

# Dividing Multi-Digit Numbers

Essential question: *How do you divide multi-digit numbers?*

## 1 EXPLORE Estimating Quotients

A local petting zoo had a total of 98,464 visitors last year. The zoo was open every day except Thanksgiving, Christmas, and New Year's Day. Estimate the average number of visitors per day.

A To find the average number of visitors per day, you need to divide. To estimate the quotient, first estimate the dividend by rounding the number of visitors to the nearest ten thousand.

B There were 365 days last year. How many days was the petting zoo open? \_\_\_\_\_

C Estimate the divisor by rounding the number of days that the zoo was open to the nearest hundred. \_\_\_\_\_ rounded to the nearest hundred is \_\_\_\_\_

D Estimate the quotient. \_\_\_\_\_ ÷ \_\_\_\_\_ = \_\_\_\_\_  
The average number of visitors per day last year was about \_\_\_\_\_

### REFLECT

1a. How can you check that your quotient is correct?

1b. Do you think that your estimate is greater than or less than the actual answer? Explain.

1c. **Error Analysis** A student said there were 250 visitors at the zoo each day last year. Explain why this is incorrect.

COMMON CORE  
CC.5.NS.2

1-1

The exact average number of visitors per day is the quotient of 98,464 and 362. This quotient can be found by using long division.

## 2 EXAMPLE Long Division

A local petting zoo had a total of 98,464 visitors last year. The zoo was open every day except Thanksgiving, Christmas, and New Year's Day. What was the average number of visitors per day?

Step 1 362 is greater than 9 and 98, so divide 984 by 362. Place the first digit in the quotient in the hundreds place. Multiply 2 by 362 and place the product under 984. Subtract.

$$\begin{array}{r} 2 \\ 362 \overline{)98,464} \\ \underline{-724} \phantom{0} \\ 260 \phantom{0} \end{array}$$

$$\begin{array}{r} 27 \\ 362 \overline{)98,464} \\ \underline{-724} \phantom{0} \\ 2606 \phantom{0} \\ \underline{-2534} \phantom{0} \\ 72 \phantom{0} \end{array}$$

$$\begin{array}{r} 27 \\ 362 \overline{)98,464} \\ \underline{-724} \phantom{0} \\ 2606 \phantom{0} \\ \underline{-2534} \phantom{0} \\ 72 \phantom{0} \end{array}$$

The average number of visitors per day last year was \_\_\_\_\_

### REFLECT

2a. How does your estimate in 1c compare to the actual average number of visitors per day? How does this compare to your prediction from 1b?

2b. How can you check that your quotient is correct?

2c. **What if...?** If the zoo had been open fewer days but the attendance for the year was the same, would the average number of visitors per day be greater than or less than the quotient you calculated?

**3 EXAMPLE** Long Division with a Remainder

Callie has 1,850 books. She must pack them into boxes to ship to a bookstore. Each box holds 12 books. How many boxes will she need to pack all of the books?

$$\begin{array}{r} 15 \text{ R} \\ 12 \overline{)1,850} \\ \underline{\phantom{0}00} \\ 6 \\ \underline{60} \\ 0 \end{array}$$

Notice that the numbers do not divide evenly. There is a remainder. What does the remainder mean in this situation?

How many boxes does Callie need to pack the books? \_\_\_\_\_ boxes  
Explain. \_\_\_\_\_

**TRY THIS!**

3a. Divide 5,796 by 28. \_\_\_\_\_

3b.  $67 \overline{)3,098}$

**PRACTICE**

Divide.

- $2,226 \div 53$  \_\_\_\_\_
- Divide 4,514 by 74. \_\_\_\_\_
- $83 \overline{)2,001}$  \_\_\_\_\_
- $3,493 \div 37$  \_\_\_\_\_
- Divide 18,156 by 267. \_\_\_\_\_
- $438 \overline{)35,506}$  \_\_\_\_\_
- $313 \overline{)39,760}$  \_\_\_\_\_

Unit 1

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Lesson 1

Divide.

- $1,643 \div 53$  \_\_\_\_\_
- $134 \overline{)3,685}$  \_\_\_\_\_
- Divide 819 by 117. \_\_\_\_\_
- $10,626 \div 21$  \_\_\_\_\_
- A theater has 1,120 seats in 35 equal rows. How many seats are in each row? \_\_\_\_\_ seats
- At a wedding reception, there will be 1,012 guests. A round table will seat 12 guests. How many tables will be needed? \_\_\_\_\_ tables
- Emilio has 8,450 trees to plant in rows on his tree farm. He will plant 115 trees per row. How many rows of trees will he have? \_\_\_\_\_ rows
- Camila has 1,296 beads to make bracelets. Each bracelet will contain 24 beads. How many bracelets can she make? \_\_\_\_\_ bracelets
- The table shows the number of miles that Awan drove over six months. Find the average number of miles per day for each month.

Month	Number of Days	Miles Traveled
January	31	1,922
February	28	2,940
March	31	3,565
April	30	3,630
May	31	2,418
June	30	3,510

22. Reasoning How is the quotient  $80,000 \div 2,000$  different from the quotient  $80,000 \div 200$  or  $80,000 \div 20$ ? \_\_\_\_\_

23. Reasoning Given that  $9,554 \div 562 = 17$ , how can you find the quotient  $95,540 \div 562$ ? \_\_\_\_\_

Unit 1

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Lesson 1