

## KEY CONCEPT OVERVIEW

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In Lessons 1 and 2, students learn to multiply multi-digit whole numbers by using several strategies. Additionally, they learn to **round** numbers to the nearest ten, hundred, thousand, or ten thousand as a strategy to help them **estimate** the product (answer) of multiplication problems.

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

- Find the product of multi-digit multiplication **expressions**.
- Round numbers in multiplication problems to estimate the answer.
- Solve word problems that involve multi-digit multiplication.

## SAMPLE PROBLEMS (From Lesson 1)

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Find the products. Show your thinking.

$$\begin{aligned} 7 \times 9 \\ = \mathbf{63} \end{aligned}$$

$$\begin{aligned} 7 \times 90 \\ = (7 \times 9) \times 10 \\ = \mathbf{63} \times 10 \\ = \mathbf{630} \end{aligned}$$

$$\begin{aligned} 70 \times 90 \\ = (7 \times 10) \times (9 \times 10) \\ = (7 \times 9) \times 100 \\ = \mathbf{6,300} \end{aligned}$$

$$\begin{aligned} 70 \times 900 \\ = (7 \times 9) \times (10 \times 100) \\ = \mathbf{63,000} \end{aligned}$$

LEARN MORE by viewing a video on the decomposition of a number bond to solve multiplication and division problems. Visit [eurmath.link/number-bond-decomp](http://eurmath.link/number-bond-decomp).

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**

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- Multiply by 10, 100, and 1,000. Give your child a multiplication expression, and have him tell you the product (answer). For example,

$$3 \times 10 = 30; 3 \times 100 = 300; 3 \times 1,000 = 3,000$$

$$50 \times 10 = 500; 50 \times 100 = 5,000; 50 \times 1,000 = 50,000$$

- Review rounding of a whole number with your child. For example,

What is 19 rounded to the nearest ten? (20)

What is 727 rounded to the nearest hundred? (700)

What is 3,815 rounded to the nearest thousand? (4,000)

**TERMS**

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**Estimate:** Approximate the value of a quantity or number. For example, you can estimate the product of  $22 \times 3$  as about 60 (22 is very close to the number 20, and  $20 \times 3 = 60$ ).

**Expression:** Any combination of sums, differences, products, or divisions of numbers that evaluates to a number. Expressions do not have an equal sign (e.g.,  $600 + 3 + 0.07$ ).

**Round:** Replace a number with another number of approximately the same value. For example, 8,261 rounded to the nearest hundred is 8,300.

## KEY CONCEPT OVERVIEW

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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  $19 \times 15$ .

Think: 20 fifteens – 1 fifteen

$$= (20 \times 15) - (1 \times 15)$$

$$= 300 - 15$$

$$= 285$$

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

## SAMPLE PROBLEM (From Lesson 7)

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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

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

$$\begin{array}{r}
 2,431 \\
 \times 106 \\
 \hline
 14,586 \\
 + 243,100 \\
 \hline
 257,686
 \end{array}$$

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**

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- 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 regrouping 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**

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**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**

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**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>

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

## KEY CONCEPT OVERVIEW

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In Lessons 10 through 12, students learn to multiply multi-digit whole numbers by decimal numbers, 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:

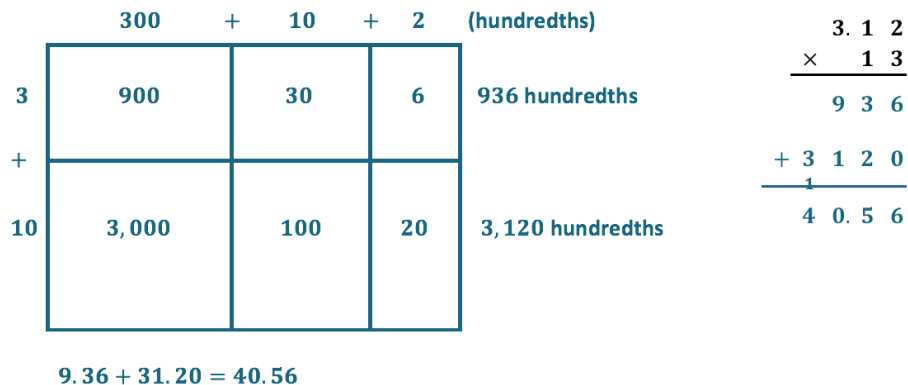
- Estimate the product (e.g.,  $4.1 \times 226 \approx 4 \times 200 = 800$ ).
- Solve multiplication problems by using an area model.
- Solve word problems that involve multiplying multi-digit whole numbers by decimal numbers.

## SAMPLE PROBLEM (From Lesson 12)

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Estimate the product. Solve by using an area model and the standard algorithm.

$$13 \times 3.12 \approx 10 \times 3 = 30$$



LEARN MORE by viewing a video on using an array and an area model to solve multiplication problems. Visit [eurmath.link/arrays-area-models](http://eurmath.link/arrays-area-models).

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**

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- Help your child practice multiplication facts. Have him bounce a basketball as he says the multiples of different numbers. For example, he can practice saying the multiples of 8 with each bounce: 0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80. Then he can say them backward: 80, 72, 64, 56, 48, 40, 32, 24, 16, 8, 0.
- Practice estimation at the grocery store. For example, say, “I want to buy 7 watermelons, and each one costs \$2.99. Estimate my total cost.” ( $7 \times \$2.99 \approx 7 \times \$3 = \$21$ )

## KEY CONCEPT OVERVIEW

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In Lessons 13 through 15, students learn to **convert** measurements using multiplication.

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

- Convert from one type of unit to another (e.g., 4.7 m = 470 cm; 24 ft = 8 yd).
- Solve word problems that involve measurement.

## SAMPLE PROBLEM (From Lesson 14)

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Convert milliliters to liters.

$$\begin{aligned} 579 \text{ milliliters} &= \underline{0.579} \text{ liter} \\ 579 \text{ milliliters} &= 579 \times (1 \text{ milliliter}) \\ &= 579 \times (0.001 \text{ liter}) \\ &= 0.579 \text{ liter} \end{aligned}$$

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

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- With your child, practice finding which unit is larger or smaller. For example, say to your child, “I’ll name two units, and you tell me the larger unit. Meter or kilometer? (Kilometer) Pound or ounce? (Pound) Inch or yard? (Yard) Pint or quart? (Quart).”
- Practice measurement conversions with your child while shopping in a supermarket. For example, you might ask your child, “If I need a pound of butter, and this package of butter is eight ounces, how many packages of butter should I buy?” or “If I only need two cups of cream, should I buy a pint or a quart of cream?”

**TERMS**

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**Convert:** To express a measurement in a different unit (e.g., liters expressed as milliliters).



## KEY CONCEPT OVERVIEW

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Lessons 16 through 18 focus on strategies to help students solve division problems of multi-digit numbers.

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

- Rewrite division problems as easier problems, and then solve. For example,

$$\begin{aligned}12,000 \div 300 \\ &= 12,000 \div 100 \div 3 \\ &= 120 \div 3 \\ &= 40\end{aligned}$$

- Estimate the **quotient**. For example,

$$\begin{aligned}609 \div 24 \\ \\ \approx 600 \div 20 \\ = 30\end{aligned}$$

- Solve word problems that involve division of multi-digit numbers.

## SAMPLE PROBLEM (From Lesson 18)

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Estimate the quotient.

$$5,492 \div 72$$

$$\begin{aligned}\approx & \mathbf{5,600 \div 70} \\ = & \mathbf{560 \div 7} \\ = & \mathbf{80}\end{aligned}$$

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** 

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- Play a skip-counting contest with your child. For example, count by 3's to 30: 3, 6, 9, 12, 15, ....  
Count by 30's to 300: 30, 60, 90, 120, 150, .... Count by 300's to 3,000: 300, 600, 900, 1200, 1500, ....
- Play the Rounding card game with your child.
  1. Take the jacks, queens, kings, tens, and jokers out of the deck.
  2. Put the stack of remaining cards facedown.
  3. Flip a set number of cards and have your child practice rounding the number represented by the flipped cards to different place value units.

For example, you flip a 6, a 1, an 8, and a 2; they represent 6,182. Rounding 6,182 to the nearest ten is 6,180; rounding 6,182 to the nearest hundred is 6,200; and rounding 6,182 to the nearest thousand is 6,000.

**TERMS** 

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**Quotient:** The answer resulting from the division of two numbers. For example, in  $5.4 \div 6 = 0.9$ , the number 0.9 is the quotient.

## KEY CONCEPT OVERVIEW

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Lessons 19 through 23 focus on larger numbers in division problems using the strategy of long division.

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

- Divide up to four-digit numbers by two-digit numbers, and then check the answer using multiplication (as shown in the Sample Problem below).
- Solve word problems that involve division.

## SAMPLE PROBLEM (From Lesson 23)

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Divide. Then, check your work using multiplication.

$$4,652 \div 22$$

$$\begin{array}{r}
 \phantom{22} \overline{) 4,652} \quad R 10 \\
 \underline{44} \phantom{0} \\
 25 \\
 \underline{22} \\
 32 \\
 \underline{22} \\
 10
 \end{array}$$

**Check:**

$$\begin{array}{r}
 211 \\
 \times 22 \\
 \hline
 422 \\
 + 4,220 \\
 \hline
 4,642
 \end{array}$$

$$\begin{array}{r}
 4,642 \\
 + \phantom{4,}10 \\
 \hline
 4,652
 \end{array}$$

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**

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- Play the Divide the Card number game with your child.
  1. Take out the jacks, queens, kings, aces, and jokers.
  2. Put the stack of remaining cards face down.
  3. Flip three or four cards from the top of the deck, and place them face up on the table. The three- or four-digit number shown by these cards will represent the whole.
  4. Your child flips two cards from the top of the deck and places them face up on the table. The two-digit number shown by these cards will represent the divisor.
  5. Write the division expression using the whole and the divisor. Then ask your child to estimate the quotient.
  6. Your child then solves the division problem using the standard algorithm.

For example, you flip three cards with the numbers 3, 1, and 2; it represents 312. Your child flips two cards with the numbers 5 and 1; it represents 51. You write  $312 \div 51$  and say, “Estimate how many times 51 can go into 312.” She says, “Six,” and then solves the division problem using the standard algorithm. (The answer is 6 with a remainder of 6.)

## KEY CONCEPT OVERVIEW

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In Lessons 24 through 27, students learn to divide decimal numbers by one-, two-, and three-digit whole numbers (e.g.,  $34.5 \div 300 = 0.115$ ).

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

- Rewrite division problems as easier problems, and then solve.

For example,  $1.2 \div 60$   
 $= 1.2 \div 6 \div 10$   
 $= 0.2 \div 10$   
 $= 0.02$

- Estimate the quotient.

For example,  $3.91 \div 17$   
 $\approx 4 \div 20$   
 $= 4 \div 10 \div 2$   
 $= 0.4 \div 2$   
 $= 0.2$

- Check the answers to division problems using multiplication.
- Solve word problems that involve division.

## SAMPLE PROBLEM (From Lesson 27)

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Divide. Check your work using multiplication.

$$5.6 \div 16$$

**Check:**

$$\begin{array}{r} \phantom{0.} \mathbf{0.35} \\ \mathbf{16} \overline{) \mathbf{5.60}} \\ \underline{- \phantom{0.} \mathbf{48}} \phantom{0} \\ \phantom{0.} \mathbf{80} \\ \underline{- \phantom{0.} \mathbf{80}} \\ \phantom{0.} \mathbf{0} \end{array}$$

$$\begin{array}{r} \phantom{0.} \mathbf{0.35} \\ \times \phantom{0.} \mathbf{16} \\ \hline \phantom{0.} \mathbf{210} \\ + \phantom{0.} \mathbf{350} \\ \hline \phantom{0.} \mathbf{560} \end{array}$$

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**

- Play a call-and-response game with your child. You say a division expression, and he says the answer in unit form. For example, 6 tenths  $\div$  2? (3 tenths); 20 hundredths  $\div$  4? (5 hundredths); 54 thousandths  $\div$  6? (9 thousandths).
- Play the Divide the Dice number game with your child. You can use two dice for tens or tenths, three dice for hundreds or hundredths, or four dice for thousands or thousandths. Your child can use two dice for tens or three dice for hundreds.
  1. You roll two dice. The numbers rolled can be written as tens or tenths. This value represents the whole.
  2. Your child rolls his two dice. The numbers rolled are written as a tens. This value represents the divisor.
  3. Using the whole and the divisor, write the division expression and say, “First, estimate the answer, and then divide using the standard algorithm.”

For example, you roll a 5 and a 6, which can represent 56 or 5.6 (your choice). Your child rolls a 1 and a 6, which represents 16. You write either  $56 \div 16$  or  $5.6 \div 16$ , and say, “First, estimate the answer, and then divide using the standard algorithm.”

Answers:

$$56 \div 16 \approx 60 \div 20 = 3; 56 \div 16 = 3.5$$

$$5.6 \div 16 \approx 6 \div 20 = 0.3; 5.6 \div 16 = 0.35$$

## KEY CONCEPT OVERVIEW

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In Lessons 28 and 29, students learn to solve multi-step word problems using long division.

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

- Divide multi-digit numbers using long division.
- Solve multi-step word problems that involve division.

## SAMPLE PROBLEM (From Lesson 29)

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Jeremiah has 2,440.8 kilograms of cashews to deliver in equal amounts to 18 stores. If 11 of the stores are in New York, how many kilograms of cashews will be delivered to stores in New York?

$$2,440.8 \div 18 = 135.6$$

$$135.6 \times 11 = 1,491.6$$

$$\begin{array}{r} \phantom{18} \overline{) 2,440.8} \\ \underline{18} \phantom{00} \\ 64 \phantom{0} \\ \underline{54} \phantom{0} \\ 100 \\ \underline{90} \\ 108 \\ \underline{108} \\ 0 \end{array}$$

$$\begin{array}{r} \phantom{11} \times 135.6 \\ \phantom{11} \times \phantom{0} 11 \\ \hline \phantom{11} 1356 \\ + 13560 \\ \hline 1,491.6 \end{array}$$

**1,491.6 kilograms of cashews will be delivered to stores in New York.**

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

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- Play the Multiply the Dice number game with your child to practice multi-digit multiplication. You can use two dice for two-digit numbers, three dice for three-digit numbers, or four dice for four-digit numbers.
  1. You can select up to four dice to roll to create a multi-digit number.
  2. Your child can select up to three dice to roll to create another multi-digit number.
  3. You write the multiplication expression using the two numbers and say, “First, estimate the answer, and then solve the problem.”

## HOW YOU CAN HELP AT HOME

(CONTINUED)

For example, you roll a 6, a 2, and a 5, which represents 625. She rolls a 1 and a 3, which represent 13. You write  $625 \times 13$  and say, “First, estimate the answer, and then solve the problem.”

Answers:  $625 \times 13 \approx 600 \times 10 = 6,000$ ;  $625 \times 13 = 8,125$

Challenge: Change the whole numbers of the first number rolled into a decimal number (e.g.,  $62.5 \times 13$ ,  $6.25 \times 13$ , or  $0.625 \times 13$ ).

Answers:

$62.5 \times 13 \approx 60 \times 10 = 600$ ;  $62.5 \times 13 = 812.5$

$6.25 \times 13 \approx 6 \times 10 = 60$ ;  $6.25 \times 13 = 81.25$

$0.625 \times 13 \approx 1 \times 10 = 10$ ;  $0.625 \times 13 = 8.125$

- Play the Divide the Dice number game with your child to practice multi-digit division. You can use two dice for two-digit numbers, three dice for three-digit numbers, or four dice for four-digit numbers.
  1. You can select up to four dice to roll to create a multi-digit number to represent the whole.
  2. Your child selects two dice to roll to create a two-digit number to represent the divisor.
  3. You write the division expression using the whole and the divisor and say, “First, estimate the answer, and then solve the problem.”

For example, you roll a 6, a 1, and a 1, which represents 611. She rolls a 2 and a 6, which represent 26. You write  $611 \div 26$  and say, “First, estimate the answer, and then solve the problem.”

Answers:  $611 \div 26 \approx 600 \div 30 = 20$ ;  $611 \div 26 = 23.5$

Challenge: Change the whole numbers of the first number rolled into a decimal number (e.g.,  $61.1 \div 26$  or  $6.11 \div 26$ ).

Answers:

$61.1 \div 26 \approx 60 \div 30 = 2$ ;  $61.1 \div 26 = 2.35$

$6.11 \div 26 \approx 6 \div 30 = 0.2$ ;  $6.11 \div 26 = 0.235$