

# Using Equivalent Fractions to Solve Problems

## Home Link 5-1

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① Fill in the equivalent fractions in the table below.



	Multiply Both the Numerator and Denominator by:				
Fraction	2	3	4	5	6
$\frac{1}{2}$	$\frac{2}{4}$		$\frac{4}{8}$		$\frac{6}{12}$
$\frac{2}{3}$		$\frac{6}{9}$		$\frac{10}{15}$	
$\frac{3}{4}$	$\frac{6}{8}$		$\frac{12}{16}$		$\frac{18}{24}$

Estimate. Then solve by finding fractions with a common denominator. Write a number sentence to show which fractions you used.

**Example:**  $\frac{1}{3} + \frac{7}{12} = ?$

Estimate: close to 1, because  $\frac{1}{3}$  is less than  $\frac{1}{2}$ , and  $\frac{7}{12}$  is a little more than  $\frac{1}{2}$

Common denominator: 12      Number sentence:  $\frac{4}{12} + \frac{7}{12} = ?$

Answer:  $\frac{11}{12}$

②  $\frac{6}{8} - \frac{1}{2} = ?$

\_\_\_\_\_ (estimate)

Common denominator: \_\_\_\_\_

Number sentence: \_\_\_\_\_

Answer: \_\_\_\_\_

③  $\frac{1}{6} + \frac{2}{3} = ?$

\_\_\_\_\_ (estimate)

Common denominator: \_\_\_\_\_

Number sentence: \_\_\_\_\_

Answer: \_\_\_\_\_

## Practice

Estimate. Then solve using U.S. traditional multiplication. Show your work on the back of this page.

④  $723 * 89 =$  \_\_\_\_\_

Estimate: \_\_\_\_\_

⑤  $1,207 * 54 =$  \_\_\_\_\_

Estimate: \_\_\_\_\_

# Using a Common Denominator

## Home Link 5-2

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- ① For each pair of fractions in the table, find a common denominator. Then rewrite the two fractions as equivalent fractions with a common denominator. Write  $>$  or  $<$  in the space provided to create a true number sentence.

Remember the three strategies you have learned:

- List equivalent fractions.
- Check to see if one denominator is a multiple of the other denominator.
- Multiply denominators to get a quick common denominator.

	Original Fractions	Common Denominator	Equivalent Fractions	$>$ or $<$
a.	$\frac{4}{7}$			$\frac{4}{7}$ _____ $\frac{3}{5}$
	$\frac{3}{5}$			
b.	$\frac{5}{9}$			$\frac{5}{9}$ _____ $\frac{2}{3}$
	$\frac{2}{3}$			
c.	$\frac{1}{4}$			$\frac{1}{4}$ _____ $\frac{2}{10}$
	$\frac{2}{10}$			
d.	$\frac{7}{9}$			$\frac{7}{9}$ _____ $\frac{5}{6}$
	$\frac{5}{6}$			
e.	$\frac{5}{12}$			$\frac{5}{12}$ _____ $\frac{3}{8}$
	$\frac{3}{8}$			

Use the table to help you rewrite the problems with common denominators. Then solve.

②  $\frac{3}{5} - \frac{4}{7} =$  \_\_\_\_\_  $-$  \_\_\_\_\_  $=$  \_\_\_\_\_

③  $\frac{1}{4} + \frac{2}{10} =$  \_\_\_\_\_  $+$  \_\_\_\_\_  $=$  \_\_\_\_\_

④  $\frac{5}{9} + \frac{2}{3} =$  \_\_\_\_\_  $+$  \_\_\_\_\_  $=$  \_\_\_\_\_

## Practice

Solve. Show your work on the back of the page.

⑤  $8,170 \div 75 \rightarrow$  \_\_\_\_\_

⑥  $298 \div 17 \rightarrow$  \_\_\_\_\_

# Adding Fractions and Mixed Numbers

## Home Link 5-3

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Estimate and then solve. Show your work. Use your estimates to check your answers.

*Remember:* Before adding fractions and mixed numbers with different denominators, you must rename one or both fractions so both fractions have a common denominator.



**Example:**  $2\frac{3}{5} + 4\frac{2}{3} = ?$

- Find a common denominator for the fraction parts. The quick common denominator for  $\frac{3}{5}$  and  $\frac{2}{3}$  is the product of the denominators,  $5 * 3$ , or 15.

- Use the multiplication rule for equivalent fractions to rename each fraction so both fractions have the common denominator.

$$\begin{array}{r} 2\frac{3}{5} \\ + 4\frac{2}{3} \\ \hline \end{array} \rightarrow \begin{array}{r} 2\frac{9}{15} \\ + 4\frac{10}{15} \\ \hline 6\frac{19}{15} \end{array}$$

- Add.

- Rename the sum.  $6\frac{19}{15} = 6 + \frac{15}{15} + \frac{4}{15} = 6 + 1 + \frac{4}{15} = 7 + \frac{4}{15} = 7\frac{4}{15}$

① Estimate: \_\_\_\_\_

$$3\frac{4}{6} + 2\frac{1}{6} = \underline{\hspace{2cm}}$$

② Estimate: \_\_\_\_\_

$$6\frac{1}{3} + 2\frac{1}{6} = \underline{\hspace{2cm}}$$

③ Estimate: \_\_\_\_\_

$$\frac{3}{4} + \frac{7}{12} = \underline{\hspace{2cm}}$$

④ Estimate: \_\_\_\_\_

$$15\frac{1}{2} + 12\frac{2}{5} = \underline{\hspace{2cm}}$$

## Practice

Write each decimal using numerals.

⑤ three and six hundred twenty-four thousandths \_\_\_\_\_

⑥ fourteen and twelve thousandths \_\_\_\_\_

Write each decimal using words.

⑦ 1.46 \_\_\_\_\_

⑧ 4.309 \_\_\_\_\_

# Marathon Training

Katie is training to run a marathon. She keeps track of how many miles she runs each day.

Use the information in the table to answer the questions.



Training Day	Number of Miles
1	$8\frac{1}{8}$
2	$4\frac{3}{8}$
3	$12\frac{3}{4}$
4	$5\frac{1}{3}$
5	$9\frac{1}{8}$

- ① How many more miles did Katie run on Day 1 than on Day 2?

Number model: \_\_\_\_\_

Estimate: \_\_\_\_\_

Show your work:

Answer: \_\_\_\_\_ miles

- ② How many miles did Katie run on Day 3 and Day 4 combined?

Number model: \_\_\_\_\_

Estimate: \_\_\_\_\_

Show your work:

Answer: \_\_\_\_\_ miles

- ③ Katie set a goal to run  $4\frac{1}{2}$  miles on Day 5. How much farther than her goal did she run?

Number model: \_\_\_\_\_

Estimate: \_\_\_\_\_

Show your work:

Answer: \_\_\_\_\_ miles

## Practice

0.501	1,737.405	128.174	25,892.46	8.25
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Choose from the list above. Write the number that has:

- ④ a 7 in the hundredths place. \_\_\_\_\_

- ⑤ a 5 in the thousandths place. \_\_\_\_\_

- ⑥ a 2 that is worth 0.2. \_\_\_\_\_

# Fraction-Of Problems

## Home Link 5-5



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Solve each fraction-of problem. Include a unit in your answer. Then write a multiplication number model for each problem.



- ① Suri made 6 gallons of lemonade to sell at her lemonade stand. In one day she sold  $\frac{2}{3}$  of the lemonade. How much lemonade did she sell?

Answer: \_\_\_\_\_

Number model: \_\_\_\_\_

- ② Antonio planned to read 15 books over the summer for the library's summer reading challenge. At the end of July he had read  $\frac{4}{5}$  of the books. How many books had he read?

Answer: \_\_\_\_\_

Number model: \_\_\_\_\_

- ③ Elliot is riding in a 100-mile bike race to raise money for a charity. So far he has completed  $\frac{7}{10}$  of the race. How far has Elliot biked?

Answer: \_\_\_\_\_

Number model: \_\_\_\_\_

- ④ Erica's garden has an area of 24 square feet. She will use  $\frac{3}{4}$  of the space for vegetables and  $\frac{1}{4}$  of the space for flowers. How much space will she use for vegetables?

Answer: \_\_\_\_\_

Number model: \_\_\_\_\_

## Practice

Write  $<$ ,  $>$ , or  $=$  to make true number sentences.

⑤  $0.3$  \_\_\_\_\_  $0.32$

⑥  $0.428$  \_\_\_\_\_  $0.43$

⑦  $1.68$  \_\_\_\_\_  $1.680$

⑧  $2.988$  \_\_\_\_\_  $1.989$

⑨  $0.06$  \_\_\_\_\_  $0.006$

⑩  $5.64$  \_\_\_\_\_  $5.46$



# Multiplying Whole Numbers and Fractions

## Home Link 5-6

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① a. What is  $\frac{1}{6}$  of 18? \_\_\_\_\_

b. What is  $\frac{4}{6}$  of 18? \_\_\_\_\_

c. Fill in the blank to make a true number sentence.

$$18 * \frac{4}{6} = \underline{\hspace{2cm}}$$

② a. What is  $15 * 3$ ? \_\_\_\_\_

b. What is  $45 \div 8$ ? \_\_\_\_\_

c. What is  $15 * 3 \div 8$ ? \_\_\_\_\_

d. Fill in the blank to make a true number sentence.

$$15 * \frac{3}{8} = \underline{\hspace{2cm}}$$

③ The art teacher has 7 bottles of glue that are each  $\frac{2}{5}$  full. He combines them so he will have fewer bottles. How many bottles of glue does he have after he combines them?

Number model: \_\_\_\_\_

Answer: \_\_\_\_\_ bottles

④ The librarian needs to return 24 books to the shelf. In one hour she finished  $\frac{3}{4}$  of the job. How many books has she returned to the shelf so far?

Number model: \_\_\_\_\_

Answer: \_\_\_\_\_ books

## Practice

For Problems 5–7, round each decimal to the nearest tenth.

⑤ 0.93 \_\_\_\_\_

⑥ 0.417 \_\_\_\_\_

⑦ 7.06 \_\_\_\_\_

For Problems 8–10, round each decimal to the nearest hundredth.

⑧ 1.482 \_\_\_\_\_

⑨ 5.715 \_\_\_\_\_

⑩ 2.996 \_\_\_\_\_

# Finding Fractions of Fractions



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Follow the directions to solve the problems. You will need two pieces of paper.

① What is  $\frac{1}{3}$  of  $\frac{2}{4}$ ?

- Fold the paper into fourths. Unfold it and shade two of the fourths.
- Fold the paper into thirds the other way, with the new folds crossing your folds from Part a. Unfold the paper and double-shade one-third of the shaded part.
- Record what your paper looks like.



- How much of the paper is double-shaded? \_\_\_\_\_
- Fill in the blank:  $\frac{1}{3}$  of  $\frac{2}{4}$  is \_\_\_\_\_.

② What is  $\frac{3}{4}$  of  $\frac{2}{3}$ ?

- Fold the paper into thirds. Unfold it and shade two of the thirds.
- Fold the paper into fourths the other way, with the new folds crossing your folds from Part a. Unfold the paper and double-shade three-fourths of the shaded part.
- Record what your paper looks like.



- How much of the paper is double-shaded? \_\_\_\_\_
- Fill in the blank:  $\frac{3}{4}$  of  $\frac{2}{3}$  is \_\_\_\_\_.

## Practice

Make an estimate. Then solve. Use your estimate to check whether your answer makes sense.

③ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 1.42 \\ + 3.37 \\ \hline \end{array}$$

④ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 6.76 \\ + 2.91 \\ \hline \end{array}$$

⑤ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 5.9 \\ + 4.14 \\ \hline \end{array}$$

# Using Area Models to Multiply Fractions



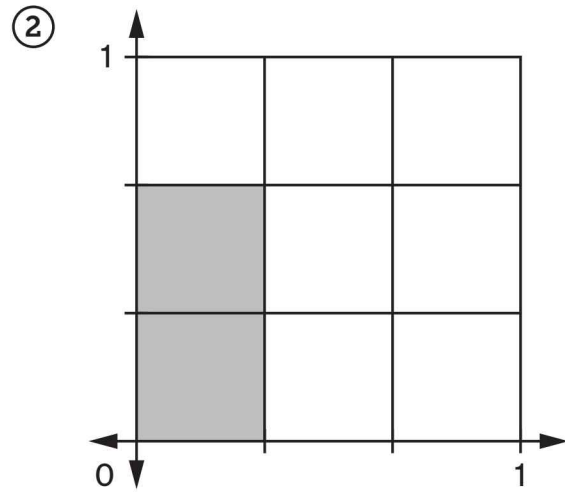
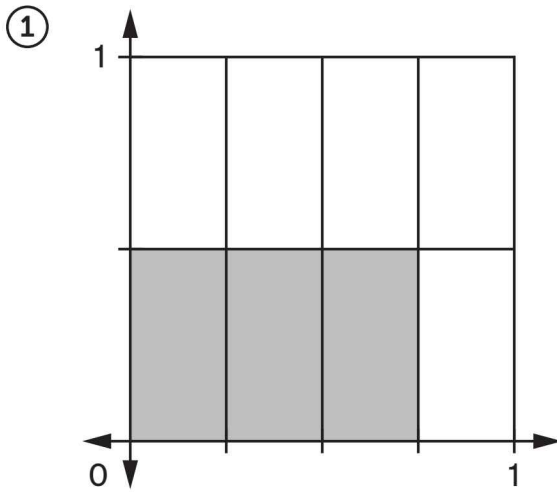
NAME \_\_\_\_\_

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- Label the blank tick marks on the number lines.
- Use the number lines to write the length and width of the shaded rectangle.
- Find the area of the shaded rectangle. (The area of the big square is 1 square unit.)  
Think: *Into how many equal parts is the big square divided? How many parts are shaded?*
- Write a multiplication number sentence for the area of the shaded rectangle.



Length of shaded rectangle: \_\_\_\_ unit

Length of shaded rectangle: \_\_\_\_ unit

Width of shaded rectangle: \_\_\_\_ unit

Width of shaded rectangle: \_\_\_\_ unit

Area of shaded rectangle: \_\_\_\_ square unit

Area of shaded rectangle: \_\_\_\_ square unit

Number sentence: \_\_\_\_ × \_\_\_\_ = \_\_\_\_

Number sentence: \_\_\_\_ × \_\_\_\_ = \_\_\_\_

## Practice

Make an estimate. Then solve. Use your estimate to check whether your answer makes sense.

③ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 6.75 \\ - 2.44 \\ \hline \end{array}$$

④ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 5.32 \\ - 2.37 \\ \hline \end{array}$$

⑤ \_\_\_\_\_  
(estimate)

$$\begin{array}{r} 8.6 \\ - 6.27 \\ \hline \end{array}$$



# Using an Algorithm to Multiply Fractions

## A Fraction Multiplication Algorithm

To multiply two fractions, multiply the numerators and multiply the denominators.

For example:  $\frac{2}{3} * \frac{3}{8} = \frac{(2 * 3)}{(3 * 8)} = \frac{6}{24}$



For Problems 1–6, use the algorithm to multiply the fractions.

①  $\frac{1}{3} * \frac{1}{2} =$  \_\_\_\_\_

②  $\frac{2}{4} * \frac{2}{3} =$  \_\_\_\_\_

③  $\frac{4}{5} * \frac{2}{5} =$  \_\_\_\_\_

④  $\frac{2}{10} * \frac{2}{3} =$  \_\_\_\_\_

⑤  $\frac{2}{8} * \frac{5}{6} =$  \_\_\_\_\_

⑥  $\frac{5}{12} * \frac{2}{7} =$  \_\_\_\_\_

⑦ If you multiply  $\frac{2}{3} * \frac{6}{10}$ , will the product be more than  $\frac{2}{3}$  or less than  $\frac{2}{3}$ ?  
How do you know?

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⑧ If you multiply  $\frac{2}{3} * \frac{6}{10}$ , will the product be more than  $\frac{6}{10}$  or less than  $\frac{6}{10}$ ?  
How do you know?

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In Problems 9–12, write true or false. Do not multiply.

⑨  $\frac{3}{4} * \frac{7}{10}$  is less than  $\frac{3}{4}$ . \_\_\_\_\_

⑩  $\frac{7}{9} * \frac{11}{12}$  is greater than  $\frac{11}{12}$ . \_\_\_\_\_

⑪  $\frac{4}{5} * \frac{2}{8}$  is greater than  $\frac{2}{8}$  but less than  $\frac{4}{5}$ . \_\_\_\_\_

⑫  $\frac{6}{7} * \frac{1}{4}$  is less than  $\frac{6}{7}$  and less than  $\frac{1}{4}$ . \_\_\_\_\_

## Practice

⑬  $\frac{2}{3} + \frac{1}{6} =$  \_\_\_\_\_

⑭  $\frac{3}{4} + \frac{3}{8} =$  \_\_\_\_\_

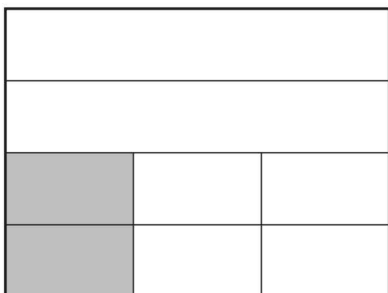
⑮  $\frac{2}{5} + \frac{1}{4} =$  \_\_\_\_\_

# Mystery Models

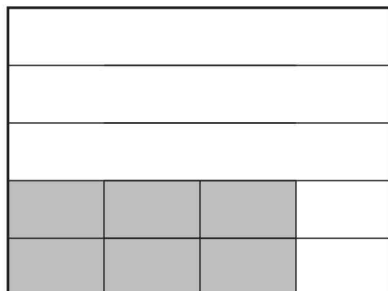
Write a multiplication number sentence that represents the amount of shaded space in the pictures below. Add to the picture or create a new drawing to represent your number sentence.



①



②



## Practice

Solve.

$$\textcircled{3} \quad 1\frac{1}{2} + 2\frac{2}{8} = \underline{\hspace{2cm}}$$

$$\textcircled{4} \quad 6 - 3\frac{1}{3} = \underline{\hspace{2cm}}$$

$$\textcircled{5} \quad 1\frac{4}{9} + 5\frac{2}{3} = \underline{\hspace{2cm}}$$

$$\textcircled{6} \quad 8\frac{1}{3} - 3\frac{3}{4} = \underline{\hspace{2cm}}$$

# Finding Equivalent Fractions

## Home Link 5-11

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① a. List three fractions that are equivalent to 1. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b. Use the fractions you wrote in Part a to find three fractions equivalent to  $\frac{6}{7}$ .

**Example:**  $\frac{6}{7} * \frac{10}{10} = \frac{60}{70}$  \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

② You are solving fraction addition problems. Use the information to find equivalent fractions.

a. Original fraction:  $\frac{4}{5}$  Denominator needed: 20

Multiply by: \_\_\_\_\_ Equivalent fraction: \_\_\_\_\_

b. Original fraction:  $\frac{1}{3}$  Denominator needed: 18

Multiply by: \_\_\_\_\_ Equivalent fraction: \_\_\_\_\_

③ Addison wanted to find a fraction equivalent to  $\frac{3}{8}$  with 16 in the denominator. He thought: “ $8 * 2 = 16$ , so I need to multiply  $\frac{3}{8}$  by 2.” He got an answer of  $\frac{3}{16}$ .

a. Is  $\frac{3}{16}$  equivalent to  $\frac{3}{8}$ ? How do you know?

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b. What mistake did Addison make?

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## Practice

Solve.

④ What is  $\frac{2}{3}$  of 9? \_\_\_\_\_

⑤ What is  $\frac{3}{5}$  of 20? \_\_\_\_\_

⑥ Explain how you found your answer for Problem 5.

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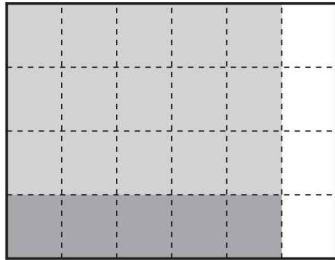
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# Writing Fraction Multiplication Stories

Solve each multiplication problem. Then write a number story that matches the number sentence and representation.



**Example:**  $\frac{1}{4} * \frac{5}{6} = \frac{5}{24}$



Number Story: Mr. Danielson had a tray of pumpkin bread that was  $\frac{5}{6}$  full. After sharing his bread with students,  $\frac{1}{4}$  of what he had brought was left. What fraction of the whole tray was left?

Number story: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

①  $4 * \frac{2}{3} =$  \_\_\_\_\_

Number story: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

②  $\frac{1}{2} * 16 =$  \_\_\_\_\_

## Practice

Make an estimate. Then add or subtract. Show your work on the back of this page.

③  $4.79 + 2.03 = ?$

Estimate: \_\_\_\_\_

$4.79 + 2.03 =$  \_\_\_\_\_

④  $8.25 - 3.91 = ?$

Estimate: \_\_\_\_\_

$8.25 - 3.91 =$  \_\_\_\_\_

# Solving Fraction Division Problems



Write a number model using a letter for the unknown. Solve, showing your solution strategy with representations or drawings. Summarize your work with a division number model. Check your answer using multiplication and write a number sentence to show how you checked.

- ① Ben has  $\frac{1}{2}$  of a loaf of bread. If he and his 3 friends share the  $\frac{1}{2}$  loaf equally, how much of the whole loaf will each person get?

Number model: \_\_\_\_\_

Each person will get \_\_\_\_\_ loaf of bread.

\_\_\_\_\_ (summary number model)      \_\_\_\_\_ (check using multiplication)

- ② Amanda has a piece of ribbon that is  $\frac{1}{4}$  yard long. She wants to share the ribbon with 2 friends so that they can each wear a ribbon for Breast Cancer Awareness Month. If each of the 3 friends gets the same amount, how much ribbon will each person get?

Number model: \_\_\_\_\_

Each person will get \_\_\_\_\_ yard of ribbon.

\_\_\_\_\_ (summary number model)      \_\_\_\_\_ (check using multiplication)

## Practice

Make an estimate. Then use U.S. traditional multiplication to solve. Show your work on the back of this page.

- ③ Estimate: \_\_\_\_\_

$$\begin{array}{r} 567 \\ \times \quad 39 \\ \hline \end{array}$$

- ④ Estimate: \_\_\_\_\_

$$\begin{array}{r} 3,408 \\ \times \quad 21 \\ \hline \end{array}$$



# More Fraction Division Problems

## Home Link 5-14

NAME \_\_\_\_\_

DATE \_\_\_\_\_

TIME \_\_\_\_\_

For Problems 1 and 2, write a number model using a letter for the unknown. Solve, showing your solution strategy. Summarize your work with a division number model. Check your answer using multiplication, and write a number sentence to show how you checked.



- ① Charity is packing a 2-pound container of trail mix into bags for a camping trip. Each bag holds  $\frac{1}{8}$  pound of trail mix. If Charity uses all 2 pounds of trail mix, how many  $\frac{1}{8}$ -pound bags will she have?

Number model: \_\_\_\_\_

Charity will have \_\_\_\_\_  $\frac{1}{8}$ -pound bags.

\_\_\_\_\_ (summary number model)

\_\_\_\_\_ (check using multiplication)

- ② Davis has a thin box that is 5 inches wide. He wants to use the box to store markers that are  $\frac{1}{2}$ -inch wide. If he lines up the markers side by side and uses the entire width of the box, how many markers can Davis fit in the box?

Number model: \_\_\_\_\_

Davis will be able to fit \_\_\_\_\_ markers in the box.

\_\_\_\_\_ (summary number model)

\_\_\_\_\_ (check using multiplication)

## Practice

Make an estimate. Then solve. Show your work on the back of this page

③  $623 \div 8 \rightarrow$  \_\_\_\_\_

Estimate: \_\_\_\_\_

④  $4,495 \div 50 \rightarrow$  \_\_\_\_\_

Estimate: \_\_\_\_\_