

9.5 Factorization with Algebra Tiles a.5

MATERIALS • algebra tiles

QUESTION How can you factor a trinomial using algebra tiles?

You have seen that algebra tiles can be used to model polynomials and to multiply binomials. Now, you will use algebra tiles to factor trinomials.

EXPLORE Factor the trinomial $x^2 + 6x + 8$

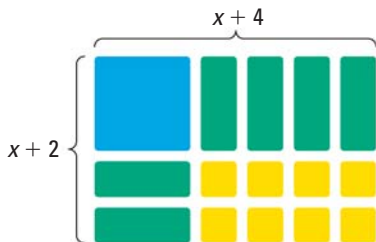
STEP 1 Make a rectangle

Model the trinomial with algebra tiles. You will need one x^2 -tile, six x -tiles, and eight 1-tiles. Arrange all of the tiles to form a rectangle. There can be no gaps or leftover tiles. The area of the rectangle represents the trinomial.



STEP 2 Find the side lengths

The side lengths of the rectangle represent the polynomials $x + 2$ and $x + 4$. So, $x^2 + 6x + 8 = (x + 2)(x + 4)$.



DRAW CONCLUSIONS Use your observations to complete these exercises

- Use multiplication to show that $x + 4$ and $x + 2$ are factors of the polynomial $x^2 + 6x + 8$.

Use algebra tiles to factor the trinomial. Include a drawing of your model.

- $x^2 + 6x + 5$
- $x^2 + 9x + 14$
- $x^2 + 5x + 6$
- $x^2 + 8x + 16$
- $x^2 + 5x + 4$
- $x^2 + 8x + 12$

- REASONING** The factors of the trinomial $x^2 + 6x + 8$ have the form $x + p$ and $x + q$, as shown above. How are p and q related to 6 and 8?