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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 1
Lesson

8

Lesson Exemplar for Mathematics Grade 7
Quarter 1: Lesson 8 (Week 8)
SY 2024-2025

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MATHEMATICS / QUARTER 1 / GRADE 7

	I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learner should have knowledge and understanding of operations on rational numbers	
B. Performance Standards	By the end of the quarter, the learners will be able to perform operations on rational numbers	
C. Learning Competencies and Objectives	**Learning Competency** 1. Perform operations on rational numbers.	
D. Content	Operations on Rational Numbers	
E. Integration	Discounts (Finance), Value of Sharing	

II. LEARNING RESOURCES
Adding decimals. (n.d.). https://www.mathsisfun.com/adding-decimals.html   Cruz, L. L., & Nolasco, O. M. (2017). Skill Book in Mathematics 7. St. Bernadette Publishing House Corporation.   IXL Maths | Online maths practice. (n.d.). IXL Learning. https://www.ixl.com/math/lessons/adding-and-subtracting-rational-numbers   IXL Maths | Online maths practice. (n.d.-b). IXL Learning. https://www.ixl.com/math/lessons/multiplying-and-dividing-rational-numbers

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS

A. Activating Prior Knowledge	**DAY 1**
	 1. Short Review
	     Part 1. Answer the following review questions.
	       1. What are rational numbers?
	       2. What are similar fractions?
	       3. What are dissimilar fractions?
	       4. How do we add or subtract similar fractions?
	       5. How do we add or subtract dissimilar fractions?
	       6. How do we multiply fractions?
		This review focuses on recalling students' understanding on the operations on fractions.
		
		 It's the prerogative of the teacher to provide examples that will activate the prior knowledge of students in answering the review questions.

	7. How do we divide fractions? Part 2. Perform the following operations on fractions and decimals. Express your answer in lowest terms. 1. $\frac{1}{3} + \frac{2}{3}$ 6. $\frac{8}{9} + \frac{1}{4}$ 2. $\frac{5}{6} - \frac{1}{6}$ 7. 0.61 + 2.342 3. $\frac{4}{7} \cdot \frac{5}{9}$ 8. 43.46 − 31.52 4. $\frac{14}{15} + \frac{2}{3}$ 9. 1.43 · 6.34 5. $\frac{\frac{11}{12}}{\frac{1}{9}}$ 10. $\frac{84.021}{2.1}$ **2. Feedback (Optional)**	The teacher is encouraged to let the students perform the review questions in solving the operations that involve fractions and decimals **Answers:** 1. 1 6. 1 5/36 2. ⅔ 7. 2.952 3. 20/63 8. 11.94 4. 28/45 9. 9.0662 5. 8 ¼ 10. 40.01

B. Establishing Lesson Purpose	**1. Lesson Purpose**
	  • Have you ever wondered how we calculate discounts, taxes, or measurements accurately?
	  • What about dividing a pizza among friends or figuring out your average grade in class?
	All these everyday tasks involve operations on rational numbers.
	
	2. Unlocking Content Area Vocabulary
		The teacher is encouraged to gather responses from the students to generalize and introduce the topic lesson on operations on rational numbers.

C. Developing and Deepening Understanding	**DAY 2** **1. Explicitation** Observe the expression below. How can we find the result of these operations? What do you notice on the denominators of the fractions? $$\left(\frac{1}{3} + \frac{5}{3}\right) - \left(\frac{1}{4} + \frac{3}{4}\right)$$ How about these expressions. a. $\frac{1}{3} + \frac{3}{2} - \left(\frac{1}{2} \cdot \frac{1}{4}\right) + \frac{2}{\frac{2}{5}}$ b. $(4.6 \cdot 3.2) - 0.89 + \frac{1.42}{1.1}$ *How are we going the solve these? What are the results of this expressions?* The given problem is an example of performing operations on rational numbers.	It is advisable to elicit more responses from students. It's in the discretion of the teacher if he/she will allow students to solve the given expressions.

DAY 3

2. Worked Example

Perform the following operations on rational numbers.

A. Addition and Subtraction of Rational Numbers

1) $2.03 + 0.041 + 5.325 = 7.396$

2) $12.245 - 4.5124 - 2.521 = 5.2116$

3) $4\frac{1}{4} + 3\frac{2}{5} = 7\frac{13}{20}$

4) $\frac{6}{13} - \frac{2}{9} = \frac{28}{117}$

5) $6.89 - 1\frac{4}{5} = 5.09$

Pointers to consider in adding and subtracting rational numbers.

For Fractions:

- To add or subtract two rational numbers (fractions) with the same denominator, we simply add or subtract the numerators and write the result over the common denominator.
- When the denominators are not the same, we must find the equivalent fractions with the same denominators. In other words, we make the fractions similar.
- For Mixed numbers, convert it to improper fractions and perform the operation

For Decimals:

- Line up the decimal points vertically. Fill in any 0's where necessary.
- Add or subtract the numbers as if they were whole numbers.
- Place the decimal point in the sum or difference so that it lines up vertically with the numbers being added or subtracted.

For Combination of Fractions and Decimals

- Convert all the terms in a similar form, either in all decimals, or fractions.
- Follow the usual way of adding and subtracting rational numbers.

B. Multiplication of Rational Numbers

1) $3\frac{1}{4} \cdot \frac{1}{2} = 1\frac{5}{8}$ 3) $4.82 \cdot 32.4 = 138.672$

2) $\frac{12}{15} \cdot \frac{3}{7} = \frac{12}{35}$ 4) $8\frac{2}{3} \cdot 1.75 = 15\frac{1}{6}$

It is also important to note that since formal discussion about integers will happen on the third quarter, the involvement of negative integers is not advisable in this lesson.

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Pointers to consider in multiplying rational numbers.
For Fractions:
- Rewrite any mixed numbers as improper fractions.
- Multiply the numerators, and then multiply the denominators.
- Simplify, if needed.

For Decimals:
- Multiply as you would with whole numbers.
- Move the decimal point in the product one place to the left for each decimal place in the factors.

For Combination of Fractions and Decimals:
- Convert all the terms in a similar form, either in all decimals, or fractions.
- Follow the usual way of multiplying rational numbers.

C. Division of Rational Numbers

1) $\dfrac{\frac{14}{15}}{\frac{3}{2}} = \dfrac{28}{45}$

2) $\dfrac{\frac{2}{20}}{\frac{14}{10}} = \dfrac{1}{14}$

3) $\dfrac{11.7}{5.2} = 2.25$

4) $\dfrac{6.973}{1.9}$ 3.67

Pointers to consider in dividing rational numbers
For Fractions:
- Rewrite any mixed numbers as improper fractions.
- Multiply the dividend by the reciprocal of the divisor.
- Simplify, if needed

For Decimals:
- Move the decimal point to the right to make the divisor a whole number. Move the decimal point the same number of places to the right in the dividend.
- Place the decimal point in the quotient directly above the decimal point in the dividend.
- Divide until there is no remainder, or until the quotient begins to repeat in a pattern. Annex zeros, if necessary.

The teacher is encouraged to elicit initial responses from students before working on the solutions.

The teacher may come up with his/her own process of solving the given examples.

The teacher has the prerogative on how he/she will execute the worked example. He/she may add other worked examples.

For Combination of Fractions and Decimals
- Convert all the terms in a similar form, either in all decimals, or fractions.
- Follow the usual way of dividing rational numbers.

DAY 4
3. Lesson Activity
Determine the hidden phrase by performing the operations on rational numbers. Show your complete solution.

R. $1\frac{2}{5}$	I. 32.26
F. 7.242	S. $1\frac{11}{14}$
T. $3\frac{31}{50}$	N. $38\frac{2}{5}$
O. 26.32	M. 5.48
E. 4.157	K. 7.222
A. $\frac{5}{7}$	U. 1.375
H. $\frac{7}{6}$	F. $5\frac{5}{11}$

Hidden Phrase:

$1.23 + 4.25$	$\frac{45}{49} \cdot \frac{7}{9}$	$\frac{13}{25} + \frac{18}{5} - \frac{5}{10}$	$\frac{\frac{7}{4}}{\frac{3}{2}}$	$\frac{36.13}{1.12}$	$4\frac{6}{7} - 3\frac{1}{14}$

$7.442 - \frac{5}{25}$	$\frac{1}{4} \cdot 5.5$	$\frac{6\frac{12}{14}}{\frac{5}{28}}$

See the Learning Activity Worksheet.

Answers:
Hidden Phrase: MATH IS FUN

D. Making Generalizations

1. Learners' Takeaways
Answer the following problems:
1. What new knowledge did you gain from this week's topic?
2. Which part of the lesson do you find challenging to understand?
3. What aspects of the lesson surprised you the most?

The teacher will guide the students in answering the takeaway questions and reflections.

	2. **Reflection on Learning** Answer the following reflection questions. 1. Looking back, what was the most valuable takeaway from this week's lesson for you? 2. In what ways has this learning guide impacted your perspective or thinking?	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION			NOTES TO TEACHERS

A. **Evaluating Learning**	**DAY 5** **1. Formative Assessment** Perform the following operations on rational numbers. Show your complete solution. Round off to the nearest hundredths (for decimals). Express your answers in simplest form / mixed number (for fractions). 1. $92.516 - 12.531 + 41.535$ 6. $\frac{6.89}{1.56}$ 2. $\frac{5}{16} \cdot \frac{2}{3}$ 7. $17.425 - 12.512 - 1.435$ 3. $4\frac{6}{8} + 1\frac{5}{6}$ 8. $4\frac{5}{2} \cdot 6\frac{1}{3}$ 4. $1 - \frac{4}{5} + \frac{1}{2}$ 9. $\frac{42.12}{20}$ 5. $4.24 \cdot 3.14$ 10. $\frac{\frac{72}{150}}{3}$ **2. Homework (Optional)**		**Answer Key:** 1. 121.52 2. $\frac{5}{24}$ 3. $6\frac{7}{12}$ 4. $\frac{7}{10}$ 5. 13.31 6. 4.42 7. 3.478 8. $41\frac{1}{6}$ 9. 2.11 10. $\frac{4}{25}$
B. **Teacher's Remarks**	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	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.
	strategies explored			
	materials used			
	learner engagement/ interaction			

	others			Teachers may also suggest ways to improve the different activities explored/lesson exemplar.

C. Teacher's Reflection	*Reflection guide or prompt can be on:*
	
	• _principles behind the teaching_
	  What principles and beliefs informed my lesson?
	  Why did I teach the lesson the way I did?
	
	• _students_
	  What roles did my students play in my lesson?
	  What did my students learn? How did they learn?
	
	• _ways forward_
	  What could I have done differently?
	  What can I explore in the next lesson?
				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.