JANUARY
Mahugiton

FEBRUARY
Mahigugmaon

MARCH
Matinabangon

APRIL
Matinahuron

MAY
Mahapsay og Malimpyo

JUNE
Maabtik og Musmod sa Insaktong Oras

JULY
Maantigo og Maabilidad

AUGUST
Maginhunahunaon para sa Uban

SEPTEMBER
Madaginoton

OCTOBER
Matinud-anon

NOVEMBER
Masaligan

DECEMBER
Maalampuon

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

5

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SCIENCE

Quarter 3 - Module 5

Basic Types of Electrical Circuits: Series and Parallel

Name of Learner: _____

Grade & Section: _____

Name of School: _____

Science – Grade 5
Support Material for Independent Learning Engagement (SMILE)
Quarter 3 – Module 5: Basic Types of Electrical Circuit: Series & Parallel
First Edition, 2021

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Lesson 1

Basic Types of Electrical Circuits
Series & Parallel

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 in **determining the effects of changing the number or type of components in a circuit *(S5FEIIIg-7).*** The scope of this module permits it to be used in many different learning situations. This module is about;

Lesson 1: Series and Parallel Circuits
Objective: Determine the effects of changing the number or type of components in a circuit.

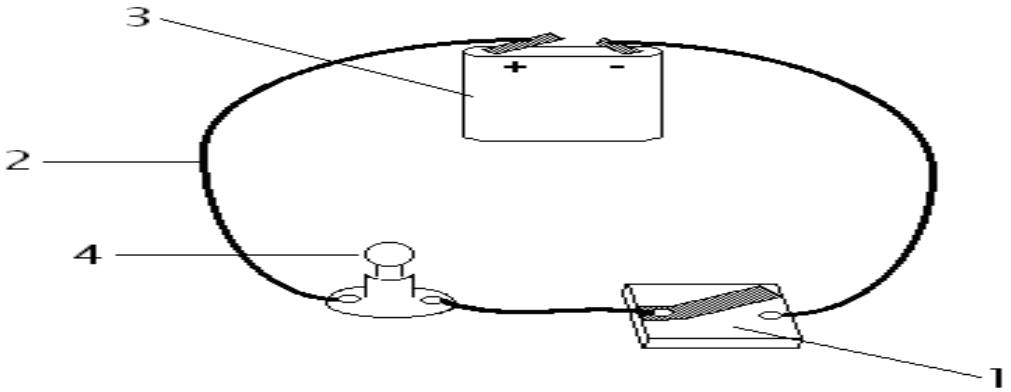
What's In

Activity 1: What's My Name?

In the previous lesson, you learned about electric circuit; its condition necessary to make a bulb light up. Can you still recall them? Answer the activity below.

Label the part of an electric circuit. Choose your answer from the box and write it on the blank space provided.

source	wire	fuse
load		switch



What's New

Activity 2; Hunt Me!

Look for the words about the basic type of electrical circuit and its component. Connect the letters inside the box in horizontal, vertical or diagonal to form the word and *encircle* it.

WORD BANK
PARALLEL
SERIES
BULB
BATTERY
WIRE

p	**A**	**R**	**L**	**L**	**R**	**0**	**I**	**C**
B	**A**	**T**	**T**	**E**	**R**	**Y**	**G**	**I**
U	**T**	**R**	**U**	**T**	**U**	**S**	**A**	**R**
L	**B**	**Y**	**A**	**I**	**N**	**E**	**D**	**C**
B	**A**	**O**	**K**	**L**	**D**	**R**	**U**	**U**
L	**T**	**U**	**O**	**S**	**L**	**I**	**X**	**I**
N	**G**	**L**	**W**	**I**	**R**	**E**	**Z**	**T**
D	**O**	**W**	**O**	**R**	**E**	**S**	**L**	**V**

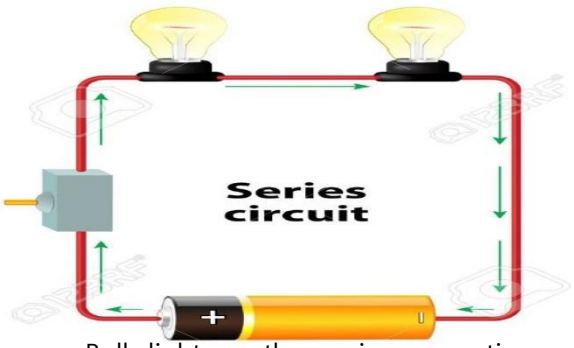
What Is It

Have you seen Christmas lights light up countless times? Have you observed once one bulb is busted or removed the entire series of lights will not light up? Compare it with the lights at home. Will the lights in the living room light up if the bulb in the kitchen is removed?

Christmas lights and light bulbs in our homes have different kinds of circuits.

There are two basic types of electrical circuits - series circuits and parallel circuits.

1. Series Circuit



Bulb lights up thru series connections.
(image:photo_54511461_stock-vector-series)

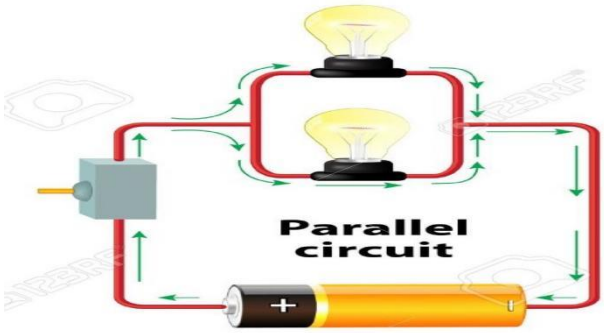
The diagram above shows the general appearance of a series circuit. A series connection is a circuit arrangement in which all the parts are connected one after the other to make only one path. So when bulbs are in place, it is a closed circuit. Bulbs will light up. However, when one bulb is removed, an open circuit is made. In an open circuit, current cannot complete its path. The remaining bulb will not light up. A series circuit does not work when a part is loosened or removed.

What would happen if we add more dry cells or battery in the series? Adding dry cells increases the current in the circuit and increases the brightness of the bulb. The bigger the current through the bulb, the brighter it glows.

What would happen if we add more bulbs in the series? Increasing the number of bulbs in a series circuit decreases the brightness of the bulbs.

2. Parallel Circuit

Trace the flow of electricity in the diagram below. How many circuits are there? Suppose one bulb would be disconnected, would the other bulb still light up? In this circuit, each bulb is a part of a different circuit.



Bulbs light up in parallel connection.
(image:*photo 54511461 stock-vector-series*)

When one bulb is loosened, removed, or burned out from a parallel circuit, the other bulbs still light up. This is because each bulb has its own pathway. A break in one pathway does not make all the lights go out because electricity can still flow through the other pathways. A parallel connection is an electric circuit in which there are two or more independent paths which the current may take.

What would happen if we add more dry cells or battery in the parallel circuit? In a parallel circuit there are more than one path for the current to flow along. When cells connected in parallel to the total value of the cells is the same as each individual cell. For two 1.5V dry cells or battery in parallel, the voltage stays at 1.5V, but the life of the dry cell or battery is doubled.

What would happen if we add more bulbs in the parallel circuit? If another loop or branch is added with another bulb, the current has an additional path to take. But the dry cell or battery produces a constant voltage, so the current through the original bulbs does not change, and neither does their brightness.

The electric circuits in our homes are using parallel circuit, why is this necessary?

Our homes get electricity from the power source through parallel connections. Appliances such as TV sets, lamps and refrigerators are wired parallel. Each appliance has its own switch, which closes or breaks the circuit. This is beneficial because the appliances operate independently. If one fails to work other appliances will still function. They can turn on and off without breaking the other circuits. The voltage in this type of circuit cannot be increased. The electric current remains the same in all its parts.

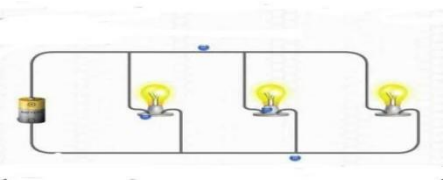
What's More

Activity 3: What Am I

A. Examine each electric circuit. Tell whether it is series or parallel.

1. 

_____

2. 

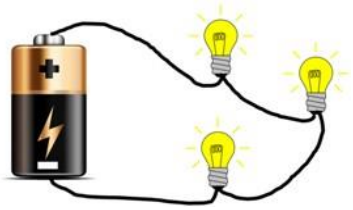
_____

B. Determine the effect of changing the number or type of components in a circuit. Put √ if the bulb in the set up will light up and X if it will not

3. 

Another bulb is added in this set up.

_____

4. 

In this set up one bulb is busted.

_____

What I Have Learned

Activity 4: Fill me!

Direction: Read it and fill in the blanks with the correct word/s.

There are two types of electrical circuit. One is (1) _____ and the other is (2) _____. In (3) _____ circuit electric current flows in one direction while in (4) _____ circuit current flows in different directions. The reason is that different parts of parallel circuit are connected to different branches of the wire. Thus, making it possible for each connection to work independently. Hence, (5) _____circuit is the most appropriate circuit for homes.

What I Can Do

Activity 5: Think It Over

Directions: Read the statements below and decide whether to agree or disagree. Draw a heart ❤ if you agree, and **X** if you disagree in the blank space provided before the number.

_____1. In decorating Christmas lights it is good to have very long Connection of series lights.

_____2. Plugging many appliances to a single extension wire is advisable.

_____3. Turn off the main switch when you need to replace a bulb.

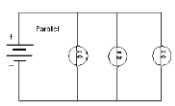
_____4. Allowing our neighbors to have series connection of electric current at home is a good decision.

_____5. Using series circuit in our appliances at home is NOT favorable.

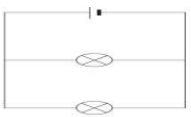
Assessment

Direction: Encircle the letter of the best answer.

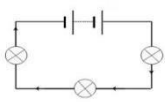
1. Why light bulbs in series circuit won't light up if one bulb is loosened or busted?
   Loosened or busted bulb _____ .
   A. breaks the pathway of electricity
   B. connects the pathway of electricity
   C. causes all bulbs connected will light up
   D. closes the circuit
2. What type of electrical circuit is appropriate at home?
   A. series circuit B. parallel circuit C. open circuit D. closed circuit
3. Study diagram below. Which one shows series circuit?



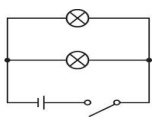
A.



B.



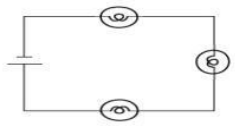
C.



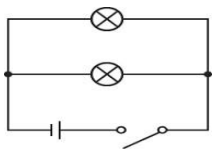
D.

4. Which type of electrical circuit that has two or more switches?
   A. series circuit
   B. parallel circuit
   C. open circuit
   D. electricity

5. What will happen if one pathway of a parallel circuit breaks?
   A. All appliances will stop working.
   B. Destroyed part of parallel circuit won't affect the flow of electricity.
   C. Electric current flow will surely stop.
   D. It will cause too much consumption of electricity.
6. What happens to the voltage in a parallel circuit?
   A. It stays the same throughout.
   B. It splits up across each component.
   C. It increases the voltage.
   D. All choices are correct.
7. Which statement describe the current of a series circuit?
   A. It stays the same throughout.
   B. It splits up across each component.
   C. It increases the current.
   D. All choices are correct.
8. The diagram shows an electrical circuit. This circuit is a series circuit because**:**



   A. It has 3 light bulbs
   B. It uses single battery
   C. The same current flows through the three light bulbs
   D. The electrical current is divided between the light bulbs.
9. What are the two types circuits?
   A. parallel and magnetic
   B. electromagnetic and series
   C. series and parallel
   D. electromagnetic and parallel
10. What type of circuit is shown in the diagram?



A. Alternating B. overload C. parallel D. series

Additional Activities

Directions: Draw diagrams of parallel and series circuits in a bond paper. Below is a rubric for scoring.

Rubrics

	Very Good (6)	Good (4)	Fair (2)
Component	All components of the electrical circuit are shown in the diagram.	One or two components of the electrical circuit is missing in the diagram.	More than two components of the electrical circuit is missing in the diagram.
Label	All components of the electrical circuit are labelled correctly.	One or two components of the electrical circuit are labelled incorrectly.	More than two components of the electrical circuit are incorrectly labelled.

Science 5 Quarter 3 Module 5 Key Answers

Activity 1
What's My name?
1. wire
2. source
3. load
4. switch

Activity 2
Hunt Me
PARALLEL
SERIES
CIRCUIT
BULB
WIRE

Activity 3
What Am I
1. SERIES
2. PARALLEL
3. /
4. X

Activity 4
Fill Me!
1-2. PARALLEL/SERIES
3.SERIES
4.PARALLEL
5.PARALLEL

Activity 5
1. X
2. X
3. ❤
4. X
5. ❤

Assessment

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

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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,

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

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

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

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

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, 0 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."