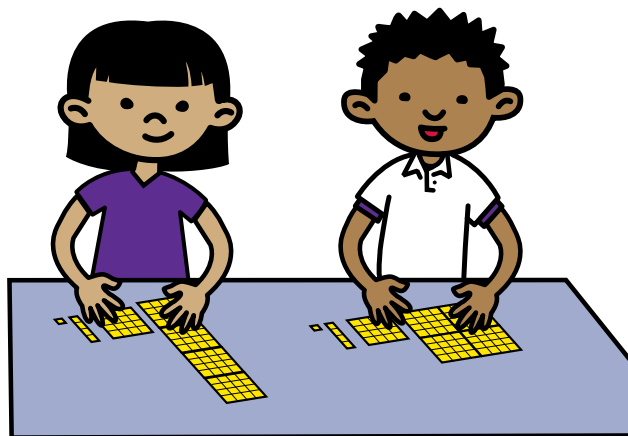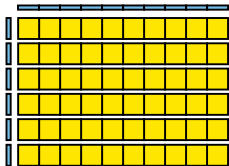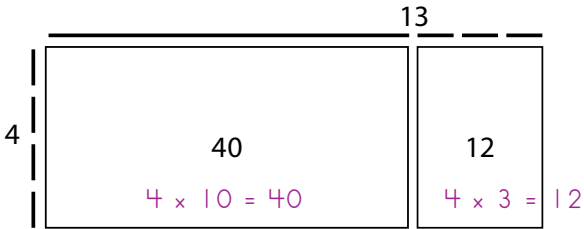**Bridges in Mathematics**
Grade 4 Unit 2

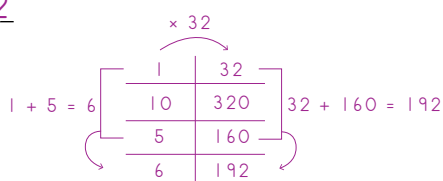# Multidigit Multiplication & Early Division

In this unit your student will:

- Use place value relationships to multiply by 10, 100, and 1,000

- Multiply 2-digit numbers

- Represent multiplication with arrays and ratio tables

- Divide with and without remainders

- Solve multiplication and division word problems

Your student will learn and practice these skills by solving problems such as these:

PROBLEM	COMMENTS
Finn needs 90 square centimeters of cloth to make a patch for the Springfield Rec Center. Finn cut a rectangle of cloth that was 6 centimeters by 10 centimeters. Was that enough? 10 + 10 + 10 + 10 + 10 + 10 = 60 6 × 10 = 60 The cloth is 60 sq. cm. That's not enough.	Students use place value relationships to multiply by 10, 100, and 1,000. Using an array helps them see, for example, that $6 \times 10 = 60$ or 6 tens. They use arrays and similar models to solve problems that involve dimes and metric units of measure. These models illustrate the place value shifts that occur when multiplying by powers of 10.
13 4 40 $4 \times 10 = 40$ 12 $4 \times 3 = 12$ 4 × 13 = 4 × 10 + 4 × 3 = 40 + 12 = 52	Students use an open array to model multiplication of greater numbers. They can break apart any factor and multiply each part separately. These separate multiplication problems are called *partial products*. In this example, students find two partial products: 4×10 and 4×3. They add the two products to find the final product of 4×13. Students will later use the open array and partial product strategy to divide.
Fill in the blanks to complete the equation. $70 \times 6 = 7 \times \underline{10} \times 6$	Students learn to use place value relationships to find missing values. In this example, we want students to use the fact that 70 is the product of 7 and 10 to determine that 10 is the unknown number.

PROBLEM	COMMENTS
Use a ratio table to find the product. $32 \times 6 = \underline{192}$ 	Students use ratio tables to solve multiplication problems. They use products they know to calculate the products they don't already know. A student used 10×32 to find 5×32 (half of 320). Then they added the partial products (1×32 and 5×32) to find the product of 6 and 32. Students will later use ratio tables to divide multidigit numbers as well.
Mr. Iglesia wants to put 25 students into groups of two. How many groups will there be? There will be 12 groups with 1 student remaining. Mr. Iglesia should let one group have 3 students so 1 student isn't left out.	Students explore division situations with remainders. They consider different ways to handle a remainder depending on the situation. They might: • Represent the remainder as a fraction • Add another group to account for the remainder • Make one group larger In this situation, students might make one group larger so the one remaining student isn't left on their own.

For additional support, you can use the Math Vocabulary Cards app at apps.mathlearningcenter.org.

Frequently Asked Questions About Unit 2

Q: Why do students use arrays and ratio tables to solve multiplication problems?

A: Arrays and ratio tables help students see why different strategies work. These visual models and the different strategies students learn help them become more proficient with multiplication. An in-depth understanding of multiplication, supported by visual models such as arrays, provides the foundation for multiplying multidigit whole numbers accurately, efficiently, and more importantly, with understanding.

Q: How can I support my student's learning?

A: To support your student in learning mathematics, you can:
- Ask your student to describe the strategies they learn in class. Encourage them to draw arrays or ratio tables to represent the multiplication problems they solve. Ask them how they could use what they know to break up an array into smaller parts, as shown in the problem 4×13 as an example.
- Visit mathathome.mathlearningcenter.org and work together through some or all of the activities in Grade 4: Set 2. These activities provide fun ways to engage everyone at home in mathematical thinking. This set also includes digital versions of familiar games that your student learned at school, such as Division Capture and Remainders Win. Your student may be excited to teach you how to play these games.
- If your student would enjoy learning about math concepts through literature, consider looking for math-related books at your local library. Encourage your student to read to you and point out the mathematical relationships they see. Some suggestions include:
  » *A Hundred Billion Trillion Stars* by Seth Fishman
  » *Code Breaker, Spy Hunter: How Elizebeth Friedman Changed the Course of Two World Wars* by Laurie Wallmark, illustrated by Brooke Smart