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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 1
Lesson
4

Lesson Exemplar for Mathematics Grade 7
Quarter 1: Lesson 4 (Week 4)
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 should have knowledge and understanding of application of percentages.
B. Performance Standards	By the end of the quarter, the learners will be able to use percentages in different contexts.
C. Learning Competencies and Objectives	At the end of the lesson the learners will be able to solve problems involving percentage increase and percentage decrease.
D. Content	1. Percentage Increase 2. Percentage Decrease
E. Integration	SDG 4 (Quality Education) Educational Resources

II. LEARNING RESOURCES
Mathematics 1 – An Integrated Approach ISBN: 971-569-182-X (Sr. Iluminada C. Coronel, F.M.M., Pablo R. Manalastas, Jr., Jose A. Marasigan, Antonio C. Coronel) The New High School Mathematics ISBN: 971-48-0628-3, Diwa Learning Systems Inc 21st Century MATHletes Textbook (Angelina P Lumbre, Alvin C. Ursua, Donnel P. Placer, Jaime R. Burgos, Mercurio T. Elenzano, Chin Uy)

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1-2** **1. Short Review** Complete the table of equivalent fractions, decimals, and percents.	You may add more items as needed for this review.

Fraction	**Decimal**	**Percent**
$\frac{1}{2}$		

	0.75	
		40%

2. Feedback (Optional)

B. Establishing Lesson Purpose	**DAY 1-2** **1. Lesson Purpose** Ask the learners: What is 40% of 200? Answer: 80 Then present the situation below: A product costs P200.00, and the salesman told you that the price of the product will become P 280.00 next week. Further, the salesman said the store will have a 30% increase in all their products. How are you going to check if the information given by the salesman is true? Let the learners give their answers, some may get it correct. *Learners may use the knowledge of computing percentage.* Then, tell them that they will know more about it in your lesson for the day. These questions may be asked also to further engage the learners to your discussion. *What comes first in your mind when you hear the following words:* *Change, Increase, Decrease, Percent and Original Value?* **2. Unlocking Content Area Vocabulary** **Percentage increase or percent of increase** measures the amount of increase in comparison to the original value, expressed as a percentage.	Have a short discussion on how to solve the problem if deemed necessary. The intention of this is to lead the learners to the current topic.
C. Developing and Deepening Understanding	**DAY 1-2** **SUB-TOPIC 1: PERCENTAGE INCREASE** **1. Explicitation** Using the same scenario, ask the learners the following questions: A product costs ₱200.00, and the salesman told you that the price of the product will become ₱280.00 next week. Further, the salesman said the store will have a 30% increase in all their products. How are you going to check if the information given by the salesman is true?	

Question:

A. Describe the change in price of the product. Is it an increase or a decrease? *(Answer: an increase in price)*
B. How much is the increase? *(Answer: 280 - 200 = 80)*
C. What is 30% of 200? *(Answer: 60)*
In this question, learners can now say whether the salesman statement is true or false.
D. What is the percentage increase?

You may pause here because most probably the learners do not know the answer. Lead the discussion to the key ideas presented below:

It is recommended that you write them on the board or show through PowerPoint presentation.

Percentage increase measures the amount of increase in comparison to the original value, expressed as percentage.

Calculating Percentage Increase:

$$\frac{(New\ Value - Original\ Value)}{Original\ Value} \text{ x } 100\%$$

Then present worked examples

2. Worked Example

Example 1: What is the percentage increase if the original value is 200 and the new value is 280?

Solution: $\frac{(280 - 200)}{200}$ x 100% = .40 or 40%

Activity 1A: Complete the table. Ask the learners to find the increase and the percentage of increase.

For activity 1.A, emphasize that the answer in percentage increase can be expressed in other forms, in fraction or in decimal forms

Original Value	**New Value**	**Increase in value** *(Difference of new value and original value)*	**Percentage increase** $\frac{(New\ Value - Original\ Value)}{Original\ Value}$ x 100%
1. 100	130	30	30%
2. 350	525	175	50%

3. 42	48.3	6.3	15%
4. 190	275.5	85.5	45%
5. 201	351.75	150.75	75%

Activity 1B: Complete the table below.

Original value	**New Value**	**Increase in value** *(Difference of new vale and original value)*	**Percentage Increase** $\frac{(New\ Value - Original\ Value)}{Original\ Value}$ x 100%
20	25	5	0.25 or 25%
210	283.5	73.5	0.35 or 35%
80	100.8	20.8	0.26 or 26 %
260	293.8	33.8	0.13 or 13%
568	1050.8	482.8	0.85 or 85%

PROBLEM SOLVING

Tell learners that the concept of percentage increase is a common scenario in real life. The problems below are some of the many examples. Involve your learners in the discussion of the solution of the problems. You may ask a learner to read the problem. Then apply Polya's strategy in solving problems, in constructing guide questions in your discussion/brainstorming.

Example 2: A Jollibee branch recorded ₱100,000 sales in one week. After a week it became ₱150,000. Find the percentage increase of its sales.

To solve the problem, let us first identify the original value and the new value. Then plug in the values in the formula.

Solution: Percent of increase = $\frac{(150{,}000 - 100{,}000)}{100{,}000}$ x 100% = .50 or 50%

Activity 1B must be done as a group task. Let the learners answer the problems with their groupmates.

Ask the learners to discuss the answer with their groupmates following the same solution presented in the worked examples.

Ask the learners these questions while discussing the solution.

1. What is the difference between the new value and the original value?
2. Which is greater? The original value or the new value?
3. By how much? How did you solve the difference?
4. Does the answer show an increase or decrease?

Example 3: The original price of a liter of petroleum is ₱67.00. The oil exporting company adjusted the price to Php 68.34 for each liter. Find the percentage increase in the price of each liter of petroleum.

Solution:

Original value: 67.00 New Value (new weight): 68.34

Increase: 1.34

Percent of increase = $\frac{(68.34 - 67)}{67}$ x 100% = 0.02 or 2%

Example 4: The monthly salary of Mr. Shy is changed from ₱8,800.00 to ₱9,284.00. What is the percentage change in his salary?

Solution:

Original value: ₱8, 800.00 New Value: ₱9, 284.00

Increase (difference) = 484

Percent of (change) increase = $\frac{(9{,}284.00 - 8{,}800.00)}{8{,}800.00}$ x 100% = .055 or 5.5%

3. Lesson Activity

Activity 1C: Solve the following problems

1. In 2020, a school recorded a total of 1200 enrollees while in 2022, the total enrollees is1,954. What is the percentage increase in the school's enrollment?
2. After increasing the price by Php1,200.00, the price of a TV set becomes P 7 600.00. What is the percentage increase in the price of the TV set?
3. Tom made two attempts in answering a set of exercises in Math. He recorded a score of 80 in the first attempt and 91 in the second attempt. What is the percentage increase in his scores? If the required percentage increase is at least 10% to proceed to the next set of exercise, can Tom proceed to the next set?

Activity 1C Answer:

1. 62.83%

2. $\frac{1{,}200}{6{,}400}$ =18.75%

3. 13.75 %, yes Tom can proceed to the next set of exercises.

DAY 3-4

SUB-TOPIC 2: PERCENTAGE DECREASE

1. Explicitation

Discussion may begin with a review of the previous session. Present this scenario:

The original price of a pair of pants was Php 850.00. In summer sales, it was reduced to Php 500.00. Find the percentage decrease or change in the price of the pants.

Question:

A. Describe the change in price of the pants. Was there an increase or a decrease? *(Answer: a decrease in price)*
B. How much is the decrease? *(Answer: 850 - 500 = 350)*
C. What is the percent of decrease?

Tell the learners that the problem can be answered by referring to the previous lesson. This time the numerator in the formula is a decrease in value instead of increase.

Percentage decrease measures the amount of decrease in comparison to the original value, expressed as percentage. Since the value will give a negative numerator, you modify the formula:

Calculating Percentage Decrease:

$$\frac{(\,amount\ of\ Decrease\,)}{Original\ Value}\ \text{x } 100\%$$

Then present worked examples.

2. Worked Example

Example 1: What is the percentage decrease if the original value is 250 and the new value is 220?

Solution: $\frac{(30)}{250}$ x 100% = .12 or 12%

These questions may be asked as you work on the solution of each example. This will help you in engaging the learners in the discussion.

1. What is the difference between the new value and the original value?
2. Which is greater? The original value or the new value?
3. If the new value is greater than the original value, what does it mean?
4. What do you mean if the new value is less than the original value?
5. Which trend showed an increase or decrease?

Activity 2A: Complete the table.

Original Value	**New Value**	**Decrease** *(Difference of new and old value)*	**Percentage Decrease** $\frac{(\text{amount of Decrease})}{\text{Original Value}}$ x 100%
100	80	20	.2 or 20%
180	111.6	68.4	0.38 or 38%
360	241.2	118.8	0.33 or 33%
1 500	1230	270	0.18 or 18 %
5 000	1000	4000	0.8 or 80%

PROBLEM SOLVING

Tell learners that the concept of percentage decrease is a common scenario in real life. The problems below are some of the many examples. Involve your learners in the discussion of the solution of the problems. You may ask a learner to read the problem. Then apply Polya's strategy in solving problem in constructing guide questions in your discussion/brainstorming.

Example 2: The value of a brand-new laptop worth ₱45,000.00 became ₱30,150.00 after a month of use. What is the decrease in price? What is the percent of decrease?

Solution: Original value: 45,000 New Value: 30,150

Decrease in price = 45,000 - 30,150 = 14,850

Percent of decrease = $\frac{14,850}{45,000}$ x 100% = .33 or 33%

Example 3: A sport enthusiast weighs 75 kilograms, after a month of tedious exercise he weighs 66 kilograms. What is the percentage decrease of his weight after a month?

Solution: Original value: 75 kgs New Value: 66 kgs

Decrease in weight = 9

Percent of decrease = $\frac{9}{75}$ x 100% = .12 or 12%

	Example 4: Joseph wants to decrease his sugar level intake from 9 teaspoons daily to 6 teaspoons to maintain a normal and healthy diet. How much percentage decrease is from 9 teaspoons to 6 teaspoons of sugar? Solution: Original value: 9 New Value: 6 Decrease = 3 Percent of decrease = $\frac{3}{9}$ x 100% = .33... or 33.33% **3. Lesson Activity** **Activity 2B:** Solve the following problems. 1. The side of a square 20 centimeters each is decreased by 2 cm each. What is the percentage decrease in the length of a side of the square? 2. Jane reduces her monthly spending from Php 4, 500 to Php3,960. What is the percent of decrease in her monthly spending? 3. The robbery rate decreased by 16% this year. If there were 1512 robberies this year, how many robberies should there be last year?	**Activity 2B Answer:** 1. 10 % 2. 12% 3. 1, 800 100% - 16% = 84% 1512 / 0.84 = 1 800 1,800 – 1512 = 288 Check: 288/1800 = .16 or16%
D. Making Generalizations	**1. Learner's Takeaways** *What I Learned about this lesson* What is the percentage increase? | What is the percentage decrease? **2. Reflection on Learning** ● How can we connect this lesson to our everyday lives? ● Cite instances where knowledge of percentages is useful in practical contexts.	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Activity 2C:** Solve the following problems and present your solution to the class: 1. Mother needs to cut her expenses as her family is growing. She budgeted expenses for food from ₱25,000 per month to ₱20,000. How much is the percent decrease in the family's food expenses?	**Activity 2C Answer:** 1. 20% 2. 53.3 and 2.022% 3. 16.25 %

<table>
<tr><td></td><td colspan="3">2. According to the news, gasoline prices should decrease by ₱1.10 per liter the following week. If the cost of gasoline prices now is ₱54.40 per liter, how much will it be in the following week? What would be the percentage decrease per liter?
3. There are 800 students in a school, 37.5% of them are girls. If the number of boys and girls are increased by 20% and 10% respectively, what is the percentage change in the number of students?

2. Homework (Optional)</td><td>37.5% of 800 = 300
Girls = 300
Boys = 500
Boys increased by 20% = 600
Girls increased by 10% = 330
Percentage increase = 130/800
= .1625 or 16.25%</td></tr>
<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="3">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>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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