LESSON MAKER PRO

# Bundle Math Moves

*Change the grouping, keep the total.*

**GRADE 7 · 7.AF.A.7**

**7.AF.A.7** "Generate expressions in equivalent forms based on context and explain how the quantities are related."

NAME _____ DATE _____

## TWO FORMS, ONE TOTAL

When the same amount is added in every group, you can multiply the number of groups by the amount in one group. Use a(b + c) = ab + ac to show the same total in two forms: one grouped by each set and one grouped by each kind of item.

## WORKED EXAMPLE

A store fills 7 party bags with x pencils and 11 erasers in each bag. Write two expressions for the total number of items.

1. One bag has x + 11 items, so 7 bags have 7(x + 11) items.
2. Distribute 7 to both parts: 7(x + 11) = 7x + 7(11).
3. Multiply: 7x + 77.

**Answer: 7(x + 11) = 7x + 77**

## PRACTICE 6 problems

**1** Each of 3 skate rentals costs x dollars for skates plus 6 dollars for a helmet. Write the total cost in factored and expanded forms.

**ANSWER** _____

**2** A video channel pays x dollars for each of 5 videos and gives a one-time 9 dollar bonus. Write an expression for the total pay. Explain why 5(x + 9) is not correct.

**ANSWER** _____

**3** A team earns 2x + 16 points from 2 challenges. Each challenge gives x base points and the same number of bonus points. Write the total in factored form and state the bonus points per challenge.

**ANSWER** _____

**4** Each of 4 art kits has 3 markers that cost x dollars each and a 2 dollar case. Write the total cost in two equivalent forms.

**ANSWER** _____

**5** A bike rental costs x dollars per hour for the bike and 5 dollars per hour for a lock. A rider rents both for 6 hours. Write the total cost in two equivalent forms.

**ANSWER** _____

**6** A class buys 8 notebooks for x dollars each and 8 pens for 3 dollars each. Write the total cost in factored form. Explain what one group represents.

**ANSWER** _____

## APPLY IT Show your work

**1** A music app charges 4 dollars per month plus x dollars for each song download. For 6 months, you download 3 songs each month. Write the total cost in two equivalent forms. Explain what each part of the expanded form counts.

WORK SPACE

**ANSWER** _____

**2** You and 2 friends each buy a T-shirt priced at x dollars. Each of you uses a 5 dollar coupon. Assume x is at least 5. Write the total amount paid in two equivalent forms and explain what the subtraction shows.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A game store sells 3 identical bundles. Each bundle has 2 cards that cost x dollars each and one 4 dollar sleeve. Delivery costs 6 dollars one time for the whole order. Write the total cost in two equivalent forms. Explain why 3(2x + 4 + 6) is not correct.

WORK SPACE AND ANSWER

# Bundle Math Moves



## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Each of 3 skate rentals costs x dollars for skates plus 6 dollars for a helmet. Write the total cost in factored and expanded forms. | **3(x + 6) = 3x + 18** |
| 2 | A video channel pays x dollars for each of 5 videos and gives a one-time 9 dollar bonus. Write an expression for the total pay. Explain why 5(x + 9) is not correct. | **5x + 9. The bonus is paid once, but 5(x + 9) counts it five times.** |
| 3 | A team earns 2x + 16 points from 2 challenges. Each challenge gives x base points and the same number of bonus points. Write the total in factored form and state the bonus points per challenge. | **2(x + 8); 8 bonus points per challenge** |
| 4 | Each of 4 art kits has 3 markers that cost x dollars each and a 2 dollar case. Write the total cost in two equivalent forms. | **4(3x + 2) = 12x + 8** |
| 5 | A bike rental costs x dollars per hour for the bike and 5 dollars per hour for a lock. A rider rents both for 6 hours. Write the total cost in two equivalent forms. | **6(x + 5) = 6x + 30** |
| 6 | A class buys 8 notebooks for x dollars each and 8 pens for 3 dollars each. Write the total cost in factored form. Explain what one group represents. | **8(x + 3). One group is one notebook and one pen.** |

## PART 2 · APPLY IT

1. **6(4 + 3x) = 24 + 18x. The 24 dollars pays the monthly charges, and 18x pays for 18 downloads.** Each month costs 4 + 3x dollars. Multiply by 6 months, then distribute.
2. **3(x - 5) = 3x - 15. The 15 dollars is the total saved with three coupons.** Three people each pay x - 5 dollars. Distributing 3 shows that the three coupons reduce the full price by 15 dollars.

## CHALLENGE

**3(2x + 4) + 6 = 6x + 18. The proposed expression charges the 6 dollar delivery fee three times, but it is paid only once.**

Accept equivalent expressions in either order. In explanations, look for a clear distinction between a cost or bonus repeated for each group and one charged or paid only once.