

Evaluating Algebraic Expressions

STRAND: Patterns, Functions, and Algebra

STRAND CONCEPT: Algebraic Expressions

SOL 7.11, 8.14a

Remediation Plan Summary

Students evaluate algebraic expressions, using physical representations of numbers as replacement values of variables.

Common Errors and Misconceptions

- Students may substitute the incorrect value in for the variable when there are two variables in the algebraic expression.
- Students may forget to follow the order of operations.
- Students may be confused when substituting in a negative value into an expression and should be reminded to put the value in parentheses.

Materials

- Warm Up activity sheet
- Large number cards
- Evaluating Expression Practice sheet
- Tape

Introductory Activity

Have students complete the “Warm-up” worksheet. Once they have completed the task, review the solutions, and answer any questions they may have. Engage students in a discussion of why the order of operations is important in mathematics.

Plan for Instruction

1. Cut apart the attached number sheets so that each large-sized number is on one sheet.
2. Write the expression $2(3 + x) - 8$ on the board. Tell students that the variable, x , in this expression can have many different values and that you are going to replace the x with a number. Tape one of the large numbers over the x , and evaluate the expression on the board asking for student input.
3. Have students choose several different values for x from the number sheets. Give each student a different number (other than the first one you used as a class) and ask them to evaluate the expression with their number. After students have evaluated their expression and ask them to trade papers with a partner. Ask each partner to rework the problem and verify the answer. Then, show the evaluation of several expression on the board and discuss how the order of operations was applied.
4. Write the expression $4a - 2b \cdot 3$ on the board. Have two students come up to the board. Have the first student choose a value for a from the number sheets and the other choose a value for b . Have the students tape their chosen numbers in the appropriate places over a and b . *What do you notice about the expression now?* Ask students to solve the problem and once the class is done, ask students for the answer. Have students explain their process and keep a list of answers provided. Students may incorrectly interpret $4(3)$ as 43 and $4(-5)$ as $4-5$. Explain that the substituted numbers must be enclosed in parentheses in order for the side-by-side digits to indicate multiplication.

AR Remediation Plan – Algebraic Expressions

5. Have the two students at the board work together to evaluate the expression they created. The other students should work through the problem at their desk. Have the two students explain their work.
6. Continue to have pairs of students come up to the board to choose replacement values for a and b , tape the numbers over the variables, and evaluate the expression on the board while the other students evaluate the expression on paper.
7. Have the students complete the “Evaluating Expressions Practice” sheet.

Pulling It All Together (Reflection)

Exit Ticket: Complete the following statement using what you learned from the lesson today.

To evaluate an algebraic expression that has the variables x and y , *you should ...*

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Warm-up

Evaluate each expression, showing each step in the order of operations.

1. $5 + 5 \cdot 3 - 2 \cdot 2^2$

2. $4 \cdot 7 + 8 \div 2^3$

3. $5^2 \div 5 \cdot (2 + 4)$

4. $(12 - 8)^2 - 4 + 21$

5. $7 - 1 \cdot 2(2^4 \div 8)$

1

2

3

4

5

6

7

8

9

0

-1

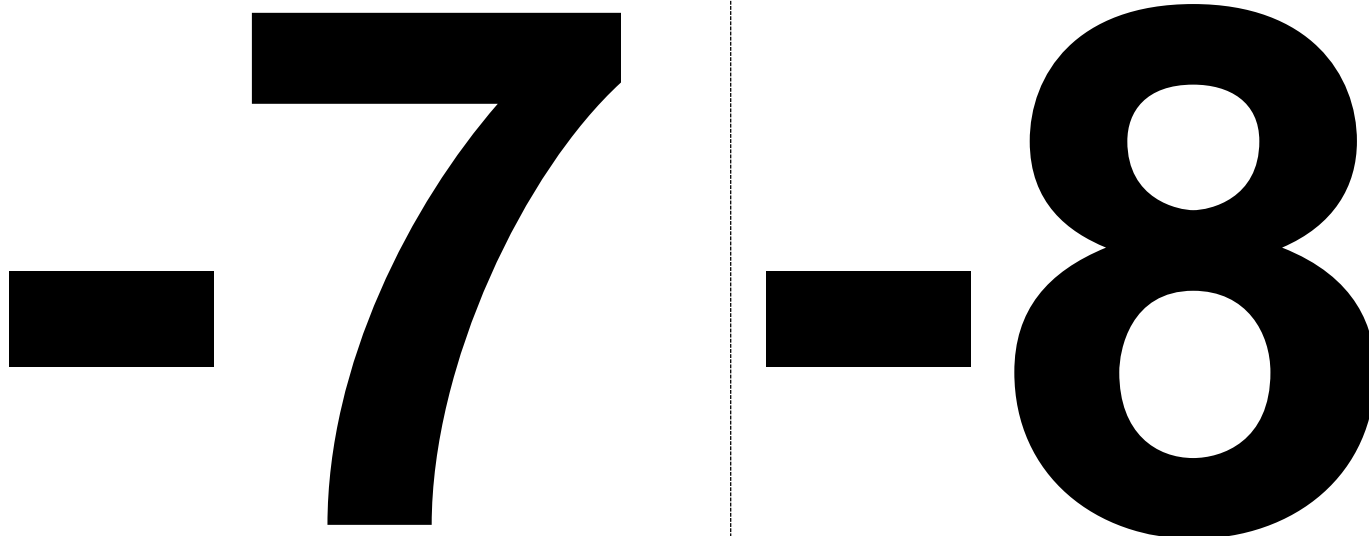
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Name: _____

Evaluating Expressions Practice

Evaluate each expression, showing each step as you apply the order of operations in the space to the right of each problem.

What is the value of $3z + 2(z - 1)$ when $z = 5$?	
What is the value of $4 - 2b^2 + 3c$ when $b = 2$ and $c = -1$?	
What is the value of $6 + x \div 3 \cdot y$ when $x = 15$ and $y = 2$?	
What is the value of $4(-1 + a)^5 - 3a^2$ when $a = 3$?	
What is the value of $4m + n - p^3$ when $m = -2$, $n = 5$, and $p = 4$?	