Expressions and Equivalence

Lesson 9 Evaluating Formulas

Standards 6.EE.A.2c

Learning target I can substitute values and evaluate expressions or formulas.

Materials Algebra tiles or rectangle models, pencils, expression cards.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about evaluating formulas. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Replace every variable with its assigned value, using parentheses. Apply the order of operations. In formulas, label the answer with the appropriate measurement units. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: A rectangle has length x + 4 and width 6. Use A = lw to write its area expression and find A when x = 6. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch exponents versus multiplication, operation order, and distributing to every term.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Replace every variable with its assigned value, using parentheses. Apply the order of operations. In formulas, label the answer with the appropriate measurement units.

Example 1 Evaluate 2x + 6 for x = 6.
Solution 18. Substitute first: 2 × 6 + 6 = 18.
Example 2 A rectangle has length x + 2 and width 2. Use A = lw to write its area expression and find A when x = 3.
Solution A = 2(x + 2); 10 square units. Substitute x = 3: 2(3 + 2) = 10.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 9 Evaluating Formulas

Name _____ Show calculations, models, and units.

1. Evaluate 2x + 2 for x = 6.

2. Evaluate 8x + 4 for x = 6.

3. Evaluate 4x + 6 for x = 2.

4. Evaluate x^2 + 8y for x = 5 and y = 5.

5. Evaluate x^2 + 5y for x = 5 and y = 6.

6. Evaluate x^2 + 8y for x = 3 and y = 3.

7. A rectangle has length x + 7 and width 6. Use A = lw to write its area expression and find A when x = 6.

8. A rectangle has length x + 5 and width 4. Use A = lw to write its area expression and find A when x = 4.

9. A rectangle has length x + 5 and width 5. Use A = lw to write its area expression and find A when x = 5.

10. A rectangle has length x + 4 and width 6. Use A = lw to write its area expression and find A when x = 6.

Evaluating Formulas

Expressions and Equivalence

1. 14
Reasoning Substitute first: 2 × 6 + 2 = 14.

2. 52
Reasoning Substitute first: 8 × 6 + 4 = 52.

3. 14
Reasoning Substitute first: 4 × 2 + 6 = 14.

4. 65
Reasoning Substitute first: 5^2 + 8 × 5 = 65.

5. 55
Reasoning Substitute first: 5^2 + 5 × 6 = 55.

6. 33
Reasoning Substitute first: 3^2 + 8 × 3 = 33.

7. A = 6(x + 7); 78 square units
Reasoning Substitute x = 6: 6(6 + 7) = 78.

8. A = 4(x + 5); 36 square units
Reasoning Substitute x = 4: 4(4 + 5) = 36.

9. A = 5(x + 5); 50 square units
Reasoning Substitute x = 5: 5(5 + 5) = 50.

10. A = 6(x + 4); 60 square units
Reasoning Substitute x = 6: 6(6 + 4) = 60.