

Evaluating and Simplifying Expressions

Reporting Category Expressions and Operations

Topic Evaluating and simplifying algebraic expressions

Primary SOL A.1 The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables.

Related SOL A.4b

Materials

- Algebra tiles
- Simplifying Expressions, Using Algebra Tiles activity sheet (attached)

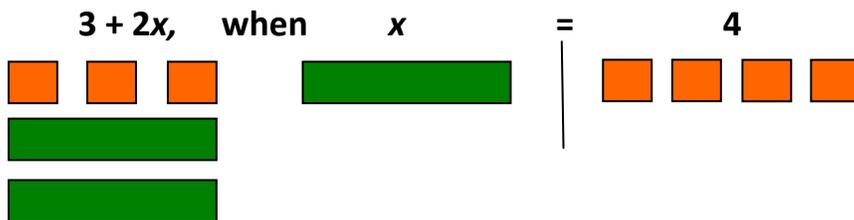
Vocabulary

algebraic expression, associative, commutative, inverse, reflexive, replacement set, substitution variable, symmetric, transitive (earlier grades)

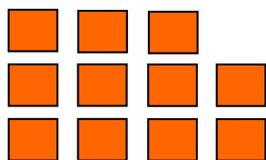
Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Algebra tiles help students make connections between the abstract and the concrete. This activity encourages modeling and drawing.

1. Use algebra tiles to model substitution when simplifying algebraic expressions. Demonstrate representing an expression with tiles and then replacing each rectangle with the appropriate tile value and combining like terms, e.g., $3 + 2x$, when $x = 4$, as follows:



Replace each with .



Therefore, when $x = 4$, $3 + 2x = 11$.

2. Distribute copies of the Simplifying Expressions with Algebra Tiles activity sheet. Instruct students to set up each original expression with the appropriate tiles and replace, or substitute, each rectangle with its tile value. Encourage students to use the language of the properties when simplifying these expressions.

Assessment

- **Questions**

- Draw a model of the expression $2x + 4$. Assign a value to x , and replace x with your selected value. Simplify the expression. Make a drawing of your procedures. What is the simplified answer?
- Write an expression that uses x . Draw a model of your expression. Replace x with -3 . Simplify the expression. Make a drawing of your procedures. What is the simplified answer?

- **Journal/Writing Prompts**

- One of your classmates was absent when we practiced simplifying expressions, using algebra tiles. Write a detailed explanation of how to use algebra tiles and substitution to simplify an expression.

- **Other**

- Have students create a poster illustrating the procedures discussed in this activity.

Simplifying Expressions, Using Algebra Tiles

Name _____ Date _____

Model each expression with algebra tiles, and make a drawing of your tile model. Then, replace each rectangle with the appropriate tile value and draw this model. Simplify the expression by combining like terms and canceling out zero pairs, where necessary. Write the simplified answer.

1. $2 + x$, when $x = 4$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer

2. $3 + 2x$, when $x = -4$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer

3. $-3 + 2x$, when $x = 4$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer

4. $4 + 3x$, when $x = 2$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer

5. $2x - 3$, when $x = -3$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer

6. $x - 3 + 2x$, when $x = 1$

Model of the Expression	Expression with the Rectangle(s) Replaced	Simplified Answer