LESSON MAKER PRO

Tile Match Lab

Use algebra tiles to show expressions that have the same value.

GRADE 7 · 7.PFA.2.b

7.PFA.2.b "Represent equivalent algebraic expressions in one variable using concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles)."

NAME _____ DATE _____

TILES AND ZERO PAIRS

Use [x] for a positive x-tile, [-x] for a negative x-tile, [1] for a positive unit tile, and [-1] for a negative unit tile. A positive tile and its matching negative tile make a zero pair, so you can add or remove zero pairs without changing an expression. Combine the tiles left after zero pairs are removed.

WORKED EXAMPLE

Use tiles to write a simplified expression: 9 [x] tiles and 13 [-1] tiles.

1. Each [x] tile represents +x, so 9 [x] tiles represent 9x.
2. Each [-1] tile represents -1, so 13 [-1] tiles represent -13.
3. There are no zero pairs to remove.
4. Write the terms together: 9x - 13.

Answer: 9x - 13

PRACTICE 6 problems

1 Write a simplified expression for this tile model: 4 [x] tiles and 2 [-1] tiles.

ANSWER _____

2 Write a simplified expression for this tile model: 2 [x] tiles, 1 [-x] tile, and 6 [1] tiles.

ANSWER _____

3 Write a simplified expression for this tile model: 3 [-x] tiles, 2 [x] tiles, and 4 [1] tiles.

ANSWER _____

4 A tile mat has 6 [x] tiles, 2 [-x] tiles, 3 [1] tiles, and 5 [-1] tiles. Remove zero pairs and write the simplified expression.

ANSWER _____

5 Use tile words to represent 3x - 7. State how many of each type of tile you need.

ANSWER _____

6 Which tile list represents an expression equivalent to 2x + 1? A. 2 [x] tiles and 1 [-1] tile B. 3 [x] tiles, 1 [-x] tile, 2 [1] tiles, and 1 [-1] tile C. 2 [x] tiles, 1 [1] tile, and 1 [-1] tile

ANSWER _____

APPLY IT Show your work

1 At an esports club, x represents a mystery bonus score. Jordan's score board shows 3 [x] bonus tiles, 1 [-x] penalty tile, 7 [1] point chips, and 2 [-1] point chips. Write Jordan's total score as a simplified expression.

WORK SPACE

ANSWER _____

2 For a music-streaming app design, a student account is shown by 4 [x] credit tiles, 2 [-x] return tiles, 3 [1] tiles, and 6 [-1] tiles. The designer adds one zero pair of x-tiles and one zero pair of unit tiles. Write the simplified expression after the tiles are added.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Tile Tray A has 8 [x] tiles, 3 [-x] tiles, 5 [1] tiles, and 7 [-1] tiles. Tile Tray B has 6 [x] tiles, 1 [-x] tile, 4 [1] tiles, and 6 [-1] tiles. Are the trays equivalent? Explain using zero pairs.

_____

_____

ANSWER KEY

Tile Match Lab

GRADE 7 · 7.PFA.2.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write a simplified expression for this tile model: 4 [x] tiles and 2 [-1] tiles.	**4x - 2**
2	Write a simplified expression for this tile model: 2 [x] tiles, 1 [-x] tile, and 6 [1] tiles.	**x + 6**
3	Write a simplified expression for this tile model: 3 [-x] tiles, 2 [x] tiles, and 4 [1] tiles.	**-x + 4**
4	A tile mat has 6 [x] tiles, 2 [-x] tiles, 3 [1] tiles, and 5 [-1] tiles. Remove zero pairs and write the simplified expression.	**4x - 2**
5	Use tile words to represent 3x - 7. State how many of each type of tile you need.	**3 [x] tiles and 7 [-1] tiles**
6	Which tile list represents an expression equivalent to 2x + 1? A. 2 [x] tiles and 1 [-1] tile B. 3 [x] tiles, 1 [-x] tile, 2 [1] tiles, and 1 [-1] tile C. 2 [x] tiles, 1 [1] tile, and 1 [-1] tile	**B**

PART 2 · APPLY IT

1. **2x + 5** Pair 1 [x] tile with 1 [-x] tile, then pair 2 positive unit chips with 2 negative unit chips. The remaining tiles represent 2x + 5.
2. **2x - 3** The original tiles simplify to 2x - 3. Each added positive and negative pair equals zero, so the expression stays 2x - 3.

CHALLENGE

Yes. Both trays simplify to 5x - 2. From Tray A, remove 2 x-zero pairs and 1 unit-zero pair to get the same tile counts as Tray B.

Accept equivalent expressions with terms in a different order, such as -2 + 4x for 4x - 2. For the tile-description item, accept any clear description using the correct positive and negative tile types and counts.