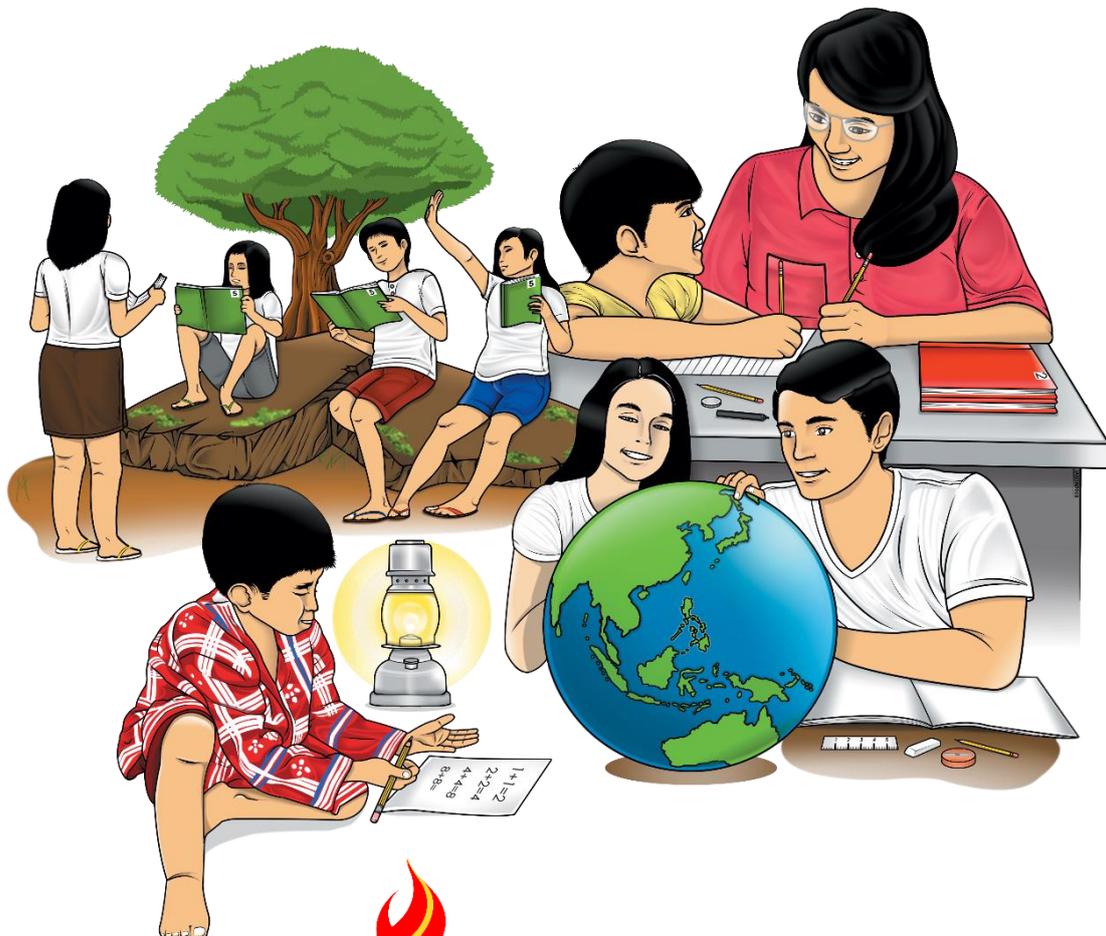


Mathematics

Quarter 2 – Module 8: Multiplying Decimals with Factors of up to 2 Decimal Places



Mathematics – Grade 5
Alternative Delivery Mode
Quarter 2 – Module 8: Multiplying Decimals with Factors of up to Decimal Places
First Edition, 2020

Republic Act 8293, Section 176 states that: No copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for the exploitation of such work for a profit. Such agency or office may, among other things, impose as a condition the payment of royalties.

Borrowed materials (i.e., songs, stories, poems, pictures, photos, brand names, trademarks, etc.) included in this book are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use these materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

Published by the Department of Education
Secretary: Leonor Magtolis Briones
Undersecretary: Diosdado M. San Antonio

Development Team of the Module

Writer: Marjury Ivy M. Tequin
Editors: Maria Niann L. Atis, Sarah May M. Balan, and Ramil R. Magdua
Reviewers: Renato S. Cagomoc, Rolando Lacbo, Joshua Sherwin T. Lim,
Eunilaine M. Serrato, and Maria Teresa Rabanos
Illustrator: Razle L. Jabelo
Layout Artist: Joey Sustituto
Management Team:
Ramir B. Uytico
Arnulfo R. Balane
Rosemarie M. Guino
Joy B. Bihag
Ryan R. Tiu
Sarah S. Cabaluna
Thelma Cabadsan-Quitilig
Elena S. De Luna
Renato S. Cagomoc
Noel E. Sagayap
Geraldine P. Sumbise
Joshua Sherwin T. Lim

Printed in the Philippines by

Department of Education – Region VIII

Office Address: DepEd Regional Office No. 8
Candahug, Palo, Leyte

Telefax: 053 – 832-2997

E-mail Address: region8@deped.gov.ph

5

Mathematics

**Quarter 2 – Module 8:
Multiplying Decimals
with Factors of up to
2 Decimal Places**

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 for you 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 on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for 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 on 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, and read the instructions carefully before performing each task.

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

Good luck and happy learning!



What I Need to Know

Hello, mathletes!

In this module, you are going to test your ability to understand multiplying decimals with factors of up to 2 decimal places. Remember that in multiplying decimal numbers, we multiply the numbers the way we multiply whole numbers and then we count the number of decimal places in the factors.

This module comprises two lessons: the first one is multiplying decimals with factors having 1 decimal place, and the second lesson is multiplying decimals with factors having 2 decimal places.

After going through this module, you are expected to:

1. state the steps in multiplying decimals;
2. perform the indicated operation with utmost accuracy; and
3. multiply decimals with factors up to 2 decimal places.

(M5NS – IId – 111.2)



What I Know

Directions: Encircle the letter of the correct answer. Use a separate sheet of paper.

1. What is the process of finding the product of two numbers?
A. addition B. multiplication C. division D. subtraction
2. What do we call the answer to multiplication?
A. sum B. difference C. product D. quotient
3. When you multiply 1.0 by 5.2, what is the answer?
A. 1.50 B. 2.50 C. 5.00 D. 5.20

4. What is the answer to this equation: $3.4 \times 1.2 = ?$
- A. 4.00 B. 4.08 C. 4.80 D. 8.40
5. Find the product of multiplying 0.45 by 3.1.
- A. 1.395 B. 1.953 C. 13.59 D. 15.93
6. What is 0.15 multiplied by 0.12?
- A. 0.0180 B. 0.1080 C. 0.1180 D. 1.0180
7. What is the product of 3.24 and 1.21?
- A. 3.4209 B. 3.8409 C. 3.9204 D. 3.9420
8. When you multiply 7.31 and 3.12, what would be the product?
- A. 20.2872 B. 20.7280 C. 22.0782 D. 22.8072
9. Rico spends P25.75 for snacks per week. How much would 5.5 weeks of snacks cost?
- A. P140.25 B. P140.625 C. P141.50 D. P141.625
10. My mother bought chicken in the market for P160.00 per kilogram. How much will she be paying for 1.25 kilogram of chicken?
- A. P180.00 B. P200.00 C. P220.00 D. P250.00

Lesson

1

Multiply Decimals with Factors Having 1 Decimal Place

In multiplying decimal numbers, we simply multiply the numbers the way we multiply whole numbers. To finalize the product, count the number of decimal places in the factors. The sum of the number of decimal places in the factors is equal to the number of decimal places in the product.



What's In

In the previous module, you have learned how to multiply decimals of up to 2 decimal places by 1 to 2-digit whole numbers.

In multiplying decimals, we follow these rules:

Step 1: Multiply the decimals just as if multiplying whole numbers. Line up the numbers on the right (do not align the decimal points). Multiply all the digits in the multiplicand from right to left by each digit in the multiplier. Regroup if necessary

Step 2: Then, add the partial products.

Step 3: Determine the number of decimal places in the product by counting the number of decimal places of the factors.

Now, let us apply the rules using an example.

Find the product of 0.73 and 6.

In multiplying these numbers, we multiply like we are multiplying whole numbers. So, we have

Step 1:

$$\begin{array}{r} 0.73 \\ \times 6 \\ \hline \end{array} \quad \longrightarrow \quad \begin{array}{r} 73 \\ \times 6 \\ \hline 438 \end{array}$$

Since we have only one-digit multiplier, we can skip **Step 2**.

Step 3: Then, we count the number of decimal places in the factors. As you can see in the solution above there are 2 decimal places in the factors. So, we count also 2 decimal places from the right of the product and put the decimal point.

Count the number of decimal places in the factor.

$$\begin{array}{r} 0.73 \\ \times 6 \\ \hline 4.38 \end{array} \quad \leftarrow \quad 2 \text{ decimal places}$$

Thus, we got the answer **4.38**.



What's New

From the previous lesson, you were taught how to multiply decimals with whole numbers. In this lesson, we will deal with multiplication of decimals with 1 decimal place.

Let's do some cooking. Have you tried cooking at home, or at least helped your mother in the kitchen while cooking, especially during this lockdown?

Let us take the word problem below.

Celia's mother went to the market to buy pork for her sweet and spicy adobo recipe. She bought 1.5 kilograms of pork. How much will she pay if the pork costs P180.00 per kilogram?



While you are pondering upon how to solve the word problem above, we will continue first with the rest of the exercises and activities in this module for you to gain more understanding. And later on, you will be able to solve the same word problems on your own.



What Is It

Refer to the sample word problem above. Let us follow the steps in multiplying decimals with factors having 1 decimal place.

Step 1: To multiply decimals, multiply the numbers the way we multiply whole numbers. Regroup if necessary.

Step 2: Then, add the partial products.

Solution:

$$\begin{array}{r} \text{Php } 180 \\ \times 1.5 \\ \hline \end{array} \quad \longrightarrow \quad \begin{array}{r} \text{Php } 180 \\ \times 15 \\ \hline 900 \\ 180 \\ \hline \end{array}$$

1 decimal place 2700

Step 3: Count the number of decimal places in the factors. In our sample word problem, notice that there is only 1 decimal place in the factor. That is why we also count 1 decimal place from the right of the product and we put the decimal point.

Thus, the answer to the problem above is **P 270.00**.

Another example:

Multiply 0.15 by 0.7

Step 1: To multiply decimals, multiply the numbers the way we multiply whole numbers. Regroup if necessary.

Solution:

$$\begin{array}{r} 0.15 \\ \times 0.7 \\ \hline \end{array} \quad \longrightarrow \quad \begin{array}{r} 15 \\ \times 7 \\ \hline 105 \end{array}$$

Since we have only one-digit multiplier, we can skip **Step 2**.

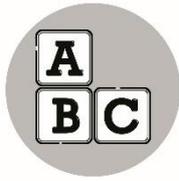
Step 3: Count the number of decimal places in the factors. As you can see in the solution above there are 3 decimal places in the factors. So, we also count 3 decimal places from the right of the product and put the decimal point.

Count the number of decimal places in the factor.

$$\begin{array}{r} 0.15 \\ \times 0.7 \\ \hline 0.105 \end{array} \quad \leftarrow \quad 3 \text{ decimal places}$$

Note that in this kind of solution wherein there is no whole number in the product, we place zero (0) before the decimal because zeros are used as an insignificant place holder to the left of significant digits if the number is a decimal.

Thus, we got the answer **0.105**.



What's More

Independent Activity 1

Directions: In each item, the factors are already multiplied, but their products have no decimal points. Put the decimal point in its proper place in every given product. An example is given as your guide.

Example: $2.3 \times 1.2 = 2.76$

1) $2.3 \times 3.7 = 851$

2) $0.37 \times 2.3 = 0851$

3) $1.34 \times 1.2 = 1608$

4) $0.16 \times 0.3 = 0048$

5) $1.87 \times 0.2 = 0374$

Independent Activity 2

Directions: Multiply the following. Show the solution and the step-by-step process in multiplying decimals with factors having 2 decimal places. Refer to the previous parts of the lesson for your reference.

1) 3.2×0.9

2) 5.4×0.3

3) 9.3×0.2

4) 4.7×1.5

5) 7.2×0.04

Independent Activity 3

Directions: Find the product. Show your solution on a separate sheet of paper.

1)
$$\begin{array}{r} 3.62 \\ \times 0.9 \\ \hline \end{array}$$

2)
$$\begin{array}{r} 73.04 \\ \times 0.2 \\ \hline \end{array}$$

3)
$$\begin{array}{r} 4.34 \\ \times 0.4 \\ \hline \end{array}$$

4)
$$\begin{array}{r} 0.02 \\ \times 0.5 \\ \hline \end{array}$$

5)
$$\begin{array}{r} 4.27 \\ \times 0.8 \\ \hline \end{array}$$

Lesson

2

Multiply Decimals with Factors of up to 2 Decimal Places



What's In

In lesson 1, you were taught how to multiply decimals with multipliers having only 1 decimal place. In this lesson, we will deal with multiplication of decimals whose multipliers are in 2 decimal places.

Multiplying decimals may sound difficult; however, it is no different from multiplying whole numbers. The same rules apply, just like in the first part of this module. But in this part of the module, you will learn new strategies in multiplying decimals, such as interpreting multiplication of a decimal by another decimal as taking a fractional part of a decimal number (the symbol \times translates to "of").

Example: 0.1×80 means finding one-tenth "of" 80. That is simply 8. Now, you may be asking how? Proceed to the next part to understand more.



What's New

Let's take this word problem.

Francis wants to paint 0.80 part of their newly installed walls at home. In the first day, he only finished 0.40 part of his goal. What part of the wall did Francis was able to paint?





What Is It

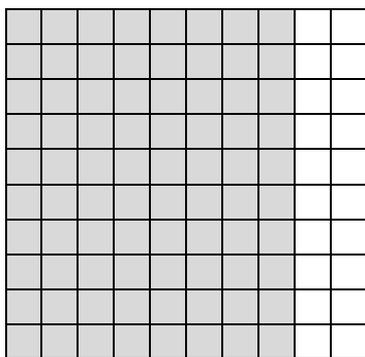
In this lesson, you will learn multiple strategies on how to multiply decimals by decimals with factors of up to 2 decimal places in the easiest and fun way. Just follow through patiently and correctly.

Note: Let us go back to the word problem on the part of the wall Francis was able to paint. We can use different strategies in solving this problem. The strategies are shown below.

To answer what is asked in the problem, find 0.40 of 0.80.

Strategy 1: Pictorial Models

Using pictorial models (grids and area models), we can multiply decimals. The area where the shading overlaps shows the product of the two decimals.

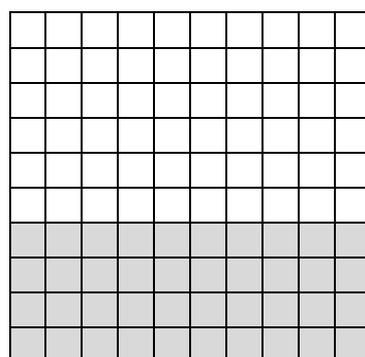


80 out of 100 blocks are shaded.
Therefore, it is

$$\frac{80}{100} \text{ OR } \frac{8}{10}$$

0.80

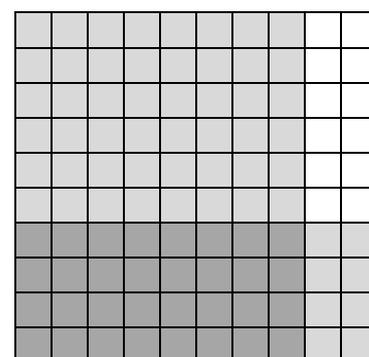
x



40 out of 100 blocks are shaded.
Therefore, it is

$$\frac{40}{100} \text{ OR } \frac{4}{10}$$

0.40



The darkest-shaded blocks show $\frac{32}{100}$

Thus, 0.32 is the answer.

= 0.3200 or 0.32

Answer: Francis painted 0.32000 or 0.32 part of the wall during the first day.

Take note that the zeros (0) after the non-zero digits in the decimal were dropped. It is simply because the zeros that occur at the end of a decimal number are called trailing zeros and dropping zeros in that case does not change the number's value. Therefore, the answer is **0.32**.

Strategy 2: Long Multiplication

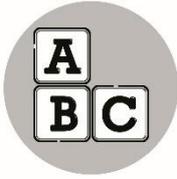
We simply multiply 0.80 and 0.40 following the general strategy of multiplication. Line up the numbers on the right (do not align the decimal points). Multiply all the digits in the multiplicand from right to left by each digit in the multiplier. Multiply the factors just like we are multiplying whole numbers.

Solution:

$$\begin{array}{r} 0.80 \longrightarrow 2 \text{ decimal places} \\ \times 0.40 \longrightarrow 2 \text{ decimal places} \\ \hline 000 \\ 320 \\ + 000 \\ \hline 0.3200 \quad 4 \text{ decimal places} \end{array}$$

Notice that there are 2 decimal places in the multiplicand and 2 decimal places in the multiplier as well. So, there are 4 decimal places in all. Then, we count 4 decimal places starting from the right of the product and put the decimal point after the fourth digit.

Thus, $0.80 \times 0.40 = \mathbf{0.3200}$ or $\mathbf{0.32}$.



What's More

Activity 1

Directions: The following decimals are already solved for you. All you have to do is place the decimal point in its proper place in every product. An example is given as your guide. Use a separate sheet for all your answers.

Example: $1.3 \times 0.22 = 0.286$

- 1) $2.35 \times 3.6 = 8460$
- 2) $0.37 \times 2.3 = 0851$
- 3) $6.49 \times 1.5 = 9735$
- 4) $0.58 \times 0.32 = 01856$
- 5) $9.23 \times 0.17 = 15691$

Activity 2

Directions: Complete the table. The first one is done for you.

X	0.12	0.35
Example: 1.20	0.1440	0.4200
1) 8.45		
2) 5.32		
3) 0.93		
4) 0.25		
5) 8.47		

$$\begin{array}{r} 1.20 \times 0.12 = \\ 0.1440 \end{array}$$

$$\begin{array}{r} 1.20 \times 0.35 = \\ 0.4200 \end{array}$$

Activity 3

Directions: Find the product. Show your step-by-step solution.

$$\begin{array}{r} 1) \quad 3.42 \\ \times 0.19 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 65.04 \\ \times 0.23 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 4.36 \\ \times 0.05 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 0.62 \\ \times 0.08 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 4.84 \\ \times 0.07 \\ \hline \end{array}$$



What I Have Learned

After studying this module, make a generalization by answering the question:

1. What are the steps in multiplying decimals?

Step 1: _____

Step 2: _____

Step 3: _____

2. What other things have you learned in this module?



What I Can Do

Now let's try to solve problems that we usually encounter in our daily living, with the application of your learning in multiplying decimals with factors of up to 2 decimal places.

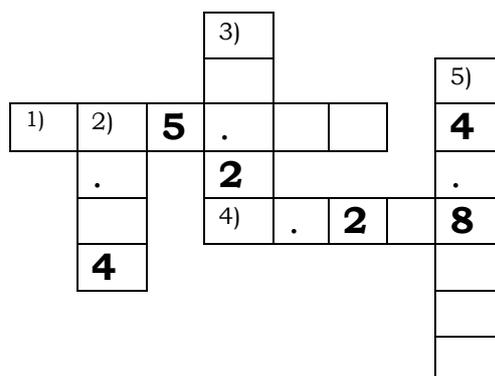
Directions: Solve the following situations. On a separate sheet of paper, copy or draw the puzzle below so you can write your answers accurately.

Across:

- Clyde's personal van gets 24.8 miles per gallon on the highway. If his fuel tank holds 10.3 gallons, how far can he travel on one full tank of gas?
- Find the product of 4.65 and 1.12.

Down:

- Multiply 3.56×1.5
- Nicole read her book for 2.5 hours every day for 4.5 days. How many hours did she spend in reading her book?
- What is 6.31 multiplied by 2.35?



How was the lesson so far? Have you already mastered the multiplication of decimals? Let's try to check what you have gained so far. Please be ready with a pen and an extra sheet of paper for the next activity. Answer it with utmost honesty and refrain from checking the answers key while answering to have a full assessment of yourself.



Assessment

Directions: Read and answer the items below. Encircle the letter of the correct answer.

1. What is the answer when you multiply 5.31 by 5.02?
A. 26.5622 B. 26.5662 C. 26.6562 D. 26.6665
2. Solve for the product of 3.71 and 8.31.
A. 30.1038 B. 30.3081 C. 30.8103 D. 30.8301
3. Find the product of 6.93 and 3.51.
A. 24.3243 B. 24.3324 C. 24.3342 D. 24.3423
4. Give the product of 6.45 multiplied by 3.56.
A. 21.629 B. 21.962 C. 22.269 D. 22.962
5. When 8.91 is multiplied by 1.32, what would be the product?
A. 10.1267 B. 10.7612 C. 11.1267 D. 11.7612
6. What would be the product of 0.36 when multiplied by itself?
A. 0.1169 B. 0.1196 C. 0.1296 D. 0.1299
7. Carlo sells a mango for Php 60.31 per kilo. In a day, he sold 8.3 kilos. How much did he earn?
A. P500.573 B. P500.75 C. P501.503 D. P501.753
8. When multiplying decimals with factors of up to 2 decimal places, where do we start counting to place the decimal point properly?
A. right B. left C. top D. bottom
9. When multiplying decimals, **Step # 2** is simply skipped if the multiplier is one-digit only. Is the statement True or False?
A. False B. True C. Maybe D. I have no idea
10. What shall we do with the partial products after multiplying decimals with factors of up to 2 decimal places?
A. divide B. multiply C. subtract D. add



Additional Activities

Directions: Read and analyze each word problem. Then solve for the answer.

1. Karen went to a school supplies store to buy notebooks. She bought 8 notebooks at Php25.75 each. How much will she pay for the notebooks?
2. Mang Andres bought 2.75 kilograms of chicken. He placed 0.5 of it in the refrigerator and cooked the rest. How many kilograms of chicken did he refrigerate?
3. A curtain has a measurement of 1.83 meters and 3.25 meters. Give the total area that it can cover.
4. Ethan rode his bike at 2.36 kilometers per hour. How many kilometers will he travel in 3.5 hours?
5. Carina was asked by her mother to go to a store to buy rice. She bought 3.5 kilograms of rice for P45.50 per kilogram. How much will she pay to the cashier?



Answer Key

What's More (Lesson 1)
Independent Activity 2

1. 3.2×0.9
Step 1: $32 \times 9 = 288$
Step 2: There is a total of 2 decimal places in the factors.
Step 3: 2.88
Step 4: Thus, $3.2 \times 0.9 = 2.88$.
2. 5.4×0.3
Step 1: $54 \times 3 = 162$
Step 2: There is a total of 2 decimal places in the factors.
Step 3: 1.62
Step 4: Thus, $5.4 \times 0.3 = 1.62$.
3. 9.3×0.2
Step 1: $93 \times 2 = 186$
Step 2: There is a total of 2 decimal places in the factors.
Step 3: 1.86
Step 4: Thus, $9.3 \times 0.2 = 1.86$.
4. 7.05
5. 0.288

What I Know

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

LESSON 1
What's More
Independent Activity 1

1. 8.51
2. 0.851
3. 1.608
4. 0.048
5. 0.374

What's More (Lesson 1)
Independent Activity 3

1. 3.258
2. 14.608
3. 1.736
4. 0.010
5. 3.416

LESSON 1

LESSON 2

<p style="text-align: center;">Assessment</p> <ol style="list-style-type: none"> 1. C 2. D 3. A 4. D 5. D 6. C 7. A 8. A 9. B 10. D 	<p style="text-align: center;">What's More (Lesson 2)</p> <p style="text-align: center;">Activity 3</p> <ol style="list-style-type: none"> 1. 0.6498 2. 14.9592 3. 0.218 4. 0.0496 5. 0.3388 	<p style="text-align: center;">What's More (Lesson 2)</p> <p style="text-align: center;">Activity 1</p> <ol style="list-style-type: none"> 1. 8.460 2. 0.851 3. 9.735 4. 0.1856 5. 1.5691
<p style="text-align: center;">What I Can Do</p>	<p style="text-align: center;">What I Have Learned</p> <p>Step 1: Multiply the decimals just as if multiplying whole numbers.</p> <p>Step 2: Then, add the partial products.</p> <p>Step 3: Determine the number of decimal places in the product by counting the number of decimal places of the factors.</p> <p>Answers to the second question may vary.</p>	
<p style="text-align: center;">Additional Activities</p> <ol style="list-style-type: none"> 1. P206.00 2. 1.375 kg 3. 5.9475 m² 4. 8.26 km 5. P159.25 	<p style="text-align: center;">What's More (Lesson 2)</p> <p style="text-align: center;">Activity 2</p> <ol style="list-style-type: none"> 1. 1.014 2. 0.6384 3. 0.1116 4. 0.0300 or 0.030 5. 1.0164 	

References

Department of Education. n.d. *Mathematic 5: Teacher's Guide*. Philippines: Department of Education.

Ursua, Alvin C. and Lumbre, Angeline P. (2016). *21st Century MATHletes Textbook*. Quezon City: Vibal Group Inc.

Villamayor, Adela C., Celeridad-Wright, Amelia D. and De Joya, Eden C. (2017). *Math for Life Worktext in Mathematics*. Quezon City: Rex Book Store Inc.

For inquiries or feedback, please write or call:

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex, Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: blr.lrqad@deped.gov.ph * blr.lrpd@deped.gov.ph