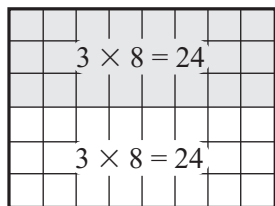


Student Guide

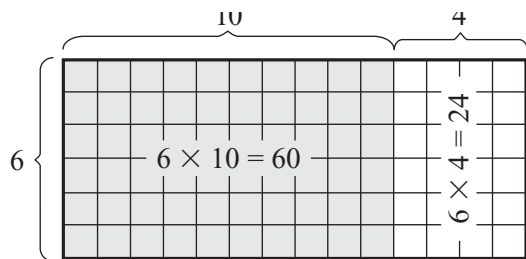
Questions 1–5 (SG pp. 86–87)

1. **A.** The number of rows in the full rectangle.
 - B.** The number of columns in the full rectangle.
 - C.** 6 is the number of rows in the shaded rectangle, 5 is the number of columns in the shaded rectangle, 30 is the product, or the number of squares in the shaded rectangle.
 - D.** 6 is the number of rows in the unshaded rectangle, 3 is the number of columns in the unshaded rectangle, 18 is the product, or the number of squares in the unshaded rectangle.
 - E.** She added $30 + 18$.
 - F.** Because 6×5 and 6×3 are easier products to do than 6×8 .
2. Responses will vary. Possible response:



$$6 \times 8 = 24 + 24 = 48$$

3. He broke 14 into $7 + 7$.
4. $6 \times 14 = 42 + 42$
 $6 \times 14 = 84$
- 5.



Copyright © Kendall Hunt Publishing Company

Break-Apart Products

Mrs. Dewey's class was working on multiplication problems. "One way to solve a multiplication problem is to break it into smaller problems that are easier to solve," said Mrs. Dewey. "Does anyone use that method?"

"I use the break-apart method to help me with multiplication facts that are hard for me to remember," said Grace. "Here is an example: To solve 6×8 , I break the 8 into $5 + 3$. I know 6×5 is 30 and 6×3 is 18. I add them together to get $6 \times 8 = 48$. Here is a picture."

Grace

Discuss

Check-In: Questions 1-5

1. Look at the rectangle and the number sentences above. Answer the questions to connect the picture with the number sentences.
 - A. What does the 6 represent?
 - B. What does the 8 represent?
 - C. What does each number in the number sentence $6 \times 5 = 30$ represent?
 - D. What does each number in the number sentence $6 \times 3 = 18$ represent?
 - E. How did Grace find the total number of squares in the large rectangle?
 - F. Why do you think Grace decided to break 8 into $5 + 3$?
2. Work with a partner. Find a different way to break 6×8 into parts. Make a sketch to show how you break the rectangle into parts. Write number sentences that match your rectangles. Follow the example above.

86 SG • Grade 4 • Unit 3 • Lesson 5 Break-Apart Products

Student Guide - Page 86

Using Break-Apart Products for Larger Numbers

"What if I already know most of the multiplication facts?" asked Jerome. "Why should I bother with the break-apart method when I already know the answers?"

"You might know the answers to most of the facts problems," said Mrs. Dewey. "But you probably don't know the answers to problems with larger numbers. The break-apart method can help you with a problem like 6×14 ."

Jerome found 6×14 by breaking apart 14. He used a rectangle like this.

Jerome

3. How did Jerome break apart 14?
4. Help Jerome complete number sentences for his rectangle. Copy the number sentences. Then fill in the blanks.

$$6 \times 14 = (6 \times 7) + (6 \times 7)$$

$$6 \times 14 = 42 + \underline{\hspace{2cm}}$$

$$6 \times 14 = \underline{\hspace{2cm}}$$
5. Ming found 6×14 by breaking 14 into two different parts. He wrote this number sentence.

$$6 \times 14 = 60 + 24 = 84$$

On a separate sheet of paper, sketch a rectangle that shows how Ming solved the problem. Label the parts.

Ming

Break-Apart Products SG • Grade 4 • Unit 3 • Lesson 5 87

Student Guide - Page 87

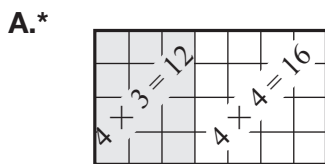
Student Activity Book

Exploring Break-Apart Products

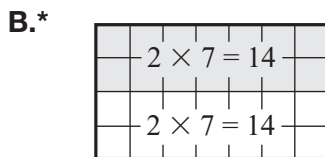
Questions 1–9 (SAB pp. 53–57)

- 1.* 32 squares
2. **A.*** $1 \times 4 = 4$; $7 \times 4 = 28$;
 $8 \times 4 = 4 + 28 = 32$ squares
- B.*** $4 \times 4 = 16$; $4 \times 4 = 16$;
 $8 \times 4 = 16 + 16 = 32$ squares See Figure 1 in the lesson.
3. **A.*** $8 \times 1 = 8$; $8 \times 3 = 24$;
 $8 \times 4 = 8 + 24 = 32$ squares
- B.*** $8 \times 2 = 16$; $8 \times 2 = 16$;
 $8 \times 4 = 16 + 16 = 32$ squares See Figure 1 in the lesson.

4.* Responses will vary. Possible responses include:



$4 \times 7 = 12 + 16 = 28$ squares



$4 \times 7 = 14 + 14 = 28$ squares

Copyright © Kendall Hunt Publishing Company

Name _____ Date _____

Exploring Break-Apart Products

1. Find the number of squares in the 8×4 rectangle below.

2. The 8 rows of the rectangles below are broken into two parts. Write a number sentence on each part that shows the number of squares. Then add the two parts together to find the total number of squares in the large rectangle. The first one is an example.

4

Ex. **A.** **B.**

Copyright © Kendall Hunt Publishing Company

Break-Apart Products SAB • Grade 4 • Unit 3 • Lesson 5 53

Student Activity Book - Page 53

Name _____ Date _____

3. The 4 columns of the rectangles below are broken into two parts.

- Write a number sentence on each part that shows the number of squares.
- Add the two parts together to find the total. Write this number sentence.

A. **B.**

4. Break the 4×7 rectangles below into two parts in two different ways.

- Choose numbers that will make multiplying 4×7 easier.
- Write a number sentence on each part that shows the number of squares.
- Write a number sentence that shows how you find the total number of squares in the large rectangle.

A. **B.**

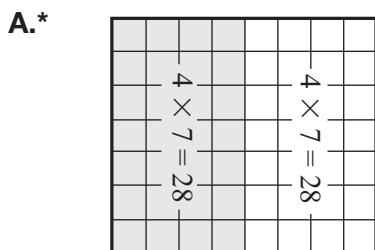
Copyright © Kendall Hunt Publishing Company

54 SAB • Grade 4 • Unit 3 • Lesson 5 Break-Apart Products

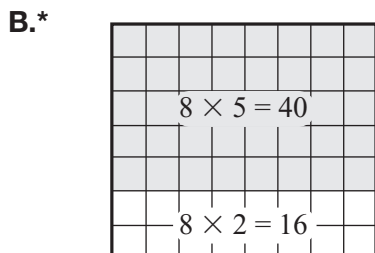
Student Activity Book - Page 54

*Answers and/or discussion are included in the lesson.

5.* Possible responses include:



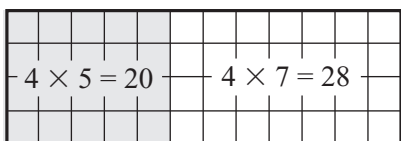
$$8 \times 7 = 28 + 28 = 56$$



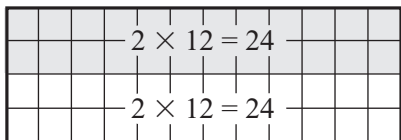
$$8 \times 7 = 40 + 16 = 56$$

See Figure 2 in the lesson.

6.* Possible responses include:

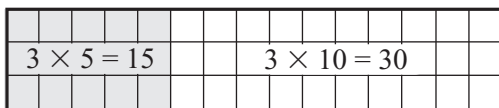


$$4 \times 12 = 20 + 28 = 48 \text{ squares}$$

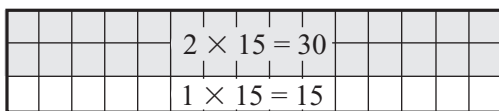


$$4 \times 12 = 24 + 24 = 48 \text{ squares}$$

7. Possible responses include:



$$3 \times 15 = 15 + 30 = 45 \text{ squares}$$



$$3 \times 15 = 30 + 15 = 45 \text{ squares}$$

Copyright © Kendall Hunt Publishing Company

Name _____ Date _____

5. Break apart the 7×8 rectangles in two different ways.

- Choose numbers that will make multiplying 7×8 easier.
- Write number sentences to show your work.

A.

B.

Copyright © Kendall Hunt Publishing Company

Break-Apart Products SAB • Grade 4 • Unit 3 • Lesson 5 55

Student Activity Book - Page 55

Name _____ Date _____

Larger Break-Apart Products

Each problem below shows the same rectangle twice. Find the number of small squares in each rectangle using the break-apart method.

- Break Rectangle A of each problem into two parts that make the multiplication easier.
- Write number sentences on the smaller rectangles to show the number of squares in each part.
- Write a number sentence to show how to find the total number of squares in the large rectangle.
- Solve the problem again using Rectangle B. This time break the rectangle into different parts.

6. 4×12

A.

B.

7. 3×15

A.

B.

Copyright © Kendall Hunt Publishing Company

56 SAB • Grade 4 • Unit 3 • Lesson 5 Break-Apart Products

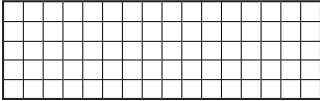
Student Activity Book - Page 56

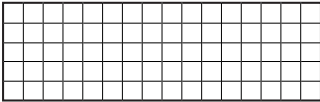
*Answers and/or discussion are included in the lesson.

Answer Key • Lesson 5: Break-Apart Products

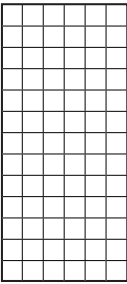
Name _____ Date _____

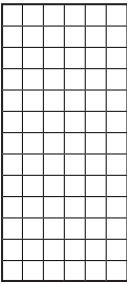
8. 5×16

A. 

B. 

9. 13×6

A.  Number Sentence: _____

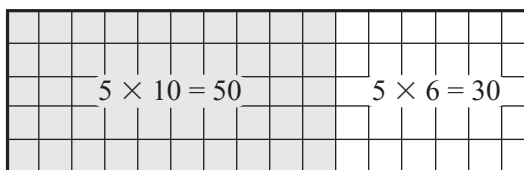
B.  Number Sentence: _____

Copyright © Kendall Hunt Publishing Company

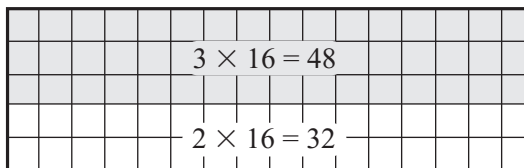
Break-Apart Products SAB • Grade 4 • Unit 3 • Lesson 5 57

Student Activity Book - Page 57

8. Possible responses include:

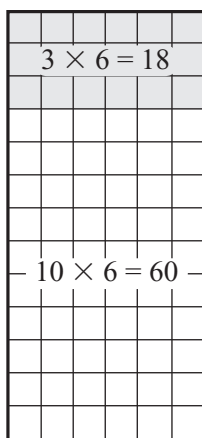


$$5 \times 16 = 50 + 30 = 80 \text{ squares}$$



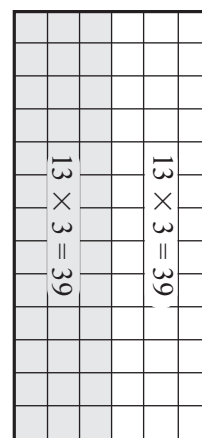
$$5 \times 16 = 48 + 32 = 80 \text{ squares}$$

9. Possible responses include:



$$10 \times 6 = 60$$

$$13 \times 6 = 18 + 60 = 78$$



$$13 \times 3 = 39$$

$$13 \times 6 = 39 + 39 = 78$$

Student Activity Book

Writing Number Sentences for Break-Apart Products

Questions 1–4 (SAB pp. 59–60)

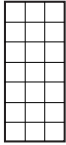
1. **A.*** 7 rows, 3 columns
B.* $7 \times 3 = 21$
2. **A.*** $5 \times 3 = 15$
B.* $2 \times 3 = 6$
C.* $7 \times 3 = 15 + 6$; $7 \times 3 = 21$
3. **A.** $10 \times 4 = 40$
B. $3 \times 4 = 12$
C. $13 \times 4 = (10 \times 4) + (3 \times 4)$;
 $13 \times 4 = 40 + 12$; $13 \times 4 = 52$
4. **A.** $13 \times 2 = 26$
B. $13 \times 2 = 26$
C. $13 \times 4 = (13 \times 2) + (13 \times 2)$;
 $13 \times 4 = 26 + 26$; $13 \times 4 = 52$

Copyright © Kendall Hunt Publishing Company

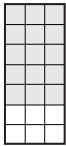
Name _____ Date _____

Writing Number Sentences for Break-Apart Products

1. **A.** How many rows and columns does the rectangle to the right have?
 Rows: _____ Columns: _____
- B.** Write a number sentence for the total number of squares.



2. **A.** Write a number sentence on the shaded part of the rectangle at the right to show the number of shaded squares.
- B.** Write a number sentence on the unshaded part to show the number of unshaded squares.
- C.** Complete these number sentences using the rectangle for Question 2:
 $7 \times 3 = (5 \times 3) + (2 \times 3)$
 $7 \times 3 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$
 $7 \times 3 = \underline{\hspace{1cm}}$



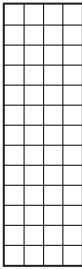
Copyright © Kendall Hunt Publishing Company

Break-Apart Products SAB • Grade 4 • Unit 3 • Lesson 5 59

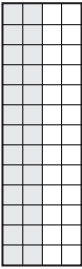
Student Activity Book - Page 59

Name _____ Date _____

3. **A.** Shade in the first 10 rows of the rectangle on the right. Write a number sentence on the shaded part to show the total number of shaded squares.
- B.** Write a number sentence on the unshaded part to show the total number of unshaded squares.
- C.** Complete the number sentences below to match the rectangle:
 $13 \times 4 = (\underline{\hspace{1cm}} \times 4) + (\underline{\hspace{1cm}} \times 4)$
 $13 \times 4 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$
 $13 \times 4 = \underline{\hspace{1cm}}$



4. **A.** The first two columns of the rectangle on the right are shaded. Write a number sentence to show the number of shaded squares.
- B.** Write a number sentence to show the number of unshaded squares.
- C.** Complete the following number sentences to match the rectangle.
 $13 \times 4 = (\underline{\hspace{1cm}} \times 2) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$
 $13 \times 4 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$
 $13 \times 4 = \underline{\hspace{1cm}}$



Copyright © Kendall Hunt Publishing Company

60 SAB • Grade 4 • Unit 3 • Lesson 5 Break-Apart Products

Student Activity Book - Page 60

*Answers and/or discussion are included in the lesson.

Name _____ Date _____

Factors, Multiples, and Primes

You may use calculators, multiplication tables, or square-inch tiles to solve the following problems.

- Danny made a rectangle with 40 tiles. If there were 5 rows, how many tiles were in each row? Draw a picture of this rectangle.
- Is it possible to make a rectangle with 6 rows using 30 tiles? Why or why not?
 - Is it possible to make a rectangle with 4 rows using 30 tiles? Why or why not?
- Is 28 a multiple of 4? Show or tell how you know.
 - Is 28 a multiple of 5? Show or tell how you know.

Copyright © Kendall Hunt Publishing Company

1 TG • Grade 4 • Unit 3 • Lesson 5 Assessment Master

Teacher Guide - Page 1

Name _____ Date _____

- Is 28 a prime number? Show or tell how you know.
- Is 31 a multiple of 5? Show or tell how you know.
- Is 31 a prime number? Show or tell how you know.
- Joe Smart is having trouble remembering 9×5 . Show Joe how to solve 9×5 using the break-apart method.

 - Break the rectangle into parts to make it easier to multiply.
 - Write number sentences on each part to show the number of squares in each.
 - Write a number sentence to show the total number of squares in the large rectangle.

Copyright © Kendall Hunt Publishing Company

Assessment Master TG • Grade 4 • Unit 3 • Lesson 5 2

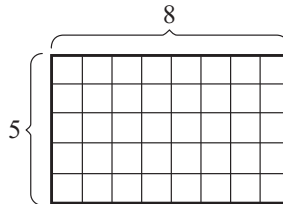
Teacher Guide - Page 2

Teacher Guide

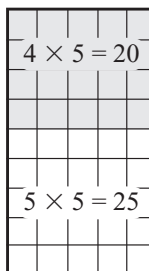
Factors, Multiples, and Primes

Questions 1–8 (TG pp. 1–3)

1. 8 tiles in each row.



- Yes, it is possible. There would be 6 rows with 5 tiles in each row.
 - Possible responses: No, because 4 is not a factor of 30. No, because 30 is not a multiple of 4.
- Yes; $4 \times 7 = 28$
 - Possible responses: No, only numbers that end in 0 or 5 are multiples of 5. No, 5 is not a factor of 28.
- 28 is not a prime number, it has factors of 2, 4, 7, and 14.
- Possible responses: No, it doesn't end in 0 or 5. No, 31 is a prime number; it has only 1 and 0 as factors.
- Yes, it is a prime number. It doesn't have any factors besides 31 and 1.
- Possible response:

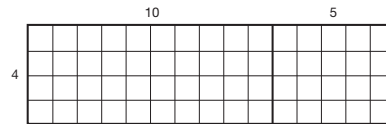


$9 \times 5 = 20 + 25 = 45$

8. **A.** 4×15
B. $4 \times 15 = (4 \times 10) + (4 \times 5)$
 $4 \times 15 = 40 + 20 = 60$

Name _____ Date _____

8. Jacob drew the rectangle below and broke it into parts.



- A.** What multiplication problem does Jacob's rectangle represent?

- B.** Complete Jacob's problem using the break-apart method. Write number sentences to show your work.

**Factors, Multiples, and Primes
Feedback Box**

	Expectation	Check In	Comments
Use arrays to solve multiplication and division problems. [Q# 1-2]	E1		
Decide whether one number is a multiple of another. [Q# 3 and 5]	E2		
Find the factors of a number. [Q# 2-6]	E3		
Decide whether a number is prime. [Q# 4 and 6]	E4		
Use break-apart products to solve a math facts problem. [Q# 7]	E9		
Use break-apart products to solve multiplication problems with larger numbers. [Q# 8]	E9		

Copyright © Kendall Hunt Publishing Company