Multiplication and Division in Word Problems

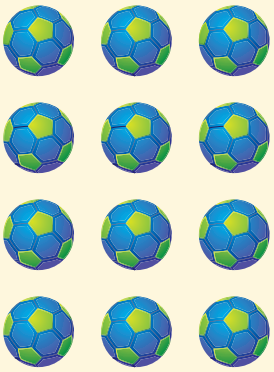
Use What You Know

Earlier, you thought about equations that compare numbers using multiplication. In this lesson, you will solve problems by comparing numbers. Take a look at this problem.

Hannah scored 3 goals last season. She scored 4 times as many goals this season. How many goals did Hannah score this season?

Last season

This season



a. How many goals did Hannah score last season? _____

b. Count to find the number of goals she scored this season. _____

c. How can you skip count to find the number of goals Hannah scored this season?

_____

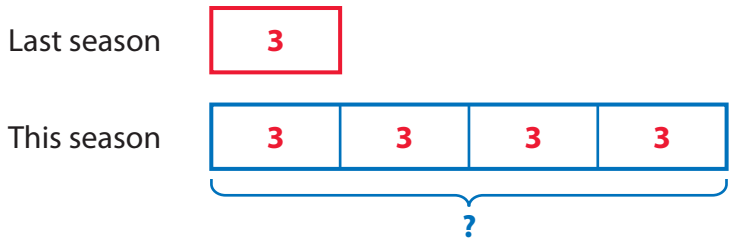
d. Besides addition, what operation can you use to solve the problem?

_____

e. What is 4 times as many as 3? _____

Find Out More

You will often need to figure out some unknown amount, like when you found the number of goals Hannah scored. You used skip counting to find 4 times 3. You can also use a bar model.



The bar model can help you write an equation to solve the problem.

$4 \times$ **goals last season** $=$ **goals this season**

Goals last season is known (**3**). Goals this season is unknown. You can use a **symbol**, such as an empty box or a question mark, to stand for what is **unknown** in the equation.

$4 \times 3 = \square$

Reflect

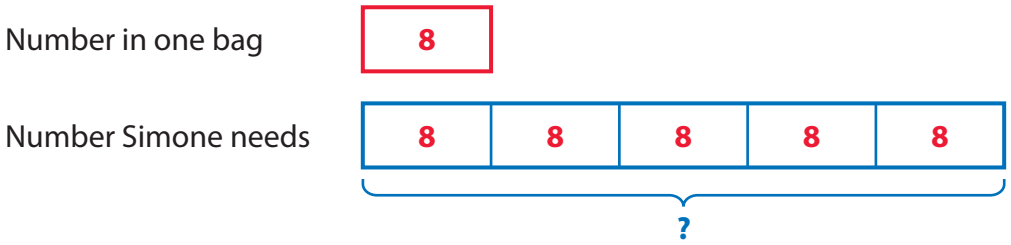
1 How would the bar model above change if Hannah scored only 2 goals last year instead of 3? Describe with words what would change. Then draw the bar model to show that.

Learn About Multiplication in Word Problems

Read the problem below. Then explore different ways to understand it.

Janelle's Market sells bags of 8 oranges. Simone needs 5 times that amount. Write and solve an equation to find the number of oranges Simone needs.

Model It You can use a model to help understand the problem.



Skip count to find the total Simone needs: 8, 16, 24, 32, 40.

Model It You can use the bar model to make an equation to help understand the problem.

5 × **oranges in one bag** = **total oranges needed**

The number of oranges in one bag is known (**8**). The total number of oranges needed is unknown.

$5 \times 8 = \square$

Connect It

Now you will solve the problem from the previous page using an equation.

2 You don't know how many oranges Simone needs. What symbol on the bar model shows how many she needs? _____

3 How does the bar model show how many oranges are in one bag?

_____

4 How does the bar model show how many oranges Simone needs?

_____

5 How can you find "*5 times as many*" as 8? _____

6 Write an equation using numbers to show how many oranges Simone needs.

_____

Simone needs _____ oranges.

7 Explain how you can write a multiplication equation from a bar model.

_____

_____

_____

Try It

Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

8 Neil and Vincent are collecting cans. Neil has collected 10 cans and Vincent has collected 3 times as many cans as Neil. Write and solve an equation to find the number of cans Vincent has collected.

_____

9 Mimi ate 6 times as many raisins as Mary. Mary ate 11 raisins. Write and solve an equation to find the number of raisins Mimi ate.

_____

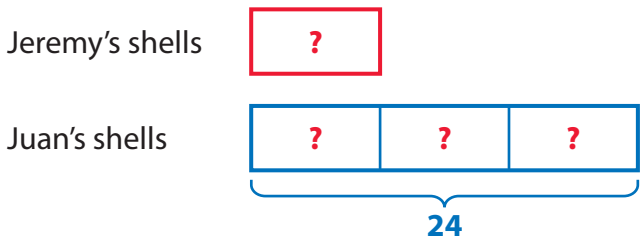
Learn About Division in Word Problems

Read the problem below. Then explore different ways to understand it.

Juan found 3 times as many seashells at the beach as Jeremy found. Juan found 24 shells. Write and solve an equation to find the number of shells Jeremy found.

Model It You can use a model to help understand the problem.

Jeremy found one group of seashells. Juan found 3 times as many shells as Jeremy.



Divide 24 by 3 to find the number of seashells in each group.

Model It You can use the model to make an equation to help understand the problem.

3 × **Jeremy's shells** = **Juan's shells**

The number of shells Juan found is known (24). The number Jeremy found is not known.

$3 \times \square = 24$

Connect It **Now you will solve the problem from the previous page using an equation.**

10 You don't know the number of shells Jeremy found. In the bar model, what part shows the number of shells Jeremy found?

11 How does the bar model show how many shells Juan found?

12 How does the bar model show that 24 is 3 times another number?

13 How can you find what number times 3 is 24?

14 Write a division equation using numbers to show how many shells Jeremy found.

Jeremy found _____ shells.

15 Explain how you can write a division equation from a model.

Try It **Use what you just learned to solve these problems. Show your work on a separate sheet of paper.**

16 Monique and Wint are both reading the same book. Monique read 63 pages last weekend. She read 7 times as many pages as Wint. Write and solve an equation to find the number of pages Wint read. _____

17 The winning baseball team scored 4 times as many runs as their opponent. The winning team scored 8 runs. Write and solve an equation to find the number of runs their opponent scored. _____

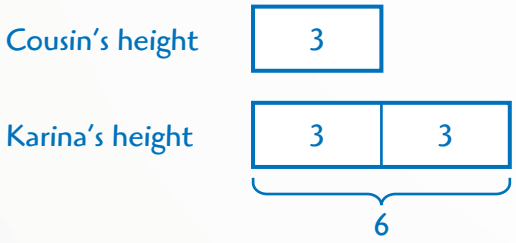
Practice Multiplying and Dividing in Word Problems

Study the example below. Then solve problems 18–20.

Example

Karina is 6 feet tall. Her cousin is 3 feet tall. How many times as tall as her cousin is Karina?

Look at how you could show your work using a bar model.



$\square \times 3 = 6$; $\square = 2$

Solution Karina is 2 times as tall as her cousin.

There are twice as many boxes in the model for Karina's height as there are for her cousin's height.

Pair/Share
How else could you solve this problem?

---

18 A small shrimp taco has 5 shrimp. There are 3 times as many shrimp in a large taco. How many shrimp are in a large taco? Write and solve an equation to find the answer.

Show your work.

What does it mean when the problem says 3 times as many?

Pair/Share
Did you and your partner write the same, or different, equations?

Solution _____

19 Christina read 7 pages in a magazine. She read 5 times as many pages in a book. How many pages did Christina read altogether?

Show your work.

I think this problem has more than one step.

Pair/Share
How can you check your answer?

Solution _____

20 Aida swam 7 laps in a pool. Kaya swam 28 laps. How many times the number of laps Aida swam did Kaya swim? Circle the letter of the correct answer.

A 4

B 21

C 35

D 196

Jae Ho chose **D** as the correct answer. How did he get that answer?

I can use multiplication or division to solve this problem.

Pair/Share
How did you and your partner know what operation to use?

Practice Multiplying and Dividing in Word Problems

Solve the problems.

1 Kyle sold 28 boxes of fruit for a fundraiser. Omar sold 2 times as many boxes of fruit as Kyle sold. What is the total number of boxes that Kyle and Omar sold?

A 84

B 56

C 42

D 14

2 Raoul biked 11 miles last week. Jackson biked 22 miles last week. Jackson biked how many times as many miles as Raoul? Which equation can help you answer the question?

A $22 - 11 = \square$

B $22 \div 11 = \square$

C $11 \times 22 = \square$

D $11 + 22 = \square$

3 Which problems can be solved using the equation $3 \times 9 = A$? Circle the letter of all that apply.

A Pam is 9 years old. She is 3 times as old as Kate. How old is Kate?

B Marco is making 9 apple tortes. He needs 3 apples for each torte. How many apples does he need?

C Three groups of actors are performing plays at a festival. There are 9 actors in each group. How many actors are performing?

D An art class meets 3 times a week for 9 weeks. How many times does the art class meet?

E Judy found 3 acorns. Aaron found 3 times as many acorns as Judy. How many acorns did Aaron find?

4 Maria has 32 postcards. Henry has h postcards. Maria has 4 times as many postcards as Henry. Choose *Yes* or *No* to indicate whether each statement is true.

a. The number of postcards Henry has can be represented by the expression $32 \div 4$. ☐ Yes ☐ No

b. Henry has 6 postcards. ☐ Yes ☐ No

c. The number of postcards Henry has can be found by solving the equation $32 = 4 \times h$. ☐ Yes ☐ No

5 Last week Viet learned 25 new spelling words. That was 5 times as many words as Max. How many words did Max learn last week? Draw a bar model to find the number of words Max learned.

Show your work.

Answer Max learned _____ new spelling words last week.

6 Mr. Naik traveled 18 days on vacation last summer. Miss Cooper traveled 3 days on vacation last summer. How many times as many days did Mr. Naik travel on vacation as Miss Cooper? Write an equation to find the answer.

Show your work.

Answer Mr. Naik traveled _____ times as many days on vacation as Miss Cooper.

Self Check **Go back and see what you can check off on the Self Check on page 45.**