

## 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  $19 \times 15$ .

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

- 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](http://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  $300 \times 120$ . Tell your child, “You figure out  $300 \times 100$ , and I’ll figure out  $300 \times 20$ . 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**

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

	<b>2,000</b>	<b>+</b>	<b>400</b>	<b>+</b>	<b>30</b>	<b>+</b>	<b>1</b>	
<b>6</b>	<b>12,000</b>		<b>2,400</b>		<b>180</b>		<b>6</b>	<b>14,586</b>
<b>+</b>								
<b>100</b>	<b>200,000</b>		<b>40,000</b>		<b>3,000</b>		<b>100</b>	<b>243,100</b>

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