

Tile Power Moves

Use signed algebra tiles to build and expand expressions.

GRADE 8 • 8.PFA.1.a

8.PFA.1.a "Represent algebraic expressions using concrete manipulatives or pictorial representations (e.g., colored chips, algebra tiles), including expressions that apply the distributive property."

NAME _____

DATE _____

BUILD EQUAL TILE GROUPS

An x-tile stands for x , and a unit tile stands for 1. To model a product, make equal groups using the tiles inside the parentheses, then combine like tiles. If the outside factor is negative, use its absolute value for the number of groups and make each group from opposite tiles.

WORKED EXAMPLE

Use algebra tiles to represent $7(x + 5)$. Then write the expanded expression.

1. Put a positive x-tile and 5 positive unit tiles in each group.
2. Make 7 equal groups, giving 7 positive x-tiles and 35 positive unit tiles.
3. Combine the tiles to write $7x + 35$.

Answer: $7x + 35$

PRACTICE 6 problems

- 1** Describe the algebra tiles for $3(x + 4)$. Then write the expanded expression.

ANSWER _____

- 2** Describe the algebra tiles for $-2(x - 6)$. Then write the expanded expression.

ANSWER _____

- 3** A tile set has 4 positive x-tiles and 8 negative unit tiles. Write a factored expression that shows equal groups.

ANSWER _____

- 4** Each of 6 identical groups has 1 positive x-tile and 3 negative unit tiles. Write a product expression and its expanded form.

ANSWER _____

- 5** A tile model has 8 positive x-tiles and 16 negative unit tiles split into 8 equal groups. Write the factored expression.

ANSWER _____

- 6** Describe the algebra tiles for $-3(2x + 4)$. Then write the expanded expression.

ANSWER _____

APPLY IT Show your work

- 1** A student council packs 3 identical school-spirit kits. Each kit has x sticker sheets and 4 button pins. Use algebra tiles to represent the total items, then write an expanded expression.

WORK SPACE

ANSWER _____

- 2** In a game app, a score adjustment is recorded as $-2(x - 6)$, where x represents points from a round. Represent the adjustment with signed algebra tiles and write the expanded expression.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A tile model represents $3(2x - 4)$. To make the opposite of the entire model, write a factored expression with a negative outside factor and an expanded expression. Explain why the unit tiles become positive.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Describe the algebra tiles for $3(x + 4)$. Then write the expanded expression.	3 positive x-tiles and 12 positive unit tiles; $3x + 12$
2	Describe the algebra tiles for $-2(x - 6)$. Then write the expanded expression.	2 groups of 1 negative x-tile and 6 positive unit tiles; $-2x + 12$
3	A tile set has 4 positive x-tiles and 8 negative unit tiles. Write a factored expression that shows equal groups.	$4(x - 2)$
4	Each of 6 identical groups has 1 positive x-tile and 3 negative unit tiles. Write a product expression and its expanded form.	$6(x - 3) = 6x - 18$
5	A tile model has 8 positive x-tiles and 16 negative unit tiles split into 8 equal groups. Write the factored expression.	$8(x - 2)$
6	Describe the algebra tiles for $-3(2x + 4)$. Then write the expanded expression.	3 groups of 2 negative x-tiles and 4 negative unit tiles; $-6x - 12$

PART 2 • APPLY IT

1. **$3(x + 4) = 3x + 12$** Model each kit with one positive x-tile and 4 positive unit tiles. Three equal groups give 3 positive x-tiles and 12 positive unit tiles.
2. **$-2(x - 6) = -2x + 12$** Use 2 groups of the opposite of $x - 6$. Each group has one negative x-tile and 6 positive unit tiles, so the total is $-2x + 12$.

CHALLENGE

$-3(2x - 4) = -6x + 12$. The negative outside factor changes every tile to its opposite, so the negative unit tiles become positive unit tiles.

Accept equivalent factored forms when they show the same equal tile groups, such as $3(-2x + 4)$ for the challenge. Accept clear signed-tile descriptions that match the positive and negative x-tiles and unit tiles in each expression.