

Multiply Fractions in Word Problems

Name: _____

Prerequisite: Multiply Fractions with Models

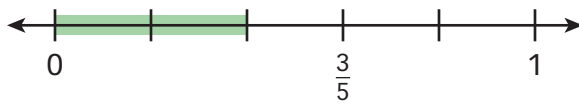
Study the example problem showing three ways to model multiplying fractions. Then solve problems 1–6.

Example

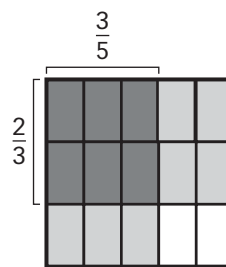
What is $\frac{2}{3} \times \frac{3}{5}$?

You can find $\frac{2}{3} \times \frac{3}{5}$ using different models.

A number line



An area model



An equation

$$\frac{2}{3} \times \frac{3}{5} = \frac{2 \times 3}{3 \times 5} = \frac{6}{15}$$

- 1** Look at the example showing models of $\frac{2}{3} \times \frac{3}{5}$. How are the models alike? How are the models different?

- 2** Write the product for $\frac{2}{3} \times \frac{3}{5}$ shown by each model in the example.

number line _____ area model _____ equation _____



Solve.

- 3 Write the missing numbers that show that $\frac{2}{5}$ and $\frac{6}{15}$ are equivalent fractions.

$$\frac{2 \times \square}{5 \times \square} = \frac{6}{15}$$

- 4 Explain how the numbers you wrote in problem 3 show that $\frac{2}{5}$ and $\frac{6}{15}$ are equivalent.

- 5 What is $\frac{2}{3} \times \frac{3}{8}$?

Show your work.

Solution: _____

- 6 Check your answer to problem 5 by modeling

$\frac{2}{3} \times \frac{3}{8}$ a different way.

Show your work.

Solution: _____

Solve Word Problems with Fractions

Study the example problem showing one way to solve a word problem with fractions. Then solve problems 1–5.

Example

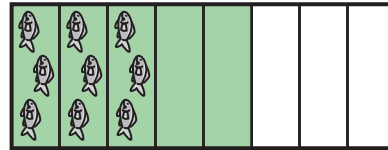
Vicky's favorite beach towel is green and white and has a fish design. The green part covers $\frac{5}{8}$ of the towel. A fish design is drawn on $\frac{3}{5}$ of that. What part of the towel has a fish design on it?

You can draw a picture.

Show a towel with $\frac{5}{8}$ shaded green.



Draw fish on $\frac{3}{5}$ of the green part.



3 of the 8 parts of the towel have fish drawn on them, so $\frac{3}{8}$ of the towel has a fish design on it.

- 1** You can also write an equation to solve the example problem. Write the numbers to complete the equation showing what part of the towel has the fish design.

$\frac{3}{5}$ of $\frac{5}{8}$ means $\frac{3}{5} \times \frac{5}{8}$.

$$\frac{3}{5} \times \frac{\square}{\square} = \frac{\square}{\square} \times \frac{5}{8} = \frac{\square}{\square}$$

- 2** Is your answer to problem 1 the same as the answer, $\frac{3}{8}$, shown in the example problem? Explain.



Solve.

- 3 Suppose the green part of Vicky's towel covers $\frac{4}{5}$ of the towel and the fish design is drawn on $\frac{3}{4}$ of that. Draw a picture to find the part of the towel that has the fish design on it. Then write the answer.

Solution: _____

- 4 Write an equation to show the answer to problem 3.

Solution: _____

- 5 At noon Ada and Kent had $\frac{3}{8}$ gallon of lemonade left at their lemonade stand. The next customer bought $\frac{1}{3}$ of the remaining lemonade. How much lemonade did the customer buy?

Show your work.

Solution: _____

Multiply Mixed Numbers in Word Problems

Study the example problem showing one way to solve a word problem with a mixed number. Then solve problems 1–4.

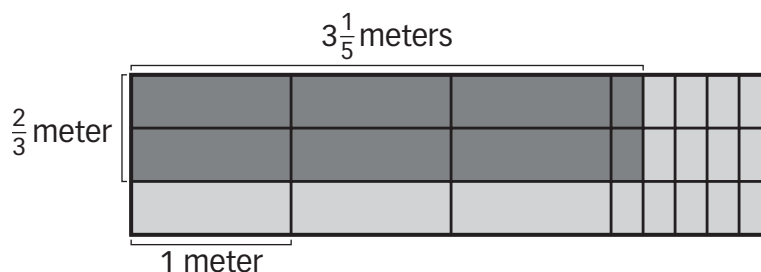
Example

Mr. Urrego is painting his deck to get it ready for the summer. He's painted an area that is $3\frac{1}{5}$ -meters long and $\frac{2}{3}$ -meter wide. How many square meters of deck are painted?

You can use an area model.

The larger sections of the area model are $\frac{1}{3} \times 1 = \frac{1}{3}$ square meter.

The smaller sections of the area model are $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$ square meter.



The model shows the number of square meters painted is:

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{15} = \frac{6}{3} + \frac{2}{15} = 2 + \frac{2}{15} = 2\frac{2}{15}$$

- 1** Write the missing numbers to complete the multiplication equation showing how much of the deck is painted.

Multiply the length and width of the painted area:

$$3\frac{1}{5} \times \frac{\square}{\square} = \square \times \frac{2}{3} + \frac{\square}{\square} \times \frac{2}{3} = \frac{\square}{3} + \frac{2}{\square} = \square \frac{2}{15}$$

_____ square meters

- 2** Look at the worked-out solutions in the example and problem 1. Which method do you prefer to solve the problem? Explain why.

Solve.

- 3 To multiply a mixed number you can also write it first as a fraction and then multiply. Write the missing numbers to show this way of multiplying to find how much of the deck is painted.

Here's the equation you've already used to solve the problem.

$$3\frac{1}{5} \times \frac{\square}{\square} = \square \times \frac{2}{3} + \frac{\square}{\square} \times \frac{2}{3} = \frac{\square}{3} + \frac{2}{\square} = \square \frac{2}{15}$$

_____ square meters

Now here is a new way to multiply.

Write $3\frac{1}{5}$ as a fraction.

$$\begin{aligned} 3\frac{1}{5} &= \square + \frac{\square}{\square} \\ &= \frac{\square}{5} + \frac{\square}{5} \\ &= \frac{\square}{5} \end{aligned}$$

Multiply using $\frac{16}{5}$ as a factor.

$$\begin{aligned} \frac{16}{5} \times \frac{2}{3} &= \frac{\square \times \square}{\square \times 3} \\ &= \frac{\square}{15} \\ &= 2\frac{\square}{15} \end{aligned}$$

_____ square meters

- 4 The multipurpose room at the Cortez School is being set up for the annual book sale. Graphic novels will be displayed in an area $1\frac{1}{4}$ -yards long and $\frac{3}{4}$ -yard wide. Will the graphic novels be displayed in an area greater than or less than 1 square yard?

Show your work.

Solution: _____

Multiply Fractions in Word Problems

Solve the problems.

- 1 Tell whether each equation showing a mixed number written as a fraction is *True* or *False*

a. $1\frac{3}{4} = \frac{7}{4}$ True False

b. $4\frac{2}{5} = \frac{22}{5}$ True False

c. $3\frac{2}{3} = \frac{11}{2}$ True False

d. $2\frac{7}{10} = \frac{27}{10}$ True False

How do you know what the denominator is when you write a mixed number as a fraction?



- 2 Camilla's class played soccer for $\frac{2}{3}$ hour. She played for $\frac{3}{5}$ of the game. How much time did Camilla play?

A $\frac{5}{15}$ hour

C $\frac{5}{8}$ hour

B $\frac{6}{15}$ hour

D $\frac{6}{8}$ hour

Will chose **A** as the correct answer. How did he get that answer?

What equation can I write to solve this problem?



- 3 How many minutes are in $\frac{2}{3}$ hour? How many minutes are in $\frac{3}{5}$ of that time?

How many minutes are in an hour?



Solution: _____



Solve.

- 4 Caleb has $2\frac{1}{5}$ yards of rope. He uses $\frac{3}{4}$ of the rope to make a dog leash. Which expression can be used to represent $\frac{3}{4}$ of $2\frac{1}{5}$? Circle the letter for all that apply.

A $\frac{3}{4} \times 2 \times \frac{1}{5}$

C $\frac{3}{4} \times 2 + \frac{3}{4} \times \frac{1}{5}$

B $\frac{3}{4} \times \frac{11}{5}$

D $\frac{3}{4} \times \frac{3}{4} + \frac{1}{5}$

What are other ways to write the mixed number $2\frac{1}{5}$?



- 5 Dante and 2 classmates are making a poster to advertise a Bike-to-School Day event. It is $1\frac{1}{2}$ -yards long and $\frac{3}{4}$ -yard wide. How large a writing area does that give them?

Show your work.

What model can I use to help understand this problem?



Solution: _____

- 6 Manny hiked $6\frac{2}{5}$ miles along a mountain trail. He stopped to climb a lookout tower $\frac{1}{4}$ of the way along his hike. How many miles did Manny hike before he stopped to climb the lookout tower?

Show your work.

Did Manny hike more or less than 1 mile before stopping to climb the tower?



Solution: _____