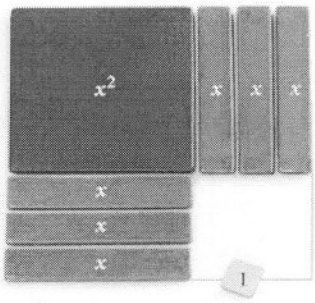
Activity Lab

Hands-On

Completing the Square

FOR USE WITH LESSON 5-7

Use tiles or draw a diagram. Copy the model below.



$x^2 + 6x +$ ■

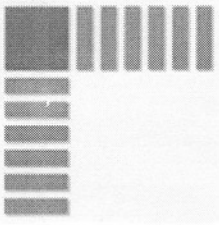
1. a. Add unit tiles until you have a complete square. How many tiles did you add?
   b. Write an expression to represent the sum of the areas of the tiles.
   c. Write an expression to represent the length times the width of the completed square.
   d. How do the six x-tiles in the model relate to the length of the sides of the completed square? To the number of unit tiles used?
2. Suppose the expression $x^2 + 8x +$ ■ can also be modeled by a complete square of tiles.
   a. Draw a diagram or use tiles to find the missing value.
   b. What is the coefficient of x in the expression?
   c. **Critical Thinking** How can you use the coefficient of x to find the length of the completed square?
3. Suppose $x^2 - 4x +$ ■ can be modeled by a complete square of tiles. Using red to represent negative values, draw a diagram or use tiles to find the missing value.

EXERCISES

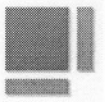
Complete each square. Then write an expression that represents the sum of the areas of the tiles and an expression that represents the length times the width of the completed square.

1.

2.



3.



Assume that each expression can be modeled by a complete square of tiles. Find the missing value.

4. $x^2 + 14x +$ ■
5. $x^2 + 20x +$ ■
6. $x^2 + 10x +$ ■
7. $x^2 + 100x +$ ■
8. $x^2 + 32x +$ ■
9. $x^2 - 8x +$ ■
10. **Make a Conjecture** In Lesson 5-5, you solved quadratic equations by taking square roots. How could you use that method together with completing the square to solve $x^2 + 6x + 6 = 0$?