JANUARY
Makugihon

FEBRUARY
Mahigugmaon

MARCH
Matinabangon

APRIL
Matinahuron

MAY
Mahapsay og Malinyo

JUNE
Maabtik og Masunod sa Ihsaktong Oras

JULY
Mauntigo 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

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Zest for Progress
Zeal of Partnership
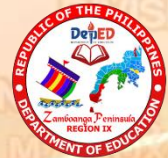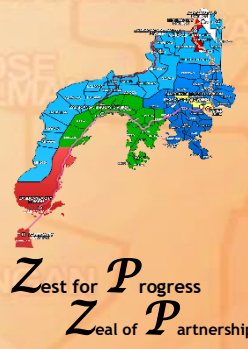
MATHEMATICS
4th QUARTER – Module 3:
ELECTRIC AND WATER METER READING

Name of Learner: _____

Grade & Section: _____

Name of School: _____

Mathematics – Grade 6
Alternative Delivery Mode
Quarter 4 - Module 3: Electric and Water Meter Reading

First Edition, 2020

Introductory Message

This Self – Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge of lessons in each SLM. This will tell you if you can proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for a better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you with your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. Read the instructions carefully before performing each task.

If you have any questions using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

In this module, you will learn how to read and interpret the readings from electric and water meters. It provides you examples and exercises that will help you find and compute the number of kilowatt-hours used.

At the end of this lesson, you are expected to:
* read and interpret electric and water meter reading (**M6ME-IVd-100**); and
* solve routine and non-routine problems involving electric and water consumption **(M6ME-IV-d-101)**

What I Know

Directions: Choose the letter of the correct answer. Write it on a separate sheet.

1. Rene would like to read the electric meter below. If you were Rene, which letter will you choose for the correct reading?
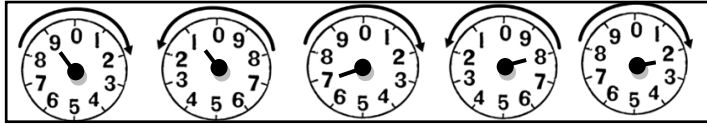
A. 91782 kWh   C. 91772 kWh
B. 91673 kWh   D. 91672 kWh

2. The water meter of a certain laundry shop for one month looks like the figure below. What was the water meter shows in the figure?
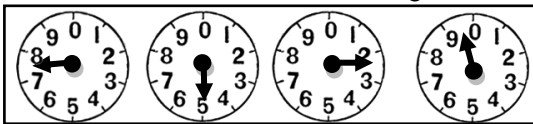
A. 8 530m³   C. 8 529m³
B. 7 529m³   D. 9 257m³

For numbers 3-5. Read the problem and answer the questions below.

On the morning of April 1, the electric meter reading was 26010 kWh. On the evening of April 31, the electric meter reading was 26165 kWh.

3. How many kilowatt-hours of electricity were used for April?
   A. 515 kWh   B. 155 kWh   C. 551 kWh   D. 255 kWh
4. If the electricity cost is Php 5.50 per kWh, how much is the electricity cost for April?
   A. Php 852.50   B. Php 582.50   C. Php 285.50   D. Php 855.20
5. What is the average cost of electricity per day in April?
   A. Php 27.50   B. Php 72.50   C. Php 17.50   D. Php 37 .50

LESSON 1	Electric and Water Meter Reading and Solving Problem involving electric and Water Consumption

What's In

Directions: Read the given problem carefully, then answer the questions that follow. Write your correct answers on a separate sheet.

A block of wood has a length of 30 cm, a width of 20 cm, and a height of 10 cm. If it is cut into cubes of 5 cm on each side, how many cubes can be produced?

1. What is asked in the problem?
2. What are the given facts?
3. What is the hidden question?
4. What operations to be used?
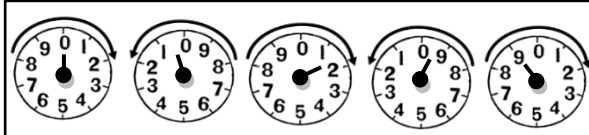5. What is the final answer?

What's New

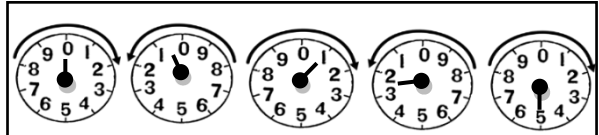A. **Directions:** Read the problem.

> Mr. De la Cruz is computing his monthly electrical consumption. Based on his electric bill, last month, he was able to consume 00125 kWh. When he checked his digital electric meter, the reading is 00199 kWh. How many kilowatt-hours did Mr. De la Cruz consume this month?

B. Observe the meter readings below.

PRESENT READING	PREVIOUS READING

For us to get the amount of electricity that Mr. De la Cruz consumed, subtract the previous electric meter reading from the present electric meter reading:

$$00199 - 00125 = 74 \text{ kWh.}$$

> So, Mr. De la Cruz consumed 74 kWh of electricity for this month.

What is It

A. What is Electric Meter?

    Electric meter is used to measure the amount of electricity consumed and this can be expressed in *kilowatt-hour (kwh).* An electromechanical meter has five dials and inside each dial is a pointer which indicates the number to be read. The pointers of the dials next to each other move in opposite directions. The pointers will alternately turn ↷ clockwise and counterclockwise ↶. These dials measure the number of kilowatt-hour you use in 1s, 10s, 100s, 1000s, and 10 000s.
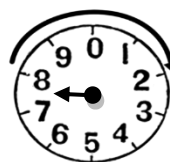
EXAMPLE:

| **A**	**B**	**C**	**D**	**E**
10 000s	1 000s	100s	10s	1s

So, the pointers of A, C, and E turn clockwise, and pointers B and D turn counterclockwise.

How do we read an electric meter?

To read electric meters:
1. Always read all the dials from right to left, starting from Dial E to Dial A.
2. Read the number by the pointer of the dial. When the pointer is between two numbers, the lower number is recorded.
3. If the pointer appears to be exactly on a number, check the dial to the right to find out the correct reading.
   - If the dial on the right has passed zero, then use the number the pointer is pointing to on the dial you are reading.
   - If the dial has not passed zero, then make use of the smaller number on the dial you are reading.

MEANING:

A.   **B.**   **C.**   **D.**   **E.**

5   **3**   **7**   **9**   **4**
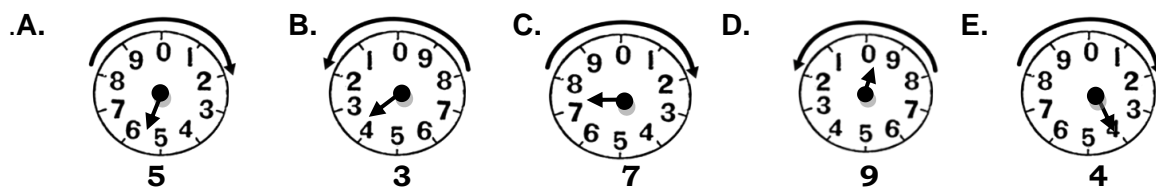
The illustration shows the following meter reading on each dial:

Dial E: The pointer is directly on number 4. Record as *4.*
Dial D: The pointer has just passed 9 and is between 9 and 0. Record as *9.*
Dial C: The next dial has passed 7 and is between 7 and 8.
     Record the smaller number, which is *7*
Dial B: The pointer is almost on 4 but, the dial to its right has not passed zero.
     So, you would record this as *3.*
Dial A: The pointer is between 5 and 6. Record the smaller number, which is *5. Thus,* the interpretation of the above electric meter is 53 794 kWh (kilowatt-hour).

What is Water Meter?

Water meter is not the same as the electric meter.

A. The *older style* of water meters is those with small dials. It looks like a series of small clocks that turn clockwise. (see picture below).
B. *Water meter* is a digital meter that shows 7 digits. The numbers indicate the reading in *cubic meters (m³).* In a digital water meter, the last three digits from the right represent *liters.*

The last three digits at the right form a decimal or fractional part when measuring the amount

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   A. Older Style of the water meter   B. Digital water meter
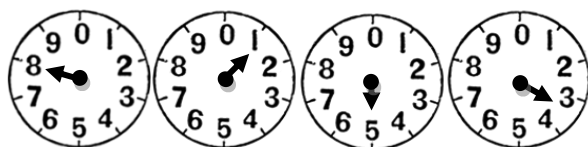
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A. To read old meter reading, we should start reading from right to left (clockwise). Read the number by the pointer of the dial. When the pointer is between two numbers, the lower number is recorded.
B. To read the water meter, we should start reading from right to left, and expressed it in *cubic meters.*

To get the meter readings in cubic meter, we should multiply 592 by 0.001
0.001m³x 592 = 0.592 m³

BASIC STEPS IN SOLVING ROUTINE WORD PROBLEMS

1. **UNDERSTAND**	3. **SOLVE**
• Know what the problem asked • Know the given facts	• Show the solution to the problem
2. **PLAN**	4. **CHECK AND LOOK BACK**
• Determine the operation to use • Write the number sentence	• Check if the answer is reasonable • State the complete answer

Read the given problems, then answer the questions that follow.

EXAMPLE 1:

Mario made a record of their 3-month electric consumption. The initial reading is 973 kWh.

April: 1120 kWh   **May: 1353 kWh**   **June: 1512 kWh**
Assume that the basic charge for the first 30 kWh is Php 120.00 and the succeeding kilowatt-hours is charged Php 6.00.
    a. How much will Mario pay for each month?
    b. In what month did he pay the most? Least?
    c. What is the average monthly consumption?

1. **UNDERSTAND**
   a. What is asked?
      • How much will Mario pay for each month?
      • In what month did he pay the most? Least?
      • What is the average monthly consumption?
   b. What are the given facts?
      • 973 kWh – the initial reading
      • 1 120 kWh – *April*   1 353 kWh – *May*   1 512 kWh – *June*
      • Php120.00 – basic charged for 30kWh
      • Php 6.00 – charged for the succeeding kilowatt-hour

2. **PLAN**
   a. What operation are we going to use to solve the problem?
      To get the amount that Mario will pay for each month, *Subtract* the present reading from the previous reading.
      For the following month, *Subtract* the previous reading from the current month's reading. Then, to get the amount Mario will pay for each month, *Subtract* 30 kWh from the monthly consumption. *Then multiply* the result by Php 6.00
      Afterward, add the amount for the first 30 kWh, which is Php 120.00. To get the average monthly consumption, add the 3-month electric consumption then, *divide* by 3.

3. **SOLVE**
   A. To get every month's electric consumption:

April: 1120 - 973 = 147 kwh	May: 1353 - 1120 =232 kWh	June: 1 512 - 1352 = 160 kWh

Now, to get each monthly consumption amount with the conditions that the first 30 kWh is Php 120.00 and Php 6.00 per remaining kilowatt-hour.

| That is, April: 147 kWh
= Php 120+ [(147-30) x Php 6]
= Php 120 + (117 x Php 6)
= Php 120 + 702
= Php 822.00 | So, for April, Mario will pay Php 822.00
May: 233 kWh
 = Php 120 + [(233-30) x Php 6]
 = Php 120 + (203 x Php 6)
 = Php 120 + 1218
 = Php 1,338.00 | So, for May, Mario will pay Php 1,338.00
June: 159 kWh
 = Php 120+ [(147-30) x Php 6]
 = Php 120 +(129 x Php 6)
 = Php 120 + 774
 = Php 894.00

So, for June, Mario will pay Php 894.00 |

B. See computation (A). The month with the highest (most) electricity consumption was in May with 233 kWh. And the least amount of electricity consumption was in April with 147 kWh.

C. To find the average monthly consumption.

Average monthly consumption $= \dfrac{147+233+159}{3} = \dfrac{539}{3} = 179.67\text{kWh}$

So, the average monthly electricity consumption is approximately 179.67 kWh

Therefore, the following are the answers to the questions:

    a. He will pay Php 822.00, Php 1,338.00, and Php 894.00 for April, May, and June, respectively.

    b. The month with the highest (most) electricity consumption was in May. They consumed the least amount of electricity in April.

D. The average electricity consumption is approximately 179.67 kWh.

4. CHECK AND LOOK BACK

Go back to your computation check if all the given values are used correctly about the given condition, especially computing the amounts.

EXAMPLE 2:

For September, Roberto records their water consumption, 0254m^3. How many cubic meters did they consume if the initial reading is 0113m^3?

A. Having an initial reading of 0113, so the water consumption of each month is:

September:

        0254 m^3 – Present Reading

   – 0113 m^3 – Previous Reading/Initial Reading

        141 m^3 – water consumption for September

Answer: They consumed 141 m^3 for September

B. To get the total amount of water consumed:

Add all the water consumption:

    141 m^3 + 204 m^3 + 190 m^3 = 535 m^3

Answer: The total amount of water consumption is 535 m^3

C. To get the average monthly consumption:

Add all the total water consumption then, divide it by 3.

Average monthly consumption $= \dfrac{535\ m^3}{3}$ = 178.33 m^3

So, the average monthly consumption is 178.33 m^3

What's More

Directions: Read the following problems and answer the questions that follow.

1. On August 20, the electric meter reading was 3411 kWh. The next month, the reading was 3619 kWh. The cost of electricity per kilowatt-hour is Php 3.00.

    a) How much electricity was consumed in a month?

    b) How much was the electricity bill for a month?

    c) What was the average cost of electricity per day?

2. Last month the water reading was 1342 m^3. The following month, the reading was 1395 m^3. How many cubic meters of water did Mr. Santos use? If water costs Php 2.65 per cubic meter, how much will Mr. Santos pay?

What I Have Learned

Directions: Write the correct word in each blank.
1. Electric meter is used to measure the amount of electricity consumed and this can be expressed in _____.
2. Water meter is used to measure the amount of watery consumed and this is expressed in _____.
3. To compute for electric or water consumption for the particular period of time, simply _____ the previous reading from the _____ reading.
4. List down the 4 steps in problem solving.
   a. _____   b. _____   c. _____   d. _____

What I Can Do

Directions: Read and interpret the electric meter below.
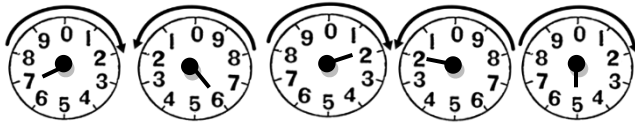
_____   _____   _____   _____   _____   _____kWh

Assessment

Directions: Read each item correctly. Select the correct answer and write only the letter of your choice.

1. The previous water reading at Sylvia's residence was 3475 m^3; the following month, the reading was 4658 m^3. How much water was consumed in one month?
   A. 1, 183 m^3 B. 1, 283 m^3 C. 2, 183 m^3 D. 2, 283 m^3

2. Mr. Cruz's electric meter reading last month was 1045 kWh, and his present electric meter reading is 1078 kWh. What is his electric for the month?
   A. 30kWh   B. 32 kWh   C. 33 kWh   D. 35 kWh

3. What is the reading indicated in the water meter?
   A. 32451 ml   C. 32451 L
   B. 32.451 cu.m.   D. 32451 cu.m

4. At the end of April, the electric meter reads 3485. At the end of May, the meter reads 3630. What is the electric consumption for May?
   A. 140 kWh   B. 145 kWh   C. 150 kWh   D.155 kWh

5. Rona reads her electric meter. The dials of the meter are shown below. What is the reading of the dials?
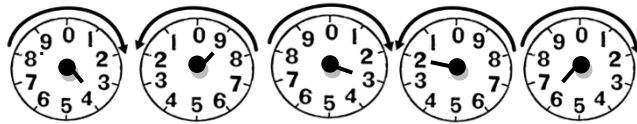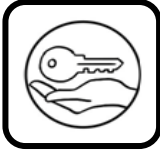

    A. 62394kWh   B. 49326kWh   C.38226   D. 64932kWh

6. The previous water reading at Martinez Residence was 2475 m³; the following month, the reading was 3658 m³. How much water was consumed in one month?
    A. 1183 m³   B. 1283 m³   C. 2183 m³   D. 2283 m³

7. Based on the problem given in number 6, if the water per cubic meter cost is   Php 1.50, how much is their water bill in one month?
    A. Php17,745.00   B. Php1,774.50   C. Php 2,774.50   D. Php3,774.50

For number 8-9. Read the problem and answer the questions below.

> On the morning of March 1, the electric meter reading was 26010 kWh. On the evening of March 31, the electric meter reading was 26165 kWh.

8. How many kilowatt-hours of electricity were used during March?
    A. 515 kWh   B.155 kWh   C.551 kWh   D.255 kWH

9. If the electricity cost is Php 5.50 per kWh, how much is the electricity cost for March?
    A. Php 852.50   B. Php 582.50   C. Php 285.50   D. Php 855.20

10. What is the average cost of electricity per day during March?
    A. Php 27.50   B. Php 72.50   C. Php 17.50   D. Php 37 .50

Answer Key

What I Know:

1. A   2. B   3. B   4. A   5. A

What's In:

1. How many cubes can be produced?
2. L=30 cm., W=20 cm., H=10 cm., 5 cm. measurement of cubes
3. What is the volume of the block of wood?
4. (length × width × height) ÷ (5³cm.)
5. 48 cubes

What's New:

00199 − 00125=74 kWh

What's More:

1. A. UNDERSTAND: What is asked?
   a. How much will Mario pay for each month?
   b. In what month did he pay the most? Least?
   c. What is the average monthly consumption?
   What are the given facts?
   3411 kWh-August, 3619 kWh- the next month.
   Php 3.00- cost of electricity per kilowatt hour.
   321 days- days in a month.
   B. PLAN
   a. subtract the August reading from the   next month reading.
   b. multiply the amount of electricity consumed by the cost of electricity per kilowatt-hour.
   c. divides the cost of electricity for a month by the number of days in a month.

Solution

a. 3619 − 3411 = 208kWh - electricity consumed in a month
b. 208 × 3.00 = Php 624 - cost of electricity in a month
c. 624 ÷ 31 = Php20.13 - the average cost per day.

2. a. 1395 present reading − 1342 previous reading = 53m³ -water used in a month
   b. 53 × 2.65 = Php 140.45 – the amount that Mr. Santos will pay in a month.

What I have Learned:

Electric meter is used to measure the amount of electricity consumed and this can be expressed in kilowatt-hour(kWh).

To read electric meter, read each dial from left to right, looking at the number where the point is. If the pointer is between numbers, get the lower numbers reading.

To read a water meter, express the reading in cubic meters(m³). The last three digits at the right show the fractions in cubic meters of water consumed.

To find the volume of water consumption, subtract the previous reading from the present reading.

What I can do:

1. 76225 kWh   2. 241125 L   3. 24.125 m3   4. 379L   5. 0.379 m3

Assessment:

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

References:

Jaime R. Burgos, Marjoseph H. Perez, and Donnel P. Placer,2016 by Vibal Group Inc. March 21 Century Mathletes 6; by Book Media press, Inc. 21-E Boni Serrano Avenue, Quezon City.

Adela C. Villamayor, Amelia D. Celeridad-Wright, and Eden C. de Joya, by Rex BookStore, Inc. Math for Life 6; by Rex Printing Company, Inc.84-86 P. Florentino St. Sta. Mesa Heights, Quezon City.

Websites

https://www.google.com/search?q=marbles+in+a+jar

https://tinyurl.com/y5stja4p