



6

SCIENCE

Quarter 3 – Module 5

Energy Transformation: Radiant (Light) and Electrical Energy



Name of Learner: _____

Grade & Section: _____

Name of School: _____

JANUARY

Makugihon

FEBRUARY

Mohiguigmaon

MARCH

Matinabungon

APRIL

Matinahuron

MAY

Mahapsay og Matimpyo

JUNE

*Maabtik og Masunod sa
Dhisaktong Oras*

JULY

Maantigo og Maabilidad

AUGUST

*Maginhantunon
para sa Uban*

SEPTEMBER

Madaginaton

OCTOBER

Matinud-anon

NOVEMBER

Masaligan

DECEMBER

Maalampon

Science – Grade

Support Material for Independent Learning Engagement (SMILE)

Quarter 3 – Module 5: Energy Transformation: Radiant (Light) and Electrical Energy

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Lesson 5

Energy Transformation: Radiant (Light) and Electrical Energy



What I Need to Know

In this module, you are expected to:

- **Demonstrate how sound, heat, light and electricity can be transformed (S6FEIId-f-2)**

The activities included are designed for you to achieve the following objectives:

1. describe how energy is transformed from one form to another; and
2. demonstrate how radiant (light) and electricity can be transformed.



What's In

In the previous lesson, you learned about the different forms of energy. Can you still recall them? Answer the activity below.

Activity 1: What Am I?

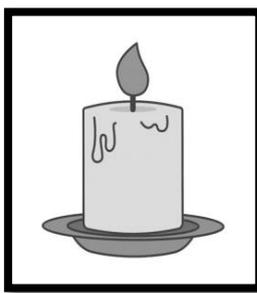
Directions: Identify the forms of energy used in the following activities / appliances. Write your answer inside the box.



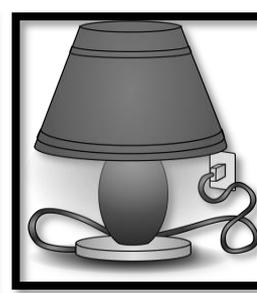
Drying clothes



Cooking of food



Lighted candle



Lighted lamp



Sewing of clothes

The world population relies heavily on energy of all forms. Energy appears in different forms: heat, light, sound, and electricity. It can flow from one place to another and can be transformed from one form to another. Every day of our life, you experience multiple energy transformations. For everything, energy transformation is always involved.

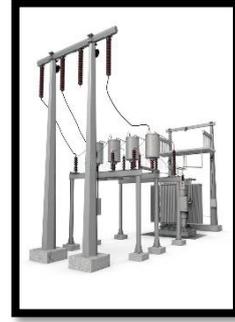
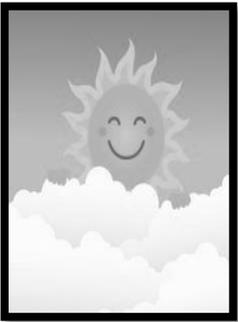


What's New

Activity 2: Loop

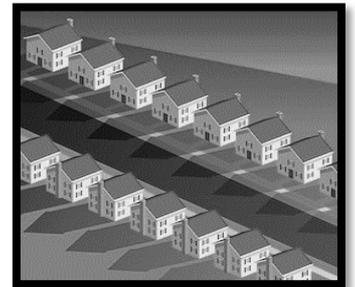
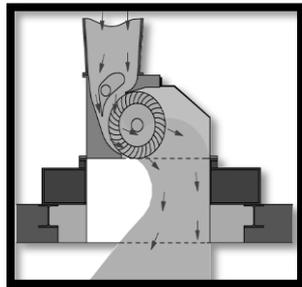
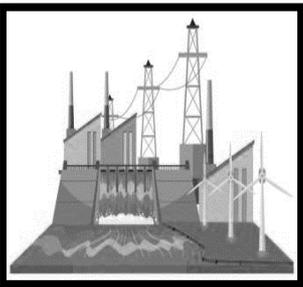
Directions: Describe how energy is transformed from one form to another by putting an arrow in the illustration and stating its source.

1.



SOURCE: _____

2.



SOURCE: _____

Activity 3: Investigating the Transformation of Energy

Problem: How is energy transformed to another form?

What you need:

- Battery-operated toy
- Candle or alcohol lamp
- Matches

What you need to do:

Observe how energy is transformed in the different objects when they work.

- A. Light the candle
- B. Place the battery in the battery-operated toy

What have you found out:

1. What form of energy is present in the candle?

2. How is energy change to another form when the candle was lighted?

3. What form of energy is present in the battery?

4. How is this energy changed when it is placed in a toy?

Safety Tips:

- * Never play with matches, candles or alcohol lamps.*
- * Do it with your parents or guardian before performing the activity.*



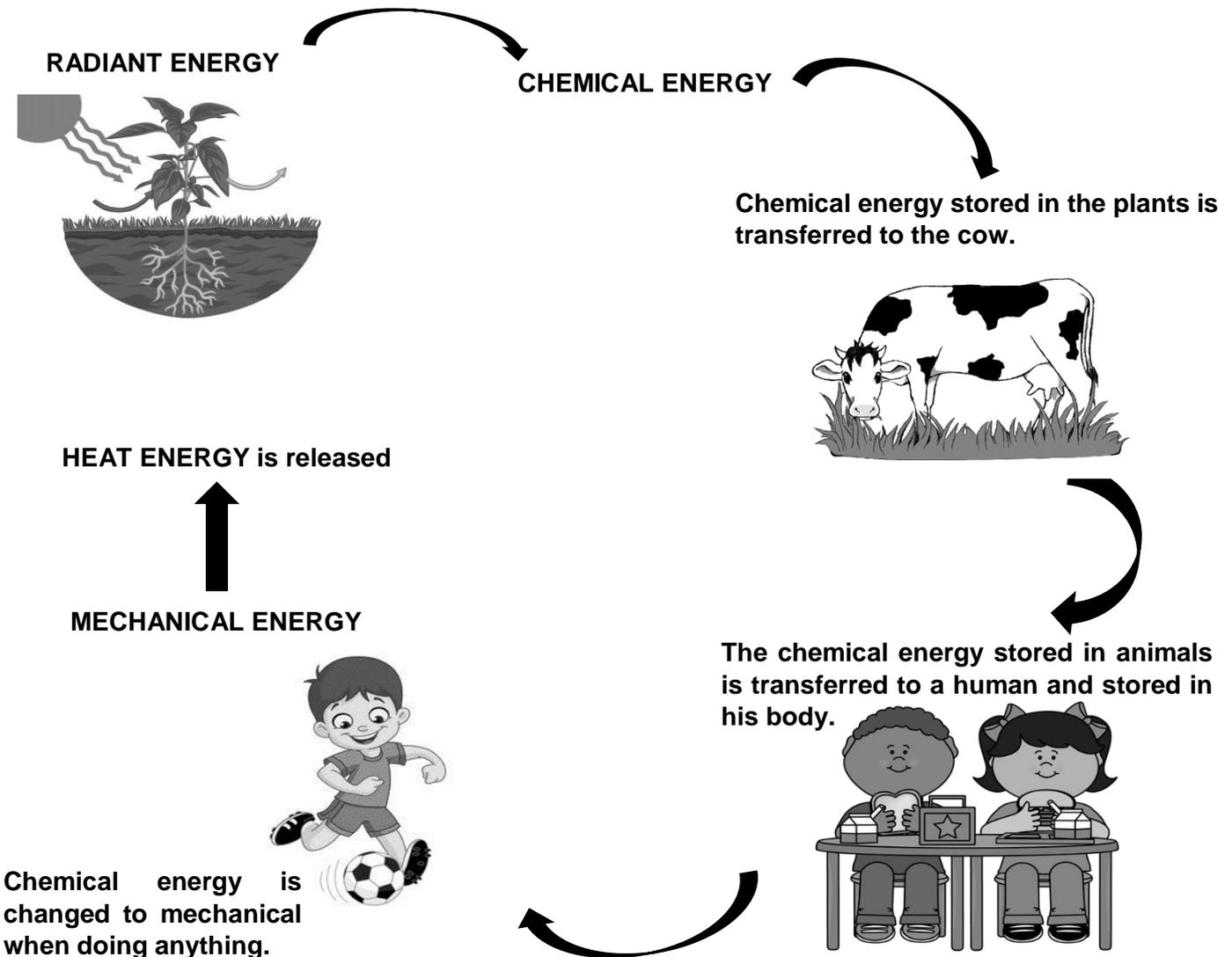
What is it

Energy can be changed freely from one form to another. Energy that is stored can be released and transformed to do useful jobs for us. Changes in the forms of energy are called **energy transformation**.

Radiant or Light Energy

Energy transformation starts when radiant energy strikes the earth's surface. Some of the energy is transformed by photosynthesis into a chemical energy stored in the carbohydrate molecules in the plant. When humans or animals eat plants, the chemical energy in the plant is transferred and becomes chemical energy in the human or animal's body.

As animals perform body process like digestion, respiration, and circulation, their process are powered by the chemical energy stored in their body, which is then transformed into mechanical energy. The same thing happens when work is being done. The energy that will power dancing, running, jumping, and other bodily activities comes from the transformation of chemical energy into mechanical energy. As chemical energy is transformed to mechanical energy and mechanical energy powers various body activities, heat is released, which is another form of energy.



Note: Always remember that the arrow (→) represents the transfer of energy to another.

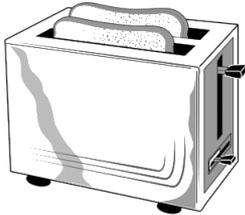
Energy transformation also occurs in some objects that we use. In your activity, when you lighted a lamp or candle, the chemical energy of the candle is changed into light energy, and at the same time, heat is produced.



CHEMICAL ENERGY → LIGHT and HEAT ENERGY

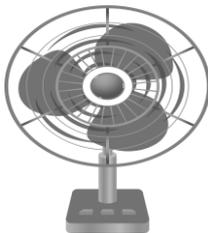
Electrical Energy

Many appliances you use every day change electrical energy into other forms. When you use a toaster, it changes electrical energy into thermal energy. The wires in a toaster are poor conductors. They do not let the current hit the atoms in the wire. The bumping of electrons raises the thermal energy of the atoms, causing the wire to become red and hot. The light energy toasts the bread.



ELECTRICAL ENERGY → LIGHT and HEAT ENERGY

Electric motors change electrical energy to mechanical energy. Electric motors run many appliances at home. Washing machines, blenders, egg beaters, and electric fan run by electric motors. When the appliance is turned on, the electric motor changes electrical energy into mechanical energy.



ELECTRICAL ENERGY → MECHANICAL ENERGY

Electrical energy also enables people to communicate through telephones or other similar communication devices. You hear someone talking to you on the line because electrical energy is transformed into sound energy.



ELECTRICAL ENERGY → SOUND ENERGY

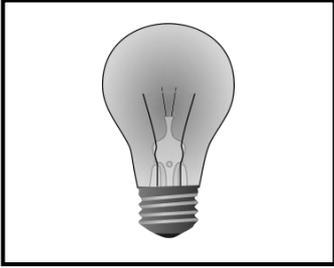
Indeed, electricity is involved in several activities in this modern world. It is commonly used and transformed into different forms to run the appliances and other devices that are needed for everyday living.



What's More

Activity 4: Are you IN or Are you OUT!

Directions: Complete the following energy transformations. Write your answer inside the box.

1.  →  → 

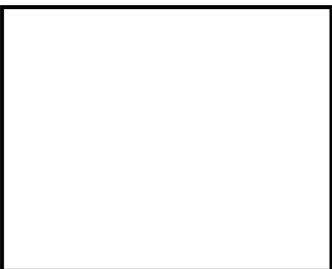
Energy in Energy out

2.  →  → 

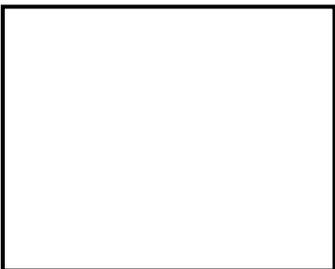
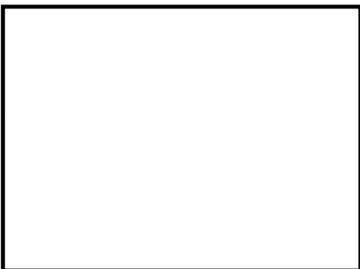
Energy in Energy out

3.  →  → 

Energy in Energy out

4.  →  → 

Energy in Energy out

5.  →  → 

Energy in Energy out



What I Have Learned

Activity 5. Wrap Me Up!

Directions: Complete the paragraph below. Encircle the correct answer inside the parenthesis.

I learned that ...

As light energy travels from the sun to earth's surface, some of this energy is transformed by photosynthesis into (mechanical, chemical, electrical) energy stored in the carbohydrate molecules in the plant. When humans or animals eat plants, the chemical energy in the plant is transferred and becomes (chemical, mechanical, heat) energy in the human or animal's body. As they perform, their body changes the chemical energy in food into (mechanical, heat, sound) energy and (chemical, mechanical, heat) energy as they walk, jump or run.

In addition, many appliances we use every day change electrical energy into other forms. When you use a toaster, it changes electrical energy into (mechanical, sound, thermal) energy. Electric motors change electrical energy to (chemical, heat, mechanical) energy. Electrical energy also enables people to communicate through telephones or other similar communication devices. You hear someone talking to you on the line because electrical energy is transformed into (sound, light, heat) energy. To be able to write and show energy transformation, energy (line, arrow, shape) are used.

Indeed, electricity is involved in several activities in this modern world. Energy can be transformed from one to another to make it more useful. Changes in the forms of energy are called (energy transfer, energy conservation, energy transformation).



What I Can Do

Activity 6. Apply Me!

Directions: Write on the line the correct sequence of energy transformations that happens in each of the following.

1. Television - _____
2. Karaoke - _____
3. Solar panel - _____
4. Street lamp - _____
5. Computer - _____



Assessment

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

- Which energy transformation occurs in an electric iron?
 - heat to light
 - light to heat
 - heat to electricity
 - electricity to heat
- Which of the following shows that electrical energy is changed to mechanical energy?
 - lighting of candle
 - an athlete run after drinking water
 - using sunlight to dry up clothes
 - washing of clothes using a washing machine
- Which of the following shows a change from light energy to heat energy?
 - buzzing of bees
 - lighted candle
 - warming of beach sand
 - ironing clothes
- Which of the following diagrams show energy transformation in using electric fan?
 - chemical energy \longrightarrow mechanical energy
 - electrical energy \longrightarrow mechanical energy
 - electric energy \longrightarrow radiant energy
 - mechanical energy \longrightarrow electrical energy
- What energy transformation takes place during the process of photosynthesis?
 - light energy \longrightarrow chemical energy
 - chemical energy \longrightarrow mechanical energy
 - light energy \longrightarrow mechanical energy
 - mechanical energy \longrightarrow heat energy

B. **Directions:** Complete the chart for energy transformations that occur in different devices. Write your answer inside the box.

Device	Starting Energy	Changes to
6. Battery	<i>Chemical energy</i>	A.
7. Transistor Radio	B.	<i>Sound energy</i>
8. Flat iron	<i>Electrical energy</i>	C.
9. Solar panel	D.	<i>Electrical energy</i>
10. Hair dryer	<i>Electrical energy</i>	E.



Additional Activity

Activity 7: Demonstrate Me!

Directions: Demonstrate how energy is transformed in the picture below. Write it inside the box.

Chest X-ray had 89% sensitivity detecting COVID-19 pneumonia during pandemic peak. How does an X-ray machines transform into another forms of energy to make it more useful?



Answer Key-Gr6Q3W5 Science

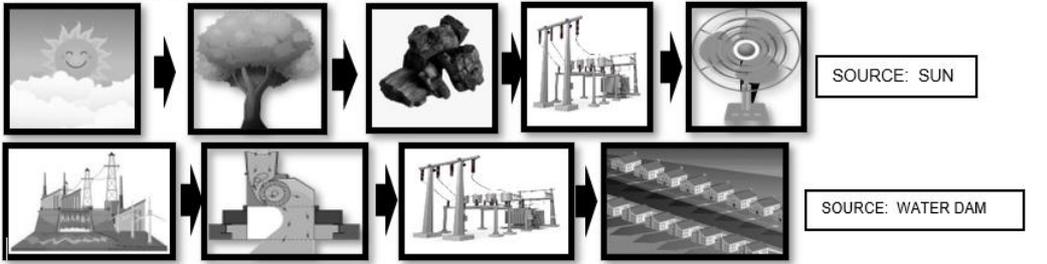
Activity 1: What am I

1. Radiant/Light Energy
2. Radiant/Light Energy
3. Chemical Energy
4. Electrical Energy
5. Mechanical Energy

Activity 3: Investigating the Transformation of Energy

1. Chemical Energy
2. From chemical energy to light/radiant energy
3. Chemical Energy
4. The energy is transformed from chemical energy to electrical energy and to mechanical energy.

Activity 2: What's New



What's More: Activity 4: Are you IN or Are you OUT!

Energy In

1. Electrical energy
2. Electrical energy
3. Electrical energy
4. Electrical energy
5. Heat/radiant energy

Energy Out

1. Light energy
2. Heat energy
3. Mechanical energy
4. Sound energy
5. Chemical energy

What I Have Learned: Activity 5: Wrap Me Up!

1. chemical
2. chemical
3. mechanical
4. heat
5. thermal
6. mechanical
7. sound
8. arrow
9. Energy transformation

What I Can Do: Activity 6: Apply me!

1. Television: electrical-mechanical-sound- heat
2. Karaoke: electrical-mechanical-sound
3. Solar Panel: light/radiant-electrical
4. Street lamp: electrical-mechanical-light
5. Computer: electrical- mechanical-sound/light/heat

Assessment:

1. D
2. D
3. B
4. B
5. A
6. Electrical energy
7. Chemical energy
8. Heat energy
9. Radiant/ Light energy
10. Heat energy

Additional Activity:

X-Ray Machine:
Electrical – mechanical- light

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- Burning candle. Retrieved from <https://images.app.goo.gl/SZdd9BQgwxLooQSd7>
- Lighted lamp. Retrieved from <https://images.app.goo.gl/5Z2hht43NDB8gVHk6>
- Sewing of clothes. Retrieved from <https://images.app.goo.gl/Mk6ZZf7Ud8UFL23A>
- Sun. Retrieved from <https://images.app.goo.gl/fzxFm4z69G6oWMTu5>
- Tree. Retrieved from <https://images.app.goo.gl/mUk5XhPRmyksdYd7>
- Charcoal. Retrieved from <https://images.app.goo.gl/Q1Z1CFppnnBPJHxt7>
- Electric Substation. Retrieved from <https://images.app.goo.gl/QS5HVpJCbqmSVJck8>
- Electric fan. Retrieve from <https://images.app.goo.gl/wSjrVbYfqCaXUbs8>
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- Sub-division. Retrieved from <https://images.app.goo.gl/MbgRqyptkj4jijQW9>
- Photosynthesis. Retrieved from <https://images.app.goo.gl/JVnCLbrVWZESWzZS8>
- Cow. Retrieved from <https://images.app.goo.gl/DkuoQE6M7Jn4Nq8r5>
- Kids Eating Lunch. Retrieved from <https://images.app.goo.gl/uVuW8anNvGAXg9NA6>
- Playing Soccer. Retrieved from <https://images.app.goo.gl/Zx77oVb4dop4RQ3t7>
- Bread Toaster. Retrieved from <https://images.app.goo.gl/reJ6jADoSiZpvpST7>
- Telephone. Retrieved from <https://images.app.goo.gl/Jc9VYhq9LMXcMMq29>
- Bulb. Retrieved from <https://images.app.goo.gl/7Uke8P5QvPXMD9Da9>
- Flat Iron. Retrieved from <https://images.app.goo.gl/prDnz1kn5ku6EzLL9>
- Washing Machine. Retrieved from <https://images.app.goo.gl/Q11owy5Jja5xxje99>
- Fire buzzer. Retrieved from <https://images.app.goo.gl/FwprmlsumyPERazU7>
- X-Ray Machine. Retrieved from <https://images.app.goo.gl/pVsb8QdbKpHyTubE8>

Region IX: Zamboanga Peninsula Hymn – Our Eden Land

Here the trees and flowers bloom	Gallant men And Ladies fair	Cebuanos, Ilocanos, Subanons, Boholanos, Ilongos,
Here the breezes gently Blow,	Linger with love and care	All of them are proud and true
Here the birds sing Merrily,	Golden beams of sunrise and sunset	Region IX our Eden Land
The liberty forever Stays,	Are visions you'll never forget	Region IX
	Oh! That's Region IX	Region IX

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

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

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.

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."