

 SCHOLASTIC

**Do
The
Math[®]**

Now!

Teacher
Guide

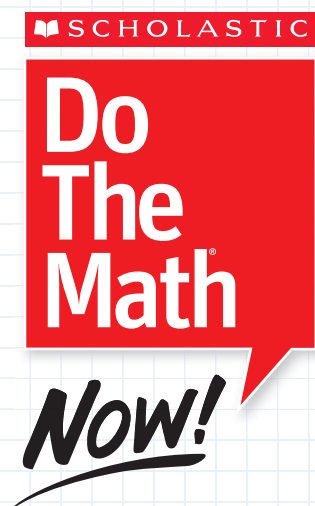


Multiplication
& Division

Created By

Marilyn Burns

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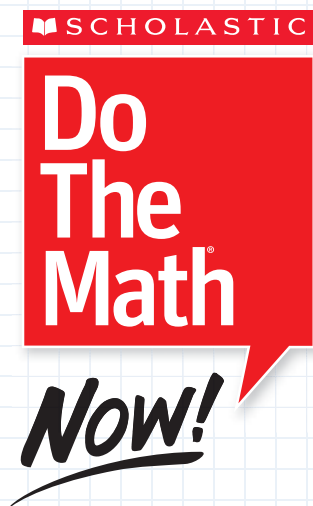
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Program Overview From Marilyn Burns



Thanks to the Do The Math Team

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Dear Colleague,

Serena and Gabe are examples of struggling math students I've met during my almost 50 years of teaching.

I showed Serena, a sixth grader, a division problem with four choices for the answer.

$$425 \div 4$$

50 100 200 400

Marilyn: Which of these numbers do you think is closest to the answer?
(I point to the four choices.)

Serena: *(Thinks for a moment and then asks.)* Can I use paper and pencil?

Marilyn: Try and figure it out in your head.

Serena: *(Thinks again and then muses.)* I know the number has to be smaller than 400 because division makes things smaller.
(Then she lowers her head and begins to "write" with her finger on the desk, setting up the problem as long division to work out the answer.)

Sadly, there are far too many students like Serena in our math classes, who have learned computational procedures but have not developed the ability to reason numerically in other ways.

I gave Gabe, a seventh grader identified by his teacher as a struggling math student, a fraction addition problem.

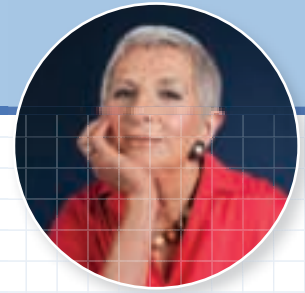
$$\frac{1}{2} + \frac{2}{5}$$

Marilyn: You don't have to figure out the exact answer to this problem. I'm interested in whether you think the answer is greater than 1 or less than 1.

Gabe: *(Looks at the problem carefully and then responds.)* It's less than 1.

Marilyn: How do you know?

Gabe: I added across the tops and across the bottoms and got three-sevenths, and I know that three-sevenths is less than one.



Gabe made one of the most common fraction errors, following a faulty procedure instead of thinking about the numbers at hand. As stated in the *Common Core State Standards for Mathematics*, “Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to . . . deviate from a known procedure to find a shortcut.” This lack of understanding prevents Serena, Gabe, and other students like them from developing needed reasoning skills.

I was a middle school math teacher for the first eight years of my teaching career. In all my classes, there were always some students who were woefully ill prepared. They usually had some skill with paper-and-pencil computation, but had learned these procedures by rote and would quickly become lost when presented with a situation that differed even slightly from exactly what they were used to seeing. Math rarely made sense to them. In fact, they didn’t even expect math to make sense. Their goal was to “do the page,” not to “do the math.” They were rarely asked to explain their reasoning, and when they were, they were unable to do so.

We created *Do The Math Now!* to meet the needs of the thousands of middle and high school students who, like Serena and Gabe, need to develop essential math understanding and skills. We decided that the best support we could provide these students would be to focus on multiplication, division, and fractions—topics that are critical foundations for the students’ continued math success with algebra.

So here it is, a yearlong course for middle and high school students who need math support in addition to their regular math classes. *Do The Math Now!* is filled with the same kinds of scaffolded and paced lessons, games, and activities that have been the mainstay of the success of *Do The Math*.

I’m pleased to present this support for finally building a foundation of essential math understanding and skills that all students need and deserve.

Marilyn Burns is one of today’s most highly respected and trusted mathematics educators. She is the founder of Math Solutions, an organization dedicated to the improvement of math instruction in our nation’s schools. Over the course of almost 50 years, Marilyn has worked with students and teachers in classrooms across the country.

Marilyn’s experiences have given her a unique insight into how to help students overcome the stumbling blocks that prevent them from being successful with mathematics. In collaboration with Scholastic, Marilyn and a team of Math Solutions master classroom teachers developed *Do The Math*, an intervention program that provides teachers with the tools and support they need to help students turn these stumbling blocks into building blocks of mathematical success.

UNIT 2

Lessons 1–15

Develop Multiplication Number Sense

In this unit, students are actively engaged with the Commutative Property of Multiplication, the Associative Property of Multiplication, and the Distributive Property of Multiplication over Addition. Relying on the visual model of rectangles, students further develop their understanding and number sense.

Students will...

- Represent rectangles with multiplication equations.
- Calculate products with factors 0–12.
- Multiply two-digit factors by 10.
- Use the Associative and Commutative Properties of Multiplication to calculate products.
- Communicate ideas with key math vocabulary: *Associative Property of Multiplication, Commutative Property of Multiplication, equation, factor, multiple, multiplication, and product.*

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

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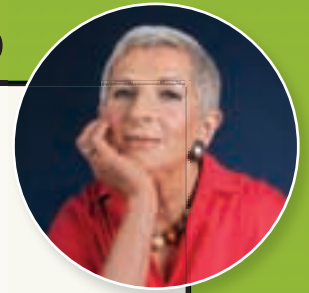
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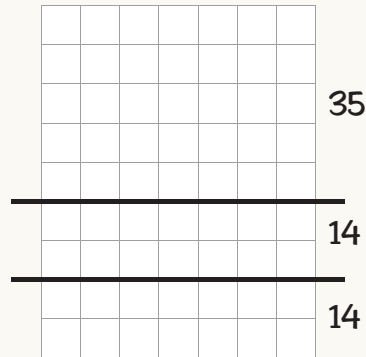
Measuring Student Understanding With the End-of-Unit Assessment 135

FROM MARILYN BURNS



Dear Colleague,

These lessons introduce students to the strategy of “rectangle splitting” to figure products, a tool that informally introduces the Distributive Property of Multiplication over Addition.



$$35 + 14 + 14 = 63$$

While students already know that the order of factors does not affect the products—that 4×3 and 3×4 , for example, have the same product—here they are formally introduced to the Commutative Property of Multiplication.

	$3 \times 4 = 12$	
		$4 \times 3 = 12$
		12

To practice the splitting strategy, students multiply by 11. Because they are familiar with the pattern of the products from 11×1 to 11×9 and already know the answers, students are able to focus on applying the strategy.

$$\begin{aligned} 11 \times 8 \\ 10 \times 8 = 80 \\ 1 \times 8 = 8 \\ 80 + 8 = 88 \\ 11 \times 8 = 88 \end{aligned}$$

Then students tackle problems of multiplying by 12. The lessons help them move from splitting rectangles to splitting numbers, and then to figuring products mentally.

UNIT
2

Lessons
6–10



Using the Strategy of
“Splitting” to Multiply

<h3>Lesson Summary</h3>	<p>Students find products greater than 36 by drawing rectangles and figuring the number of squares in them.</p>	<p>Students use the number-splitting strategy to multiply by 11.</p>
<h3>Objectives</h3>	<ul style="list-style-type: none"> • Introduce key math vocabulary: <i>Commutative Property of Multiplication</i>. • Represent rectangles with equations. • Calculate products with factors 0 through 12. • Use the Commutative Property of Multiplication to solve problems. • Communicate ideas with key math vocabulary: <i>Commutative Property of Multiplication, equation, factor, multiplication, product, and times</i>. 	<ul style="list-style-type: none"> • Represent rectangles with equations. • Calculate products with factors 0 through 12. • Communicate ideas with key math vocabulary: <i>equation, multiplication, product, and times</i>.
<h3>Materials</h3> <p>T = Teacher Bag S = Student Bag C = Chart</p>	<ul style="list-style-type: none"> • <i>WorkSpace</i> pages 54, 55, 190 and 195–198 • <i>Cut-Out Rectangles</i> C • <i>Grid Chart</i> C • <i>Math Vocabulary</i> chart • scissors 	<ul style="list-style-type: none"> • <i>WorkSpace</i> pages 56 and 57 • <i>Grid Chart</i> C • Unit 2: Do The Math Community News
<h3>Built-in Differentiation</h3>	<p>Clear visual directions in the <i>WorkSpace</i> provide support for students who are not yet proficient with written or verbal directions.</p>	<p>Recording each equation on the board when demonstrating rectangle splitting provides visual support before the added challenge of figuring products mentally.</p>



Interactive Whiteboard Tools contains all hands-on manipulatives and *WorkSpace* pages for Unit 2, Lessons 6–10.

LESSON 8

LESSON 9

LESSON 10



Assess

Students use the number-splitting strategy to multiply by 12.

Students figure products mentally by using the number-splitting strategy to multiply the factors 11 and 12.

Students demonstrate understanding of the objectives of Lessons 6–9 by completing *WorkSpace* pages independently.

- Represent rectangles with equations.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary: *equation, factor, multiplication, product, and times.*

- Recall products for factors 0 through 12.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary: *equation, factor, multiplication, product, and times.*

- Recall products for factors 0 through 12.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary: *equation, multiplication, and product.*

- *WorkSpace* pages 58 and 59
- *Multiplication Chart*
- *Grid Chart*

- *WorkSpace* page 60
- blank paper

- *WorkSpace* pages 61–67
- *Pathways Game Board A*
- green tiles
- *Additional Practice*

The carefully **paced** transition from the geometric model of rectangle to the numeric model of number splitting supports students transitioning to the goal of figuring products mentally.

Communication with partners as they use the number-splitting strategy reinforces the concept and the language used to express it.

Assessing students with **familiar problems** allows students to show their understanding without having to approach the material in an unfamiliar format.

UNIT
2

Lessons
6–10



Using the Strategy of
“Splitting” to Multiply



TeacherSpace CD-ROM contains Unit Assessments, Additional Practice pages, and other reproducibles to support teaching these lessons.

LESSON 7 Using splitting to multiply by 11



Lesson Summary

Students use the number-splitting strategy to multiply by 11.

Objectives

- Represent rectangles with equations.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary: *equation, multiplication, product, and times.*

Materials

- *WorkSpace* pages 56 and 57  = Chart
- *Grid Chart* 
- Unit 2: *Do The Math Community News*



Interactive Whiteboard Tools

WorkSpace pages and manipulatives for Lesson 7 are provided on the *Interactive Whiteboard Tools* CD-ROM.



Preparation

Unit 2: *Do The Math Community News*

Make 1 copy for each student from page 367 or the *TeacherSpace* CD-ROM.

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
equation	<i>ecuación</i>
multiplication	<i>multiplicación</i>
product	<i>producto</i>
times	<i>por</i>

Academic Vocabulary

ENGLISH	SPANISH
rectangle	<i>rectángulo</i>
row	<i>fila</i>
strategy	<i>estrategia</i>



WHOLE GROUP

STEP 1

Review figuring products by rectangle splitting.

1 Introduce the lesson.

Today, we'll practice multiplying by 11 using a strategy that I think will help you figure the products more easily.

2 Students split a rectangle to figure 11×8 .

Look at WorkSpace page 56. The first multiplication problem is 11 times 8. Let's say the answer together. (88)

The rectangle on the page matches the problem 11 times 8 because it has 11 rows with 8 squares in each row.

Now show how you might figure the product by rectangle splitting. You may talk with your partners about how to do this, but each of you should show your work on your own page.

Give students time to solve the problem. Then call on students to present their solutions. Students may split the rectangle in different ways; acknowledge all of their approaches.

WORKSPACE PAGE 56

Rectangle Splitting: 11

DIRECTIONS

- ▶ Draw a rectangle to match the multiplication problem.
- ▶ Split the rectangle to make two easier problems.
- ▶ Write equations for your split rectangle.
- ▶ Write the product in the box for each equation.

$11 \times 8 = \boxed{88}$ $11 \times 9 = \boxed{99}$ $11 \times 13 = \boxed{143}$

56 UNIT 2 • Lesson 7

 **WHOLE GROUP**

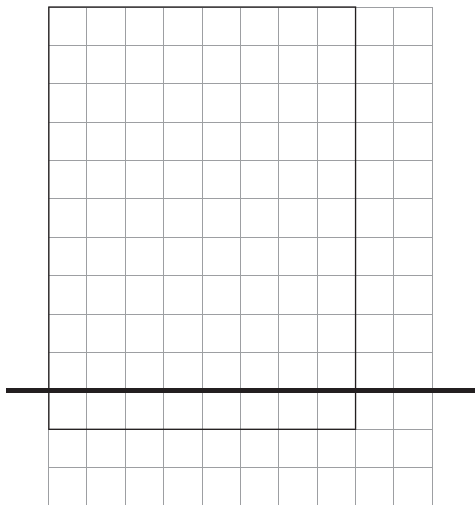
STEP 2 **Guide students as they relate rectangles and equations.**

3 Model splitting the rectangle into 10×8 and 1×8 .

Tell students that you want to show how to split the rectangle so that you can multiply by 10. Explain that multiplying by 10 is easy and that splitting a rectangle this way will help solve problems with greater numbers.

 *Here's how to split an 11-by-8 rectangle so that one of the new rectangles has 10 rows.*

Draw the rectangle on the *Grid Chart* and then draw a horizontal line as shown.

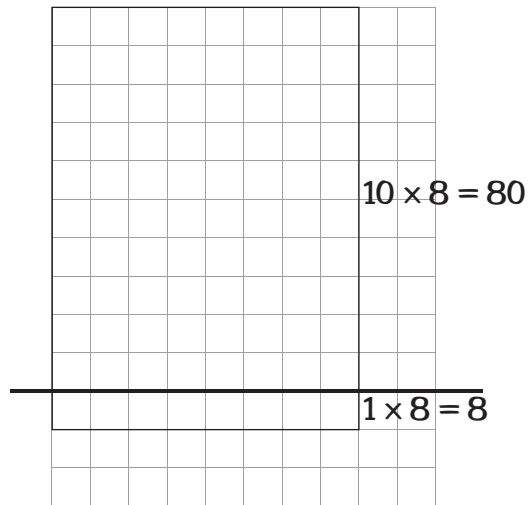


1 Demonstrate writing equations for an 11×8 rectangle.

 *Why do I want one rectangle to be 10 by 8?*

Have students talk with their partners about the advantage of the 10×8 rectangle. Choose a student to explain. (To multiply by 10, we can tack on a zero.)

Now make the connection between the rectangles and their equations. Write $10 \times 8 = 80$ and $1 \times 8 = 8$ as shown.



Explain that you changed the original problem into two easier problems, just as you split the rectangle into two smaller rectangles. Instead of solving 11×8 , you solved 10×8 and 1×8 . Then you can add the answers.

Write on the board as shown.

$$11 \times 8$$

$$10 \times 8 = 80$$

$$1 \times 8 = 8$$

$$80 + 8 = 88$$

$$11 \times 8 = 88$$

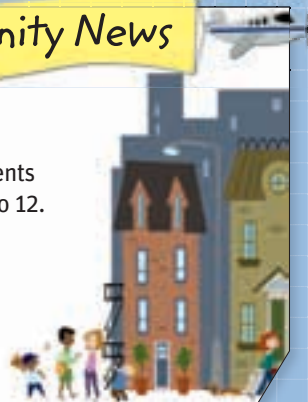


Do The Math

Community News

Distribute the copies of the News.

This *News* provides directions for a multiplication game which gives students practice multiplying numbers from 7 to 12.



CONTINUE

LESSON 7 continued Using splitting to multiply by 11

 WHOLE GROUP

STEP 3

Demonstrate the number-splitting strategy.

1 Demonstrate how to solve 11×9 by splitting the factor 11.

Now let's try another problem. We'll solve it just by thinking about the numbers, without drawing a rectangle.

Write 11×9 on the board. Ask the students to say the answer together.

SUPPORTING INSTRUCTION

Explain to students that although they may already know the product of 11×9 , you're using the problem as a way to learn a multiplication strategy. After students learn the strategy, they'll try it on problems for which they don't already know the answer.

If we drew a rectangle to solve 11 times 9, we would split it so that instead of one rectangle with 11 rows, we would have a rectangle with 10 rows and a rectangle with 1 row. We can do the same thing with just the numbers. Instead of splitting a rectangle, we split the number 11 into $10 + 1$. Watch and listen as I do this.

As you explain, record the steps on the board.

Split 11 so that it's 10 and 1.

Then multiply each part by 9.

Then add 90 and 9 to get 99.

So $11 \times 9 = 99$.

$$\begin{aligned} 11 \times 9 \\ 11 = 10 + 1 \\ 10 \times 9 = 90 \\ 1 \times 9 = 9 \\ 90 + 9 = 99 \\ 11 \times 9 = 99 \end{aligned}$$

2 Model solving 11×13 by splitting the factor 11.

Write 11×13 on the board.

I'll show you the number-splitting strategy again, this time to multiply 11 times 13.

Record each step on the board as you explain.

I can split the 11 into 10 and 1. Then I can multiply 10 times 13, and 1 times 13. That gives me 130 plus 13. What is 130 plus 13? (143) So, $11 \times 13 = 143$.

$$\begin{aligned} 11 \times 9 \\ 11 = 10 + 1 \\ 10 \times 9 = 90 \\ 1 \times 9 = 9 \\ 90 + 9 = 99 \\ 11 \times 9 = 99 \\ 11 \times 13 \\ 11 = 10 + 1 \\ 10 \times 13 = 130 \\ 1 \times 13 = 13 \\ 130 + 13 = 143 \\ 11 \times 13 = 143 \end{aligned}$$

CONNECTING TO ALGEBRA

Splitting numbers and multiplying to get partial products develops a conceptual understanding of the Distributive Property. We don't introduce the name of the property; rather, our focus is on making sense of it—understanding how and why it works through rectangle and number splitting. With this foundation, students are less likely to make mistakes in algebra like multiplying $3(a + 8)$ and getting $3a + 8$. Using and understanding the Distributive Property is essential for success in algebra.



STEP 4

Guide students as they use the number-splitting strategy.

1 Model solving 11×15 .

What two multiplication problems would you write to solve 11 times 15? (10×15 and 1×15)

What is 10 times 15? (150)

What is 1 times 15? (15)

What is 150 plus 15? (165)

Record each step on the board.

Write the product to complete the equation:
 $11 \times 15 = 165$.

$$\begin{aligned} 11 \times 15 \\ 10 \times 15 &= 150 \\ 1 \times 15 &= 15 \\ 150 + 15 &= 165 \\ 11 \times 15 &= 165 \end{aligned}$$

2 Model solving 11×12 .

Let's try another. What two multiplication problems would you write to solve 11 times 12? (10×12 and 1×12)

What is the product of each problem? (120 and 12)

What is 11 times 12? (132)

Write the product to complete the equation:
 $11 \times 12 = 132$.

$$\begin{aligned} 11 \times 12 \\ 10 \times 12 &= 120 \\ 1 \times 12 &= 12 \\ 120 + 12 &= 132 \\ 11 \times 12 &= 132 \end{aligned}$$



STEP 5

Students solve problems independently.

1 Students use the strategy.

Now you'll try two problems on your own.

Have students turn to *WorkSpace* page 57. Explain the directions and have students complete the page.

WORKSPACE PAGE 57

Number Splitting: 11

DIRECTIONS

11 \times 12 1 $11 = 10 + 1$ 2 $120 + 12 = 132$ 3 $11 \times 12 = 132$

Split a factor and write two equations. Add the products of the two equations. Write the product.

① 11×14

Equation 1 $10 \times 14 = 140$

Equation 2 $1 \times 14 = 14$

Add the products.

$140 + 14 = 154$

Write the product. $11 \times 14 = 154$

② 11×17

Equation 1 $10 \times 17 = 170$

Equation 2 $1 \times 17 = 17$

Add the products.

$170 + 17 = 187$

Write the product. $11 \times 17 = 187$

Split the rectangles below to show how you split the numbers in 1 and 2.

Students may split the second factor; they will find the sum of 11×10 and 11×4 , and the sum of 11×10 and 11×7 .

UNIT 2 • Lesson 7 57

2 Students check their solutions.

Have students compare their solutions with those of their partners. If two partners have different solutions, have each one explain to the other how he or she solved the problem. Have both students determine which solution is correct.

SUPPORTING INSTRUCTION

If a student can't explain his or her solution, ask questions such as: *How did you split 11? How did you decide which two equations to use? Where did you get the numbers that add to 154 (or 187)?*

LESSON 10 Assessing student understanding

Lesson Summary

Students demonstrate understanding of the objectives of Lessons 6–9 by completing *WorkSpace* pages independently.

Objectives

- Recall products for factors 0 through 12.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary: *equation*, *multiplication*, and *product*.

Materials

- WorkSpace* pages 61–67
 - Pathways Game Board A*
 - green tiles **T** **S**
 - Additional Practice
- T** = Student Bag
S = Student Bag



Interactive Whiteboard Tools

WorkSpace pages and manipulatives for Lesson 10 are provided on the *Interactive Whiteboard Tools* CD-ROM.



Preparation

Print out a full-page copy of the *Pathways* Game Board A from the *TeacherSpace* CD-ROM. Adhere it to the board in order to demonstrate the game to the whole group. Alternatively, you can demonstrate the game to your students using the *Interactive Whiteboard Tools*.

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
equation	<i>ecuación</i>
multiplication	<i>multiplicación</i>
product	<i>producto</i>

Academic Vocabulary

ENGLISH	SPANISH
strategy	<i>estrategia</i>



WHOLE GROUP

STEP 1

Teach a multiplication game.

1 Introduce the lesson.

Today you'll show what you know by completing WorkSpace pages independently. Then you'll play a game called Pathways that will give you practice with multiplying.

2 Explain how to play Pathways.

Display a *Pathways* game board.



The goal is to be the first player to make a continuous pathway across the game board—top to bottom or side to side. Each square is a stepping stone.

To show different paths to win, trace your finger across the board. Start at a top square such as 24 and trace going up and down or along diagonals (or both) to get to the bottom of the board (for example: 24, 40, 56, and 49). Then start at the left side such as 30 and trace your finger across until you get to the right side (for example: 30, 25, 56, 64, 20). Explain that as long as they make a continuous path, they don't need to make it in order.

3 Demonstrate a turn.

Explain that the numbers in each of the squares are products and the numbers beneath are factors.

First I choose 2 factors. I'll choose 3 and 6. I place green tiles on the two numbers. 3×6 is 18 so I will mark an X on 18. Then it is my partner's turn.

18	32	24	15	48
28	40	35	64	20
30	12	56	21	16
9	25	49	42	36
	4	5		7 8

Write $3 \times 6 = 18$ on the board.

Both players write the equation on the game recording sheets in the WorkSpace.

INDIVIDUALS

STEP 2

Students complete an assessment.

4 Demonstrate the other player's turn.

After the first turn, a player can only move one green tile to a new number. My partner could move the green tile off of the 3 and on to any other number or move the green tile off of 6 and on to any other number. Let's say that my partner moves the tile from the 6 to the 7. Now he or she multiplies 3 times 7 and marks an O on that product.

What is 3×7 ? (21)

Draw a ring around 21 on the game board.

We both write the equation on our game recording sheets.

Pathways Game Board A

18	32	24	15	48
28	40	35	64	20
30	12	56	21	16
9	25	49	42	36

4 5 6 8

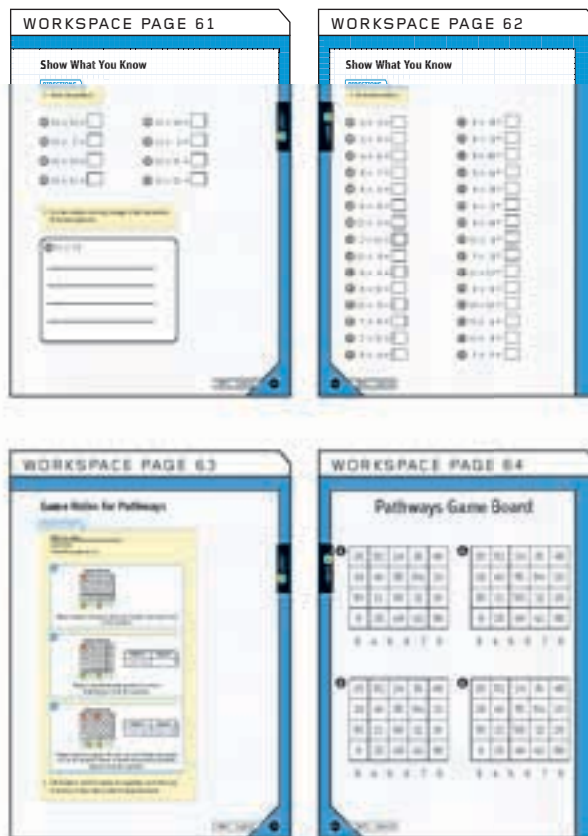
You and your partner take turns moving only one of the tiles on each turn and then marking the product with an X or O. It is okay if on your turn you move one tile and place it on the same factor as the other tile. For example, both tiles could be on 6. You multiply 6×6 and mark 36 on the game board. Also you may not mark a product that is already taken by your partner.

The first player to make a path from top to bottom or side to side is the winner.

1 Students complete Workspace pages 61 and 62.

Have students turn to Workspace pages 61 and 62. Explain that they should complete both pages independently and should not use the multiplication chart to write or verify products.

When you finish these two pages, you will play Pathways. The game boards are on Workspace page 64 and you can record your and your partner's equations on page 65. If you need to refer to the rules, they are on Workspace page 63.



AFTER THE LESSON

 **CheckPoint**

Monitor Progress and Differentiate Instruction

Use the *Annotated WorkSpace* to assess pages 61 and 62. Although these lessons are carefully paced and scaffolded, there may be instances when students need additional support or challenges.

For Students Who Need More Support

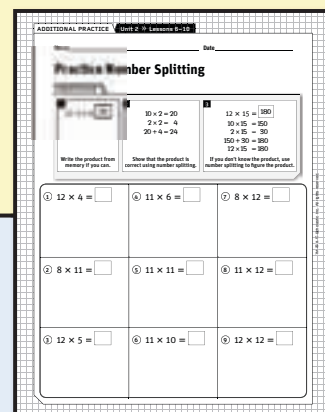
- Have the student make flash cards of the multiplication facts that he or she still needs to learn. Have the student turn over the flash cards one at a time. As each card is turned over, suggest ways to figure out the product if necessary. Allow the student to use paper and pencil to record equations. Then have the student state the product. If the product is incorrect, help the student find the error in his or her solution.
- Play *Pathways* one-on-one with a student who needs additional practice using some of the more difficult facts, such as those on Game Boards D and E. By doing this you will have an opportunity to discuss ways to figure an unknown product. For example, if the student does not know 6×12 , you can suggest that he or she split the 12 into 10 and 2, and then think: 6×10 is 60, 6×2 is 12, and $60 + 12 = 72$. You are not only helping the student with the facts, but also strengthening his or her understanding of splitting.

For Students Ready for a Challenge

- Provide the student with a *Pathways* game card that has factors greater than 8 (B, C, D, or E) and have the student play the game by himself or herself. The goal is to make a pathway in as few turns as possible. The student should check his or her products on the Multiplication Chart.
- Provide grid paper and challenge the student to draw a 15-by-7 rectangle. Ask the student to split the rectangle so that there is a group of 10 (splitting the rectangle into a 10-by-7 and a 5-by-7) and to figure the product ($70 + 35 = 105$). Alternatively, guide the student to split the rectangle into three groups of 5 (three 5-by-7 rectangles, or $35 + 35 + 35 = 105$). Have the student make up his or her own rectangles and use splitting to figure the products. The student can draw rectangles with 13–19 rows with 2–9 tiles in each row.

ADDITIONAL PRACTICE

All students could benefit from additional practice. For your convenience, the reproducible of the Additional Practice for Lessons 6–10 is available on the *TeacherSpace* CD-ROM. This Additional Practice gives students more opportunities to use number splitting to find products of problems with factors of 11 or 12.



End-of-Unit Assessment





Measure Student Understanding

After completing Lesson 15 and differentiating instruction, administer the Unit 2: End-of-Unit Assessment found on pages 347 and 348 or on the *TeacherSpace* CD-ROM.

For Tracking Student Progress

Use the End-of-Unit Assessment Answer Key on page 362 to determine the number of items students answered correctly for each of the following unit objectives. Record their results on the Objectives Tracker found on page 339.

Unit objectives are listed in bold. Lesson objectives are listed below with the corresponding assessment items in parentheses.

-  **Represent multiplication of whole numbers with visual models.**
 Represent rectangles with multiplication equations. (Items 1–3)
-  **Multiply whole numbers.**
 Calculate products with factors 0 through 10. (Items 4–10)
 Calculate products with factors of 11 or 12 using the number-splitting strategy. (Items 11–13 and 21)
 Calculate products with two-digit factors and 10. (Items 14 and 15)
 Multiply one-digit numbers by multiples of 10 from 10 to 100. (Items 16 and 17)
-  **Utilize the properties of numbers to solve problems.**
 Use the Associative Property of Multiplication to determine the product of three factors. (Items 18–20 and 22)
-  **Communicate ideas with key math vocabulary:** Associative Property of Multiplication, factor, product. (Items 21 and 22)

MULTIPLICATION & DIVISION

Objectives Tracker (Units 1–2)

► Record the number of items a student answered correctly for each objective in the boxes below. For more information about these objectives, see the Measure Student Understanding pages at the end of each unit.


B = Beginning-of-Unit Assessment
E = End-of-Unit Assessment

OBJECTIVES	STUDENT NAMES									
	B	E	B	E	B	E	B	E	B	E
UNIT 1										
Represent multiplication of whole numbers with visual models. (Items 1–3 and 22)	9	9	9	9	9	9	9	9	9	9
Multiply whole numbers. (Items 4–10)	10	10	10	10	10	10	10	10	10	10
Write and solve multiplication problems. (Items 11–13 and 21)	3	3	3	3	3	3	3	3	3	3
Communicate ideas with key math vocabulary. (Items 21 and 22)	2	2	2	2	2	2	2	2	2	2
UNIT 2										
Represent multiplication of whole numbers with visual models. (Items 1–3)	3	3	3	3	3	3	3	3	3	3
Multiply whole numbers. (Items 4–10 and 21)	15	15	15	15	15	15	15	15	15	15
Utilize the properties of numbers to solve problems. (Items 18–20 and 22)	4	4	4	4	4	4	4	4	4	4
Communicate ideas with key math vocabulary. (Items 21 and 22)	2	2	2	2	2	2	2	2	2	2

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Measure student progress and understanding by comparing student results on the Beginning- and End-of-Unit Assessments.

For Further Differentiation

If you find a student is still having difficulty with one or more of the objectives, revisit the For Students Who Need More Support suggestions found on the Lesson 5, 10, and 15  **CheckPoint** pages. This student should receive individualized support to master these objectives during the next unit.

UNIT 2

Lessons
1–15



End-of-Unit Assessment

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WorkSpace



Created By
Marilyn Burns

Multiplication & Division

Multiplication Chart

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Rectangle Splitting: 11

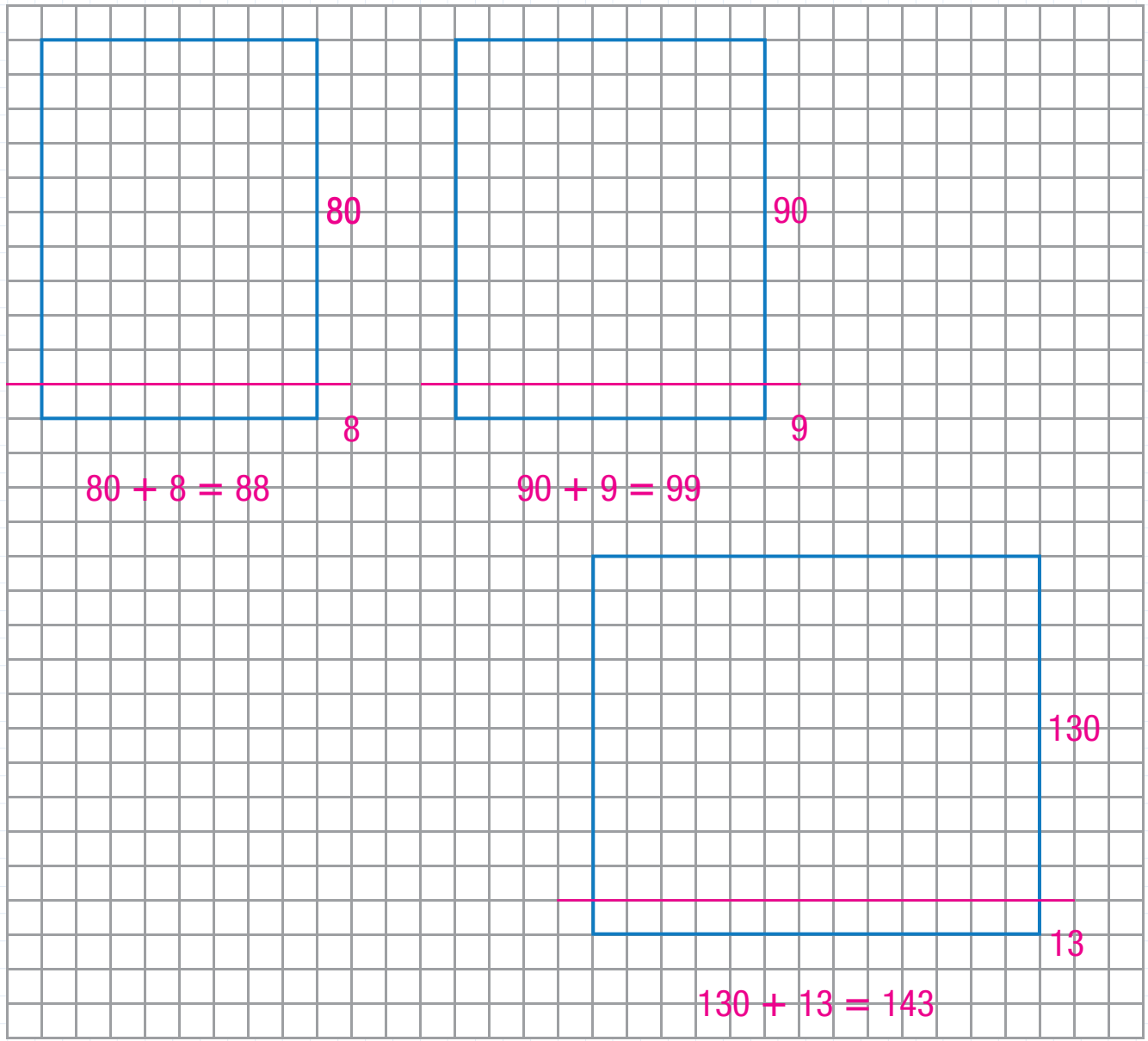
DIRECTIONS

- Draw a rectangle to match the multiplication problem.
- Split the rectangle to make two easier problems.
- Write equations for your split rectangle.
- Write the product in the box for each equation.

$11 \times 8 =$ 88

$11 \times 9 =$ 99

$11 \times 13 =$ 143



Number Splitting: 11

DIRECTIONS

11×12

1

$$11 = 10 + 1$$
$$10 \times 12 = 120$$
$$1 \times 12 = 12$$

Split a factor and write two equations.

2

$$120 + 12 = 132$$

Add the products of the two equations.

3

$$11 \times 12 = 132$$

Write the product.

1 11×14

Equation 1 $10 \times 14 = 140$

Equation 2 $1 \times 14 = 14$

Add the products.

$$140 + 14 = 154$$

Write the product. $11 \times 14 = 154$

2 11×17

Equation 1 $10 \times 17 = 170$

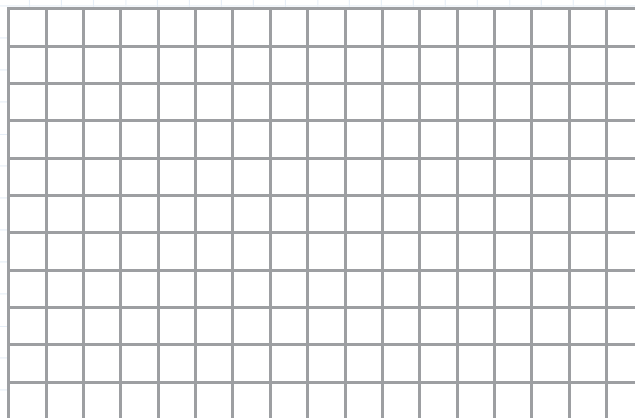
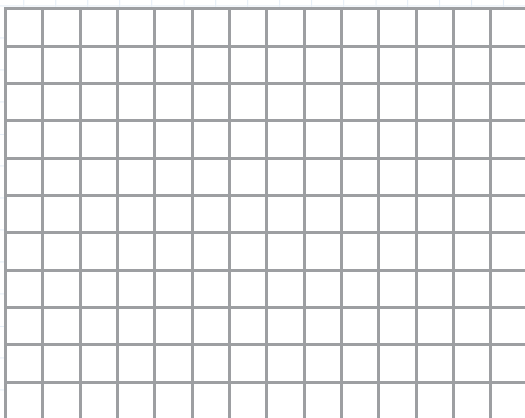
Equation 2 $1 \times 17 = 17$

Add the products.

$$170 + 17 = 187$$

Write the product. $11 \times 17 = 187$

Split the rectangles below to show how you split the numbers in 1 and 2.



Students may split the second factor; they will find the sum of 11×10 and 11×4 , and the sum of 11×10 and 11×7 .

Show What You Know

DIRECTIONS

► Write the products.

$$\textcircled{1} \quad 12 \times 12 = \boxed{144}$$

$$\textcircled{5} \quad 12 \times 10 = \boxed{120}$$

$$\textcircled{2} \quad 11 \times 7 = \boxed{77}$$

$$\textcircled{6} \quad 12 \times 5 = \boxed{60}$$

$$\textcircled{3} \quad 11 \times 10 = \boxed{110}$$

$$\textcircled{7} \quad 12 \times 11 = \boxed{132}$$

$$\textcircled{4} \quad 11 \times 12 = \boxed{132}$$

$$\textcircled{8} \quad 11 \times 13 = \boxed{143}$$

► Use the number-splitting strategy to find the product.
Write each equation.

$$\textcircled{9} \quad 12 \times 13$$

$$\underline{10 \times 13 = 130} \quad \text{or} \quad \underline{12 \times 10 = 120}$$

$$\underline{2 \times 13 = 26} \quad \underline{12 \times 3 = 36}$$

$$\underline{130 + 26 = 156} \quad \underline{120 + 36 = 156}$$

$$\underline{12 \times 13 = 156} \quad \underline{12 \times 13 = 156}$$