![InsightMath California]

Extending Multiplication and Division Strategies

Family Guide | Grade 3 | Unit 5

> **Your student is exploring how understanding properties and using flexible models and strategies can help to multiply and divide efficiently and fluently.**

Key Math Ideas

In this unit, your student will build on what they know about multiplication and division by applying more advanced strategies to solve problems efficiently. They are introduced to parentheses as a way of grouping numbers in an equation. They see that parentheses tell them which part of an equation to solve first when an equation has more than one operation, such as addition and multiplication. Your student will also explore how multiplication and division are inverse operations, or operations that have the opposite effect. By the end of the unit, they will be using what they have learned across the unit to solve word problems efficiently and write equations to show their thinking.
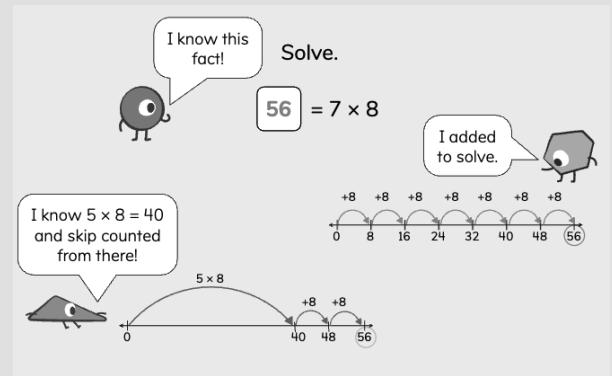
### → In the beginning of the unit, your student will learn to

- partition (split a whole into parts) a rectangle to find its area and explain how they found the total area;
- write expressions to show how they can find the area of rectangle by partitioning it;
- solve two-step equations that have parentheses.

→ In the middle of the unit, your student will learn to

- recognize that numbers can be multiplied in any order and the answer will stay the same;
- multiply numbers in an order that makes it easier to solve a problem. For example, $7 \times 5 \times 2$ can be solved by first multiplying $5 \times 2 = 10$ (a known fact) and then multiplying $7 \times 10 = 70$;
- decompose a multiple of 10 (20, 30, 40, etc.) into two parts, where one is 10 ($20 = 2 \times 10$, $30 = 3 \times 10$, etc.);
- use efficient strategies to solve word problems.

→ At the end of the unit, your student will learn to

- recognize that multiplication and division are inverse operations, or operations that have the opposite effect ($3 \times 4 = 12$ and $12 \div 4 = 3$) and this can be used to solve problems, such as solving $55 \div 5 = \_\_$ using $5 \times \_\_ = 55$;
- write an equation to represent a word problem and use a letter to represent the unknown number, such as representing the problem "I have 5 baskets with 7 apples in each basket. How many apples do I have?" with $5 \times 7 = A$;
- apply multiplication and division to understand picture graphs where each picture represents more one object.
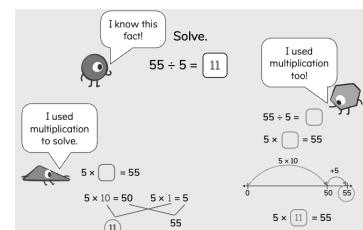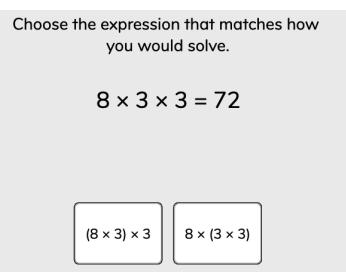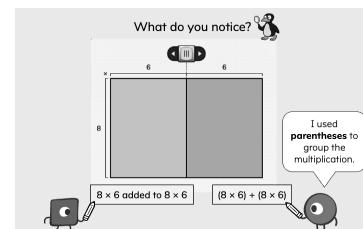
Helpful Hint

When solving a word problem, ask your student to act out what is happening. This will help them recognize whether or not they should be using multiplication, addition, division, or subtraction to solve each step. Have them write an equation as they do each step to represent their thinking.

Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ **In the beginning of the unit:**
- How does partitioning a rectangle make it easier to find the area?
- If you see parentheses in an equation, what does that tell you?

→ **In the middle of the unit:**
- What multiplication or division facts do you know that can help you solve this equation?
- How can you group the numbers in this multiplication equation to make it easier to solve?
- How do you prefer to solve word problems? Why?

→ **At the end of the unit:**
- How are multiplication and division the same? How are they different?
- How can you use multiplication to help you solve a division equation?
- How can I represent the unknown number in a word problem with an equation?

If...	Try...
your student reverses the numbers in a division equation (for example, representing 24 divided by 6 as 6 ÷ 24 instead of 24 ÷ 6) . . .	asking them to draw a picture showing "24 divided by 6." Emphasize that the number before the division sign represents the total amount and the number after the division sign represents the number of groups or the number in each group.

Student Strengths Spotlight

I learn from my mistakes.	Exploring new ideas can lead to mistakes, and students take this opportunity to recognize the every mistake is an opportunity to learn.
I start by observing what is happening in the problem.	Before starting to solve, students take time to understand and make sense of the problem.
I am careful about the words I use to explain thinking.	Using precise mathematical language allows students to explain their thinking correctly.

Try This Together!

- **Grocery Shopping.** While at the store, have your student look for items that are sold in groups. Ask them questions to find the total number of items. For example, if there are 4 bananas in a bunch and you buy 3 bunches of bananas and then 2 single bananas, how many bananas would you have? Have your student create an equation to match their thinking, such as 4 × 3 + 2 = 14 bananas.

- **Mind Math.** Play a game of mind math and give your student a number, asking them what numbers can be multiplied to create that number. For example, ask, "what numbers can be multiplied to make 45?" (3 and 15, 5 and 9) or "what numbers can be multiplied to make 210?" (21 and 10 or 7, 3, and 10).