





## Dividing Fractions 2: Fitting the Divisor



*How many times does one thing fit into another? You can always write a **division** from this situation. Think: “How many times does the *divisor* go into the *dividend*?”*


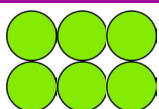
How many times does  go into  ?  
 Eight times. We can write a division:  $2 \div \frac{1}{4} = 8$ .  
 Then check the division:  $8 \times \frac{1}{4} = \frac{8}{4} = 2$ .


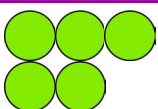
How many times does  $\frac{1}{2}$  go into 3?  
 Six times. We can write a division:  $3 \div \frac{1}{2} = 6$ .  
 Then check the division:  $6 \times \frac{1}{2} = \frac{6}{2} = 3$ .

1. Solve. Write a division. Then write a multiplication that checks your division.


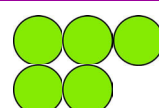
**a.** How many times does  go into  ?  
 $2 \div \frac{1}{3} = \underline{\hspace{2cm}}$   
 Check:  $\underline{\hspace{2cm}} \times \frac{1}{3} =$


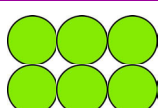
**b.** How many times does  go into  ?  
 $1 \div \frac{1}{4} = \underline{\hspace{2cm}}$   
 Check:  $\underline{\hspace{2cm}} \times \frac{1}{4} =$

**c.** How many times does  go into  ?  
 $6 \div \frac{1}{3} = \underline{\hspace{2cm}}$   
 Check: \_\_\_\_\_

**d.** How many times does  go into  ?  
 $5 \div \frac{1}{4} = \underline{\hspace{2cm}}$   
 Check: \_\_\_\_\_

Now you write the division. Be careful: the divisor is the number that “goes into” the dividend.

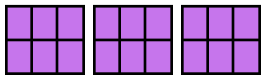
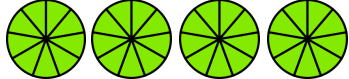
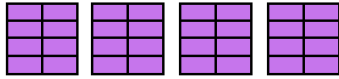
**e.** How many times does  go into  ?  
 $\underline{\hspace{2cm}} \div \frac{\text{yellow square}}{\text{yellow square}} =$   
 Check: \_\_\_\_\_

**f.** How many times does  go into  ?  
 $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$   
 Check: \_\_\_\_\_

**g.** How many times does  $\frac{1}{6}$  go into 2?  
 $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$

**h.** How many times does  $\frac{1}{5}$  go into 3?  
 $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} =$

2. Divide. Think, “How many times does the *divisor* go into the *dividend*?” Use the pictures to help.

 <p>a. <math>3 \div \frac{1}{6} =</math></p>	 <p>b. <math>4 \div \frac{1}{9} =</math></p>	 <p>c. <math>4 \div \frac{1}{8} =</math></p>	
<p>d. <math>3 \div \frac{1}{2} =</math></p>	<p>e. <math>3 \div \frac{1}{7} =</math></p>	<p>f. <math>4 \div \frac{1}{5} =</math></p>	<p>g. <math>2 \div \frac{1}{3} =</math></p>

Did you notice a pattern? There is a **shortcut** to dividing a whole number by a unit fraction!

$5 \div \frac{1}{4}$ $\downarrow \downarrow$ $5 \times 4 = 20$	$3 \div \frac{1}{8}$ $\downarrow \downarrow$ $3 \times 8 = 24$	$9 \div \frac{1}{7}$ $\downarrow \downarrow$ $9 \times 7 = 63$
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Why does it work that way? For example, consider the problem  $5 \div (1/4)$ . Since  $1/4$  goes into 1 exactly 4 times, it must go into 5 exactly  $5 \times 4 = 20$  times.

3. Solve. Use the shortcut.

<p>a. <math>3 \div \frac{1}{6} =</math></p>	<p>b. <math>4 \div \frac{1}{5} =</math></p>	<p>c. <math>3 \div \frac{1}{10} =</math></p>	<p>d. <math>5 \div \frac{1}{10} =</math></p>
<p>e. <math>7 \div \frac{1}{4} =</math></p>	<p>f. <math>4 \div \frac{1}{8} =</math></p>	<p>g. <math>4 \div \frac{1}{10} =</math></p>	<p>h. <math>9 \div \frac{1}{8} =</math></p>

4. Write a *division* for each word problem, and solve. Do *not* write just the answer.

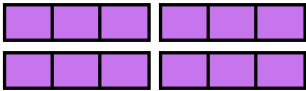
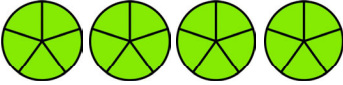

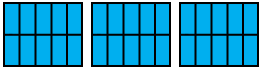
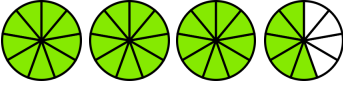

<p>a. How many <math>1/2</math>-meter pieces can you cut from a roll of string that is 6 meters long?</p>
<p>b. How many <math>1/4</math>-cup servings can you get from 2 cups of almonds?</p>
<p>c. Ben has small weights that weigh <math>1/10</math> kg each. How many of those would he need to make 5 kg?</p>
<p>d. An eraser is <math>1/8</math> inches thick. How many erasers can be stacked into a 4-inch tall box?</p>

5. Write a story problem to match each division, and solve.


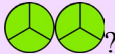



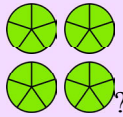

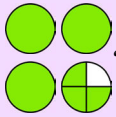
a.  $2 \div \frac{1}{2} =$

b.  $5 \div \frac{1}{3} =$

6. These divisions are not as easy as the previous ones, but they are not difficult either. Again, think how many times the divisor goes into the dividend. The pictures can help.

 <p>a. <math>4 \div \frac{2}{3} =</math></p>	 <p>b. <math>4 \div \frac{4}{5} =</math></p>	 <p>c. <math>2 \frac{5}{6} \div \frac{1}{6} =</math></p>
 <p>d. <math>3 \div \frac{6}{10} =</math></p>	 <p>e. <math>3 \frac{5}{9} \div \frac{4}{9} =</math></p>	 <p>f. <math>2 \frac{4}{8} \div \frac{5}{8} =</math></p>

7. Write a division and solve. Write also a multiplication to check your division.

<p>a. How many times does  go into ?</p> <p><math>\underline{\quad} \div \underline{\quad} = \underline{\quad}</math>      <math>\underline{\quad} \times \underline{\quad} = \underline{\quad}</math></p>	<p>b. How many times does  go into ?</p> <p><math>\underline{\quad} \div \underline{\quad} = \underline{\quad}</math>      <math>\underline{\quad} \times \underline{\quad} = \underline{\quad}</math></p>
<p>c. How many times does  go into ?</p> <p><math>\underline{\quad} \div \underline{\quad} = \underline{\quad}</math>      <math>\underline{\quad} \times \underline{\quad} = \underline{\quad}</math></p>	<p>d. How many times does  go into ?</p> <p><math>\underline{\quad} \div \underline{\quad} = \underline{\quad}</math>      <math>\underline{\quad} \times \underline{\quad} = \underline{\quad}</math></p>

8. A recipe calls for  $\frac{1}{2}$  cup of butter, among other ingredients. Alison had plenty of all of the other ingredients except the butter. How many batches of the recipe can she make if she has ...

a. 3 cups of butter?

b.  $2\frac{1}{2}$  cups of butter?

9. Jackie made three apple pies and divided them into twelfths. She plans on serving two slices to each guest. How many servings will she get out of the three pies?

*Hint: Draw a picture.*

10. How many  $\frac{2}{10}$ -liter servings do you get from 1 liter of juice?

Out of 4 liters of juice?

11. When Natalie goes jogging, she jogs for  $\frac{1}{4}$  mile, then walks for  $\frac{1}{4}$  mile, then again jogs for  $\frac{1}{4}$  mile, and so on. How many such stretches are there for her in a jogging track that is  $2\frac{1}{2}$  miles long?

12. Jill makes bead necklaces that must be exactly 24 inches long. She has size SS beads, which are  $\frac{1}{8}$ -inch thick, and size S beads, which are  $\frac{1}{4}$ -inch thick.

a. How many beads would be in a necklace made solely of SS beads?

b. How many beads would be in a necklace made solely of S beads?

c. She also makes a necklace with the pattern SS-S-SS-S. How many of each kind of bead does she need?

Bead	Width
SS	$\frac{1}{8}$ in
S	$\frac{1}{4}$ in