Name _____

Evaluate Numerical Expressions

Florida's B.E.S.T.

- **Algebraic Reasoning** 5.AR.2.1, 5.AR.2.2, 5.AR.2.3
- **Mathematical Thinking & Reasoning** MTR.4.1, MTR.6.1, MTR.7.1

I Can apply the order of operations to evaluate numerical expressions.

Remember that a numerical expression is a mathematical phrase that uses only numbers and operation symbols.

$(5 - 2) \times 7$ $\quad 7.2 \div 9 + 16$ $\quad (\frac{2}{4} - \frac{1}{5}) + \frac{1}{20}$

To **evaluate**, or find the value of, a numerical expression with more than one type of operation, you must follow rules called the **order of operations**. The order of operations tells you in what order you should evaluate an expression.

Order of Operations

1. Perform operations in parentheses.
2. Multiply and divide from left to right.
3. Add and subtract from left to right.

UNLOCK the Problem Real World

A bread recipe calls for 4 cups of wheat flour and 2 cups of rye flour. To triple the recipe, how many cups of flour are needed in all?

Evaluate $3 \times 4 + 3 \times 2$ to find the total number of cups.

A Gabriela did not follow the order of operations correctly.

Gabriela

○ 3 x 4 + 3 x 2 First, I added.

3 x 7 x 2 Then, I multiplied.

○

Explain why Gabriela's answer is not correct.

_____

B Follow the order of operations by multiplying first and then adding.

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○ 3 x 4 + 3 x 2

○

So, _____ cups of flour are needed.

Evaluate Expressions with Parentheses

To evaluate an expression with parentheses, follow the order of operations. Perform the operations in parentheses first. Multiply from left to right. Then add and subtract from left to right.

Example

Each batch of granola Lena makes uses 3 cups of oats, 1 cup of raisins, and 2 cups of nuts. Lena wants to make 5 batches of granola. How many cups of oats, raisins, and nuts will she need in all?

Write the expression. $5 \times (3 + 1 + 2)$

First, perform the operations in parentheses. $5 \times (\_\_\_\_\_)$

Then multiply. _____

So, Lena will use _____ cups of oats, raisins, and nuts in all.

- MTR What if Lena makes 4 batches? Will this change the numerical expression? Explain.

_____

Try This!

Rewrite the expression with parentheses to equal the given value.

A $6 + 12 \times 8 - 3$; value: 141

- Evaluate the expression without the parentheses. _____
- Try placing the parentheses in the expression so the value is 141.

  Think: Will the placement of the parentheses increase or decrease the value of the expression?

- Use order of operations to check your work.

  $6 + 12 \times 8 - 3$

B $5 + 28 \div 7 - 4$; value: 11

- Evaluate the expression without the parentheses. _____
- Try placing the parentheses in the expression so that the value is 11.

  Think: Will the placement of the parentheses increase or decrease the value of the expression?

- Use order of operations to check your work.

  $5 + 28 \div 7 - 4$