heat and electricity.
D. Particles in metals are very closely packed.
- What happens when particles in a metal are closely packed?
A. Heat is quickly transferred. C. Heat can't be transferred
B. Heat is slowly transferred. D. Heat is barely transferred
- Which of the following is another reason why metals are good conductors of heat and electricity?
A. Electrons in metals hardly move around and carry heat from one particle to other particles.
B. Electrons in metals move around freely and carry heat from one particle to other particles.
C. Electrons in metals move around slowly and carry heat from one particle to other particles.
D. Electrons in metals are limited to move and carry heat from one particle to other particles.



Additional Activities

Activity 8: Complete Me!

Directions: Answer the question. Write the answers inside the boxes provided in the diagram below.



Answer Key Science5Q3Module2

<p>What's In (Activity 1: Quick Flashback)</p> <p>1. ☺ 6. ☆ 2. ☆ 7. ☺ 3. ☆ 8. ☺ 4. ☺ 9. ☆ 5. ☆ 10. ☆</p>	<p>What I Can Do (Activity 7: Look and Write)</p> <p>Answers Vary</p>	<p>What's More (Activity 3: Examine Me)</p> <p>1. 5. ✓ 2. ✓ 6. ✓ 3. 7. 4. ✓ 8. ✓</p> <p>(Activity 4: Form Me)</p> <p>1. CONDUCTOR 2. METALS 3. PLASTIC 4. INSULATOR 5. ALUMINUM</p>																																																																																																				
<p>What's New (Activity 2: Search Me)</p> <table border="1"> <tr><td>R</td><td>E</td><td>T</td><td>H</td><td>E</td><td>D</td><td>O</td><td>I</td><td>C</td><td>A</td></tr> <tr><td>O</td><td>G</td><td>E</td><td>C</td><td>O</td><td>I</td><td>D</td><td>I</td><td>N</td><td>L</td></tr> <tr><td>S</td><td>O</td><td>G</td><td>O</td><td>L</td><td>D</td><td>T</td><td>L</td><td>I</td><td>U</td></tr> <tr><td>I</td><td>R</td><td>W</td><td>L</td><td>C</td><td>S</td><td>H</td><td>N</td><td>A</td><td>M</td></tr> <tr><td>L</td><td>E</td><td>R</td><td>A</td><td>A</td><td>C</td><td>O</td><td>A</td><td>S</td><td>I</td></tr> <tr><td>V</td><td>I</td><td>E</td><td>L</td><td>W</td><td>S</td><td>B</td><td>E</td><td>E</td><td>N</td></tr> <tr><td>E</td><td>E</td><td>P</td><td>R</td><td>A</td><td>M</td><td>S</td><td>E</td><td>I</td><td>U</td></tr> <tr><td>R</td><td>A</td><td>P</td><td>E</td><td>T</td><td>I</td><td>E</td><td>S</td><td>T</td><td>M</td></tr> <tr><td>S</td><td>E</td><td>O</td><td>M</td><td>E</td><td>T</td><td>A</td><td>L</td><td>S</td><td>S</td></tr> <tr><td>H</td><td>I</td><td>C</td><td>U</td><td>R</td><td>U</td><td>B</td><td>B</td><td>E</td><td>R</td></tr> </table>	R	E	T	H	E	D	O	I	C	A	O	G	E	C	O	I	D	I	N	L	S	O	G	O	L	D	T	L	I	U	I	R	W	L	C	S	H	N	A	M	L	E	R	A	A	C	O	A	S	I	V	I	E	L	W	S	B	E	E	N	E	E	P	R	A	M	S	E	I	U	R	A	P	E	T	I	E	S	T	M	S	E	O	M	E	T	A	L	S	S	H	I	C	U	R	U	B	B	E	R	<p>Assessment</p> <p>1. C 6. D 2. A 7. B 3. D 8. D 4. B 9. A 5. A 10. B</p>	<p>What I Have Learned (Activity 5: Fill Me In)</p> <p>1. Conductors 2. materials 3. Metals 4. allow 5. insulators</p> <p>(Activity 6: True and Change)</p> <p>1. True 2. conductor 3. some 4. True 5. True</p>
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<p>Additional Activities</p> <p>1. Metals have metallic bonds or their particles are very closely packed.</p> <p>2. Metals have delocalized bonds or their particles are free to move around.</p>																																																																																																						

References

Colored Elastic Rubber Bands, Size: 1/2 To 4 Diameter, Retrieved from; <https://www.indiamart.com/proddetail/colored-elastic-rubber-bands-17617710012.html>

Food Network Kitchen, Retrieved from; <https://www.foodnetwork.com/how-to/packages/shopping/product-reviews/best-cookware-sets>

High Quality Bamboo Toothpick, Retrieved from; <https://shopee.ph/300pcs-Hight-Quality-Bamboo-Toothpick-i.162329865.3807126779>

Joy Staple Wire #35 Metal 5000/Box, Retrieved from; <https://www.officewarehouse.com.ph/product/4126/kalaha>, Retrieved from; <https://adlayproject.wordpress.com/2016/12/12/adlay-chocolate-pops/>

kaldero - pot for cooking rice, Retrieved from; <https://d1png.com/png/352319>

Paper, Retrieved from; <https://en.wikipedia.org/wiki/Paper>

Philippine Twenty-peso coin, Retrieved from; https://en.wikipedia.org/wiki/Philippine_twenty-peso_coin

Stainless Steel Spoon, Retrieved from; <https://www.indiamart.com/proddetail/stainless-steel-spoon-11163738088.html>

Two Gold Bars Stock Illustration, Retrieved from; <https://www.istockphoto.com/vector/two-gold-bars-gm909605938-250533546>

925 Sterling Silver Ring with CZ Customized Design for Wholesale, Retrieved from; <https://yihaojewelry.en.made-in-china.com/product/HXRnPeNEggYs/China-925-Sterling-Silver-Ring-with-CZ-Customized-Design-for-Wholesale.html>

Image of metal ions held together by metallic bonds; <http://resources.schoolscience.co.uk/Corus/16plus/steelch1pg1.html>

Image of delocalized electrons; https://www.google.com/search?q=images+of+delocalised+electrons&rlz=1C1GCEA_enPH918PH918&source=lnms&tbn=isch&sa=X&ved=2ahUKEwiT8vrW-pfuAhVLGaYKHVPFAWIQ_AUoAXoECBsQAw&biw=1280&bih=610#imgrc=g42wcz3DiAOHPM&imgdii=M_0lhsWilzZo7M

Books

Larisma, Evelyn T., Mariano, Jan Jason M. (Copyright 2013 by Rex Book Store, Inc.) RBSI The New Science Link 5 First Edition Worktext in Science and Health. ISBN 978-971-23-6298-9

Sarte, Evelyn T., Garcia, Ednaliza R., Lopez, Eliza A., Dela Cruz, Mary Jean G., and Arradaza, Harold A. (Copyright 2016 by Vibal Group, Inc.) Science Beyond Borders Textbook. ISBN 978-971-07-3878-6

Sarte, Evelyn T., Garcia, Ednaliza R., Lopez, Eliza A., Dela Cruz, Mary Jean G., and Arradaza, Harold A. (Copyright 2016 by Vibal Group, Inc.) Science Beyond Borders Teacher's Manual. ISBN 978-971-07-3879-3

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
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 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."