LESSON 4 Order of Operation on Whole Numbers

OBJECTIVE

State, explain and interpret the PMDAS rule.

Simplify a series of operations on whole numbers involving more than two operations using the PMDAS

Analyze and solve problems.

ENGAGE

A teacher wrote the expression (4 + 2 x 5) ÷7 + 3 on the board and called two pupils solve it.

Below are the solutions of two pupils.

Pupil 1	pupil 2
(4 + 2 x 5) ÷ 7+3	(4 + 2 x 5) ÷ 7+3
= (6 x 5) ÷ 7+3	= (4 + 10) ÷ 7+3
= 30 ÷ 7 + 3	= 14 ÷ 7 + 3
= 30 ÷ 10	= 2 + 3
= 3	= 5

Whose solution do you think is correct

EXPLORE

The expression can be solved by following the rules on order of operations, this is called the PMDAS rule which stands for parentheses, multiplication, division, addition, and subtraction.

In any numerical expression that has more than one Operation perform the operation inside the parentheses first. Then perform multiplication and division working from left to right Lastly. Perform addition and subtraction working from left to right.

Hence, according to the rule. Pupil 2's solution correct

(4 + 2 x 5) ÷ 7 + 3	Solve the operations inside the parenthesis
= (4 + 10) ÷ 7 + 3	Multiply 2 and 5 first
= 14 ÷ 7 + 3	Add 4 and 10
= 2 + 3	Divide 14 by 7
= 5	Add 2 and 3

EXPLAIN

Let us try other examples.

Example 1	400 ÷ 2 x 5 – 120 + 5	Divide 400 by 2.
	= 200 x 5 – 120 + 5	Multiply 200 by 5.
	= 1000 – 120 + 5	Subtract 120 from 1000.
	= 880 + 5	Then, add.
	= 885	

Example 2	44(9 ÷ 3) – 81 + 45	Solve the expression inside the Parenthesis.
	= 44 x 3 – 81 + 45	Multiply 44 by 3.
	= 132 – 81 + 45	Subtract 81 from 132
	= 51 + 45	Then, add.
	= 96	

Example 3	100 ÷ (18+10-18) x 4	Solve the expression inside the Parenthesis.
	= 100 ÷ 10 x 4	Divide 100 by 10.
	= 10 x 4	Then, multiply.
	= 40	

Note: we work from left to right when there are only addition and subtraction We also work from left to right when there are only multiplication and division.

Application and Problem Solving

Example 4 Mang Delfin bought 60 crates of chicos. Each crate contain 150 chicos. He repacked them into bags of 6 chicos each. How many bags of chicos did he make?

Solution:

We first need to know the total number of chicos. Since there are 6 crates containing 150 chicos, we have to multiply 60 by 150 to get the total number of chicos. After doing so, we divide total by 6

$$(60 \times 150) \div 6 = N$$

$$(60 \times 150) \div 6 = 9000 \div 6 = 1500$$

Therefore. Mang Delfin repacked 1500 bags of chicos.