



# Model Multiplication and Division

**Objective** Use models to multiply and divide integers.

## Vocabulary

integers

**Materials**  
red and yellow  
counters  
work mat

### Work Together

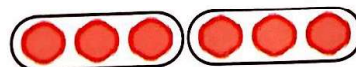
You can use counters to help you multiply and divide **integers**.

▶ To model multiplication, recall that multiplication is repeated addition.

Find  $+2 \times -3$ .

### Multiplying by a Positive Integer

$+2 \times -3$  means to add 2 groups of  $-3$  to zero. Model  $+2 \times -3$  by adding 2 groups of 3 red counters to your workmat.



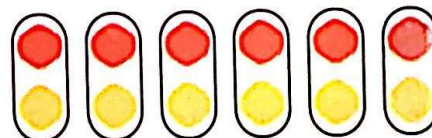
- How many red counters did you use?
- What is  $+2 \times -3$ ?

**Remember** A yellow counter represents  $+1$  and a red counter represents  $-1$ . A pair of 1 red and 1 yellow counter represents zero.

Find  $-2 \times +3$ .

### Multiplying by a Negative Integer

$-2 \times +3$  means to remove 2 groups of  $+3$  from zero. Start with 0. Use pairs of yellow and red counters to show 0.

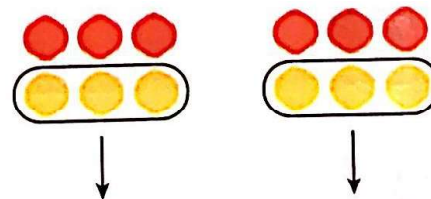


- How many pairs of yellow and red counters do you need to be able to remove 2 groups of 3 yellow counters?

Now remove 2 groups of 3 yellow counters.

- What integer do the remaining counters represent?

- What is  $-2 \times +3$ ?



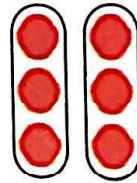
$-2 \times -3$  means to remove 2 groups of  $-3$  from zero.

- How would you revise the activity to find  $-2 \times -3$ ?

- What is  $-2 \times -3$ ?

► To model division, recall that division and multiplication are inverse operations. Use related division and multiplication facts.

$$+2 \times -3 = -6 \text{ means that } -6 \div +2 = -3$$



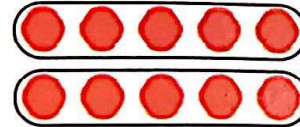
Find  $-10 \div -5$ .

### Dividing by an Integer

$-10 \div -5$  means how many sets of  $-5$  will you add to zero to make  $-10$ .

Find a missing factor to help you divide.

- What factor would you multiply  $-5$  by to get  $-10$ ?
- What is  $-10 \div -5$ ?



### On Your Own

Multiply. Use counters to help you.

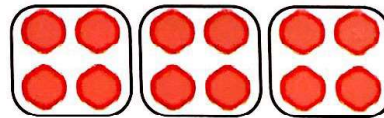
1.  $+3 \times -5$

2.  $-5 \times -4$

3.  $-4 \times +3$

4.  $-2 \times -6$

5. What multiplication is being modeled at right?



Divide by finding a missing factor.

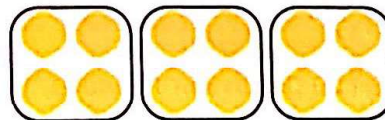
6.  $+10 \div -2$

7.  $-8 \div -4$

8.  $-16 \div +4$

9.  $+9 \div -3$

10. Write a division sentence for the array shown at right.



### Talk About It • Write About It

You learned how to model multiplication and division of integers.

11. Compare the quotients of  $-6 \div +2$  and  $+6 \div -2$ . What do you notice?
12.  $-3 \times -5$  means to remove 3 groups of  $-5$  from zero. Explain how you can multiply  $-3 \times -5$ . Use words or a picture with labels.

**Model Multiplication and Division**

Multiply. Use counters to help you.

1.  $-2 \times +4$

\_\_\_\_\_

2.  $-5 \times -8$

\_\_\_\_\_

3.  $+5 \times -4$

\_\_\_\_\_

4.  $+4 \times -3$

\_\_\_\_\_

5.  $-6 \times -6$

\_\_\_\_\_

6.  $+6 \times -2$

\_\_\_\_\_

7.  $+5 \times -7$

\_\_\_\_\_

8.  $-9 \times -9$

\_\_\_\_\_

9.  $+9 \times -8$

\_\_\_\_\_

Divide by finding a missing factor.

10.  $-30 \div -6$

\_\_\_\_\_

11.  $-49 \div +7$

\_\_\_\_\_

12.  $+64 \div -8$

\_\_\_\_\_

13.  $+18 \div +3$

\_\_\_\_\_

14.  $-18 \div -3$

\_\_\_\_\_

15.  $-20 \div +5$

\_\_\_\_\_

16.  $-6 \div +2$

\_\_\_\_\_

17.  $-12 \div -6$

\_\_\_\_\_

18.  $-3 \div -3$

\_\_\_\_\_



# Model Multiplication and Division

**Use related division and multiplication facts to model division.**

$-8 \div +4 = -2$	$-8 \div -4 = +2$	$+8 \div -4 = -2$	$+8 \div +4 = +2$
$-2 \times +4 = -8$	$+2 \times -4 = -8$	$-2 \times -4 = +8$	$+2 \times +4 = +8$

**Multiply. Use counters to help you.**

1.  $-6 \times +3$

\_\_\_\_\_

2.  $-4 \times -5$

\_\_\_\_\_

3.  $+2 \times -6$

\_\_\_\_\_

4.  $+5 \times -3$

\_\_\_\_\_

5.  $+6 \times -1$

\_\_\_\_\_

6.  $+7 \times -2$

\_\_\_\_\_

7.  $-9 \times +2$

\_\_\_\_\_

8.  $-8 \times -3$

\_\_\_\_\_

**Divide by finding a missing factor.**

9.  $+2 \div -2$

\_\_\_\_\_

10.  $-4 \div -1$

\_\_\_\_\_

11.  $-6 \div -3$

\_\_\_\_\_

12.  $-16 \div +4$

\_\_\_\_\_

13.  $-9 \div -3$

\_\_\_\_\_

14.  $+10 \div +5$

\_\_\_\_\_

15.  $-12 \div -4$

\_\_\_\_\_

16.  $+14 \div -7$

\_\_\_\_\_

## Problem Solving

17. Explain how you can multiply  $-3 \times -3$ .  
Use words or pictures with a label.

\_\_\_\_\_

**Show Your Work**