LESSON MAKER PRO

Same Cost, New View

Rewrite expressions to see what each cost means.

GRADE 7 · MT.7.EE.2

MT.7.EE.2 "Understand that rewriting an expression in different forms in a problem in context can show how the quantities in it are related."

NAME _____ DATE _____

THE BIG IDEA

Equivalent expressions show the same total in different ways. A product can show the cost of one group times the number of groups. A sum can show how much each part adds to the total.

WORKED EXAMPLE

Each of 3 snack boxes has x crackers and 4 grapes. Rewrite 3(x + 4) as a sum. What does each term count?

1. Multiply each part inside the parentheses by 3.
2. 3(x + 4) = 3x + 3(4)
3. 3x + 3(4) = 3x + 12

Answer: 3x + 12. The terms count 3x crackers and 12 grapes.

PRACTICE 6 problems

1 A club buys x notebooks at $6 each and x pens at $5 each. Rewrite 6x + 5x as one product. What does it show?

ANSWER _____

2 An arcade charges $10 per round and takes $1 off each round with a coupon. Rewrite 10x - x as one product for x rounds. What does it show?

ANSWER _____

3 Each of 5 game packs has x tokens and 6 bonus tokens. Rewrite 5(x + 6) as a sum. What does each term count?

ANSWER _____

4 Each of 2 albums has x video clips and 8 photos. Rewrite 2(x + 8) as a sum. What does each term count?

ANSWER _____

5 A streaming plan costs $18 per month and gives a $6 credit each month. Rewrite 18x - 6x as one product for x months. What does it show?

ANSWER _____

6 Skate park visits cost $15 each, plus a one-time $6 card fee. Someone writes 15(x + 6) for the cost of x visits. Rewrite that expression as a sum. Does it match the cost? Explain.

ANSWER _____

APPLY IT Show your work

1 A music app charges $6 per month plus $2 per song downloaded that month. Nora downloads x songs each month for 5 months. Write two equivalent expressions for her total cost. Explain what each form shows.

WORK SPACE

ANSWER _____

2 A bike-share ride costs $10 to start, plus $6 per hour. You take x rides, and each ride lasts 2 hours. Write two equivalent expressions for the total cost. Explain what each form shows.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Hoodies cost $30 each at two stores. Store A takes $5 off each hoodie. Store B takes $6 off the entire purchase. Let x be a positive whole number of hoodies. Write two equivalent forms for each store's total cost. For which values of x is Store A cheaper? Explain by comparing the total discounts.

WORK SPACE AND ANSWER

ANSWER KEY

Same Cost, New View

GRADE 7 · MT.7.EE.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A club buys x notebooks at $6 each and x pens at $5 each. Rewrite 6x + 5x as one product. What does it show?	**11x. Each notebook-and-pen pair costs $11.**
2	An arcade charges $10 per round and takes $1 off each round with a coupon. Rewrite 10x - x as one product for x rounds. What does it show?	**9x. Each round costs $9 after the coupon.**
3	Each of 5 game packs has x tokens and 6 bonus tokens. Rewrite 5(x + 6) as a sum. What does each term count?	**5x + 30. The terms count 5x regular tokens and 30 bonus tokens.**
4	Each of 2 albums has x video clips and 8 photos. Rewrite 2(x + 8) as a sum. What does each term count?	**2x + 16. The terms count 2x video clips and 16 photos.**
5	A streaming plan costs $18 per month and gives a $6 credit each month. Rewrite 18x - 6x as one product for x months. What does it show?	**12x. The plan costs $12 per month after the credit.**
6	Skate park visits cost $15 each, plus a one-time $6 card fee. Someone writes 15(x + 6) for the cost of x visits. Rewrite that expression as a sum. Does it match the cost? Explain.	**15(x + 6) = 15x + 90. No, it makes the card fee $90 instead of $6. The cost is 15x + 6.**

PART 2 · APPLY IT

1. **5(6 + 2x) = 30 + 10x. The first form shows the monthly cost times 5 months. The second shows $30 in monthly fees plus the cost of all the songs.** Multiply the monthly cost, 6 + 2x, by 5. Distribute 5 to get 30 + 10x.
2. **x(10 + 2(6)) = 22x. The first form shows the cost of one ride times x rides. The second shows that each ride costs $22.** One ride costs $10 plus 2 hours at $6 per hour, or $22. Multiply by x rides.

CHALLENGE

Store A: 30x - 5x = 25x. Store B: 30x - 6, which can also be written as 25x + 5x - 6. Store A is cheaper when x is 2 or more because its total discount, $5x, is then greater than Store B's $6 discount.

Accept equivalent expressions with correct explanations of what their parts represent. In the challenge, students must compare Store A's total discount of $5x with Store B's $6 discount, not compare $5 with $6.