Student Guide

Questions 1–33 (SG pp. 72–78)

1.* 18 tiles, $3 \times 6 = 18$; 3 rows times 6 tiles in each row equals 18 total tiles.

2.* 18 tiles, $6 \times 3 = 18$; 6 rows times 3 tiles in each row equals 18 total tiles

3.* 6 tiles, $18 \div 3 = 6$; 18 total tiles divided into 3 rows equals 6 tiles in each row

4.* 3 tiles, $18 \div 6 = 3$; 18 total tiles divided into 6 rows equals 3 tiles in each row.

5. **A.** $3 \times 8 = 24$

   B. $8 \times 3 = 24$; $24 \div 3 = 8$; $24 \div 8 = 3$

6. **A.** $2 \times 2 = 4$

   B. No, because using the turn-around rule makes the same sentence.

   C. $4 \div 2 = 2$

   D. No.

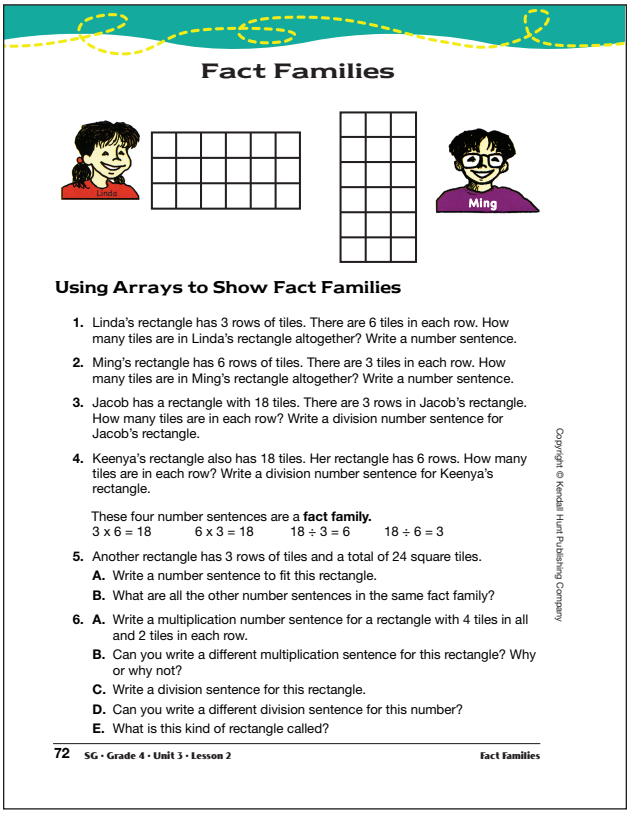
   E. A square.

7. **A.** 2 number sentences; $3 \times 3 = 9$ and $9 \div 3 = 3$

   B. 2 facts in each fact family

8. **A.** $5 \times 2 = 10$; $2 \times 5 = 10$; $10 \div 5 = 2$; $10 \div 2 = 5$

   B. $5 \times 5 = 25$; $25 \div 5 = 5$



Fact Families

Linda

Ming

Using Arrays to Show Fact Families

1. Linda's rectangle has 3 rows of tiles. There are 6 tiles in each row. How many tiles are in Linda's rectangle altogether? Write a number sentence.
2. Ming's rectangle has 6 rows of tiles. There are 3 tiles in each row. How many tiles are in Ming's rectangle altogether? Write a number sentence.
3. Jacob has a rectangle with 18 tiles. There are 3 rows in Jacob's rectangle. How many tiles are in each row? Write a division number sentence for Jacob's rectangle.
4. Keenya's rectangle also has 18 tiles. Her rectangle has 6 rows. How many tiles are in each row? Write a division number sentence for Keenya's rectangle.

   These four number sentences are a **fact family.**
   3 x 6 = 18 6 x 3 = 18 18 ÷ 3 = 6 18 ÷ 6 = 3
5. Another rectangle has 3 rows of tiles and a total of 24 square tiles.
   A. Write a number sentence to fit this rectangle.
   B. What are all the other number sentences in the same fact family?
6. **A.** Write a multiplication number sentence for a rectangle with 4 tiles in all and 2 tiles in each row.
   B. Can you write a different multiplication sentence for this rectangle? Why or why not?
   C. Write a division sentence for this rectangle.
   D. Can you write a different division sentence for this number?
   E. What is this kind of rectangle called?

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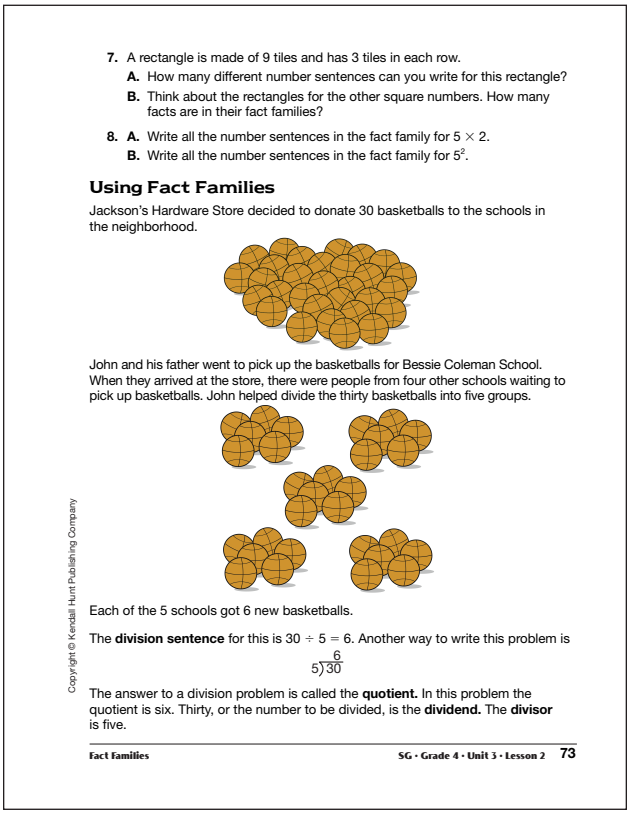

7. A rectangle is made of 9 tiles and has 3 tiles in each row.
   A. How many different number sentences can you write for this rectangle?
   B. Think about the rectangles for the other square numbers. How many facts are in their fact families?
8. **A.** Write all the number sentences in the fact family for 5×2.
   B. Write all the number sentences in the fact family for 5^2.

Using Fact Families

Jackson's Hardware Store decided to donate 30 basketballs to the schools in the neighborhood.

John and his father went to pick up the basketballs for Bessie Coleman School. When they arrived at the store, there were people from four other schools waiting to pick up basketballs. John helped divide the thirty basketballs into five groups.

Each of the 5 schools got 6 new basketballs.

The **division sentence** for this is $30 \div 5 = 6$. Another way to write this problem is $5\overline{)30}^{\,6}$

The answer to a division problem is called the **quotient.** In this problem the quotient is six. Thirty, or the number to be divided, is the **dividend.** The **divisor** is five.

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

Then John told everyone that he would label all the basketballs with the correct school name. Everyone brought the new basketballs back to him for labeling, one school at a time. John added 6 + 6 + 6 + 6 + 6. He knew this was the same as five groups of six, or 5 times 6, or 30 basketballs in all.

John knew that 5 × 6 = 30 is related to the division sentence 30 ÷ 5 = 6. There are two more sentences that are related: 6 × 5 = 30 and 30 ÷ 6 = 5. All four of these sentences together are a **fact family.**

Discuss

9. Jackson's Hardware Store also gave away a total of 30 soccer balls. Each school received a crate of six balls.
   - **A.** How many schools got soccer balls? Write a number sentence to describe this.
   - **B.** What does each number in the sentence represent?
10. John found he had 30 marbles at home and decided to give an equal number of marbles to each of his three sisters. How many marbles did John give to each sister? Draw a picture for this problem and describe it using a division sentence. Write another number sentence that is in the same fact family.
11. Nila wrote a division story for 20 ÷ 5. Nila drew a picture for her story.

   - **A.** What is another number sentence that is in the same fact family as 20 ÷ 5?
   - **B.** Write a division story for $10\overline{)50}$. Draw a picture for your story and write a number sentence. Write three more sentences that are in the same fact family.

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12. Maya baked chocolate chip cookies. She counted out 45 cookies and put an equal number in each of 9 bags. Then she gave one bag of cookies to each of 9 friends.
    - **A.** How many cookies did she give each friend? Write a number sentence for this story.
    - **B.** Write a multiplication number sentence in the same fact family. What do the numbers in the multiplication sentence represent?
13. Which of the following problems are in the same fact family as 5 × 8 = 40?

$10\overline{)40}$ $5\overline{)40}$ 8 × 4 = 32 8 × 5 = 40

Explore

Solve Questions 14–25. Use fact families, manipulatives, or other strategies. Write a number sentence for each problem. Then write the other sentences in the same fact family.

14. How many dimes are in 80 cents?
15. How many nickels are in 35 cents?
16. How many nickels are in 15 cents?
17. How many nickels are in 25 cents?
18. How many dimes are in 60 cents?
19. How many dimes are in $1.00?
20. How many dimes are in 40 cents?
21. Maya gets paid for helping a neighbor with her baby one afternoon each week. She saves all the money she gets and after six weeks, she has $36. How much money does Maya get paid each week? Write a number sentence.
22. How many weeks will Maya have to help her neighbor to make $60? Write a number sentence.
23. John lives 4 blocks from school. It takes him 16 minutes to walk to school. How long does it take John to walk one block? Write a number sentence.

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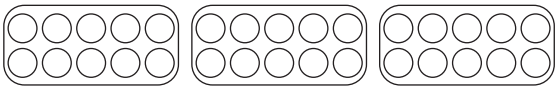
Student Guide

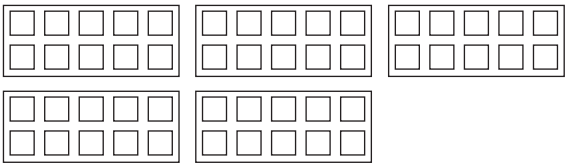
9. **A.*** 5 schools; 30 ÷ 6 = 5

   B.* 30 soccer balls, 6 balls in a crate, 5 schools
10. 10 marbles; 30 ÷ 3 = 10. Other sentences in the same fact family are 30 ÷ 10 = 3, 3 × 10 = 30, 10 × 3 = 30.
    Possible picture:



11. **A.** Possible answers: 20 ÷ 4 = 5, 4 × 5 = 20, 5 × 4 = 20.

    B. Stories and pictures will vary.
    Possible response: John had 50 baseball cards he put 10 cards on each page of his album. How many pages did he use?



    50 ÷ 10 = 5 50 ÷ 5 = 10
    5 × 10 = 50 10 × 5 = 50
12. **A.** 5 cookies; 45 ÷ 9 = 5

    B. 5 × 9 = 45 (or 9 × 5 = 45); 5 cookies in a bag, 9 bags (or 9 friends), 45 cookies in all
13. $5\overline{)40}$ and 8 × 5 = 40
14. 8 dimes; 80 ÷ 10 = 8, 80 ÷ 8 = 10, 10 × 8 = 80, 8 × 10 = 80
15. 7 nickels; 35 ÷ 5 = 7, 35 ÷ 7 = 5, 7 × 5 = 35, 5 × 7 = 35
16. 3 nickels; 15 ÷ 5 = 3, 15 ÷ 3 = 5, 3 × 5 = 15, 5 × 3 = 15
17. 5 nickels; 25 ÷ 5 = 5, 5 × 5 = 25
18. 6 dimes; 60 ÷ 10 = 6, 60 ÷ 6 = 10, 6 × 10 = 60, 10 × 6 = 60
19. 10 dimes; 100 ÷ 10 = 10, 10 × 10 = 100
20. 4 dimes; 40 ÷ 10 = 4, 40 ÷ 4 = 10, 4 × 10 = 40, 10 × 4 = 40
21. 36 ÷ 6 = 6 dollars per week
22. 60 ÷ 6 = 10 weeks
23. 16 ÷ 4 = 4 minutes

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

24. 64 words; $8 \times 8 = 64$

25. 7 boys; $49 \div 7 = 7$

26. **A.*** 5 candy bars; $5 \times 1 = 5$

B.* 8 candy bars; $8 \times 1 = 8$

C.* 26 candy bars; $26 \times 1 = 26$

27. **A.*** 0 candy bars; $5 \times 0 = 0$

B.* 0 candy bars; $9 \times 0 = 0$

C.* $18 \times 0 = 0$, the same amount as 9×0.

28. **A.*** 0 **B.*** 5 **C.*** 0

D.* 10 **E.*** 0 **F.*** 98

G.* 0 **H.*** 5348

29. **A.*** Any number multiplied by 0 is 0. Zero groups of any number is zero.

B.* Any number multiplied by 1 is the number itself. One group of any number is that number.

30. 7 little brothers; $7 \times 1 = 7$

31. 0 problems; $5 \times 0 = 0$

32. 14 girls; $14 \div 1 = 14$

33. Possible response. Moe can use Joe's number sentence and the turn-around rule, $4 \times 10 = 40$ and $10 \times 4 = 40$.

Homework
Questions 1–8 (SG p. 78)

1. 9 dimes **2.** 6 nickels

3. Stories and pictures will vary. Possible response: Fran had 81 candies to share among 9 of her friends. How many candies will she give each friends? $81 \div 9 = 9$ candies. There is only one other number sentence in the same fact family: $9 \times 9 = 81$.

4. Two dimes and one nickel, one dime and three nickels.

5. Three dimes and two nickels, two dimes and four nickels, one dime and six nickels.

6. **A.** Irma had 15 candies; $3 \times 5 = 15$

Michael had 25 candies; $5 \times 5 = 25$

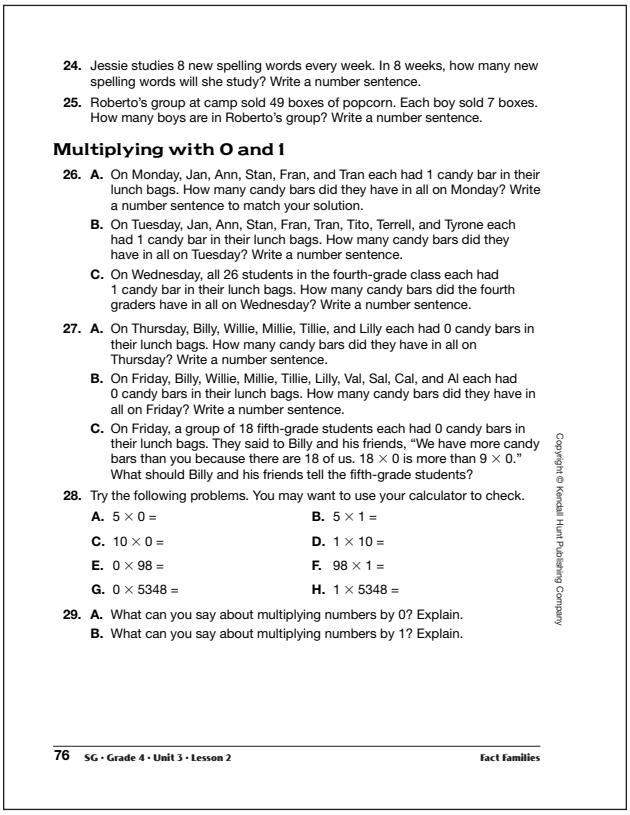
Romesh had $1 \times 5 = 5$

Jessie had no candies; $0 \times 5 = 0$

B. 45 candies

7. 4 dimes

8. 6 packs. Possible strategy: 2 packs cost 30¢. $30¢ \times 3 = 90¢$. So 6 packs cost 90¢.



24. Jessie studies 8 new spelling words every week. In 8 weeks, how many new spelling words will she study? Write a number sentence.
25. Roberto's group at camp sold 49 boxes of popcorn. Each boy sold 7 boxes. How many boys are in Roberto's group? Write a number sentence.

Multiplying with 0 and 1

26. A. On Monday, Jan, Ann, Stan, Fran, and Tran each had 1 candy bar in their lunch bags. How many candy bars did they have in all on Monday? Write a number sentence to match your solution.
B. On Tuesday, Jan, Ann, Stan, Fran, Tran, Tito, Terrell, and Tyrone each had 1 candy bar in their lunch bags. How many candy bars did they have in all on Tuesday? Write a number sentence.
C. On Wednesday, all 26 students in the fourth-grade class each had 1 candy bar in their lunch bags. How many candy bars did the fourth graders have in all on Wednesday? Write a number sentence.
27. A. On Thursday, Billy, Willie, Millie, Tillie, and Lilly each had 0 candy bars in their lunch bags. How many candy bars did they have in all on Thursday? Write a number sentence.
B. On Friday, Billy, Willie, Millie, Tillie, Lilly, Val, Sal, Cal, and Al each had 0 candy bars in their lunch bags. How many candy bars did they have in all on Friday? Write a number sentence.
C. On Friday, a group of 18 fifth-grade students each had 0 candy bars in their lunch bags. They said to Billy and his friends, "We have more candy bars than you because there are 18 of us. 18×0 is more than 9×0." What should Billy and his friends tell the fifth-grade students?
28. Try the following problems. You may want to use your calculator to check.
A. $5 \times 0 =$ B. $5 \times 1 =$
C. $10 \times 0 =$ D. $1 \times 10 =$
E. $0 \times 98 =$ F. $98 \times 1 =$
G. $0 \times 5348 =$ H. $1 \times 5348 =$
29. A. What can you say about multiplying numbers by 0? Explain.
B. What can you say about multiplying numbers by 1? Explain.

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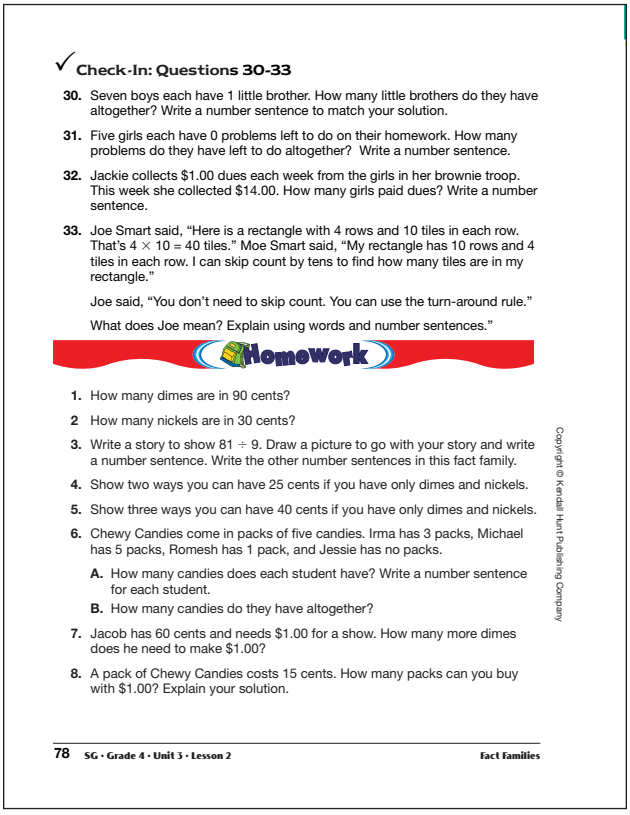

✓ Check-In: Questions 30-33

30. Seven boys each have 1 little brother. How many little brothers do they have altogether? Write a number sentence to match your solution.
31. Five girls each have 0 problems left to do on their homework. How many problems do they have left to do altogether? Write a number sentence.
32. Jackie collects $1.00 dues each week from the girls in her brownie troop. This week she collected $14.00. How many girls paid dues? Write a number sentence.
33. Joe Smart said, "Here is a rectangle with 4 rows and 10 tiles in each row. That's $4 \times 10 = 40$ tiles." Moe Smart said, "My rectangle has 10 rows and 4 tiles in each row. I can skip count by tens to find how many tiles are in my rectangle."

Joe said, "You don't need to skip count. You can use the turn-around rule."

What does Joe mean? Explain using words and number sentences."

Homework

1. How many dimes are in 90 cents?
2. How many nickels are in 30 cents?
3. Write a story to show $81 \div 9$. Draw a picture to go with your story and write a number sentence. Write the other number sentences in this fact family.
4. Show two ways you can have 25 cents if you have only dimes and nickels.
5. Show three ways you can have 40 cents if you have only dimes and nickels.
6. Chewy Candies come in packs of five candies. Irma has 3 packs, Michael has 5 packs, Romesh has 1 pack, and Jessie has no packs.
A. How many candies does each student have? Write a number sentence for each student.
B. How many candies do they have altogether?
7. Jacob has 60 cents and needs $1.00 for a show. How many more dimes does he need to make $1.00?
8. A pack of Chewy Candies costs 15 cents. How many packs can you buy with $1.00? Explain your solution.

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