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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 1
Lesson
6

Lesson Exemplar for Mathematics Grade 7
Quarter 1: Lesson 6 (Week 6)
SY 2024-2025

Development Team

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MATHEMATICS / QUARTER 1 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners demonstrate knowledge and understanding of use of rates.
B. Performance Standards	By the end of the quarter, the learners are able to use percentages in different contexts (NA).
C. Learning Competencies and Objectives	**Learning Competency:** 1. Identify and explain the uses of rates. 2. Solve problems involving rates. **Learning Objectives:** 1. Define, identify, and give examples of rates. 2. Explain the uses of rates. 3. Express rate as unit rate. 4. Solve problems involving rates (e.g. speed)
D. Content	Uses of Rates and Word Problems Involving Rates
E. Integration	Finance and Economics

II. LEARNING RESOURCES

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** *For Sub-topic 1*: **Would You Rather...?.** Choose the things that you want/prefer more than the other and justify your answer. Would you rather… … have more time or more money?	The intention of Activity 1 is to help the learners think critically and at the same time give them a sense about rates.

	… work for more hours per day but fewer days, or work fewer hours per day for more days? … get rich through hard work or by winning the lottery? … get unlimited gift certificate to a restaurant or a clothing store? … let your kids wear a uniform to school or clothing of their choice? … spend the next year exempt from all taxes or have a one-month paid vacation? … buy 1 take 1 or buy 2 and get 50% on the third 1? … buy 2 get 1 free or 50% off? … buy 3 for Php 100 or buy at Php33 each? … buy 1L for Php300 or 3 pcs. of 350mL for Php120 each? **Guide Questions:** 1. How did you find the activity? 2. Were you able to answer the given problem logically? 3. Can you explain the importance of this activity in real life? **2. Feedback (Optional)**	You can use online educational platforms like Quizziz, Kahoot, etc. to make the review of lowest term of ratio interactive. If internet connection and devices are pressing challenges, revert to group competitions. Provide "Show-Me Boards" for group answers. The purpose of this activity is to prepare the learners in converting rates to unit rates.
B. Establishing Lesson Purpose	**1. Lesson Purpose** *For Sub-topic 1*: **Guess the Word.** Below are jumbled letters related to our lesson today. Guess the words and describe each. 1. ETRA 6. THGIEW 2. PEDES 7. CEPIRS 3. TREME 8. PACESS 4. OTIAR 9. SECPIE 5. MEIT 10. MGRALOKI **Guide Questions:** 1. Were you able to guess all the words correctly? 2. What have you noticed with the words in the activity? 3. What comes to your mind when you hear/read those words? 4. How are these words related to each other?	To facilitate language development, learners will answer the activity. To make this more interesting, the teacher may present it thru a game entitled "Guess the Word". After the activity, you need to emphasize that the learners will realize the relevance of these words to the lesson throughout the discussion. **Answer Key:** 1. RATE 2. SPEED 3. METER 4. RATIO 5. TIME

	2. Unlocking Content Area Vocabulary *For Sub-topic 1*: • **Ratio –** the comparison of two quantities with the same unit. • **Rate –** is a ratio comparing two quantities of different kinds of units. • **Unit Rate –** a rate for one of something. It has a denominator of 1 unit when written as a fraction. To write a rate as a unit rate, divide the numerator and the denominator of the rate by the denominator.	6. WEIGHT 7. PRICES 8. SPACES 9. PIECES 10. KILOGRAM
C. Developing and Deepening Understanding	**DAY 1** **SUB-TOPIC 1: Identifying and Explaining the Uses of Rates** **1. Explicitation** After doing and analyzing Activities 1.1, and 1.2 let the learners focus their attention on how to identify and explain the uses of rates and on how to differentiate it to ratio, which was discussed in Grade 6. **Ratio** is the comparison of two different quantities with the same unit as having 3 boys in every 5 girls, where we are just counting and comparing the number of boys to girls without using unit of measurements and, writing it in fraction $\frac{3}{5}$ or in ratio form 3 : 5 (read as 3 to 5). **Rate** is related to ratio; it is also comparing two different quantities, but these quantities have different units of measurement and, it is often expressed in fraction form. Rate is used to describe many important real-life concepts. Below are some of its examples: **2. Worked Example** Speed tells how far a vehicle, a person or a moving object covers per unit time. Example 1. Maria's car is travelling at a speed of two kilometers per hour maybe written as 2 $\frac{km}{h}$ or 2 kph Rate per piece of work done tells us the payment a person receives per unit time of work. Example 2. A minimum wage earner or a worker receives a salary of Php690.00 per day (690 $\frac{pesos}{day}$)	After the teacher had explicitly listed all "tentative" procedures the learners were able to extract from Activity 1 and 2, they can now introduce to the identification and explanation of the uses of rates. Help the learners read the unit like $\frac{km}{h}$ is kilometer per hour.

Rate in doing a piece of work tells us the amount of work a person or group of persons can accomplish per unit time.

Example 3. A secretary can type 150 letters per minute ($150\ \frac{letters}{minute}$)

Cost tells us the amount of money paid in exchange for products.

Example 4. Three candies cost two pesos ($\frac{3\ candies}{2\ pesos}$)

Discussion. The most common element in the examples above is **time**, which is the denominator in numbers 1-3. All the examples above except for number 4 are expressed in Unit Rate. Unit rates have 1 as the denominator and is often but not always expressed in whole numbers.

3. Lesson Activity

What is my Rate?

A. Instructions: Tell whether the given is a unit rate or not.
   1. Php300 per 5 liters
   2. Php43 per kilo
   3. 100 cm per meter
   4. 600 m per round
   5. 60 seeds per 3 boxes

B. Give your own example of rates and unit rates.

Guide Questions:

1. How did you find the activity?
2. Were you able to answer the given problem correctly?
3. How did you arrive at your answer to the problem?
4. Can you explain the importance of this activity in real life?

DAY 2

SUB-TOPIC 2: Expressing Rates to Unit Rates

1. Explicitation

Simplify Me! Express each ratio in simplest form. Write your answer on your answer sheet.

1. 3 out of 12
2. 40 km to 60 km
3. 18 wins out of 36 games

For Day 2:
You can use online educational platforms like Quizziz, Kahoot, etc. to make the review of lowest term of ratio interactive. If internet connection and devices are pressing challenges, revert to group competitions. Provide "Show-Me Boards" for group answers.

4. 200 words in 5 minutes
5. 300 books in 15 shelves

Guide Questions:

1. What did you do in each item/ problem?
2. How were you able to answer each problem?
3. Do you have any idea about our topic of discussion?
4. What is it? Explain further.

2. Worked Example

In converting rates to unit rates, it is important that a learner knows how to get the lowest term of a fraction or to know the greatest common factor of numerator and denominator.

Example 1 (I Do-We Do). Express them in unit rates:

Rates	Getting the Lowest Term	Unit Rates
Item No. 4 200 words in 5 minutes	Express rate to fraction $\frac{200}{5}$ GCF is 5, therefore we must divide the numerator and denominator by 5. $\frac{200\div5}{5\div5} = \frac{40}{1} = 40$	$40\ \frac{words}{minute}$ 40 words per minute
Item No. 5 300 books in 15 shelves	$\frac{300}{15}$ GCF is 15: $\frac{300\div15}{15\div15} = \frac{20}{1} = 20$	$20\ \frac{books}{shelf}$ 20 books per shelf

Example 2. (You Do). Analyze the given below and express each as unit rate.

1. Php128 per 2 liters of gasoline
2. 50 dresses in 10 hours
3. Php375 per 1 ½ hours

The purpose of this activity is to prepare the learners in converting rates to unit rates.

Note. Activity 4 should be done prior to discussing the concept of unit rates. Make sure that students understand how to simplify fractions or ratios.

Answer Key Activity 4:

1. $\frac{1}{4}$ or 1:4
2. $\frac{2}{3}$ or 2:3
3. $\frac{1}{2}$ or 1:2
4. $\frac{40}{1}$ or 40 or 40:1
5. $\frac{20}{1}$ or 20 or 20:1

I Do- We Do strategy can be employed to model how to get the unit rates. **I Do** part is for the teacher to model the process. **We Do** part is for students to model the process with partial guidance from the teacher.

Example 2 is an activity for learners. **You Do** part is for students to model the process without teacher guidance.

4. 5 packs for Php200
5. 5 rooms for 20 members

DAY 3

SUB-TOPIC 3: Solving Problems Involving Rates

1. Explicitation

Can you Solve Me? (By Group). Read and answer each problem below. Write your answer on your answer sheet.

1. Aliyah can jog 6 km in 2 hours. At this rate, how many kilometers can Aliyah jog in 5 hours?
2. Jim can write 10 pages of his novel in 4 hours. At this rate, how many pages can Jim write in 16 hours?
3. Bill can hit a bucket of 323 golf balls in 17 hours. How many golf balls can Bill hit in 23 hours?
4. A plane flew 2220 kilometers in 3 hours. What is its speed?
5. Mark can make 49 birthday cakes in 7 days. How many birthday cakes can Mark make in 5 days?

Guide Questions:

1. How did you find the activity?
2. Were you able to answer the given problem correctly?
3. How did you arrive at your answer to the problem?
4. Identify the steps.

2. Worked Example

For the learners to solve the problems in Activity 3.1, they need to express first the given rate to unit rates.

Questions	Solutions	Answer/Conclusion
Example 1. Aliyah can jog 6 km in 2 hours. At this rate, how many kilometers can Aliyah jog in 5 hours?	Express rate to fraction $\frac{6}{2}$ GCF is 2. $\frac{6\div2}{6\div2} = \frac{3}{1} = 3\frac{km}{hr}$	Therefore, Aliyah can jog 15 kilometers in 5 hours

This activity must be answered orally, for lively discussion you may use “Show Me Board”, give merits for those learners who can explain their answers.

Answer Key Example 2:

1. Php64/L
2. 5 dresses/hour
3. Php250/hour
4. Php40/pack
5. 4members/room

For Activity 5, monitor how group collaboration works. Encourage them to communicate mathematically.

Let the learners who got the correct answer in Activity 5 explain their answers.

	If Aliyah can jog 3 km in 1 hour, we must multiply it by 5 hours to find out how many kilometers she can jog in 5 hours: $(3\frac{km}{hr})(5hr) = 15\ km$	
Example 2. Jim can write 10 pages of his novel in 4 hours. At this rate, how many pages can Jim write in 16 hours?	$\frac{10}{4}$ Divide both numerator and denominator by 4. $\frac{10\div4}{4\div4} = \frac{2.5}{1} = 2.5\frac{pages}{hour}$ Multiplying by 6 hours $(2.5\frac{pages}{hour})(16hours) = 40\ pages$	Therefore, Jim can write 40 pages of his novel in 16 hours.
Example 3. Bill can hit a bucket of 323 golf balls in 17 hours. How many golf balls can Bill hit in 23 hours?	$\frac{323}{17}$ Both numerator and denominator can be divided by 17. $\frac{323\div17}{17\div17} = \frac{19}{1} = 19\frac{golfs}{hour}$ Multiplying by 23 hours $(19\frac{golfs}{hour})(23hours) = 437\ golfs$	Therefore, Bill can hit golf balls in 23 hours.
Example 4. A plane flew 2220 kilometers in 3 hours. What is its speed?	$\frac{2220}{3}$ Both numerator and denominator can be divided by 3.	The unit rate is the speed of the plane. Therefore, the speed of the plane is $740\frac{km}{h}$.

		$\frac{2220\div3}{3\div3} = \frac{740}{1} = 740\frac{km}{h}$	
	Example 5. Mark can make 49 birthday cakes in 7 days. How many birthday cakes can Mark make in 5 days?	$\frac{49}{7}$ Both numerator and denominator can be divided by 7. $\frac{49\div7}{7\div7} = \frac{7}{1} = 7\frac{cakes}{day}$ Multiplying by 5 days $(7\frac{cakes}{day})(5\ days) = 35\ cakes$	Therefore, Mark can make 35 cakes in 5 days.

3. Lesson Activity

Do Worksheet No. 2 by group, let the learners explain their answers and give feedback immediately.

Worksheet No. 2 Answer Key:

1. An estimate of 23,726 people/km^2
2. Php240
3. 60 guests
4. (a) 1.5 km/min
   (b) $\frac{420}{375}$ min or 1.12 min

D. Making Generalizations

DAY 1-4

1. Learners' Takeaways

Let learners do the following:

1. What were the most important concepts you learned?
2. What aspects of the topic were the most challenging for you?
3. What questions do you still have about the topic?

Instruct them to use their notebook for writing their reflections. Encourage them to listen actively to each other's perspectives and insights in the sharing part.

2. Reflection on Learning Sharing

After giving learners time to reflect, facilitate a discussion where they share their reflections with a partner, small group, or the whole class.

This can be done at every end of the session or topic.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**DAY 4** **1. Formative Assessment** Activity 3. Answer the following problems. 1. Aling Martha can sew 60 blouses in 5 days. How many blouses can she make in a day? What is her rate per day in sewing blouses? 2. Marielle can type 621 words in 9 minutes. How many words can she type in 1 minute? What is her rate per minute in typing? 3. A computer shop charges Php180 for a 6-hour computer rental. How much are customers charged per hour? How much should a customer pay if she rents a computer for 8 hours? 4. A waiter serves 36 guests in 3 hours. How many guests can he serve in 1 hour? How many guests can he serve in 5 hours? 5. You scored 80 points in 5 games. How many points do you score per game? How many points do you score in 3 games? 6. A pair of shoes costs Php4,000. How much is 3 pairs of shoes? 7. A car travels for 3 hours and covers 180 kilometers. Find its speed. How far can it travel in 5 hours? 8. A brown sugar is sold in grocery stores for 2 kilos for Php174. How much is a kilo of brown sugar? 9. A book is sold to Eros at Php125. How much is 6 books? 10. Ben runs 21.24 km in 2 hours. How far can he run in 1 minute? in 1 hour? 11. An athlete ran 500 km non-stop in 75 hours. Calculate his speed (in simplest fraction form). How far can he run in 1 day? 12. Aaron travels 18 km in 3 hours, how many kilometers he has reached in 2 hours? 13. A 16 oz milk tea costs Php80 in store A, instore B 10 oz costs Php70, which store has a cheaper milk tea per ounce? 14. Marina observed that the machine consumes 3 hours and 15 minutes in finishing 3 baskets of laundry. How long will it take for 1 basket to finish? How long will it take her to finish 5 baskets? 15. Three bags of the same brand is worth Php33,000. How much is 4 bags? 16. Five t-shirts of the same brand and style costs Php1,200. How much is two t-shirts? **2. Homework (Optional)**	See Worksheet No. 3 Use 2-point or 3-point rating system in checking. **Activity 3 Answer Key:** 1. 12 blouses; 12 blouses/day 2. 69 words; 69 words/min 3. Php30; Php240 4. 12 guests; 60 guests 5. 16 points; 48 points 6. Php12,000 7. 60 km/h; 300 km 8. Php87 per kilo 9. Php750 10. 0.177km; 10.62 km 11. $\frac{20}{3}$ km/h; 160 km 12. 12 km 13. store A has cheaper milk tea per ounce because it has Php5/ oz while store B has Php7/oz. 14. 65 min or 1 h and 5 min; 325 min or 5 h and 25 min 15. Php44,000. 16. Php480.00

<table>
<tr><td rowspan="5">B. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement and other related stuff.

Teachers may also suggest ways to improve the different activities explored/lesson exemplar.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>C. Teacher's Reflection</td><td colspan="2">Reflection guide or prompt can be on:
• <u>principles behind the teaching</u>
What principles and beliefs informed my lesson?
Why did I teach the lesson the way I did?

• <u>students</u>
What roles did my students play in my lesson?
What did my students learn? How did they learn?

• <u>ways forward</u>
What could I have done differently?
What can I explore in the next lesson?</td><td colspan="2">Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.</td></tr>
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