

KEY CONCEPT OVERVIEW

In Lessons 3 through 9, students learn to multiply multi-digit whole numbers by using the **area model** (as shown in the Sample Problem below).

You can expect to see homework that asks your child to do the following:

- Change an expression written in word form to one written in number form, and vice versa. For example, *the sum of 3 sixteens and 2 nines* can be written as $(3 \times 16) + (2 \times 9)$.
- Solve multi-digit multiplication problems by using mental math. For example, consider the problem 19×15 .

$$\begin{aligned} &\text{Think: } 20 \text{ fifteens} - 1 \text{ fifteen} \\ &= (20 \times 15) - (1 \times 15) \\ &= 300 - 15 \\ &= 285 \end{aligned}$$

- Estimate and solve problems, including word problems, that involve multi-digit whole number multiplication.

SAMPLE PROBLEM (From Lesson 7)

Draw an area model. Then solve by using the **standard algorithm**.

$$2,431 \times 106 = 257,686$$

| | | | | | | | | |
|-----|---------|--------|-------|-----|---------|---|---|--|
| | 2,000 | + | 400 | + | 30 | + | 1 | |
| 6 | 12,000 | 2,400 | 180 | 6 | 14,586 | | | |
| + | | | | | | | | |
| 100 | 200,000 | 40,000 | 3,000 | 100 | 243,100 | | | |

$$14,586 + 243,100 = 257,686$$

| | |
|---|-----------------|
| | 2, 4 3 1 |
| × | 1 0 6 |
| | <u> </u> |
| | 1 4, 5 8 6 |
| | <u> </u> |
| + | 2 4 3, 1 0 0 |
| | <u> </u> |
| | 2 5 7, 6 8 6 |

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

- Quiz your child on the difference between a sum and a **product**. Try to do simple mental math together involving both sums and products. For example, tell your child, “Think of the product of 2 and 3.” (The answer is 6.) “Now think of the product of 3 and 4.” (The answer is 12.) “What’s the sum of those two products, 6 and 12?” (The answer is 18.)
- Practice using partial products while doing multiplication. This can be a two-person activity with you and your child. Use easier three-digit numbers. For example, try 300×120 . Tell your child, “You figure out 300×100 , and I’ll figure out 300×20 . Then we can add those two numbers together to get the result.” ($300 \times 100 = 30,000$; $300 \times 20 = 6,000$; $30,000 + 6,000 = 36,000$)

TERMS

Product: The number resulting from the multiplication of two or more numbers. For example, in $4 \times 0.2 = 0.8$, the number 0.8 is the product.

Standard algorithm: A standard step-by-step procedure to solve a particular type of problem. For example, the process of multiplying vertically with regrouping is a standard algorithm.

MODELS

Area Model

$2,431 \times 106 = 257,686$

| | | | | | | | | |
|------------|----------------|----------|---------------|----------|--------------|----------|------------|----------------|
| | 2,000 | + | 400 | + | 30 | + | 1 | |
| 6 | 12,000 | | 2,400 | | 180 | | 6 | 14,586 |
| + | | | | | | | | |
| 100 | 200,000 | | 40,000 | | 3,000 | | 100 | 243,100 |

$14,586 + 243,100 = 257,686$