

Choose a Strategy to Multiply Basic Facts

FOCUS

Mathematics Objective Solve multiplication problems by using a chosen strategy.

Language Objective Describe and demonstrate, in writing and orally, different multiplication strategies.

Essential Understanding Various strategies can be used to solve multiplication problems.

COHERENCE

Look Back Previously, students multiplied with a factor of 9 and learned to use subtraction with 10s facts and 1s facts to solve 9s facts. Students used various strategies to multiply with factors 0-10.

This Lesson Students solve multiplication problems using a strategy of their choosing.

Look Ahead Later, students will solve problems involving multiplication and data by using different strategies.

Additional Connection Multiplying by using different strategies connects to previous work with solving word problems involving arrays.

RIGOR

Procedural Skill Students solve multiplication problems using a strategy of their choosing, including using known facts, the Distributive Property, and the Associative Property.

Vocabulary

Revisit previously taught vocabulary.

Materials

- Two-color counters (or Teaching Tool 35), optional

Student Resources

 Family Engagement

Intervention System (IS)

B44 Arrays and Multiplication

B46 Multiplying by 2 and 5

B47 Multiplying by 9

B48 Multiplying by 1 and 0

B49 Multiplying by 10

B50 Multiplying by 3

B51 Multiplying by 4

B52 Multiplying by 6 or 7

B53 Multiplying by 8

B54 Multiplying Three Numbers

Teacher Resources

Available at
Savvas Realize®.

 Editable Lesson Plan

 Lesson Presentation Slides

 enVision on the Go: Planning Support



Notes

Language Support

Student Discourse Use this activity to support students in discussing which strategies make the most sense to them for any of the problems in the Guided Practice. Encourage students to justify their responses. Provide sentence starters such as, "I solved using _____ because...", "For this problem, I _____," "The _____ strategy makes sense because..." Encourage students to ask each other clarifying questions. Support students in disagreeing respectfully, if the situation arises.

Math Talk

Tilt or Balance?

Is 4×7 less than, equal to, or greater than 5×6 ?



Answer:
Less than

Fluency Read the question and ask students to decide if the expressions are equal. If not equal, ask: **Which expression is greater than the other?** Students should use comparison symbols to help explain. Have students share their answers in pairs or small groups and then have a class discussion.

Exit Ticket



Name _____

Lesson **3-8**
Exit Ticket

1. Which strategy could be used to find the product of 6×4 ?

- ☐ A $(5 \times 3) + (1 \times 1)$
- ☒ B $(6 \times 2) + (6 \times 2)$
- ☐ C $(5 + 1) \times (2 + 3)$
- ☐ D $(6 \times 1) + (1 \times 4)$

2. Louisa cuts a ribbon into 8 same-size pieces. Each piece is 7 inches long. How long was the ribbon?

- ☐ A 49 inches
- ☒ B 56 inches
- ☐ C 64 inches
- ☐ D 87 inches

Have you met the lesson goals?

Math Goal

I can choose a strategy to solve multiplication problems.



☐ I Can



☐ With Help



☐ Not Yet

Language Goal

I can use words to show how to use different strategies to multiply.



☐ I Can



☐ With Help



☐ Not Yet

Teacher Answer Key

Assessment 1 of 1

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Auto-scored version online.

Use the Exit Ticket results to support students as needed by reminding them that they can use different strategies to multiply. If a student uses a strategy that may not be the most efficient, ask: **What is another strategy you could use?** Students can ask themselves:

- Is it a known fact?
- Can I skip-count?
- Can I break apart one factor and add? (Distributive Property)
- Can I break apart one factor and multiply? (Associative Property)
- Can I use a 10s fact and subtract?

English Language Development

ELL English Language Learners (Visual Learning)

ELL English Language Learners (Practice and Problem Solving)

MLR7 Compare and Connect (Visual Learning)

Language Support (Guided Practice)

Step 1 Explore and Share



10-15 min



Explore and Share



Scout Observational Assessment

ETP Explore and Share



Formative Assessment

Purpose Investigate different strategies for multiplying.

Materials Two-color counters (or Teaching Tool 35), optional

Introduce WHOLE CLASS

Ask: If you were ordering paper towels for the school, which carton would you choose to order? Why?

Monitor, Select, and Sequence SMALL GROUP

Observe students at work.

- **Are students using different strategies to find the total number of rolls in each carton?** They might have one strategy that they use for all three cartons, or they might use different strategies depending on what they notice about the factors.

Look for solutions that use different strategies. If students use the same strategy regardless of the factors, ask: *Is there a different way to find the answer?*

Select solutions for students to present. Show solutions that use a range of strategies.

Early Finishers

Ask: If the school orders two of each carton, how many rolls of paper towels will they have? [244 rolls]

Connect WHOLE CLASS

Connect Solution Strategies Discuss students' work.

Connect Zoey's use of the Associative Property with José's use of the Distributive Property. Both Zoey and José got an answer of 42, but José's way used the known facts of 5s and 2s and Zoey's way resulted in an unknown fact.

Connect to the Visual Learning During the Visual Learning, connect to student work in Explore and Share. Be sure students understand that different strategies can be used to multiply, but some strategies may be more efficient than others.

Name _____

Choose a Strategy to Multiply Basic Facts

I can ... choose a strategy to solve multiplication problems.

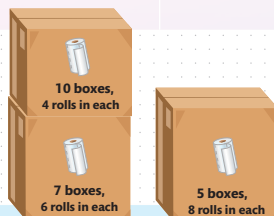
Let's Build

Lesson 3-8

Explore and Share

A school needs to order rolls of paper towels. The paper towels come in boxes that are packaged in cartons of different sizes. Find the total number of rolls of paper towels in each carton.

Choose a strategy to help you solve.



Ask yourself:

- Can I break apart one factor and add?
- Can I use 10s facts and subtract?
- Can I break apart one factor and multiply?
- Is there another strategy I can use?

I can use **reasoning** to choose a strategy.

See margin for sample student work.

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Sample Student Work

small: $10 \times 4 = 40$

medium: $7 \times 6 = 7 \times (2 \times 3)$
 $= (7 \times 2) \times 3$
 $= 14 \times 3 = 14 + 14 + 14$
 $= 42$

large: $5 \times 8 = 40$

14
14
+ 14
42

Zoey's Work

Zoey used mental math for the small carton and large carton. She used the Associative Property for the medium carton by breaking apart the factor of 6 into the factors of 2 and 3.

José's Work

José used mental math for the small carton and large carton. He used the Distributive Property for the medium carton by breaking apart the factor of 7 into the addends of 5 and 2.

small: $10 \times 4 = 40$

medium: $7 \times 6 = (5 \times 6) + (2 \times 6) = 30 + 12 = 42$

large: $5 \times 8 = 40$

Visual Learning Animation

Essential Question

How Can You Use Different Strategies to Find Products?

Visual Learning

A Mrs. Epstein buys 6 cases of juice boxes for 45 third graders. Are there enough juice boxes for all of the third-grade students? You can choose a strategy to find the product of 6×8 .

Look below for some strategies you have learned.

B Mia's Choice

I will **break apart one factor** and use addition.

6 groups of 8 is the same as 5 groups of 8 plus 1 group of 8.

$$6 \times 8 = (5 + 1) \times 8$$

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

$$5 \times 8 = 40$$

$$1 \times 8 = 8$$

$$40 + 8 = 48$$

$$6 \times 8 = 48$$

C Juan's Choice

I will **use 10s facts** and use subtraction.

6 groups of 8 is the same as 6 groups of 10 minus 6 groups of 2.

$$6 \times 8 = 6 \times (10 - 2)$$

$$= (6 \times 10) - (6 \times 2)$$

$$6 \times 10 = 60$$

$$6 \times 2 = 12$$

$$60 - 12 = 48$$

$$6 \times 8 = 48$$

D Ana's Choice

I will **break apart one factor** and use multiplication.

6 groups of 8 is the same as 2 times 3 groups of 8.

$$6 \times 8 = (2 \times 3) \times 8$$

$$2 \times (3 \times 8) = ?$$

$$2 \times 24 = ?$$

$$24 + 24 = 48$$

48 is greater than 45, so there are enough juice boxes.

Talk About Math Ideas

What are some other ways you can break apart the two factors?

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ELL English Language Learners Writing

Review the term *enough*. Use the term as you discuss how to solve whether Mrs. Epstein buys enough juice boxes for the class.

Emerging Ask students to read the question aloud and complete this sentence stem: "Mrs. Epstein needs to buy at least _____ juice boxes."

Expanding Ask students to read the question aloud and complete these sentence stems: "Each case contains _____ juice boxes. Mrs. Epstein buys _____ juice boxes. She needs to buy at least _____ juice boxes."

Bridging Have partners read the problem. Then have them write the steps they need to solve the problem.

ETP Visual Learning

Classroom Conversation

A How many juice boxes does Mrs. Epstein need to buy for everybody to have one? [45]

B Why does Mia's strategy work? [Sample answer: She broke 6 into $5 + 1$ and multiplied each by 8.]

C Reason Quantitatively Juan used 10s facts and subtraction. Is this an efficient strategy for solving this problem? [Sample answer: It could be efficient for him if he can subtract mentally; $6 \times 8 = (6 \times 10) - (6 \times 2) = 60 - 12 = 48$]

D Ana broke apart one factor and used multiplication. How efficient is this method for solving this problem? [Sample answer: It could be efficient for her. Ana broke apart the factor 6 into the factors of 2 and 3 so she could use the known fact of 3×8 and then double 24.]

Prevent Misconceptions Watch for students who don't recognize that all three strategies work. Point out that the goal is to learn to recall all the facts, but these and other strategies can be used to find unknown facts.

MLR7 Compare and Connect

Prompt students to review the strategies used in Box B, Box C, and Box D. Ask: *Would you use Mia's, Juan's, or Ana's strategy to find the product of 6×8 ? Why?*

Ask a student to share their response. Then, ask another student to state whether they agree or disagree and why.

ETP Talk About Math Ideas

Have students engage in a think-pair-share about other ways to break apart the two factors. Listen for conversations about breaking apart the factors in ways that result in known facts.

ETP Revisit the Essential Question

Point out that various strategies can be used to multiply. Students should use strategies that are efficient for them and that will help them learn the facts.

Step 3 Practice and Problem Solving



15-20 min

Interactive Practice

Adaptive Practice

You may opt to have students complete automatically scored practice items online.

Name _____

Guided Practice

Do You Understand?

1. Show two different ways to find 8×9 . Which strategy would you use and why?
Sample answer: Double 4×9 or quadruple 2×9 ; I would double 4×9 because I know my 4s facts and I could just double that fact.

Do You Know How?

- In 2 and 3, choose a strategy to find each product.
 2. 7×5 **35** 3. 8×6 **48**
Check students' strategies.

Practice and Problem Solving

In 4-12, choose a strategy to find each product.

Consider the numbers in the problem to help decide what strategy to use.



4. $7 \times 7 =$ **49** 5. $8 \times 2 =$ **16** 6. $24 = 4 \times 6$
Check students' strategies.

7. $16 = 4 \times 4$ 8. $72 = 8 \times 9$ 9. $30 = 5 \times 6$
Check students' strategies.

10.
$$\begin{array}{r} 10 \\ \times 7 \\ \hline 70 \end{array}$$

Check students' strategies.

✓ 11.
$$\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$$

12.
$$\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$$

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- ✓ 13. **Look for Relationships** Use the given facts to help find the missing products at the right. What patterns do you see in these facts?
45; 63; 90; Sample answer: The pattern is that each product is one factor (5; 7; 10) less than the multiple of 10.

$10 \times 5 = 50$ so $9 \times 5 = ?$
 $10 \times 7 = 70$ so $9 \times 7 = ?$
 $10 \times 10 = 100$ so $9 \times 10 = ?$

Think: How can I use 10s facts to solve 9s facts?



14. During Chinese New Year, children get red envelopes with money from their family. Mia received 9 red envelopes. Each envelope had \$6 in it. How much money did Mia receive? Show how you know.
\$54; Sample answer: $9 \times 6 = 54$; $9 \times 6 = (10 \times 6) - (1 \times 6) = 60 - 6 = 54$

15. **Critique Reasoning** David wants to buy new shoes and a jersey. The shoes cost \$56. The jersey costs \$42. David has \$88 and says that is enough money. Do you agree? Explain.
No; Sample answer: \$56 is close to \$60 and \$42 is close to \$40, so the cost is close to \$100. David does not have enough.

16. **Higher Order Thinking** Mr. Evans needs to put 32 students into 8 equal groups. What strategy would you use to help Mr. Evans figure out how many students are in each group? Explain your thinking.
Sample answer: I put 32 counters into an array with 8 rows. There are 4 columns, so there are 4 students in each group.

Assessment Practice

- ✓ 17. Find 6×8 .
 A 14
 B 24
 C 38
 D 48

18. Find 7×9 .
 A 16
 B 49
 C 63
 D 79

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Guided Practice

Formative Assessment

Error Intervention Item 1

If students are unable to think of ways to find the product of 8×9 ,
then review using 10s and 1s facts to multiply with 9 as a factor. **How can you use a 10s fact to find a 9s fact?** [Sample answer: I can find the 10s fact and a 1s fact and subtract the 1s product from the 10s product.]

Choose Efficient Strategies If students do not use 5s facts as a strategy for Item 2 and Item 3, ask: **How can you use 5s facts to find the products?** [Sample answer: Skip-count by 5s for Item 2; use (8×5) and (8×1) for Item 3]

Practice and Problem Solving

ELL English Language Learners

Item 15 Critique Reasoning Students may be unfamiliar with the words *jersey* and *enough*. Have students read the problem silently. Then read the problem aloud. Show students a picture of a jersey. Refer to the use of *enough* in the Visual Learning problem and then make a connection to *enough* in Item 15.

ETP Quick Check

Formative Assessment

✓ Check marks indicate items for prescribing differentiation. Items 11 and 17: 1 point. Item 13: up to 3 points. The online Quick Check is auto scored and auto prescribes differentiation.

Step 4 Assess and Differentiate



15-30 min

Differentiation Library **DL**

- Additional Differentiation Library resources are described at the start of this topic.
- Differentiation resources that support diverse learning styles are online and in the Differentiation Library Teacher's Guide.

0-3 points: Intervention Activity or Reteach to Build Understanding Activity

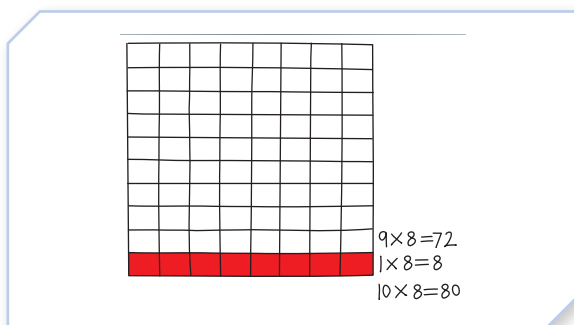
4-5 points: Enrichment Activity

In addition, **English language learners** may benefit from the Build Mathematical Literacy Activity.

Intervention Activity

Materials Centimeter Grid Paper (or Teaching Tool 20), Crayons

- Write "9 × 8."
- Have students draw a grid with 10 rows with 8 squares in each row.
- Ask students to find how many tens there are in 10 × 8. Have students write the equation.
- Ask students to shade the bottom row and write the equation it represents.
- Ask students to write an equation to represent the unshaded part of the grid.



Video Tutorial Available at Savvas Realize®

Students can access this video anytime to reinforce lesson content.

Another Look Video

Additional Practice

Printable or autoscored at Savvas Realize®

Name _____

Choose a Strategy to Multiply Basic Facts

3-8

Another Look!

Find 6×9 .

Break apart and use addition	Use 10s facts and use subtraction	Break apart and use multiplication
$6 \times 9 = (2 + 4) \times 9$	$6 \times 9 = 6 \times (10 - 1)$	$6 \times 9 = 2 \times 3 \times 9$
$6 \times 9 = (2 \times 9) + (4 \times 9)$	$6 \times 9 = (6 \times 10) - (6 \times 1)$	$6 \times 9 = 2 \times (3 \times 9)$
$6 \times 9 = 18 + 36$	$6 \times 9 = 60 - 6$	$6 \times 9 = 2 \times 27$
$6 \times 9 = 54$	$6 \times 9 = 54$	$6 \times 9 = 27 + 27 = 54$

You can use different strategies to find 6×9 .

For **1-10**, find each product. Choose a strategy. **Check students' strategies.**

1. $3 \times 7 =$ <u>21</u>	2. $6 \times 8 =$ <u>48</u>	3. $4 \times 9 =$ <u>36</u>	4. <u>72</u> = 8×9
5. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	6. $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$	7. $\begin{array}{r} 10 \\ \times 6 \\ \hline 60 \end{array}$	8. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
9. What is 8×5 ? <u>40</u>	10. What is 7×4 ? <u>28</u>		

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11. There are 8 markers in each package. Paula buys 3 packages of markers. How many markers did Paula buy?
24

Remember: You do not have to use the same strategy for every multiplication fact.

12. **Reasoning** Explain the strategy you used to solve Item 11 above. Is there another strategy you could have used? Explain.
Answers will vary. Check students' strategies.

13. **Critique Reasoning** To find 7×9 , Neal finds the product of 7×10 and then subtracts 3. Does Neal's strategy work? If it does not work, what can he do to get the correct product?
No; Sample answer: Neal can multiply 7×10 , but then he needs to subtract 7. This is the same as $7 \times (10 - 1)$, which is 7×9 .

14. **Higher Order Thinking** Four teams with the same number of students are needed for gym class. There are 24 students in the gym class. How can you figure out how many students will be on each team?
Sample answer: I can use a pattern of 4s until I get to 24: 4, 8, 12, 16, 20, 24. I counted 6 times, so each team will have 6 students.

15. Write a word problem that can be solved using the multiplication fact for 6×8 . Then, tell which strategy you would use to solve it.
Answers will vary. Check students' work.

Assessment Practice

16. Find 3×9 . Ⓐ 12 Ⓑ 23 Ⓒ 27 Ⓓ 39	17. Find 9×4 . Ⓐ 42 Ⓑ 36 Ⓒ 27 Ⓓ 13
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