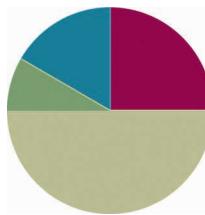


## Lesson 6

**Objective:** Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

### Suggested Lesson Structure

|                       |                     |
|-----------------------|---------------------|
| ■ Fluency Practice    | (15 minutes)        |
| ■ Application Problem | (5 minutes)         |
| ■ Concept Development | (30 minutes)        |
| ■ Student Debrief     | (10 minutes)        |
| <b>Total Time</b>     | <b>(60 minutes)</b> |



### Fluency Practice (15 minutes)

- Sprint: Use the Commutative Property to Multiply **3.4K** (9 minutes)
- Group Counting **3.4D, 3.4E** (4 minutes)
- Make Ten **3.4K** (2 minutes)

### Sprint: Use the Commutative Property to Multiply (9 minutes)

Materials: (S) Use the Commutative Property to Multiply Sprint

Note: This Sprint reviews Lesson 5.

### Group Counting (4 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by sixes, sevens, eights, and nines in this activity anticipates multiplication using those units later in the module. Focusing on the mentioned transitions bolsters student understanding of the distributive property of multiplication.

Direct students to count forward and backward, occasionally changing the direction of the count:

- Sixes to 60, emphasizing the 30 to 36 transition
- Sevens to 70, emphasizing the 35 to 42 transition
- Eights to 80, emphasizing the 40 to 48 transition
- Nines to 90, emphasizing the 45 to 54 transition



#### Lesson 6:

Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

## Make Ten (2 minutes)

Note: This fluency activity prepares students for the skip-counting strategies used to multiply units of 6 and 7 in Lessons 8 and 9.

T: (Write  $9 + \underline{\quad} = 10$ .) Say the unknown addend.

S: 1.

Continue with the following suggested sequence:  $1 + \underline{\quad} = 10$ ,  $5 + \underline{\quad} = 10$ ,  $8 + \underline{\quad} = 10$ ,  $2 + \underline{\quad} = 10$ ,  $6 + \underline{\quad} = 10$ ,  $7 + \underline{\quad} = 10$ ,  $4 + \underline{\quad} = 10$ , and  $3 + \underline{\quad} = 10$ .

## Application Problem (5 minutes)

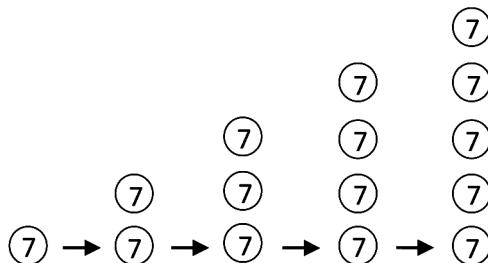
Jocelyn says 7 fives has the same answer as 3 sevens + 2 sevens. Is she correct? Explain why or why not.

Note: This problem reviews the commutative property from Lesson 1 and also previews the first fact used in the Concept Development to ensure all students' automaticity with the answer.

## Concept Development (30 minutes)

Materials: (S) Personal white board

T: (Draw 1 circle with a 7 inside.) This circle represents 1 unit of 7. As I draw circles, count the sevens with me. (Draw circles one on top of the other until you make one column of 5 circles.)



S: 1 seven, 2 sevens, 3 sevens, 4 sevens, 5 sevens.

T: Whisper the multiplication fact for 5 sevens.

S:  $5 \times 7$ .

T: Use commutativity to name a related fact.

S:  $7 \times 5$ .

T: What are 5 sevens,  $5 \times 7$ , and  $7 \times 5$  all equal to?

S: 35.

Jocelyn is correct.

3 sevens + 2 sevens is 5 sevens. Using the commutative property, we know that 5 sevens is equal to 7 fives. If we write it as an equation, it would look like this:  $5 \times 7 = 7 \times 5$  and the answer to both facts is 35.

### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

This lesson moves from pictorial representations in the vignette to abstract in the examples suggested for continued guided practice. Depending on the needs of the class, start out concretely. Have students manipulate cubes rather than draw or look at dots. As they become comfortable with the material, transition to pictorial circles, and, if appropriate, eventually to an abstract example.

T: Let's use our familiar fives facts to find facts we haven't learned yet. (Draw a dot above the first 5 dots in another color, shown right.) What is  $5 \text{ sevens} + 1 \text{ seven}$ ? 7

S: 6 sevens. 7

T: (Write  $35 + 7$ .) Tell your partner how this expression shows the total of 6 sevens. 7

S: 35 is the total of 5 sevens, and 7 is the total of 1 seven.  $\rightarrow 35 + 7$  shows 5 sevens + 1 seven in number form.  $\rightarrow$  It's the break apart and distribute strategy we learned before! The dots show 6 sevens broken into 5 sevens and 1 seven because we know those facts, and they're easy! 7

T: What is the total of 6 sevens? 7

S: 42. 7

T: On your personal white board, use commutativity to write the two multiplication facts we just solved. 7

S: (Write  $6 \times 7$  and  $7 \times 6$ .) 7

T: Compare  $5 \times 7$  and  $6 \times 7$ . What is the difference between them? 7

S:  $6 \times 7$  has one more group of 7 than  $5 \times 7$ .  $\rightarrow$  That's what the teacher showed with the dots, 5 sevens and 6 sevens. 7

T: By noticing that  $6 \times 7$  is only 1 more group of 7 than  $5 \times 7$ , we used the total of  $5 \times 7$  to help us make an easy addition problem to find  $6 \times 7$ . 7

Continue with the following suggested sequence. Use the model of the dots as necessary, changing the value of 1 dot to match the problem.

- $5 \times 9$  to find  $6 \times 9$  and  $9 \times 6$
- $5 \times 6$  to find  $6 \times 6$

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Problem 1 of the Problem Set reviews  $6 \times 7$  used in the vignette using blocks. Although the blocks were not used in the lesson, it is familiar enough to feel friendly for students and provides an opportunity to discuss the difference in models during the Debrief.

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Name <u>Gina</u> _____ Date _____</p> <p>1. Each  has a value of 7.</p> <p><math>7 \{</math> </p> <p>Unit form: 5 <u>Sevens</u></p> <p>Facts: <math>5 \times 7 = 7 \times 5</math></p> <p>Total = <u>35</u></p> | <p>Unit form: 6 sevens = <u>5</u> sevens + <u>1</u> seven</p> <p><math>= 35 + 7</math></p> <p><math>= 42</math></p> <p>Facts: <math>6 \times 7 = 42</math></p> <p><math>7 \times 6 = 42</math></p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Debrief (10 minutes)

**Lesson Objective:** Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- What pattern did you notice between Problems 1 and 2?
- Explain to your partner how one fact can help you solve two new facts.
- Explain why you used multiplication or division to solve Problem 4. How does a division sentence in this problem relate to a multiplication sentence?
- How does the strategy we learned today relate to the break apart and distribute strategy we studied in Module 1?
- How might you use the strategy we practiced today to solve other problems? For example, how might you use  $5 \times 7$  to help you solve  $7 \times 7$ ?

## Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

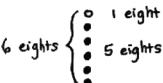
2. a. Each dot has a value of 8.

Unit form: 5 ights

Facts:  $5 \times 8 = 8 \times 5$

Total: 40

b. Use the fact above to find  $8 \times 6$ . Show your work using pictures, numbers or words.

6 eights 

$$\begin{aligned} 6 \text{ eights} &= 5 \text{ eights} + 1 \text{ eight} \\ &= 40 + 8 \\ &= 48 \end{aligned}$$

Since I know  $6 \times 8 = 48$  by adding 1 more eight to 5 eights, I also know that  $8 \times 6 = 48$  because of commutativity.

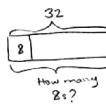
3. An author writes 9 pages of her book each week. How many pages does she write in 7 weeks? Use a five fact to solve.

$5 \times 9 = 45$  

$$\begin{aligned} 7 \times 9 &= (5 \times 9) + (2 \times 9) \\ &= 45 + 18 \\ &= 63 \end{aligned}$$

She writes 63 pages in 7 weeks.

4. Mrs. Gonzalez buys a total of 32 crayons for her classroom. Each pack contains 8 crayons. How many packs of crayons does Mrs. Gonzalez buy?



$$32 \div 8 = 4$$

Mrs. Gonzalez buys 4 packs of crayons.

5. Hannah has \$500. She buys a camera for \$435 and 4 other items for \$9 each. Now Hannah wants to buy speakers for \$50. Does she have enough money to buy the speakers? Explain.

$$\begin{array}{r} 4 \times \$9 = \$36 \\ \$435 \\ + \$36 \\ \hline \$471 \end{array}$$

$$\begin{array}{r} \$471 \\ - \$471 \\ \hline \$29 \end{array}$$

Hannah has \$29 left. She does not have enough money to buy the speakers.



### Lesson 6:

Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

**A**

Number Correct: \_\_\_\_\_

Use the Commutative Property to Multiply

|     |                 |  |
|-----|-----------------|--|
| 1.  | $2 \times 2 =$  |  |
| 2.  | $2 \times 3 =$  |  |
| 3.  | $3 \times 2 =$  |  |
| 4.  | $2 \times 4 =$  |  |
| 5.  | $4 \times 2 =$  |  |
| 6.  | $2 \times 5 =$  |  |
| 7.  | $5 \times 2 =$  |  |
| 8.  | $2 \times 6 =$  |  |
| 9.  | $6 \times 2 =$  |  |
| 10. | $2 \times 7 =$  |  |
| 11. | $7 \times 2 =$  |  |
| 12. | $2 \times 8 =$  |  |
| 13. | $8 \times 2 =$  |  |
| 14. | $2 \times 9 =$  |  |
| 15. | $9 \times 2 =$  |  |
| 16. | $2 \times 10 =$ |  |
| 17. | $10 \times 2 =$ |  |
| 18. | $5 \times 3 =$  |  |
| 19. | $3 \times 5 =$  |  |
| 20. | $5 \times 4 =$  |  |
| 21. | $4 \times 5 =$  |  |
| 22. | $5 \times 5 =$  |  |

|     |                 |  |
|-----|-----------------|--|
| 23. | $5 \times 6 =$  |  |
| 24. | $6 \times 5 =$  |  |
| 25. | $5 \times 7 =$  |  |
| 26. | $7 \times 5 =$  |  |
| 27. | $5 \times 8 =$  |  |
| 28. | $8 \times 5 =$  |  |
| 29. | $5 \times 9 =$  |  |
| 30. | $9 \times 5 =$  |  |
| 31. | $5 \times 10 =$ |  |
| 32. | $10 \times 5 =$ |  |
| 33. | $3 \times 3 =$  |  |
| 34. | $3 \times 4 =$  |  |
| 35. | $4 \times 3 =$  |  |
| 36. | $3 \times 6 =$  |  |
| 37. | $6 \times 3 =$  |  |
| 38. | $3 \times 7 =$  |  |
| 39. | $7 \times 3 =$  |  |
| 40. | $3 \times 8 =$  |  |
| 41. | $8 \times 3 =$  |  |
| 42. | $3 \times 9 =$  |  |
| 43. | $9 \times 3 =$  |  |
| 44. | $4 \times 4 =$  |  |

**Lesson 6:**

Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

## B

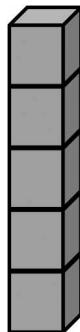
Use the Commutative Property to Multiply

|     |                 |  |
|-----|-----------------|--|
| 1.  | $5 \times 2 =$  |  |
| 2.  | $2 \times 5 =$  |  |
| 3.  | $5 \times 3 =$  |  |
| 4.  | $3 \times 5 =$  |  |
| 5.  | $5 \times 4 =$  |  |
| 6.  | $4 \times 5 =$  |  |
| 7.  | $5 \times 5 =$  |  |
| 8.  | $5 \times 6 =$  |  |
| 9.  | $6 \times 5 =$  |  |
| 10. | $5 \times 7 =$  |  |
| 11. | $7 \times 5 =$  |  |
| 12. | $5 \times 8 =$  |  |
| 13. | $8 \times 5 =$  |  |
| 14. | $5 \times 9 =$  |  |
| 15. | $9 \times 5 =$  |  |
| 16. | $5 \times 10 =$ |  |
| 17. | $10 \times 5 =$ |  |
| 18. | $2 \times 2 =$  |  |
| 19. | $2 \times 3 =$  |  |
| 20. | $3 \times 2 =$  |  |
| 21. | $2 \times 4 =$  |  |
| 22. | $4 \times 2 =$  |  |

|     |                 |  |
|-----|-----------------|--|
| 23. | $6 \times 2 =$  |  |
| 24. | $2 \times 6 =$  |  |
| 25. | $2 \times 7 =$  |  |
| 26. | $7 \times 2 =$  |  |
| 27. | $2 \times 8 =$  |  |
| 28. | $8 \times 2 =$  |  |
| 29. | $2 \times 9 =$  |  |
| 30. | $9 \times 2 =$  |  |
| 31. | $2 \times 10 =$ |  |
| 32. | $10 \times 2 =$ |  |
| 33. | $3 \times 3 =$  |  |
| 34. | $3 \times 4 =$  |  |
| 35. | $4 \times 3 =$  |  |
| 36. | $3 \times 6 =$  |  |
| 37. | $6 \times 3 =$  |  |
| 38. | $3 \times 7 =$  |  |
| 39. | $7 \times 3 =$  |  |
| 40. | $3 \times 8 =$  |  |
| 41. | $8 \times 3 =$  |  |
| 42. | $3 \times 9 =$  |  |
| 43. | $9 \times 3 =$  |  |
| 44. | $4 \times 4 =$  |  |

Name \_\_\_\_\_

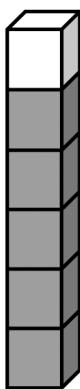
Date \_\_\_\_\_

1. Each  has a value of 7.

Unit form: 5 \_\_\_\_\_

Facts:  $5 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \times 5$ 

Total = \_\_\_\_\_



Unit form: 6 sevens = \_\_\_\_\_ sevens + \_\_\_\_\_ seven

 $= 35 + \underline{\hspace{2cm}}$  $= \underline{\hspace{2cm}}$ Facts:  $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$  $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

2. a. Each dot has a value of 8.



Unit form:  $5 \underline{\hspace{2cm}}$



Facts:  $5 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \times 5$



Total =  $\underline{\hspace{2cm}}$

b. Use the fact above to find  $8 \times 6$ . Show your work using pictures, numbers, or words.

3. An author writes 9 pages of her book each week. How many pages does she write in 7 weeks? Use a fives fact to solve.

---

4. Mrs. Gonzalez buys a total of 32 crayons for her classroom. Each pack contains 8 crayons. How many packs of crayons does Mrs. Gonzalez buy?

---

5. Hannah has \$500. She buys a camera for \$435 and 4 other items for \$9 each. Now Hannah wants to buy speakers for \$50. Does she have enough money to buy the speakers? Explain.

Name \_\_\_\_\_

Date \_\_\_\_\_

Use a fives fact to help you solve  $7 \times 6$ . Show your work using pictures, numbers, or words.

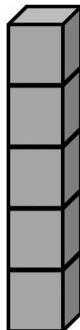
**Lesson 6:**

Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.



Name \_\_\_\_\_

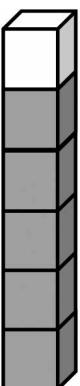
Date \_\_\_\_\_

1. Each  has a value of 9.

Unit form: \_\_\_\_\_

Facts:  $5 \times$  \_\_\_\_\_ = \_\_\_\_\_  $\times 5$ 

Total = \_\_\_\_\_



Unit form: 6 nines = \_\_\_\_\_ nines + \_\_\_\_\_ nine

 $= 45 +$  \_\_\_\_\_ $=$  \_\_\_\_\_Facts: \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

2. There are 6 blades on each windmill. How many total blades are on 7 windmills? Use a fives fact to solve.

---

3. Juanita organizes her magazines into 3 equal piles. She has a total of 18 magazines. How many magazines are in each pile?

---

4. Markuo spends \$27 on some plants. Each plant costs \$9. How many plants does he buy?

**Lesson 6:**

Apply the distributive and commutative properties to relate multiplication facts  $5 \times n + n$  to  $6 \times n$  and  $n \times 6$  where  $n$  is the size of the unit.

