

LESSON 5 Solving Real-Life Problems Involving Whole Numbers

OBJECTIVE

Use the order of operations in solving mathematical problems.

Follow Polya's problem-solving techniques to solve real-life problems

ENGAGE

There are 4 Bus Liner A and 1 Bus Liner B that were hired at ₱ 11,445.00 each to take 280 students to the Palarong pambansa venue. What was the transportation cost per pupil?

EXPLORE

George Polya is a Hungarian mathematician who, in 1945, formulated steps in problem solving namely: understand the problem, make a plan, carry out the plan, and look back, Now let us solve the problem above using these steps.

Step 1 – Understand

- a. What is asked in the problem
 - The transportation cost per pupil.
- b. What are given
 - 4 Bus Liner A and 1 Bus Liner B
 - ₱ 11,445,00 paid for hiring 1 Bus
 - There are 280 students
- c. What are the hidden question?
 - How many buses were used?
 - How much was paid for all buses?

Step 2 – Make a Plan

- a. What operations will be used?
 - addition, multiplication, and division
- b. What is the mathematical sentence?
 - $(4+1) \times 11\,445 \div 280 = N$ (the transportation per pupil)

Step 3 – Carry out the plan

Since the number sentence has more than one operation , we will apply PMDAS rule in order to properly solve for N

$$[(4 + 1) \times 11\,445] \div 280 = N$$

$$(5 \times 11\,445) \div 280 = N$$

$$57\,225 \div 280 = N$$

$$204.375 = N$$

Therefore. each pupil's transportation cost ₱204.375, which is approximately ₱204.40

Step 4 – Look Back

Is the answer reasonable?

Estimate to check:

$$60\,000 \div 300 \text{ is } 200$$

$$204.375 \text{ is near } 200$$

Therefore, the answer is reasonable.

EXPLAIN

Learning to utilize Polya's four step process is important in becoming a good solver. Now let us consider another problem.

Carla receives a daily allowance of ₱60.00 She spends ₱22.00 for transportation ₱20.00 for snacks and saved the rest. How much does she save in 21 days?

Solution:

Step 1 – Understand

- a. What is asked?
 - The amount she saved in 21 days
- b. What are given?
 - a daily allowance of ₱60.00, spends ₱ 22.00 for transportation and 20 for snacks
- c. What is the hidden question?
 - How much does she save in a day?

Step 2 – Make a Plan

- a. What operation will be used?
 - addition, multiplication, and division
- b. What is the number sentence
 - $60 - (22 + 20) =$ The amount she saves in a day
 - $[60 - (22 + 20)] \times 21 =$ The amount she saves in a day

Step 3 – Carry Out the Plan

Perform first the operation inside the parenthesis

$60 - (22 + 20) = 60 - 42$	$[60 - (22 + 20)] \times 21$
$= 18$	$= 18 \times 21$
	$= 378$

Step 4 – Look Back

Is the answer correct?

Check:

Add all the expenses and the amount she saves in a day

$$22 + 20 + 18 = 60$$

$$60 = 60$$

Therefore, Carla saves ₱378.00 in 21 days

Try to solve the following problem.

Arnel, Jacque and Ferdie saved ₱45,000.00 together in the bank. Arnel saved twice as much as Jacque while Ferdie saved twice as much as the combined savings of Arnel and Jacque. How much did each one save?