

Exercise 1: Multiplication of Integers in the Real-World

Generate real-world situations that can be modeled by each of the following multiplication problems. Use the Integer Game as a resource.

a. $-3 \times 5 = -15$

I lost three \$5 bills. I lost a total of \$15.
The product is -15.

b. $-6 \times (-3) = 18$

I removed six -3's from my hand in the Integer game, and my score increased 18 points.
The product is 18.

c. $4 \times (-7) = -28$

If I lose 7 pounds per month for 4 months, my weight will change -28 pounds total.
The product is -28.

Lesson Summary

To multiply signed numbers, multiply the absolute values to get the absolute value of the product. The sign of the product is positive if the factors have the same sign and negative if they have opposite signs.

Problem Set

1. Complete the problems below; then, answer the question that follows.

①	$3 \times 3 = 9$	$3 \times 2 = 6$	$3 \times 1 = 3$	$3 \times 0 = 0$	$3 \times (-1) = -3$	$3 \times (-2) = -6$
②	$2 \times 3 = 6$	$2 \times 2 = 4$	$2 \times 1 = 2$	$2 \times 0 = 0$	$2 \times (-1) = -2$	$2 \times (-2) = -4$
③	$1 \times 3 = 3$	$1 \times 2 = 2$	$1 \times 1 = 1$	$1 \times 0 = 0$	$1 \times (-1) = -1$	$1 \times (-2) = -2$
④	$0 \times 3 = 0$	$0 \times 2 = 0$	$0 \times 1 = 0$	$0 \times 0 = 0$	$0 \times (-1) = 0$	$0 \times (-2) = 0$
⑤	$-1 \times 3 = -3$	$-1 \times 2 = -2$	$-1 \times 1 = -1$	$-1 \times 0 = 0$	$-1 \times (-1) = 1$	$-1 \times (-2) = 2$
⑥	$-2 \times 3 = -6$	$-2 \times 2 = -4$	$-2 \times 1 = -2$	$-2 \times 0 = 0$	$-2 \times (-1) = 2$	$-2 \times (-2) = 4$
⑦	$-3 \times 3 = -9$	$-3 \times 2 = -6$	$-3 \times 1 = -3$	$-3 \times 0 = 0$	$-3 \times (-1) = 3$	$-3 \times (-2) = 6$

Which row shows the same pattern as the outlined column? Are the problems similar or different? Explain.

The 5th row. The problems have the same answers, but the factors are switched.

2. Explain why $(-4) \times (-5) = 20$. Use patterns, an example from the Integer Game, or the properties of operations to support your reasoning.

Losing four (-5) cards will increase a score by 20. Since a negative value decreases a score, the score increases when it is removed.

3. Each time that Samantha rides the commuter train, she spends \$4 for her fare. Write an integer that represents the change in Samantha's money from riding the commuter train to and from work for 13 days.

$$-8 \cdot 13 = -104$$

or

$$-4 \cdot 13 = -52 \text{ (oneway)}$$

$$-52 + -52 = -104$$

Sam pays \$8 a day to ride the train. She rode the train for 13 days.

4. Write a real-world problem that can be modeled by $4 \times (-7)$.

I lost \$7 each day for 4 days. I lost a total of \$28. The product is -28.

Challenge

5. Use properties to explain why for each integer a , $-a = -1 \times a$. (Hint: What does $(1 + (-1)) \times a$ equal? What is the additive inverse of a ?)

