10

NAME _____ DATE _____

Modeling Activity

(Use with Lesson 10-5)

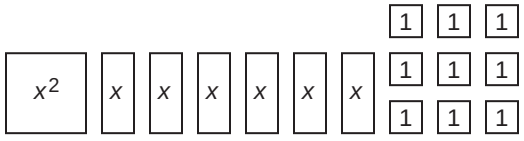
Factoring Perfect Squares

Materials: algebra tiles , product mat

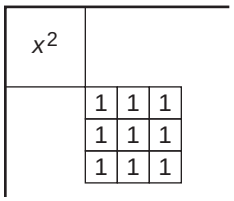
You can use algebra tiles as a model for factoring simple trinomials. When the rectangle formed by the tiles is a square, the trinomial is a perfect square.

Activity: Use algebra tiles to determine whether $x^2 + 6x + 9$ is a perfect square trinomial. If so, factor it.

▶ Model the polynomial $x^2 + 6x + 9$.

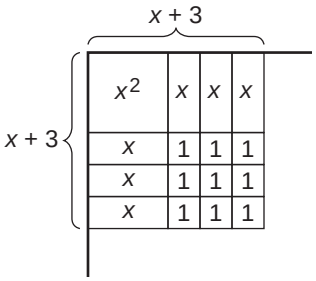


▶ Place the x^2-tile at the corner of the product mat. Since you are attempting to make a square, arrange the 1-tiles into a 3-by-3 rectangular array.



▶ Complete the rectangle with the 6 x-tiles.

▶ The rectangle has a width of $x + 3$ units and a length of $x + 3$ units. Since the rectangle is a square, $x^2 + 6x + 9$ is a perfect square trinomial. Therefore, $x^2 + 6x + 9 = (x + 3)^2$.



MODEL

Use algebra tiles to determine whether each trinomial is a perfect square trinomial. If so, factor it.

1. $x^2 - 6x + 9$ **yes; $(x - 3)^2$**
2. $x^2 + 6x - 9$ **no**
3. $x^2 + 7x + 6$ **no**
4. $x^2 + 4x + 4$ **yes; $(x + 2)^2$**
5. $x^2 - 10x + 25$ **yes; $(x - 5)^2$**
6. $x^2 - 2x + 1$ **yes; $(x - 1)^2$**
7. $x^2 + x - 2$ **no**
8. $4x^2 + 4x + 1$ **yes; $(2x + 1)^2$**
9. $4x^2 - 4x + 1$ **yes; $(2x - 1)^2$**
10. $3x^2 - 8x + 4$ **no**
11. $4x^2 - 8x + 4$ **yes; $4(x - 1)^2$**
12. $4x^2 + 8x + 4$ **yes; $4(x + 1)^2$**

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13. List all the perfect square trinomials in this activity and their factors.

13. Exercises 1, 4, 5, 6, 8, 9, 11, and 12.

14. What do you notice about the first term of each perfect square trinomial?

14. All the first terms are perfect squares.

15. What do you notice about the last term of each perfect square trinomial?

15. All the last terms are perfect squares.

16. What do you notice about the middle term of each perfect square trinomial?

16. All the middle terms equal twice the product of the square root of the first term times the square root of the last term.