

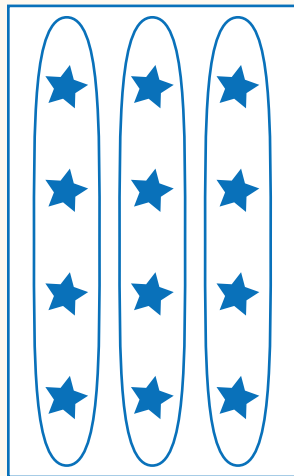
# Understand Multiplication as a Comparison



Dear Family,

This week your child is exploring multiplication as a comparison.

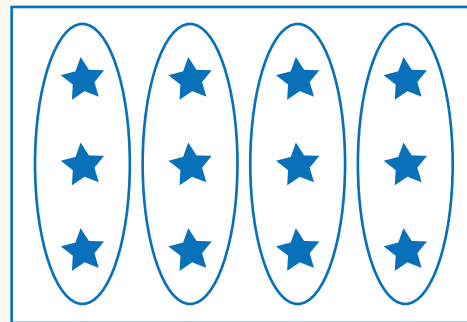
Your child is learning about multiplication as a way to compare two numbers.



This model shows that **12 is 3 times as many as 4.**

You can write the comparison as a multiplication equation:

$$12 = 3 \times 4$$

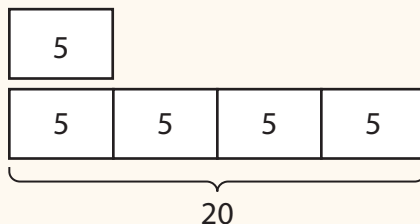


This model shows that **12 is 4 times as many as 3.**

You can write the comparison as a multiplication equation:

$$12 = 4 \times 3$$

Your child is also learning how to use bar models to help understand multiplication as a comparison.



This bar model shows that 20 is 4 times as many as 5:  $20 = 4 \times 5$ .

Invite your child to share what he or she knows about multiplication as a comparison by doing the following activity together.

## ACTIVITY MULTIPLICATION AS A COMPARISON

Do this activity with your child to explore multiplication as a comparison.

**Materials** 20 pennies or other identical small objects

- With your child, arrange 10 pennies to show that 10 is 2 times as many as 5. The pennies should look like this:

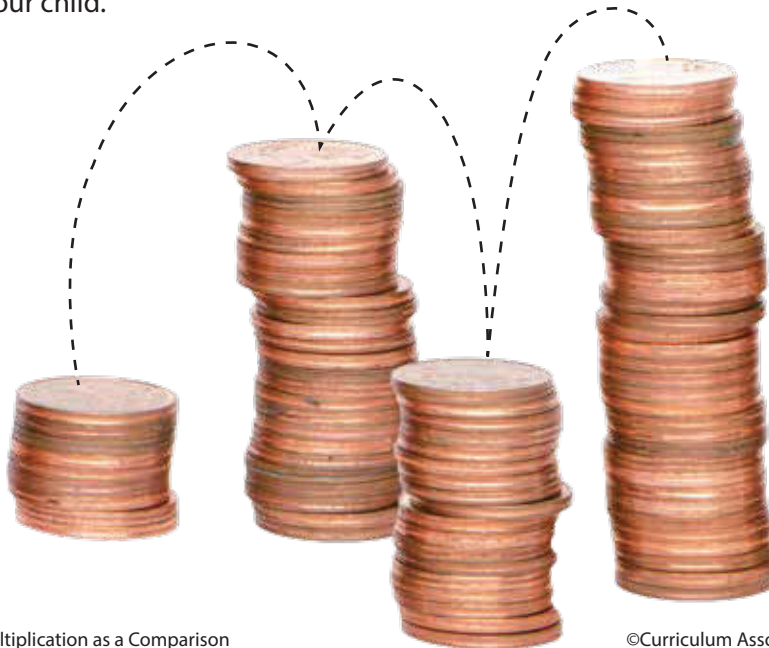


- Now ask your child to arrange 10 pennies to show that 10 is 5 times as many as 2. (The pennies should be arranged in 5 rows with 2 pennies in each row.)
- Repeat the activity, asking your child to arrange pennies to show other multiplication comparisons.

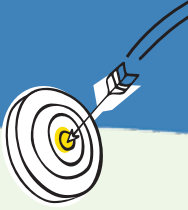
*Examples:*

- 14 is 7 times as many as 2.
- 14 is 2 times as many as 7.
- 18 is 6 times as many as 3.
- 18 is 3 times as many as 6.

Look for real-life opportunities to explore multiplication as a comparison of two numbers with your child.



# Explore Multiplication as a Comparison



What are some ways to think about multiplication?



## Learning Target

- Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.

SMP 1, 2, 3, 4, 5, 6, 7

## MODEL IT

Complete the problems below.

1 You can think about multiplication as joining equal groups.

a. Draw 3 groups of 5 stars.

b. Write a multiplication equation to find the total number of stars.

..... × ..... = .....

2 You can also think about multiplication as a way to compare two numbers.

a. Draw a group of 5 stars in the box on the left. Draw three times as many stars in the boxes on the right.

<b>5 stars</b>	<b>3 times as many</b>

b. Use the model to complete the sentence and the multiplication equation.

..... is 3 times as many as 5.

..... = ..... × .....



## DISCUSS IT

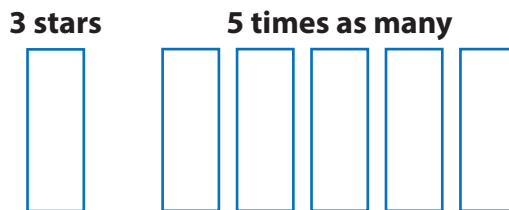
- Compare your models and equations to your partner's models and equations. Are they the same?
- I think *times as many* shows multiplication because ...

# MODEL IT

Complete the problems below.

3 When you multiply, the order of the factors does not matter.

a. Draw a group of 3 stars in the first box. Draw five times as many stars in the boxes to the right.



b. Use the model to complete the sentence and multiplication equation.

..... is 5 times as many as 3.  
 ..... = ..... × .....



## DISCUSS IT

- How are the equations you write in problem 4 alike and different?
- I think models and equations can help you understand multiplication as a comparison because ...

4 You can also show **multiplicative comparisons** as connected bars in a model. Complete the descriptions and equations for each model.



..... is ..... times as many as 5.  
 ..... = ..... × 5



..... is ..... times as many as 3.  
 ..... = ..... × 3

## 5 REFLECT


Explain how finding 3 *times as many as* 5 is different from finding 3 *more than* 5.

.....

.....

# Prepare for Multiplication as a Comparison

- 1 Think about what you know about multiplication. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.

What Is It?	What I Know About It	
 <b>multiplication</b>		
Examples	Examples	Examples

- 2 Draw 5 groups of 4 squares. Write a multiplication equation to find the total number of squares.

Solve.

- 3 a. Draw a group of 2 circles in the first box. Draw six times as many circles in the boxes to the right.

2 circles



6 times as many



- b. Use the model to complete the sentence and multiplication equation.

..... is 6 times as many as 2.

..... = .....  $\times$  2

- 4 Complete the descriptions and equations for each model.

a.

4 circles



..... times as many



..... is ..... times as many as 4.

..... = .....  $\times$  4

b.

3 circles



..... times as many



..... is ..... times as many as 3.

..... = .....  $\times$  3

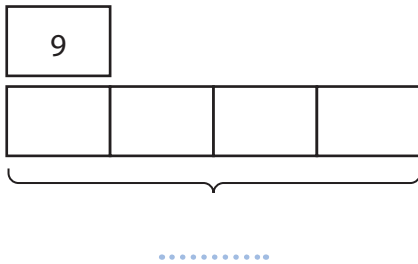
- 5 How are the multiplication equations you wrote in problem 4 alike? How are they different?

# Develop Understanding of Multiplication as a Comparison

## MODEL IT: BAR MODELS AND EQUATIONS

Try these two problems.

- Complete the bar model below to show the comparison *36 is 4 times as many as 9*. Then write a multiplication equation.



**Equation** .....

- Draw and label a bar model to show a number that is 6 times as many as 9. Then write a multiplication equation.

**Equation** .....



### DISCUSS IT

- How do you and your partner think that a bar model shows how to compare two numbers?
- I think a bar model helps me understand multiplication as a comparison because . . .

## MODEL IT: WORDS AND EQUATIONS

Use words to describe multiplication equations as comparisons.

- 3 Complete the sentence to interpret  $7 \times 5 = 35$  as a comparison.

..... times as many as ..... is .....

- 4 Write a comparison word problem that could be modeled by the equation  $4 \times 6 = 24$ .



### DISCUSS IT

- How do you use words to interpret a multiplication equation as a comparison?
- I think using words helps me understand a multiplication equation as a comparison because ...

## CONNECT IT

Complete the problems below.

- 5 Think about  $7 \times 9 = 63$ . How could you use a bar model and words to represent this multiplication equation as a comparison?

- 6 Yao blew up 8 balloons. Flora blew up 2 times as many balloons as Yao. Choose any model to show the number of balloons Flora blew up. Show your work.

**Solution** .....



# Practice Multiplication as a Comparison

Study how the Example shows using a bar model to show multiplication as a comparison. Then solve problems 1–7.

## EXAMPLE

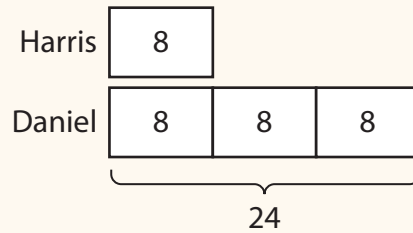
Harris rides his bike 8 blocks to school. Daniel rides his bike 3 times as far as Harris. How far does Daniel ride his bike to school?

You can use a bar model to show multiplication as a comparison.

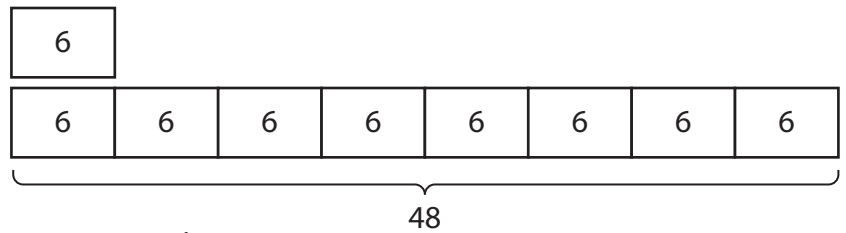
24 is 3 times as many as 8.

$$24 = 3 \times 8$$

Daniel rides his bike 24 blocks to school.



- 1 Use the bar model at the right to describe the comparison and write an equation.



48 is ..... times as many as .....

$$\dots = \dots \times \dots$$

- 2 Draw and label a bar model to show a number that is 5 times as many as 7.

- 3 Write a word problem that the bar model in problem 2 could represent.

4 Tara scores 6 times as many soccer goals as Leah during one season. Leah scores 3 goals. Draw a bar model and write an equation that represents the number of goals Tara scores.

5 What two comparisons does the equation  $4 \times 2 = 8$  show?

a. .... is .... times as many as .....

b. .... is .... times as many as .....

6 Draw two different bar models to represent  $2 \times 4 = 8$ .

7 A pet caretaker walks dogs 9 times a day. He walks dogs 5 days a week from Monday to Friday. Draw and label a bar model to show the total number of times the caretaker walks dogs in a week.



# Refine Ideas About Multiplication as a Comparison

## APPLY IT

Complete these problems on your own.

### 1 EXPLAIN

Mia plants 8 seeds. Her sister plants 6 times as many seeds as Mia. How could you find the number of seeds Mia's sister plants?

### 2 COMPARE

How is 4 times as many as 7 related to 7 times as many as 4? Explain your reasoning.

### 3 ANALYZE

Sergio found 4 pennies on the ground. His sister said she found 2 times as many pennies. Sergio figured out that his sister found 6 pennies. What did Sergio do wrong?



### PAIR/SHARE

Discuss your solutions for these three problems with a partner.

Use what you have learned to complete problem 4.

- 4 Paige and Ben each babysit one week. Paige babysits for 3 times as many hours as Ben. Ben babysits for 7 hours.

**Part A** Draw a bar model to represent the situation.

**Part B** Look at your model. Now write a different word problem that could also be represented by the model. Then write an equation that the model represents.



**Equation** .....

## 5 MATH JOURNAL

Show two ways you can think about  $5 \times 8 = 40$  as a comparison.