

Fractions as Division



Dear Family,

This week your child is learning how fractions and division are related.

He or she might see a problem like the one below.

Three family members equally share 4 granola bars. How much does each family member receive?

This word problem can be represented as a division problem. The family equally shares 4 granola bars among 3 people, so the division problem to solve is $4 \div 3$.

A model is a useful way to show the problem.

The model below shows 4 wholes. Each whole is divided into 3 parts.



Each family member receives $\frac{1}{3}$ of each of 4 whole bars. So, the answer to the division problem $4 \div 3$ is $\frac{4}{3}$. You can say that the fraction $\frac{4}{3}$ represents the division problem $4 \div 3$.

This shows how fractions and division are related. You can think of fractions as the division of two numbers.

Another way to write the fraction $\frac{4}{3}$ is to show it as a mixed number. So, each family member receives $\frac{4}{3}$, or $1\frac{1}{3}$, granola bars.

Invite your child to share what he or she knows about how fractions and division are related by doing the following activity together.



ACTIVITY FRACTIONS AS DIVISION

Do this activity with your child to explore fractions as division.

Work with your child to find opportunities to practice modeling a division situation as a fraction.

- Together with your child, think of things that can be shared equally among family members, such as boxes of crackers or bags of grapes.
- Choose one idea. Work together with your child to show how to equally divide a number of the items among the people in your family.

Example: 4 family members equally share 7 bags of trail mix.

- Have your child write the idea as a division problem.

Example: $7 \div 4 = \frac{7}{4}$

- Have your child explain how much of the item each family member will get.

Example: Each person will get $\frac{7}{4}$, or $1\frac{3}{4}$, bags of trail mix.



Understand Multiplication by a Fraction



Dear Family,

This week your child is exploring multiplying fractions.

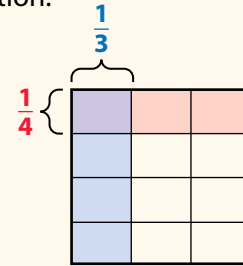
An area model can help you visualize finding a fraction of a fraction.

The model shows $\frac{1}{4}$ and $\frac{1}{3}$ of the same whole.

Each row shows $\frac{1}{4}$ of the whole.

Each column shows $\frac{1}{3}$ of the whole.

The part shaded purple shows $\frac{1}{4}$ of $\frac{1}{3}$ of the whole, or $\frac{1}{12}$.



Your child is learning that finding a fraction of a fraction is the same as finding the product of the fractions. Your child might see a problem like the one below.

If $\frac{2}{3}$ of the gym floor has been cleaned and students can play on $\frac{3}{4}$ of the cleaned floor, what part of the whole gym floor can the students play on?

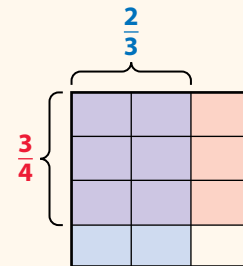
To solve the problem, you find $\frac{3}{4}$ of $\frac{2}{3}$, or $\frac{3}{4} \times \frac{2}{3}$.

The model shows $\frac{3}{4}$ and $\frac{2}{3}$ of the same whole.

3 rows show $\frac{3}{4}$ of the whole.

2 columns show $\frac{2}{3}$ of the whole.

The part shaded purple shows $\frac{3}{4}$ of $\frac{2}{3}$ of the whole.

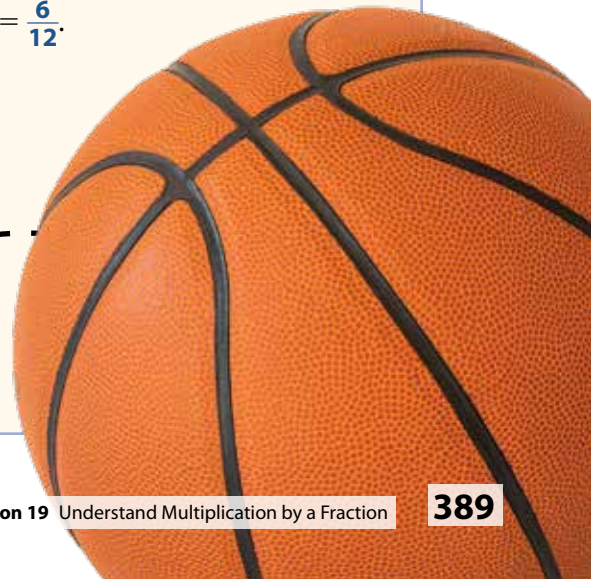


The model is divided into 12 equal parts, 6 of which are shaded purple.

You can see that $\frac{6}{12}$ of the whole is shaded purple. So, $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$.

Students can play on $\frac{6}{12}$, or $\frac{1}{2}$, of the gym floor.

Invite your child to share what he or she knows about multiplying fractions by doing the following activity together.



ACTIVITY MULTIPLY BY A FRACTION

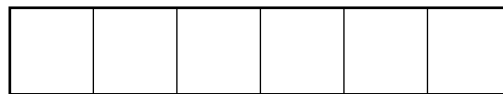
Do this activity with your child to understand multiplication by a fraction.

Materials 2 different colors of crayons or colored pencils, number cube

- Together with your child, draw a blank rectangle at the bottom of the page to show the product of two fractions.
- One person rolls the number cube. This number tells how many equal parts to show in the rectangle. Draw vertical lines to show the equal parts.

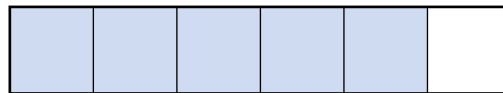


Example: Roll a 6 and draw vertical lines to show 6 equal parts in the rectangle.



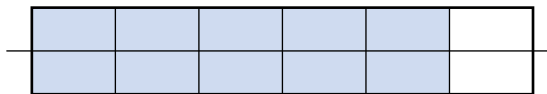
- The same person shades a fraction of the rectangle and names that fraction.

Example: Shade $\frac{5}{6}$.



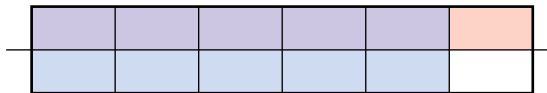
- The other person rolls the number cube. This number tells how many equal parts to show in the same rectangle. Draw horizontal lines to show the equal parts.

Example: Roll a 2 and draw a horizontal line to show 2 equal parts (top and bottom) of the rectangle.



- The same person shades a fraction of the rectangle and names that fraction.

Example: Shade $\frac{1}{2}$.



- The part where the shading overlaps shows the product. Together, write the fraction multiplication equation that the picture shows.

Example: $\frac{1}{2} \times \frac{5}{6} = \frac{5}{12}$

Multiply Fractions in Word Problems



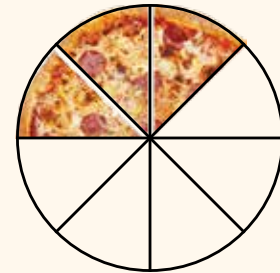
Dear Family,

This week your child is learning about multiplying fractions in word problems.

He or she might see a problem like this:

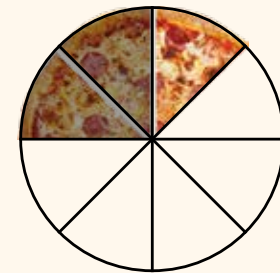
*Michael found $\frac{3}{8}$ of a pizza in the refrigerator. He ate $\frac{2}{3}$ of it.
How much of the original whole pizza did Michael eat?*

- One way to understand this problem is to draw a picture. Your child could draw $\frac{3}{8}$ of a pizza.



To show the part of the pizza that Michael ate, your child could shade 2 of the 3 pieces to show $\frac{2}{3}$.

The shaded parts show how much of the original whole pizza Michael ate. Michael ate $\frac{2}{8}$, or $\frac{1}{4}$, of the original whole pizza.



- Another way your child could solve the problem is to write a multiplication equation.

$\frac{2}{3}$ of $\frac{3}{8}$ means $\frac{2}{3} \times \frac{3}{8}$.

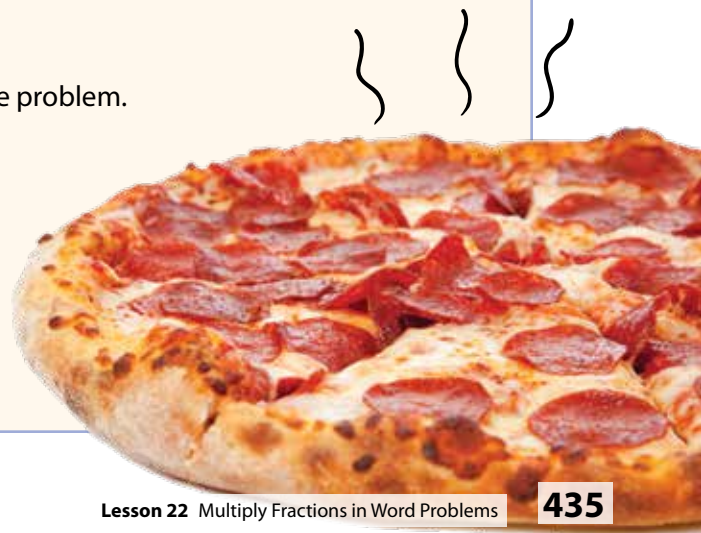
$$\frac{2}{3} \times \frac{3}{8} = \frac{2 \times 3}{3 \times 8} = \frac{6}{24}$$

So, $\frac{6}{24}$ is equivalent to $\frac{2}{8}$, or $\frac{1}{4}$.

The answer is the same using either way to solve the problem.

Michael ate $\frac{1}{4}$ of the original whole pizza.

Invite your child to share what he or she knows about multiplying fractions and word problems by doing the following activity together.



ACTIVITY MULTIPLYING FRACTIONS IN WORD PROBLEMS

Do this activity with your child to multiply fractions in word problems.

Together with your child, make up and solve real-world problems about multiplying fractions or use the problems below.

Below are examples of problems you could solve.

1. Pete found $\frac{5}{6}$ of a party sandwich left in the refrigerator. He took $\frac{1}{2}$ of the $\frac{5}{6}$ of the sandwich to his neighbor. How much of the original sandwich did Pete take to his neighbor?



2. Shawn had $\frac{3}{5}$ of a gallon of paint left in the can. He used $\frac{2}{3}$ of it to paint a cabinet. How much of the gallon of paint did he use?



3. Renee made some money babysitting. She saved $\frac{3}{4}$ of the money. She spent $\frac{2}{5}$ of the money she saved to buy a shirt. What fraction of the money did Renee spend on the shirt?



Answers:

1. $\frac{5}{12}$; 2. $\frac{6}{15}$ or $\frac{2}{5}$; 3. $\frac{6}{20}$ or $\frac{3}{10}$

Understand Division with Unit Fractions



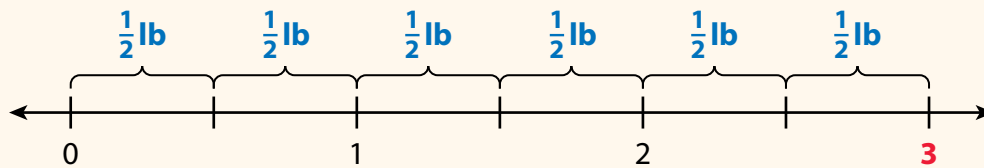
Dear Family,

This week your child is exploring division with unit fractions.

A **unit fraction** is a fraction that has 1 as the numerator. $\frac{1}{6}$ and $\frac{1}{4}$ are examples of unit fractions. To learn about division with unit fractions, your child might see a problem like the one below.

A butcher wants to divide 3 pounds of meat into packages that will each contain $\frac{1}{2}$ pound of meat. How many packages can she make?

This problem can be solved by finding $3 \div \frac{1}{2}$. It can be helpful to use a number line model to understand the problem.



The model shows that $3 \div \frac{1}{2} = 6$. The butcher can make 6 packages that each contain $\frac{1}{2}$ pound of meat.

Another way to say this is that the butcher can make 2 packages of meat per pound. An equation that shows this is $3 \times 2 = 6$.

So, $3 \div \frac{1}{2} = 6$, and $3 \times 2 = 6$. Your child is learning that division and multiplication with fractions are related, just like division and multiplication with whole numbers are related.

Invite your child to share what he or she knows about division with unit fractions by doing the following activity together.

ACTIVITY DIVIDING WITH UNIT FRACTIONS

Do this activity with your child to understand division with unit fractions.

Work together with your child to solve real-life problems involving division with unit fractions.

- Together with your child, use the picture to solve the problem below.
 1. Suppose we want to give each person in our family half of a sandwich. The sandwiches are shown below. How many people can we feed with these 4 sandwiches? Do we have enough for our family, too many, or too few?



- Look for similar situations in everyday life that involve dividing with a unit fraction. Below are some examples of problems you could solve.
 2. If you divide 2 hours of piano practice into sessions of $\frac{1}{2}$ hour each, how many sessions do you have to practice?
 3. One lap around the track is $\frac{1}{4}$ mile. How many laps do you need to do to run 3 miles?

Answers:

1. $4 \div \frac{1}{2} = 8$; You can feed 8 people with the four sandwiches; 2. $2 \div \frac{1}{2} = 4$ sessions; 3. $3 \div \frac{1}{4} = 12$ laps

Divide Unit Fractions in Word Problems



Dear Family,

This week your child is learning about dividing with unit fractions in word problems.

He or she might see a word problem like the one below.

Molly used $\frac{1}{4}$ square yard of fabric to decorate 4 flags. She used an equal amount of fabric for each flag. How much fabric did she use for each flag?

This problem can be solved by finding $\frac{1}{4} \div 4$.

One way to understand this problem is to use a model.

The square shown at the right represents 1 whole square yard of fabric. The shaded rectangle represents the $\frac{1}{4}$ square yard that Molly used to decorate the 4 flags.

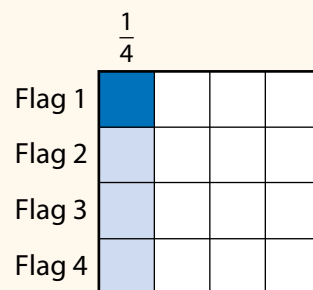
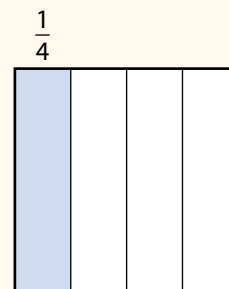
You can divide the shaded rectangle into 4 equal parts to represent the 4 flags Molly decorated.

The part shaded dark blue shows the amount used for one flag. 1 out of 16 parts of the whole square yard is used for 1 flag. Molly used $\frac{1}{16}$ square yard of fabric for each flag.

Your child can also write a division equation to solve the problem.

$$\frac{1}{4} \div 4 = \frac{1}{16}$$

Invite your child to share what he or she knows about dividing with unit fractions in word problems by doing the following activity together.



ACTIVITY DIVIDING BY UNIT FRACTIONS

Do this activity with your child to divide by unit fractions in word problems.

Materials yardstick, tape measure, or ruler

- Together with your child, solve the problem below about dividing by a unit fraction.

How many square tiles are needed to make a border along a wall? Each tile measures $\frac{1}{3}$ foot on each side, and the wall is 6 feet long.



- Now suppose you are going to use the tiles to make a border along a wall in your own house. First, measure to find the length of the wall in feet. Then round your measurement to the nearest foot. Last, divide that number by $\frac{1}{3}$ to find the number of tiles you would need.



Answer: $6 \div \frac{1}{3} = 18$ tiles