GENERAL PHYSICS 2
2nd Semester – Module 5
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What I Need to Know

This module will help you understand the concepts of current, resistance, and electromotive force. At the end of this module, you should be able to:

1) Evaluate the equivalent resistance, current, and voltage in a given network of resistors connected in series and/or parallel STEM_GP12EM-IIg-48;
2) Calculate the current and voltage through and across circuit elements using Kirchhoff’s loop and junction rules (at most two loops only) STEM_GP12EM-IIg-49; and
3) Solve problems involving the calculation of currents and potential differences in circuits consisting of batteries, resistors, and capacitors. STEM_GP12EM-IIg-51.

What’s In

In the previous module, we have studied the principles of electric currents within a simple circuit. However, if you take a closer look at a computer, TV, radio, or any appliance, you will discover that these devices have a complicated network of circuits. These circuits contain resistors, capacitors, sources, transformers, motors, etc.

For this module, you will be studying the methods in analyzing networks from computing the unknown values of resistors, voltages, currents, and capacitors. Series and parallel connections can be represented by equivalent resistance. However, general networks can also be solved using Kirchhoff’s two rules based on energy conservation and charge moving around the loop.

You will also deal with circuits that combine capacitors and resistors where the current varies with time.

These principles are needed to understand electrical wiring systems in our homes.
Critical Reading
Transmission lines and power plants were built to provide every home and business establishment with electrical energy. There was a hesitation when it was first introduced. Today, the country is very dependent on electrical energy in every industry. However, the energy crisis is currently a problem in the Philippines. This pressing public concern leads to power interruption and causes commerce and industry to stop. Hence, there is a need to upgrade the electric grid to meet the recent demands on energy. The plan for SMART GRID is being pushed to achieve sustainable development. The figure below shows the difference between a smart grid and a standard grid.

**Before Smart Grid:**
*One-way power flow, simple interactions*

**After Smart Grid:**
*Two-way power flow, multi-stakeholder interactions*

*Image Source: https://thoughtsprudencestrategy.blogspot.com/2020/03/smart-grid-vs-traditional-grid.html*

**Activity 1. Towards A Smart City**
**Direction:** Answer the following questions based on the material read and the illustration given

1. What are the three (3) features of a smart grid?
(2) How will you define a smart city? Is the characteristic of a smart city similar to smartphones? In what way(s)?

(3) The following characteristics of a smart grid are necessary to build a smart city. Provide reason/s why these characteristics must be present in every smart grid and how they will help sustain development?

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Why is this important in building a smart grid?</th>
<th>How will it help create a smart city?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
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<tr>
<td>Affordability</td>
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<tr>
<td>Security</td>
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<td></td>
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<tr>
<td>Green Friendly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(4) Is it possible to build a smart grid in the Philippines? What necessary actions are needed to fulfill this goal? (You may answer from the perspective of a government leader or as an ordinary citizen.)

What Is It

Resistors in Series

The figure above shows the series combination of three resistors with resistance \( R_1, R_2, \) and \( R_3 \). In a series connection, the path between points \( a \) and \( b \) is considered a single path. In this case, the current across the circuit is always the same. Since the current is the same throughout the resistors and by applying Ohm’s law to each resistor, the potential difference for each resistor is:

\[
V_1 = IR_1 \quad V_2 = IR_2 \quad V_3 = IR_3
\]

You can always check if the source of potential difference was distributed throughout the components by getting the sum of \( V_1, V_2, \) and \( V_3 \).

\[
V_{ab} = V_1 + V_2 + V_3
\]

From the expression, we can say that

\[
V_{ab} = I(R_1 + R_2 + R_3)
\]

\[
\frac{V_{ab}}{I} = R_1 + R_2 + R_3
\]

In accordance with Ohm’s law, \( R = \frac{V}{I} \). Thus, the equivalent resistance is just the sum of the resistance of every resistor expressed as:
The figure above shows the parallel combination of three resistors with resistance $R_1$, $R_2$, and $R_3$. In a parallel connection, alternative paths are given between points $a$ and $b$. In this case, the potential difference across the circuit is always the same. Since the potential difference is the same throughout the resistors and by applying Ohm’s law to each resistor, the current for each resistor is:

$$I_1 = \frac{V}{R_1} \quad I_2 = \frac{V}{R_2} \quad I_3 = \frac{V}{R_3}$$

The total current $I$ must be equal to the sum of the three currents. Thus,

$$I_{total} = I_1 + I_1 + I_3$$

$$I_{total} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

$$I_{total} = V\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right)$$

$$\frac{I_{total}}{V} = \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right)$$

In accordance with Ohm’s law, $R = \frac{V}{I}$. In this case, $\frac{I}{V} = \frac{1}{R}$. Thus, the equivalent resistance is just the sum of the resistance of every resistor expressed as:

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

**Example 1:**
Compute the equivalent resistance for the network below:
**A** What is/are given?  
V = 18 V; R1 = 4Ω; R2 = 6 Ω; R3 = 3 Ω

**B** What is asked?  
(a) equivalent resistance  
(b) potential difference for each resistor

**C** Are the units consistent with the formula?  
Yes

**E** What strategy must be employed?  
We use the formula for series and parallel connection. We need to find the equivalent capacitance for 6 and 3 Ω resistors. If we have the equivalent capacitance, we can now solve for the equivalent capacitance of series combination.

**F** Solution

**(a) equivalent capacitance**

Since R2 and R3 are in parallel connection, we will compute the reciprocals of their resistance.

\[
\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{6Ω} + \frac{1}{3Ω} = \frac{1}{2Ω} \rightarrow \left(\frac{1}{R_{eq}}\right)^{-1} = \left(\frac{1}{2Ω}\right)^{-1} \rightarrow R_{eq} = 2Ω
\]

We were able to combine R2 and R3 leaving us a series connection of R1 and R23.

Since they are now in series, we can now solve for sum of individual resistances.

\[
R_{123} = R_1 + R_{23} = 4Ω + 2Ω = 6Ω
\]

Since resistors are now in series, we can solve for the current (which is similar in all components)

\[
I_{total} = \frac{V}{R_{123}} = \frac{18 V}{6Ω} = 3A
\]

Thus, a current of 3A is running around the circuit. We will also solve for the voltage drops or potential difference for each resistor using Ohm’s law.
By checking: $V_1 + V_2 = 12\ V + 6\ V = 18\ V$

This means, a 6 V potential difference is present in the parallel connection of $R_{23}$ and a 12 V is present in $R_1$. In determining the current, we use the Ohm’s law and the value of 6 V:

$$I_2 = \frac{V_2}{R_2} = \frac{6\ V}{6\ \Omega} = 1\ A \quad I_3 = \frac{V_2}{R_3} = \frac{6\ V}{3\ \Omega} = 2\ A$$

So far, the values for current are correct since the current traveling around the circuit is 3A.

<table>
<thead>
<tr>
<th><strong>G</strong></th>
<th>What is the conclusion?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Therefore, the equivalent resistance of the network is 6Ω. The current and voltage of $R_1$ are 3 A and 12 V, respectively. The current and voltage of $R_2$ are 1A and 6 V, respectively. Finally, the current and voltage of $R_3$ are 2A and 6 V, respectively.</td>
</tr>
</tbody>
</table>

**Kirchoff’s Rules**

Sometimes networks can’t be simplified using series-parallel combinations. The figure below shows an example of a complicated network.

---

**Figure 1.** An example of a network that could not be reduced by simple series-parallel connection.

*Image Source: https://www.electronics-tutorials.ws/dccircuits/dcp_4.html*
In solving complicated networks, we will be using Kirchhoff’s rules. However, be familiar with the following terms: junction and loop. A junction is a point where three or more conductors meet. A loop is the closed conducting path.

There are two (2) statements (points) under Kirchhoff’s rules.

(1) **Point Rule:** The sum of the currents in the branch is always equal to zero. This is based on the conservation of charges. Junctions should not accumulate charges. Hence, the total current entering the junction must be equal to the total current leaving the junction. Figure 1 shows the 11 A current entering the junction. When it leaves the junction, the 11 A current splits into 7A and 4A currents.

\[
I_1 = I_2 + I_3
\]

\[
\sum I_{in} = \sum I_{out}
\]

**Figure 1. The values of currents entering and leaving the junction following the junction rule**

The junction rule is expressed as the sum of current, which is equal to zero

\[
\sum I = 0
\]

(2) **Loop Rule:** The sum of the potential differences in any loop must equal to zero. This is an expression of the energy relationship. As a charge goes around the loop and returns to its starting point, the sum of the changes of its potential energy is equal to zero. Figure 3 shows the loop rule.

\[
V = 12.0 \text{ V} \quad R_1 = 1.00 \text{ } \Omega
\]

\[
R_2 = 2.00 \text{ } \Omega
\]

\[
R_3 = 3.00 \text{ } \Omega
\]

**Figure 3. Kirchhoff’s Loop Rule**
This is expressed as:

\[
\sum V = 0
\]

It will not matter which direction or loop you would like to assume. If we have wrong guess of its direction, we will get a negative value for the current. If we have the correct guess of its direction, we will get a positive value for the current. Let us be reminded with the following sign conventions:

**Figure 4.** Sign conventions for the loop rule. (a) Negative potential if the assumed direction of loop is the same with the direction of current; (b) Positive potential if the assumed direction of loop is opposite with the direction of current; (c) Positive potential if the direction of the assumed direction of loop is from negative terminal to positive terminal; and (d) Negative potential if the assumed direction of loop is from positive to negative terminal. *Image Source: https://cnx.org/contents/7DqkHtKM@2/Kirchhoff-s-Rules*

The most difficult part in dealing with Kirchhoff’s rules is keeping track with signs. The rules and principles are easy to understand.

**Example 2:**
In the circuit shown below, find the unknown current \(I\), the resistance \(R\), and the emf \(E\).
What is/are given? 1A across 2Ω, 6A across 2 Ω and 18 V
What is/are asked? ε, R₁ and current across R₁
Strategy: First, we assume the direction of currents in junction a. The charges will start traveling from the positive terminal of the sources and end in negative terminals.

We assign junction a as an application for junction rule.

We obtain

\[ I + 1A = 6A \]
\[ I + 1A - 6A = 0 \] (1)

Next, we assume the directions of the loop 1, 2 and 3.
Loop 1:
\[ 18 \text{ V} - IR_1 + 1 \text{ A}(2\Omega) = 0 \] \hspace{0.5cm} (2)

Loop 2:
\[ 1 \text{ A}(2\Omega) + 6\text{ A}(2\Omega) + \varepsilon = 0 \] \hspace{0.5cm} (3)

Loop 3:
\[ IR_1 - 18 \text{ V} + \varepsilon + (2\Omega)(6\text{ A}) = 0 \] \hspace{0.5cm} (4)

Solution:
We solve for the unknown values using equations 1, 2, 3 and 4
Solve for $I$ using equation 1:
\[ I + 1A - 6A = 0 \quad \rightarrow \quad I = 6A - 1A = 5A \quad \rightarrow \quad I = 5A \]
Hence, we have the correct assumption of the direction of current.

The unknown current is 5A. Substitute this value in equation 2:
\[
18 V - IR_1 + 1 A(2\Omega) = 0 \\
18 V - (5A) R_1 + 1 A(2\Omega) = 0 \\
- (5A) R_1 = -18 V - 2V \\
\frac{-(5A) R_1}{-5A} = \frac{-20 V}{-5A} \\
R_1 = 4\Omega
\]
The unknown resistance is 4Ω.

Solve for $\varepsilon$ using equation 3
\[
1 A (2\Omega) + 6A (2\Omega) + \varepsilon = 0 \\
2V + 12 V + \varepsilon = 0 \\
\varepsilon = -14 V
\]
Therefore, the unknown emf is -14 V

The negative value obtained implies that the actual polarity of the emf is opposite from our assumption. The positive terminal should lie on the right life side.

**Measuring Devices**

The measuring devices are used to measure the quantities involved in studying circuits.

1. **Galvanometer** is a device used in detecting the presence and direction of electric current in the device.
2. **Multimeter** is also a measuring device that could measure current, resistance, and voltage.
3. **Ammeter** is used to measure the magnitude of current passing through the device.
4. **Voltmeter** is used to measure the voltage or potential difference.

Both ammeter and voltmeter are used to measure the resistance or power. Figure 4 shows the method for measuring the current and voltage of the circuit.
Resistance-Capacitance Circuits

The figure below shows a simple circuit diagram of capacitor, voltage source and resistor. At some time $t$, we close the switch to allow the capacitor to charge. As the capacitor charges, the voltage increases and the potential difference across the resistor decreases. However, the sum of the voltage drops is equal to $V$.

When the capacitor is fully charged, the potential difference across the resistor becomes zero, the current becomes zero and the voltage appears now at the capacitor. This is expressed as:

$$V_{across\text{resistor}} = iR \quad V_{\text{capacitor}} = \frac{q}{C}$$

As shown in Kirchhoff’s rule:

$$V_{total} = V_{across\text{resistor}} + V_{across\text{capacitor}} = iR + \frac{q}{C} \rightarrow V = iR + \frac{q}{C}$$

Solving for current $i$

$$i = \frac{V}{R} - \frac{q}{RC}$$

As the charge increases, $q/RC$ becomes larger and the capacitors reaches final value denoted as $Q_f$. The current $i$ becomes zero.
\[ \frac{q}{RC} = \frac{V}{R} \quad \text{Hence, } q = CV = Q_f \]

It was also found out that when capacitor reaches the final value \( CV = Q_f \), the time it takes is equal to \( RC \). The product \( RC \) is then the measure of how quick the capacitor charges also known as time constant or relaxation time:

\[ \tau = RC \]

**Example 3:** A resistor with resistance \( R = 10 \, \text{M}	ext{Ω} \) is connected in series with a capacitor with capacitance \( 1 \, \mu\text{F} \). What is the time constant?

<table>
<thead>
<tr>
<th></th>
<th>What is/are given?</th>
<th>C = 1 , \mu\text{F}; R = 10 , \text{M}	ext{Ω}</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>What is asked?</td>
<td>( \tau = ? )</td>
</tr>
</tbody>
</table>
| C | Are the units consistent with the formula? | No, \( \mu\text{F} \) must be converted to \( \text{F} \)  
1 \( \mu\text{F} = 1 \times 10^{-6} \, \text{F} \)  
and \( \text{M}	ext{Ω} \) to \( \text{Ω} \)  
10 \( \text{M}	ext{Ω} = 10 \times 10^6 \, \text{Ω} \) |
| E | What strategy must be employed? | We use the time constant formula |
| F | Solution            | \[ \tau = RC = (10 \times 10^6 \, \text{Ω})(1 \times 10^{-6} \, \text{F}) = 10 \, \text{s} \] |
| G | What is the conclusion? | Therefore, it takes 10 seconds for the capacitor to be fully charged. |

**What’s More**

**Activity 2: Qualitative Problems.**

**Direction:** Answer the following questions.

(1) Some Christmas tree lights have a characteristic that when one light (filament) burns out, the lights throughout go out too. However, burned-out lights go out in other series lights. Discuss the difference of these two sets of lights.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Activity 2: Qualitative Problems

Direction: Answer the following questions.

(1) Some Christmas tree lights have a characteristic that when one light (filament) burns out, the lights throughout go out too. However, burned-out lights go out in other series lights. Discuss the difference between these two sets of lights.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

(2) Why do lights on a car become dimmer when you start a car?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

(3) What similarities and differences do you see from the equivalent resistance and capacitance formula?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
What I Have Learned

Activity 3: Quantitative Problem

Direction: Solve as directed. Write your answers on a separate sheet of paper. You may also consult your Physics teacher.

Find the unknown values of voltage and current in each resistor as shown in the given circuit diagram.

![Circuit Diagram]

<table>
<thead>
<tr>
<th>Criteria</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics Approach</td>
<td>Approach is appropriate and complete</td>
<td>Approach contains minor errors</td>
<td>Some of the concepts and principles are missing or inappropriate</td>
<td>Solution doesn't indicate an approach</td>
</tr>
<tr>
<td>Procedure</td>
<td>Mathematical and logical procedures are clear, complete and connected</td>
<td>Mathematical and logical procedures are missing/contain errors</td>
<td>Most of the mathematical and logical procedures are incomplete and contain errors</td>
<td>All procedures are incomplete and contain errors</td>
</tr>
<tr>
<td>Description</td>
<td>Diagrams and symbols used are appropriate and complete</td>
<td>Parts of the diagrams and symbols contain errors</td>
<td>Most of the parts of the diagrams and symbols are not useful</td>
<td>The entire visualization is wrong or did not include visualization.</td>
</tr>
</tbody>
</table>
What I Can Do


Direction: Create a concept map to show what you have learned from this module. You can use words, terms, phrases, or formulas in connecting these concepts. Refer to the scoring guide below:

<table>
<thead>
<tr>
<th>Legible (easy to read)</th>
<th>No (0-1)</th>
<th>Yes (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate (concepts were used accurately)</td>
<td>Many inaccuracies (0-2)</td>
<td>A few inaccuracies (3-4)</td>
</tr>
<tr>
<td>Complete (sufficient number of relevant concepts and relationships)</td>
<td>Limited use of concepts (0-2)</td>
<td>Some use of concepts (3-4)</td>
</tr>
<tr>
<td>Sophisticated (finding meaningful connections between relevant concepts)</td>
<td>Little or none (0-1)</td>
<td>Few meaningful connections made (2-4)</td>
</tr>
</tbody>
</table>

Mueller's Classroom Concept Rubric

Assessment

Directions: Write the letter of your choice in the space provided.

____ 1. In a parallel combination of resistors, the current is
   a. varying
   b. same
   c. greater in value
   d. lesser in value

____ 2. In a series combination of resistors, the voltage drop is
   a. varying
   b. same
   c. greater value
   d. lesser value

____ 3. What happens to the energy when the electron goes into the 2nd bulb after passing through the 1st bulb?
4. When resistors are connected in parallel, what happens to their resistance?
   a. more than the smallest resistance
   b. within the values of largest and smallest resistance
   c. less than the smallest resistance
   d. depends on the voltage drop

5. The Kirchhoff’s rule on voltage drops is consistent with
   a. energy conservation
   b. impulse and momentum
   c. conservation of charge
   d. angular momentum conservation

6. A 20 V potential difference is applied in a series combination of a 10 Ω and a 30 Ω resistors. The current in the 10 Ω resistor is
   a. 0.5 A
   b. 0.3 A
   c. 0.67 A
   d. 0.2 A

7. The potential difference across the 10 Ω resistor in No. 6 is
   a. 5 V
   b. 10 V
   c. 15 V
   d. 20 V

8. The equivalent resistance in No. 6 when connected in parallel is
   a. 0.54 Ω
   b. 0.25 Ω
   c. 7.5 Ω
   d. 24 Ω

9. Which of the following statements is true for the junction below:
   
   ![Diagram]

   a. \( I_1 + I_2 = I_3 \)
   b. \( I_3 + I_2 = I_1 \)
   c. \( I_1 - I_2 = I_3 \)
   d. \( I_3 - I_2 = I_1 \)

For No. 10, please refer to the figure below:
10. Applying voltage rule of Kirchhoff, the loop gives:
(a) \( E_1 - E_2 = I_1r_1 + I_2r_2 \)
(b) \( E_2 = E_1 + I_1r_1 + I_2r_2 \)
(c) \( E_1 + E_2 = I_1r_1 + I_2r_2 \)
(d) \( E_1 + I_1r_1 = E_2 + I_2r_2 \)

For Nos. 11 to 12, refer to the figure below:

11. The smallest current that passes through is ________?
   a. 10 \( \Omega \) resistor
   b. 20 \( \Omega \) resistor
   c. 60 \( \Omega \) resistor
   d. 30 \( \Omega \) resistor

12. The largest potential difference is dropped at?
   a. 10 \( \Omega \) resistor
   b. 20 \( \Omega \) resistor
   c. 60 \( \Omega \) resistor
   d. 30 \( \Omega \) resistor

13. How long would it take for the capacitor to reach 4.1 V if it has a 1 \( \mu F \) and connected with 2800 \( \Omega \) resistor.
   a. 0.0003 s
   b. 3 s
   c. 0.000000003 s
   d. 0.003 s

14. What is the initial current of the circuit?
   a. 2.21 \( \times 10^{-3} \) A
   b. 3.14 \( \times 10^{-3} \) A
   c. 0.17 \( \times 10^{-3} \) A
   d. 1.46 \( \times 10^{-3} \) A

15. The current flowing in the branches can be determined through
   a. Lenz laws
   b. Coulomb’s laws
   c. Kirchhoff’s rule
   d. Gauss’s laws
Additional Activities

Activity 5. Social Context

Direction: The community is a rich source of learning opportunities of sources of direct current circuits. Choose one from the following suggested activities in understanding the importance and utilization of electric potential in our daily lives:

1. Conduct simulations on direct current circuits. From this, write a short reflection. Scan the QR code to gain access to the simulations.
2. Demonstrate the series and parallel connections using batteries, bulbs, wires, and multimeter. Compare how series and parallel connections are different from each other. Design a data collection sheet where you can record the quantities.
3. Suppose you have an 1800 W toaster, 1400 W electric frying pan, and a 75 W lamp plugged in a 20A, 120 V circuit. The devices are in parallel connection with the voltage source. What is the current drawn in each device? Will this combination blow a fuse (20 A)?

Answer Key General Physics 2 Module 5

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<tbody>
<tr>
<td>12</td>
<td>10</td>
<td>5</td>
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<td>14</td>
<td>9</td>
<td>B</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>7</td>
<td>A</td>
<td>1</td>
</tr>
</tbody>
</table>

Assessment
A, 7

Activity 3. Qualitative Problems

[Instructions and problems related to the qualitative nature of the activities are mentioned here, but not transcribed due to the page limit.]
References


Linus and his blanket: would you be worried? | Yahoo Answers.


In addition to the material in the main text
L Narrow the range of potential differences to the desired limits.

How to Create Circuit Diagram Online? | by Ralph Garcia .... https://ralphagarcia.medium.com/how-to-create-circuit-diagram-online-c2df71f49e73

In addition to the material in the main text Notes to the .... https://www.coursehero.com/file/p76bqhur/In addition-to-the-material-in-the-main-text-Notes-to-the-Teacher-are-also/


Linus and his blanket: would you be worried? | Yahoo Answers. https://answers.yahoo.com/question/index?qid=20060803150053AAXHp6g

Online References


Physics 2B.

Physics Exp 3 - PHY 2049L EXPERIMENT 3 .... - Course Hero.

Printed Resources


What is the potential difference across the 10 resistor in .... https://www.transstutors.com/questions/what-is-the-potential-difference-across-the-10-resistor-in-the-figure-what-is-the-po-2799733.htm

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

Here the Badaos roam the seas
Here the Samals live in peace
Here the Tausogs thrive so free
With the Yakan in unity

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

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 unmeasured 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
'Tis I, 0 my country, raising a song unto thee.

And even my grave is remembered no more
Unmarked by never a cross nor a stone
Let the plow sweep through it, the spade turn it o'er
That my ashes may carpet earthy 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-bye!
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 o'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 wearesome 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 mastering responsibilities 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 revered 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.