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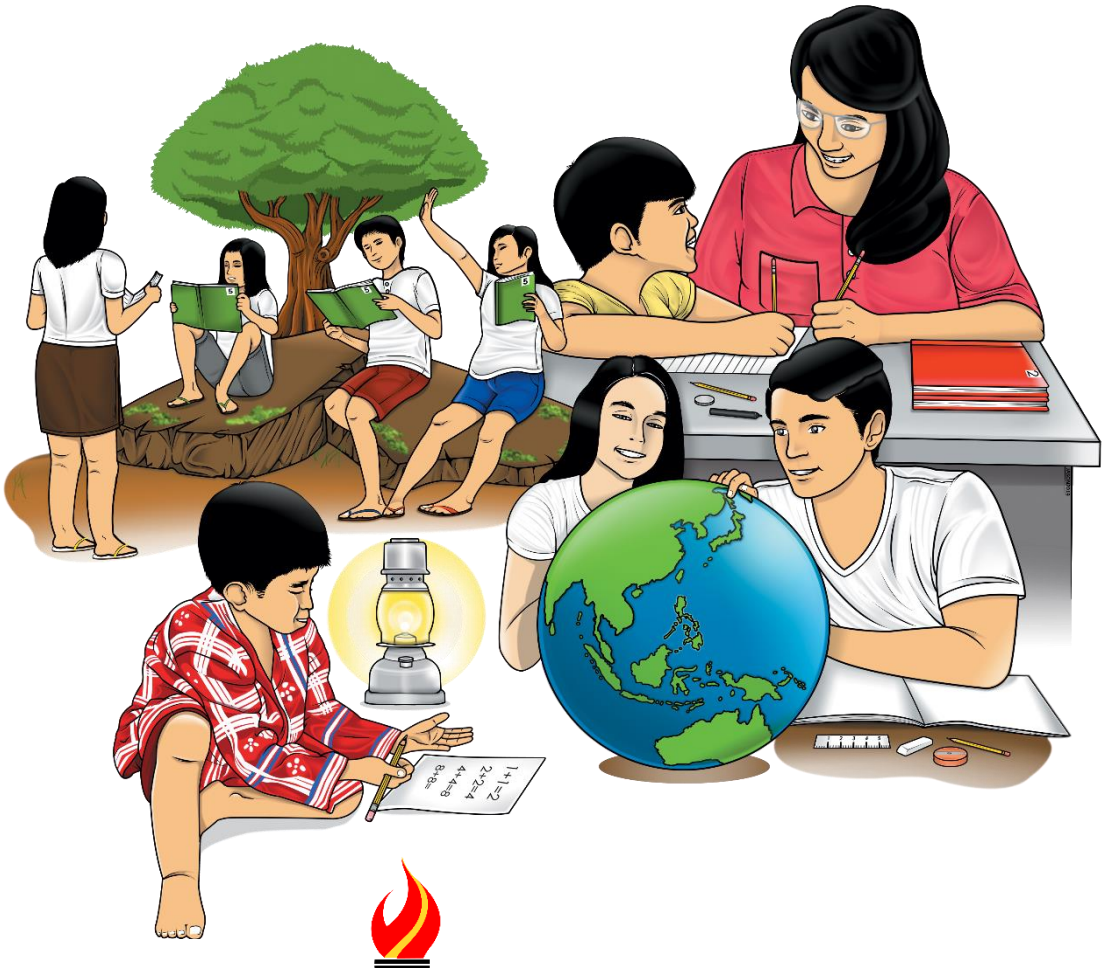
Mathematics

Quarter 2 – Module 13: Solving Problems Involving Division of Decimals and Whole Numbers



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 2 – Module 13: Solving Problems Involving Division of Decimals and Whole Numbers
First Edition, 2020

Published by the Department of Education
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Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by
Department of Education – Region VIII
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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

Hi, Mathletes! This module was designed and written with you in mind. It is here to help you gain understanding and test your ability in solving routine and non-routine problems involving division with or without any of the other operations of decimals and whole numbers including money using appropriate problem-solving strategies and tools.

At the end of this module, you will be able to:

- solve routine and non-routine problems involving division with or without any of the other operations of decimals and whole numbers including money using appropriate problem- solving strategies and tools.

What I Know

Directions*:* Solve each word problem. Round off your answer to the nearest hundredths. Choose the letter of the correct answer.

1.) Martin bought a piece of ribbon 3.6 m long. He cut it into pieces of 0.4 m each. How many pieces did he make?
A) 5.90 B) 8.60 C) 9 D) 10.50

2.) Mang Tomas has 12.5 hectares of land. He wants to divide it into 2.5 hectares each for his sons. How many sons does Mang Tomas have?
A) 3 B) 4 C) 5 D) 6

3.) The total weight of red beans is 7.8 kilograms. If each pack of red beans is 0.65 kilograms, how many packs of red beans are there in all?
A) 12 B) 12.14 C) 12.16 D) 13

4.). Elena has a piece of wood that is 8.25 feet in length. She needs to cut it into pieces that are 0.75 feet in length. How many pieces can she cut from the piece of wood?
A) 8 B) 9 C) 10 D) 11

5.) At a department store, men's socks sell at 3 pairs for ₱97.50. How much does each pair of socks cost?
A) ₱23.50 B) ₱31.50 C) ₱32.50 D) ₱ 33.50

6.) When answering word problems, we read carefully and understand what the problem is all about. After reading and understanding the problem, what would be the next step to do?
A.) Find or develop a formula
B.) Draw a diagram
C.) Figure out exactly what the problem is asking for.
D.) Solve right away.

7.) Paul is a construction supervisor. He works for 9.5 hours and earns ₱1 472.50 per day. How much was his hourly rate? In this word problem, what is being asked?
A.) Paul's monthly salary
B.) Paul's daily rate
C.) Paul's pay per hour
D.) Paul's job description

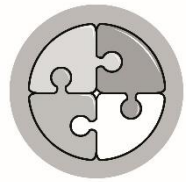
8.) After solving the Math equation in a word problem, what do you do next?
A.) Verify if the answer is correct.
B.) Choose the operation to use.
C.) Determine what is asked.
D.) Replace numbers in word form into digits.

9.) Word problem may include facts that don't help you find the solution. They are there to test your ability in comprehension and attention to what is really needed in solving for the correct answer. What do you think is the best way to deal with these facts included in the problem?
A.) Pay attention to units of measurement.
B.) Find or develop a formula.
C.) Use a calculator.
D.) Eliminate excess information.

10.) A case of 12 bottles of juice contains a total of 16.32 liters. How much does each bottle hold? In this problem, what is the operation to be used?
A.) addition B.) division C.) subtraction D.) multiplication

Lesson 1 Solving Problems Involving Division of Decimals and Whole Numbers

In order to solve routine and non-routine problems involving division with or without any of the other operations of decimals and whole numbers, you need to master the skills on dividing decimals and whole numbers, dividing whole numbers with quotients in decimal form and most importantly understanding word problems. All of these will help you gain understanding of the concept of the lesson. Let's get started.



What's In

In the previous modules, you have learned how to **Divide Decimals with Whole Numbers**. Let's check if you can still recall it.

In dividing decimals with whole numbers, the following steps are to be considered:

Step 1: Divide just like dividing whole numbers. Continue dividing until the difference is equal to zero.

Step 2: Now put the decimal point in the answer directly above where the dividend's decimal point is placed.

Step 3: Check. Multiply the quotient and the divisor. The product must be equal to the dividend.

Applying the steps:

Find the quotients of the following problems. Number 1 is done for you.

1. $3.6 \div 4 =$ 2. $0.56 \div 7 =$ 3. $9.3 \div 3 =$

Solution for number 1.

$$
\begin{array}{r}
0.9 \\
4\overline{)3.6} \\
0 \\
\hline
36 \\
36 \\
\hline
0
\end{array}
$$

4. $0.25 \div 5 =$ 5. $0.8 \div 2 =$

To Check:

$$
\begin{array}{r}
0.9 \\
\times \quad 4 \\
\hline
3.6
\end{array}
$$

Notes to the Teacher

You may provide your learners other technique/formula which is applicable as long as they would be able to arrive at the correct solution /answer.

Other related concept can also be introduced for better understanding of this lesson.

What's New

From the previous lessons, you were taught on how to divide whole numbers with quotients in decimal form. In this lesson, we will deal with solving problems involving division of decimals and whole numbers. And just as there is a correct way to divide whole numbers with quotients in decimal form, there is a correct way as well on how to divide decimals and whole numbers involved in a word problem.

.

Activity 1: Read and comprehend the problem.

> Mang Estong operates a computer shop. Elmer is one of his regular customers and usually pays ₱128.80 for 4 hours of surfing the Internet for his projects and assignments. How much is the hourly rate at Mang Estong's shop?

What Is It

In solving a word problem, all you need to remember and strictly observe is the Four-Step Method below.

1.) **Understand**
- Know what is asked.
- Identify the relevant facts.

2.) **Plan** – Choose the operation or the formula to use.

3.) **Solve** – Perform the strategy.

4.) **Check** - Verify if the answer is correct.
- State the complete answer.

Let's go over with the word problem from Activity 1, following the steps:

Step 1: **Understand**

● Know what is asked. *The hourly rate at Mang Estong's computer shop*

Note: To know what is being asked in a word problem, all you have to do is to focus and analyze on the last statement of the problem that is in question form.

● Know the given facts*. ₱128.80.40; 4 hours*

Note: These are the important information you need to pick-up in a word problem and usually the ones that are needed to solve the problem. These can be presented in a digit or word form.

Step 2: **Plan**

●Determine the operation or formula to use: *Division*

Note: In the sample word problem, it is given that the total amount being paid by Elmer for 4 hours at Mang Estong's computer shop totaled to ₱128.80. So, to know the hourly rate of the shop, the total amount paid should be divided equally into four. That explains why we need to use division for the operation.

Step 3: **Solve**

- Show how the solution is done.

Amount paid for 4 hours of Internet usage (₱ 128.80) ÷ 4 hours
= Rate per hour

₱ 128.80 ÷ 4 = **₱32.20** hourly rate at Mang Estong's computer shop

Step 4: **Check and Look Back**

- You can use a calculator to check your answer.
- State the complete answer.

Therefore, the rate per hour at Mang Estong's computer shop is **₱32.20**.

What's More

Directions: Solve the following problems. Make use of the steps provided in the previous part of this lesson for your guided practice. Supply the missing parts of the steps. Round off your answer to the nearest hundredths.

Note that when rounding off decimals, if that digit is less than 5, do not change the rounding digit but drop all digits to the right of it. If that digit is greater than or equal to five, add one to the rounding digit and drop all digits to the right of it.

1.) A group of 30 pupils signed up for a weekend computer course. They paid a total of ₱425.50. How much did each pupil pay?

What is asked: _____.

Given facts: ₱425.50 total amount of the computer course and 30 pupils

Operation to use: Division

Number sentence: ₱425.50 ÷ 30 = ₱14.18 each pupil paid for the weekend computer course

Final answer: _____

2.) In an EPP class, Jian made 8 hamburgers for lunch, using 1.36 kg of ground beef. How much ground beef was in each hamburger?

What is asked: The amount of ground beef in each hamburger

Given facts: _____

Operation to use: Division

Number sentence: _____

Final answer: Therefore, the amount of beef per hamburger is 0.17 kg.

3.) Mrs. Villaflor had 0.81 meters of gold ribbon which she cut into pieces. If each piece measured 0.09 meters how many pieces of ribbons were cut?

What is asked: The number of pieces of ribbons being cut

Given facts: 0.81 meters of gold ribbon and 0.09 meters each piece

Operation to use: _____

Number sentence: _____

Final answer: Therefore, the pieces of ribbons that were cut are 9 pieces.

4.) The Boy Scouts planted Narra trees along a 0.90 km river bank. For every 0.05 km distance, a Narra tree seedling is planted. How many seedlings were planted along the riverbank?

What is asked: The number of seedlings planted along the riverbank

Given facts: _____

Operation to use: Division

Number sentence: 0.90÷ 0.05 = 18 tree seedlings planted

Final answer: _____**.**

5.) Mrs. Alvin bought 7 mangoes for ₱59.50. How much did each mango cost?

What is asked: _____.

Given facts: ₱59.50 cost of 7 mangoes

Operation to use: _____

Number sentence: ₱59.50 ÷ 7 = ₱8.50 each mango

Final answer: Therefore, the cost of each mango is ₱8.50.

What I Have Learned

To solve the word problem, use the Four-Step Method:

1.) **Understand**
- Know what is asked.
- Identify the relevant facts.

2.) **Plan** – Choose the operation or the formula to use.

3.) **Solve** – Perform the strategy.

4.) **Check** - Verify if the answer is correct.

- State the complete answer.

What I Can Do

Directions: Solve the following problems. Round off your answer to the nearest hundredths. Number 1 is done for you.

1) If a car travels a distance of 186.15 kilometers (km) in 4 hours (h), what is its average speed?

Solution: *186.15 km ÷ 4 h* ***= 46.5375 or 46.54 km/h***
Answer: 46.54 km/h

2.) Five student organizations made a profit of ₱3,387.60 in their last fund-raising project. If they shared the earnings equally, how much did each organization receive?

3.) At a department store, men's socks sell at 6 pairs for ₱172. 50. How much does each pair of socks cost?

4.) A bathroom is 3.4 meters long and 2.8 meters wide. How many square tiles with 2 dm on each side are to be used to cover it?

5.) Francis delivers an average of 20 kilograms of fish to the market daily. If he earns ₱ 4,588.50 a week, how much is his daily income assuming that he works 7 days a week?

Assessment

Directions: Solve the following problems. Choose the letter of the correct answer.

1.) Tarrayo's Family has a catering business. In one birthday party, they charged their customer ₱12,784.80 for a party of 80 persons. How much is the cost per person?
A.) ₱ 149.81 B.) ₱ 159.81 C.) ₱169.81 D.) ₱ 195.81

2.) Rannie bought 5 black leather belts for ₱ 567.50. How much did each belt cost?
A.) ₱ 112.50 B.) ₱113.50 C.) ₱115.30 D.) ₱133.12

3.) A digital camera can take pictures every 0.08 second. How many pictures can it continuously take in 4.8 seconds?
A.) 40 B.) 50 C.) 55 D.) 60

4.) An electrician's apprentice earns ₱ 8.75 per hour. If he earned ₱415.65 last week, then about how many hours did he work?
A.) 47 B.) 47.50 C.) 48.75 D.) 51

5.) A four-person relay team completed a race in 78.4 seconds. On average, what was each runner's time?
A.) 19.6 B.) 21.13 C.) 24.4 D.) 30.12

6.) Darwin cut strips of papers with 0.25 dm wide from a sheet of 1.50 dm wide. How many strips of papers did Darwin cut?
A.) 12 B.) 10 C.) 9 D.) 6

7.) A nutritionist poured 0.70 L of honey into 14 L plastic cups. Find the number of plastic cups filled.
A.) 18 B.) 20 C.) 30 D.) 35

8.) A rectangular rice field is 0.40 km wide and has an area of 2.80 sq. km. Find the length of the field.
A.) 21 B.) 13 C. 7 D.) 5

9.) A city government plans to put streetlights along its 88 km main road. The streetlights are to be placed 0.22 km apart from each other. How many streetlights will the city government need?

A.) 543 B.) 444 C.) 400 D.) 300

10.) A bamboo pole of 0.80 m long was cut into pieces, each measured 0.05 meters long. How many pieces of bamboo were cut?

A.) 38 B.) 23 C. 18 D.) 16

Additional Activities

Directions: Match the quotient in column **B** with the word problem in a column **A**

A	**B**
1.) Mary has a piece of ribbon that is 4.5 meters long. She wants to cut it into pieces that are 0.25 meters long. How many pieces of ribbons will she have?	A.) 24
2.) One inch is equivalent to 2.54 centimeters. How many inches are there in 50.8 centimeters?	B.) 38
3.) Julie has 9.6 pounds of trail mix to divide into 12 bags. How many pounds of trail mix will go in each bag?	C.) 18
4.) A necklace is being made with beads that are 1.25 centimeters in diameter each. The necklace is 30 centimeters long. How many beads are needed?	D.) 0.8
5.) The longest vehicle tunnel in the world is the Laerdal Tunnel in Norway with a length of 15.2 miles. How many vehicles could fit in the tunnel bumper to bumper in one lane, if the length of the average vehicle is 0.4 mile?	E.) 20
	F.) 1.8

Answer Key

Assessment

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

What I Know

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

What I Can Do

1. ₱ 46.54
2. ₱ 677.52
3. ₱ 28.75
4. 238
5. ₱ 655.50

What's In

1. 0.9
2. 0.08
3. 3.1
4. 0.05
5. 0.4

Additional Activities

1. C
2. E
3. D
4. A
5. B

What's More

1. The amount each pupil paid for the computer course; P14.18

2. ₱1.36 kg of ground beef; 8 hamburgers and 1.36kg /8 =

3. Division; 0.81÷ 0.09 = 9 pieces of ribbon

4. 0.90 km river bank and 0.05 km distance; Therefore, there were 18 tree seedlings planted along the riverbank.

5. Division; The cost of each mango

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