Shelby County Schools

Extended Learning Day

Packet

5th Grade

Multiply Fractions Using an Area Model

Name: _____

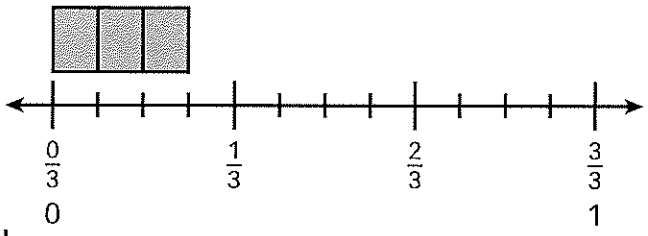
Prerequisite: Model Fraction Multiplication

Study the example problem showing a model of multiplying a fraction by a fraction. Then solve problems 1–7.

Example

What is $\frac{3}{4} \times \frac{1}{3}$?

The number line is divided into thirds. Each third is divided into fourths. Each of these parts is $\frac{1}{12}$ of the whole.



$\frac{3}{4}$ of 1 third is shaded. The whole is divided into twelfths, with 3 twelfths shaded. So, $\frac{3}{4} \times \frac{1}{3} = \frac{3}{12}$.

1 Why is the shaded rectangle above the number line in the example divided into 3 parts?

_____

_____

_____

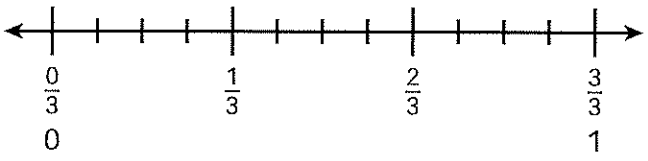
2 How would the model in the example change if the problem was $\frac{3}{4} \times \frac{2}{3}$?

_____

_____

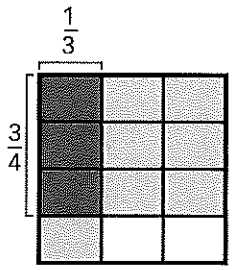
3 What is $\frac{3}{4} \times \frac{2}{3}$? Use the number line to the right to model your answer.

$\frac{3}{4} \times \frac{2}{3} =$ _____



Solve.

4 Look at the model and answer the following questions.



Each column is what fraction of the whole? _____

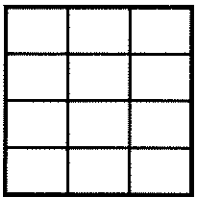
Each row is what fraction of the whole? _____

How many parts are in the whole? _____

The dark gray parts show $\frac{3}{4}$ of $\frac{1}{3}$. What fraction of the whole is $\frac{3}{4} \times \frac{1}{3}$? _____

What is the product of $\frac{3}{4} \times \frac{1}{3}$? _____

5 Shade and label the model to show $\frac{3}{4} \times \frac{2}{3}$. Complete the equation.



$\frac{3}{4} \times \frac{2}{3} = \frac{\square}{\square}$

6 $\frac{6}{12}$ is equal to $\frac{1}{2}$. How does the model you shaded in problem 6 show that?

_____

_____

_____

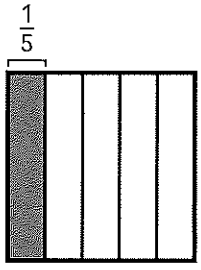
_____

_____

7 Write a fraction from the box to complete the expression. Then complete the model to show the problem.

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$

$\frac{\square}{\square} \times \frac{1}{5}$



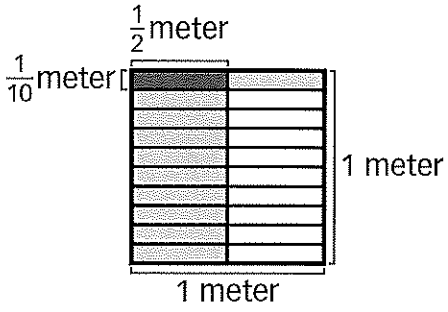
Name: _____

Multiply Unit Fractions to Find Areas

Study the example problem showing multiplying unit fractions to find area. Then solve problems 1–5.

Example

Cardboard that measures 1 meter on each side is cut into cards that are $\frac{1}{10}$-meter wide and $\frac{1}{2}$-meter long. What is the area of each card?



You can model the problem with a picture:

You can model the problem with an equation.

area $= \frac{1}{2} \times \frac{1}{10} = \frac{1 \times 1}{2 \times 10} = \frac{1}{20}$ square meter

1 Suppose the length of each card in the example problem is shortened to $\frac{1}{4}$ meter. Will the area of each card now be greater or less than $\frac{1}{20}$ square meter? Explain.

_____

_____

_____

_____

_____

2 Which expression represents the area of a card described in problem 1?

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

B $\frac{1}{2} \times \frac{1}{10}$

C $\frac{1}{4} \times \frac{1}{10}$

D $\frac{1}{4} \times \frac{1}{20}$

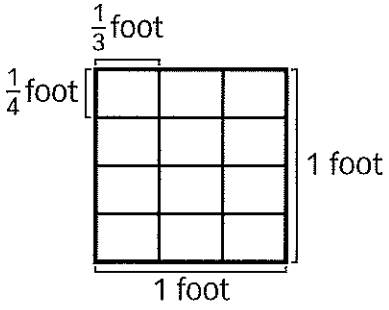
Solve.

3 What is the area of a card that is $\frac{1}{10}$-meter wide and $\frac{1}{4}$-meter long?

Show your work.

Solution: _____

4 Mr. Von's 5th-grade class is going on a field trip. Each student is given a name card to wear that is $\frac{1}{4}$-foot wide and $\frac{1}{3}$-foot long.

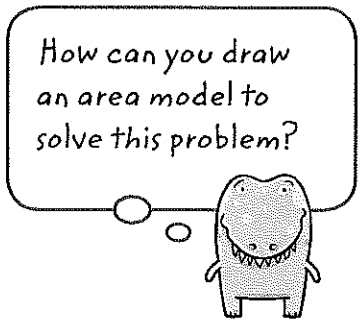


Shade the model to find the area of each name card. Complete the equation.

$\frac{1}{4}$-foot $\times$ $\frac{1}{3}$-foot $=$ $\frac{\square}{\square}$ square foot

5 Signs for science project displays are cut from pieces of poster board that measure 1 yard on each side. Each sign is $\frac{1}{3}$-yard long and $\frac{1}{9}$-yard wide. How many signs can be cut from 1 piece of poster board? What is the area of each sign?

Show your work.



Solution: _____

Name: _____

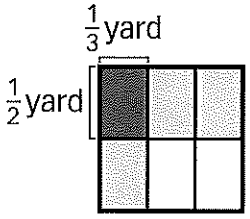
Multiply Fractions Greater than One

Study the example problem showing multiplying fractions greater than 1. Then solve problems 1–6.

Example

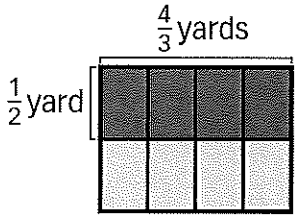
What is the area of a rectangle that is $\frac{1}{2}$-yard wide and $\frac{4}{3}$-yards long?

This area model shows $\frac{1}{2}$ yard $\times$ $\frac{1}{3}$ yard $=$ $\frac{1}{6}$ square yard.



$\frac{1}{2} \times \frac{1}{3}$

This model uses the same $\frac{1}{6}$-square yard parts to show an area that is $\frac{1}{2}$ yard $\times$ $\frac{4}{3}$ yards.



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

Four $\frac{1}{6}$-square yard parts are shaded dark gray.

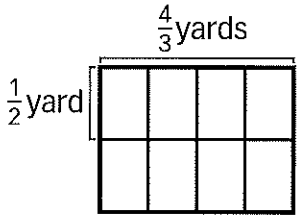
$\frac{1}{2}$ yard $\times$ $\frac{4}{3}$ yards $=$ $\frac{4}{6}$ square yard

1 How many $\frac{1}{2}$-yard lengths are in 1 yard? _____

2 How many $\frac{1}{3}$-yard lengths are in 1 yard? _____

3 Draw a line around the part of the model from the example problem that represents 1 square yard.

Does $\frac{4}{6}$ square yard cover more or less area than 1 square yard? Explain.



_____

_____

_____

Solve.

4 Danah has a strawberry patch in her garden. Its border is $\frac{4}{5}$-meters wide and $\frac{3}{2}$-meters long. What is the area of Danah's strawberry patch?

Show your work.

Solution: _____

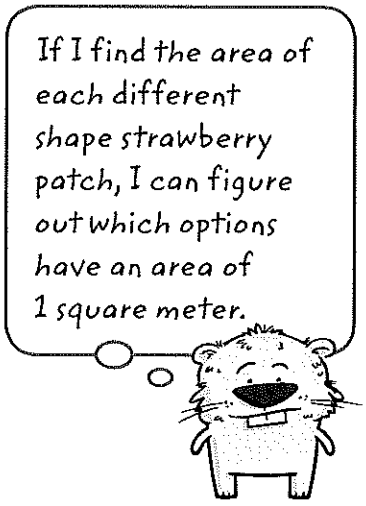
5 Danah is planting a second strawberry patch and wants it to have an area of exactly 1 square meter. Which of the following could be the width and length of its borders? Circle the letter for all that apply.

A $\frac{1}{2}$-meter wide and $\frac{3}{2}$-meters long

B $\frac{2}{3}$-meter wide and $\frac{3}{2}$-meters long

C $\frac{4}{5}$-meter wide and $\frac{5}{4}$-meters long

D $\frac{2}{3}$-meter wide and $\frac{6}{4}$-meters long



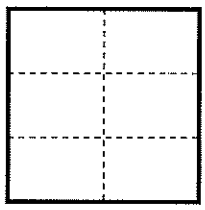
6 Look at problem 5. If Danah wants her strawberry patch to be exactly 1 square meter, can the length of her strawberry patch be greater than 1 meter? Explain.

Name: _____

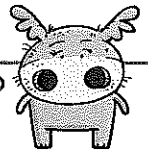
Multiply Fractions to Find Area

Solve the problems.

1 Owen has a square sheet of paper that measures 1 foot on each side. He folds the paper vertically and horizontally so that it makes equal sections. The model shows the unfolded paper. Which expression represents the area of 1 section?



If each side of the paper is 1-foot long, how wide is each section? How long?



A $\frac{1}{3} \times \frac{1}{3}$ square feet

B $\frac{2}{1} \times \frac{1}{3}$ square foot

C $\frac{1}{2} \times \frac{1}{3}$ square foot

D $\frac{3}{1} \times \frac{1}{2}$ square foot

2 What is the area of a rectangle with a length of $\frac{7}{5}$ meter and a width of $\frac{5}{10}$ meter?

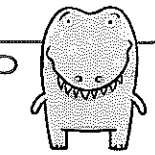
A $\frac{35}{50}$ square meter

B $\frac{50}{35}$ square meter

C $\frac{12}{15}$ square meter

D $\frac{12}{10}$ square meters

If I draw a model that is 1 square meter divided into fifths and tenths, what is the area of each small part?



Patsy chose **C** as the correct answer. How did she get that answer?

_____

_____

_____

_____

_____

Solve.

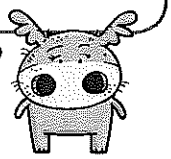
3 Each expression below shows the length and width of a rectangle in yards. Write each expression in the correct box according to the area it represents.

$\frac{2}{3} \times \frac{3}{5}$ $\quad \frac{2}{3} \times \frac{5}{3}$ $\quad \frac{1}{2} \times \frac{9}{10}$

$\frac{1}{4} \times \frac{4}{1}$ $\quad \frac{1}{4} \times \frac{5}{3}$ $\quad \frac{4}{3} \times \frac{6}{8}$

Area less than 1 square yard	Area equal to 1 square yard	Area greater than 1 square yard

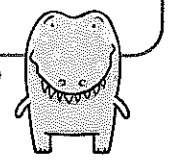
How do the numerator and denominator compare in a fraction less than 1? A fraction equal to 1? A fraction greater than 1?



4 Pick one of the expressions from problem 3. Draw an area model to represent the expression.

$\frac{\square}{\square}$ yard $\times$ $\frac{\square}{\square}$ yard

If I choose $\frac{1}{4} \times \frac{5}{3}$, how many rows should I draw in my area model? How many columns?



5 Write an equation to show the area of the rectangle in problem 4.

I already figured out whether the area is less than, greater than, or equal to 1 square yard in problem 3.

Multi-Digit Subtraction—Skills Practice

Name: _____

Subtract within 1,000,000. **Form A**

1 11,223 − 311	**2** 2,123 − 1,321	**3** 432,765 − 43,276	**4** 80,449 − 24,085
5 184,234 − 93,517	**6** 319,019 − 9,416	**7** 62,626 − 6,262	**8** 37,740 − 18,870
9 7,347 − 5,182	**10** 956,201 − 524,110	**11** 476,747 − 9,696	**12** 535 − 353
13 90,000 − 1,234	**14** 37,665 − 776	**15** 215,451 − 8,795	**16** 52,252 − 50,992
17 602,602 − 444,444	**18** 5,702 − 2,915	**19** 877,007 − 525	**20** 13,579 − 2,846

Multi-Digit Subtraction—Skills Practice

Name: _____

Subtract within 1,000,000. **Form B**

1	2	3	4
13,445 − 522	8,789 − 7,987	654,631 − 65,432	70,338 − 13,074
5	6	7	8
162,478 − 81,759	518,018 − 8,515	71,717 − 7,171	51,120 − 25,560
9	10	11	12
6,536 − 5,372	833,021 − 312,110	596,454 − 9,393	626 − 262
13	14	15	16
70,000 − 2,345	28,776 − 887	437,673 − 9,895	32,131 − 30,881
17	18	19	20
501,501 − 333,333	6,803 − 4,806	966,006 − 414	14,568 − 3,725

3rd grade/Math Educational Websites and Web Resources

Title of Resource	Web Address	Description	Student Access
Khan Academy	https://www.khanacademy.org	Students will be able to get additional practice with skills in various subjects and test prep.	Students will need to sign up for a free account if they do not already have an account.
Zearn.org	**https://Zearn.org**	Students will be able to get additional practice with skills in various subjects and test prep.	Students will need to sign up for a free account if they do not already have an account.
LearnZillion	**https://Learnzillion.org**	Students will be able to get additional practice with skills in various subjects and test prep.	Students will need to sign up for a free account if they do not already have an account.
AAAmath.org	**AAAmath.org**	Students will be able to get additional practice with skills in various subjects and test prep.	A student account is not needed to access this website.
Ixl.com	**Ixl.com**	Students will be able to get additional practice with skills in various subjects and test prep.	A student account is not needed to access this website.
Adaptedmind.com	**Adaptedmind.com**	Students will be able to get additional practice with skills in various subjects and test prep.	A student account is not needed to access this website.
Hoodamath.com	**Hoodamath.com**	Students will be able to get additional practice with skills in various subjects and test prep.	A student account is not needed to access this website.