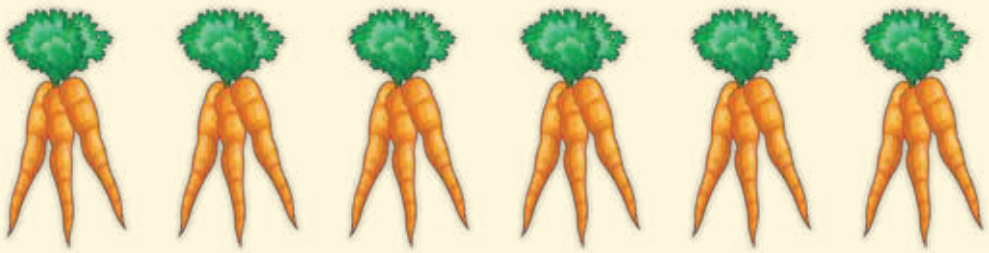
Split Numbers to Multiply

Use What You Know

In Lesson 2, you learned some ways to make multiplying numbers easier. Take a look at this problem.

Ty has 6 bunches of carrots. There are 3 carrots in each bunch. How many carrots does Ty have altogether?



a. Circle 5 of the bunches.
What multiplication equation can you write to find how many carrots are in 5 bunches? _____

b. Circle the 1 bunch that is left.
What multiplication equation can you write to find how many carrots are in 1 bunch? _____

c. Look at the two sets of bunches you circled. You found the number of carrots in each set.
Explain how you could use those two numbers to find the total number of carrots.

_____

_____

_____

Find Out More

You can break apart numbers to help you figure out multiplication problems you do not know.

Ty did not know what 6 groups of 3 were, but he did know what 5 groups of 3 were. That left 1 group of 3.

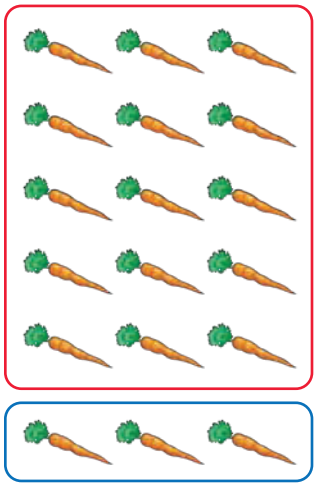
Ty broke apart **6** into **5 + 1**. Then he multiplied each part by 3 and added the products together.

You can write 5 bunches of 3 carrots plus 1 bunch of 3 carrots like this:

(5 × 3) + **(1 × 3)**

The parentheses show you that you multiply each set of numbers first, and then add the products together.

You can also show this using an array.



5 × 3 = 15

1 × 3 = 3

You can write what the array shows three ways:

6×3 or $(5 + 1) \times 3$ or $(5 \times 3) + (1 \times 3)$

Reflect

1 What if Ty had 4 carrots in each bunch instead of 3? Explain how he could break apart the numbers to find the product of 6×4.

Learn About

Breaking Apart Numbers to Multiply

Read the problem below. Then explore different ways to break apart one of the numbers to solve the problem.

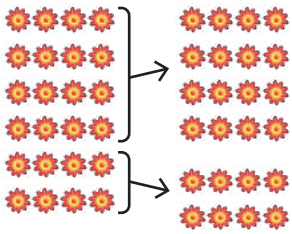
Mario has 6 vases of flowers. There are 4 flowers in each vase. How many flowers does Mario have in all? Break apart one of the numbers to find the answer.

Picture It **You can use equal groups to help understand the problem.**

Mario chose to break apart the number of groups to find the answer.

Model It **You can also use an array to help understand the problem.**

Mario made an array and then broke apart the rows to show the new groups.



Solve It **You can also use words to help understand the problem.**

6 vases of 4 flowers is the same as 4 vases of 4 flowers plus 2 vases of 4 flowers.

Connect It Now you will explore different ways to solve the problem from the previous page.

2 What numbers did Mario break 6 into to help him solve the problem?

3 What two multiplication equations did Mario use then?

4 What is another way you could break apart 6?

5 What numbers could Mario break 4 into to help him solve the problem?

6 What two multiplication equations would Mario use if he broke apart the 4?

7 Explain why Mario's way of solving the problem is not the only way.

Try It Use what you just learned to solve this problem.

8 Show two different ways to break apart the numbers to solve 4×3. Draw models and show the math equations you used.

Learn About

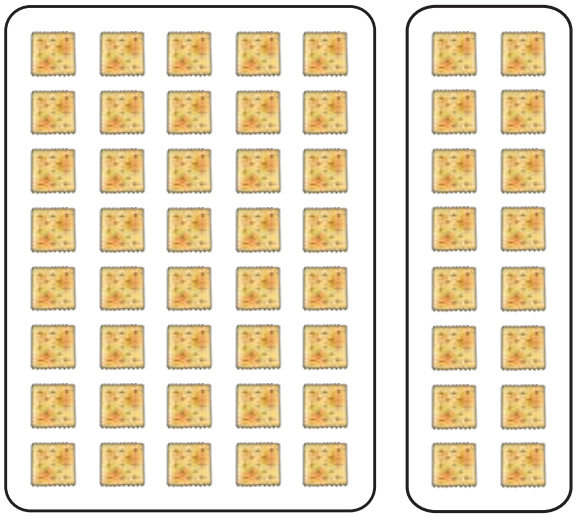
Breaking Apart Numbers to Multiply

Read the problem below. Then explore ways to break apart a number to make one hard multiplication equation into two easier multiplication equations.

Matt shared some crackers with 8 friends. He gave each friend 7 crackers. How many crackers did Matt give away? Break apart one of the numbers to find the answer.

Model It **You can use an array to help understand the problem.**

Instead of breaking apart the rows (the number of friends), Matt broke apart the columns (the number of crackers).



Solve It **You can also use words and multiplication expressions to help understand the problem.**

Giving 8 friends 7 crackers is the same as giving 8 friends 5 crackers each, then giving each of them 2 more crackers. You can write the multiplication three ways:

8×7 or $8 \times (5 + 2)$ or $(8 \times 5) + (8 \times 2)$

Connect It **Now you will think more about the problem from the previous page.**

9 What numbers did Matt break 7 into to help him solve the problem? _____

10 What two multiplication expressions did Matt use then? _____

11 Show how to use the two multiplication expressions to find the answer.

12 Madison knows the answer to 4×7. How can this help her multiply 8×7?

13 Explain why someone might want to break apart one of the numbers in a multiplication equation.

Try It **Use what you learned about breaking apart numbers to solve these problems.**

14 Alice knows the answer to 5×7. How can that help her find the answer to 6×7? Draw a model and show the math equations you used.

15 Tim knows the answer to 6×7. How can that help him find the answer to 6×9? Draw a model and show the math equations you used.

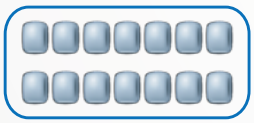
Practice Breaking Apart Numbers to Multiply

Study the example below. Then solve problems 16–18.

Example

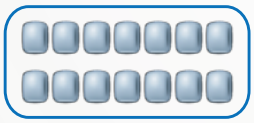
Stacy is making 4 bracelets. Each bracelet uses 7 silver beads. How many silver beads does Stacy need? Show how to break apart one of the numbers to make the problem easier to solve.

Look at how you could show your work using an array.



$2 \times 7 = 14$

$14 + 14 = 28$



$2 \times 7 = 14$

Solution 28 silver beads

The student broke apart the 4 into 2 + 2 and then added the two products together.

Pair/Share

How else could you have broken apart one of the numbers to solve this problem?

16 There are 6 bowls of apples. There are 6 apples in each bowl. Show how to break apart the number 6 to make the problem easier to solve.

What ways do you know to break apart the number 6? Which way do you think is easiest?

Pair/Share

What is another model you could have used to show how to break the number apart?

17 Joe has 8 shelves with 9 books on each shelf. How many books does Joe have altogether? Show how to break apart one of the numbers to make the problem easier to solve.

You can break apart the number 9 many different ways.

Solution _____

Pair/Share

How did you and your partner decide how to break apart one of the numbers?

18 Jordan found 6×8 by breaking apart the 6 into $5 + 1$. Which of the following correctly shows the next step in finding the result? Circle the letter of the correct answer.

A $(5 \times 6) + (1 \times 6)$

B $(6 \times 8) + (1 \times 8)$

C $(5 + 8) \times (1 + 8)$

D $(5 \times 8) + (1 \times 8)$

Jordan broke apart the 6 in 6×8. What will he do with the 8?

Avery chose **A** as the correct answer. How did she get that answer?

_____

_____

_____

_____

Pair/Share

Does Avery's answer make sense?

Practice Breaking Apart Numbers to Multiply

Solve the problems.

1 Tucker solved 7×5 by breaking it apart as shown below.

$(7 \times 3) + (7 \times \_\_\_\_)$

What number belongs in the blank?

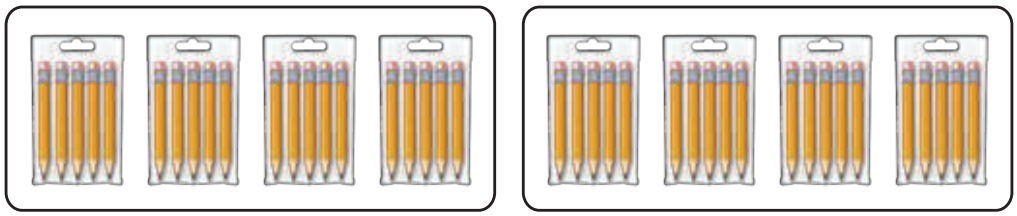
A 1

B 2

C 4

D 8

2 Cole has 8 packs of pencils. There are 5 pencils in each pack. He wants to know how many pencils he has in all. The model below shows how he breaks apart one number in the problem.



Which expression shows how Cole solves the problem?

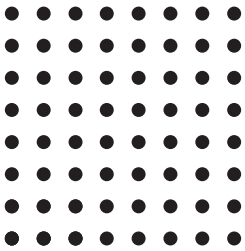
A $(4 \times 5) + (4 \times 5)$

B $(8 \times 2) + (8 \times 2)$

C $(4 \times 2) + (4 \times 2)$

D $(3 \times 5) + (5 \times 5)$

3 Use the array below to solve 8×8. First draw circles to break the array into two groups. Then fill in the blanks to show how you broke the numbers apart.



$8 \times 8 = (8 \times \_\_\_\_) + (8 \times \_\_\_\_)$

4 Is each expression equivalent to the product of 6 and 9? Choose *Yes* or *No*.

a.	$(6 \times 3) + (6 \times 3)$	☐ Yes	☐ No
b.	$(6 \times 4) + (6 \times 5)$	☐ Yes	☐ No
c.	$6 \times (6 + 3)$	☐ Yes	☐ No
d.	$9 \times (2 + 4)$	☐ Yes	☐ No
e.	$(9 \times 3) + (9 \times 3)$	☐ Yes	☐ No

5 There are 9 rows in Mrs. Mitchell's flower garden. Each row has 9 flowers planted in it. How many flowers are planted in the garden? Show how to break apart the numbers to find the answer.

Answer There are _____ flowers in the garden.

Self Check **Go back and see what you can check off on the Self Check on page 1.**