

## Divide Multi-Digit Numbers

Name: \_\_\_\_\_

**Prerequisite:** Dividing by a 2-Digit Divisor

**Study the example problem showing division with a 2-digit divisor. Then solve problems 1–6.**

**Example**

A farmer sells milk in crates that hold 18 bottles. She has 612 bottles of milk. How many crates can the farmer fill?

To solve, divide 612 by 18. Use the partial-quotients model.

$$\begin{array}{r}
 34 \leftarrow \text{quotient} \\
 4 \leftarrow \text{partial quotient} \\
 30 \leftarrow \text{partial quotient} \\
 18 \overline{)612} \\
 \underline{-540} \leftarrow 18 \times 30 \\
 72 \\
 \underline{-72} \leftarrow 18 \times 4 \\
 0
 \end{array}$$

The farmer can fill 34 crates.

- 1** In the example problem, why is the first partial quotient 30 and not 3?

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- 2** Why is the second partial quotient 4 and not 40?

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- 3** How do you use the partial quotients to find the quotient?

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**Vocabulary**

**partial quotient** a strategy used to divide multi-digit numbers. The quotients you get in each step are called "partial quotients."

**Solve.**

- 4 A school collected 1,204 cans of food during a food drive that lasted 28 days. How many cans were collected on average each day?

**Show your work.**

Solution: \_\_\_\_\_

- 5 Tracey is trying to figure out how many rows of chairs are needed to seat 888 students, with 24 chairs in each row. She writes the equation  $24 \times \square = 888$ .

a. What related division equation could Tracey use?

\_\_\_\_\_

b. How many rows of chairs are needed? \_\_\_\_\_

- 6 Ricardo used partial quotients to divide 1,862 by 38 and got 13.

a. How could Ricardo decide whether his answer is reasonable? Is his answer reasonable?

\_\_\_\_\_  
\_\_\_\_\_

b. Is Ricardo's quotient correct? If not, explain and correct his error. If so, show that he is correct.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Using the Division Algorithm

**Study the example problem showing how to use the division algorithm. Then solve problems 1–6.**

### Example

There are 896 people at the school's basketball game. The stands are divided into 16 equal sections. If each section has the same number of people, how many people are in each section?

First, estimate the quotient:  $900 \div 20 = 45$ .

You can use the division algorithm to divide 896 by 16.

$$\begin{array}{r}
 56 \\
 16 \overline{)896} \\
 \underline{-80} \phantom{0} \\
 96 \\
 \underline{-96} \\
 0
 \end{array}$$

There are 56 people in each section.

- 1** Why is the 5 in the quotient written above the 9 in the dividend? What does the 5 mean in the quotient?

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- 2** Divide 896 by 16 using partial quotients. Compare the methods. For example, how is the 80 in the standard algorithm expressed in the partial-quotients method?

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**Solve.**

**3** A train traveled 936 miles at a constant speed in 12 hours.

**a.** How can you find the number of miles the train traveled each hour?

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**b.** What is a reasonable estimate for the quotient?

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**c.** How many miles did the train travel each hour?

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**4** Zachary is reading a book that has 420 pages. The book is divided into 28 chapters. What is the average number of pages per chapter?

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**5** An art teacher has 816 toothpicks to distribute equally among 16 students. How many toothpicks does each student get?

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**6** A local theater charges \$26 for each adult ticket and \$17 for each student ticket. For one show, the theater took in \$988 from adults and \$731 from students. How many people attended the performance?

**Show your work.**

*Solution:* \_\_\_\_\_



**Solve.**

**4** A sporting goods company ships their baseballs in cartons that hold 48 balls. How many cartons will they need to ship 1,400 baseballs?

a. How can you find the number of cartons?

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b. What is the quotient? What does the remainder mean?

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c. How many cartons will the company need? \_\_\_\_\_

**5** Henry has a length of string that is 2,850 centimeters long. He needs some pieces that are 78 centimeters long for an art project. What is the greatest number of pieces that Henry can cut? \_\_\_\_\_

**6** One of the buses in a bus company's fleet recorded 46,736 miles traveled. This was after a total of 92 trips. What was the average distance traveled on each trip?

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**7** A citrus grower harvested 2,419 grapefruit and 4,395 oranges last season. He packaged the grapefruit in boxes of 18 and the oranges in boxes of 30. After packing as many boxes as possible, how many pieces of fruit did the grower have left over?

**Show your work.**

*Solution:* \_\_\_\_\_

## Divide Multi-Digit Numbers

Solve the problems.

- 1 A farmer is packing 2,205 pounds of potatoes into boxes. Each box can hold 49 pounds. How many boxes can the farmer fill?

- A 10
- B 20
- C 45
- D 46

How are the numbers in the problem related?



- 2 What is the quotient of 6,135 and 15?

- A 40 R9
- B 49
- C 409
- D 6,120

How can estimation help me answer this question?



Olivia chose **B** as the correct answer. How did she get that answer?

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- 3 A recipe for fruit punch calls for 2 cans of pineapple juice and 3 cans of orange juice. Hiri is making a large batch of juice for a community function and uses 72 cans of orange juice. How many cans of pineapple juice should he use?

**Show your work.**

What two numbers can you divide to help you solve this problem?



*Solution:* \_\_\_\_\_

**Solve.**

**4** Tell whether each quotient has a remainder. Select Yes or No.

- a.  $782 \div 17$        Yes     No  
b.  $1,296 \div 22$        Yes     No  
c.  $4,256 \div 38$        Yes     No

When will you have a remainder in dividing two numbers?



**5** Which of these have the quotient 128? Select all that apply.

- A**  $2,048 \div 16$                       **C**  $5,760 \div 45$   
**B**  $2,986 \div 24$                       **D**  $6,576 \div 67$

Could estimation help me to eliminate any of the answer choices?



**6** East High School had a total of 12,510 people in attendance during their 15-game soccer season. West High School had a total of 14,310 people for 18 games. On average, which school had a greater number of people watching per game? How much greater?

**Show your work.**

How can you find the average number of people who watched each game?



*Solution:* \_\_\_\_\_

**7** A lightbulb manufacturer produces 20,000 lightbulbs each week. They ship the lightbulbs to stores in cartons of 75. How many cartons are needed to ship 20,000 lightbulbs?

- A** 50 cartons                      **C** 266 cartons  
**B** 250 cartons                      **D** 267 cartons

Do you need to round up or down because of the remainder?

