5th Grade

Math Packet

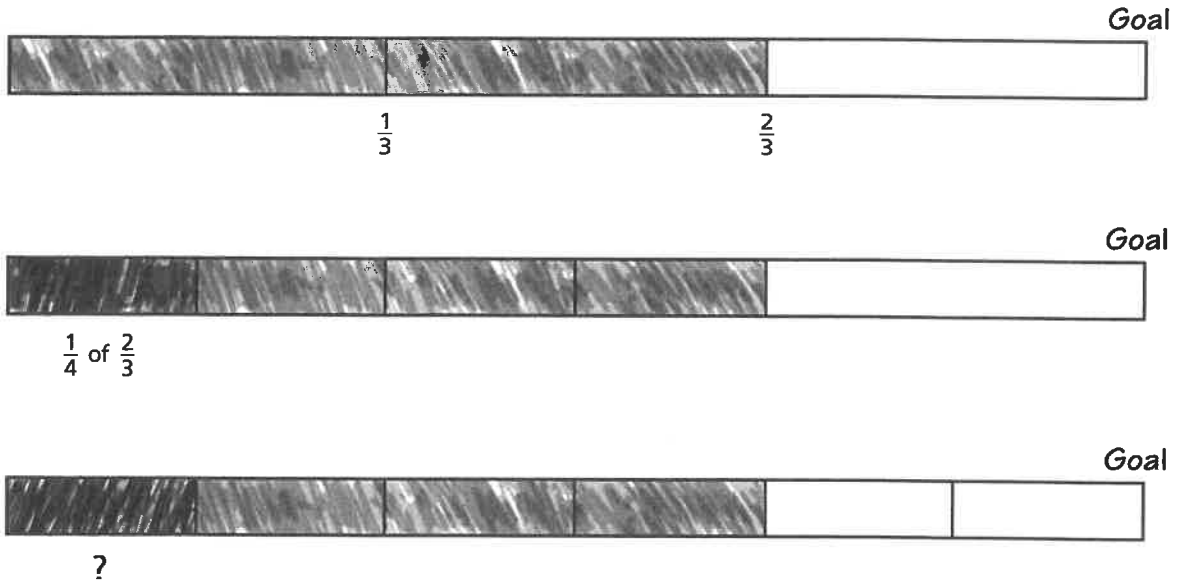
For April 17-May 1

Please be sure to call, email, or text any 5th grade math teacher if you have any questions about the work. Also, please join us for Zoom math lessons each Monday and Wednesday at 1:00 for more learning.

3.2 Finding a Part of a Part

In *Bits and Pieces I*, you used thermometers to show what fraction of a fundraising goal had been met. These thermometers are like number lines. You mark thermometers in the same way you mark number lines to show parts of parts and to name the resulting piece. The fundraising thermometers can help you make sense of the number lines you will use in this problem.

One sixth-grade class raises $\frac{2}{3}$ of their goal in four days. They wonder what fraction of the goal they raise each day on average. To figure this out, they find $\frac{1}{4}$ of $\frac{2}{3}$. One student makes the drawings shown below:



Getting Ready for Problem 3.2

The student above divides the fraction of the goal $\left(\frac{2}{3}\right)$ that is met in four days into fourths to find the length equal to $\frac{1}{4}$ of $\frac{2}{3}$. To figure out the new length, the student divides the whole thermometer into pieces of the same size.

What part of the whole thermometer is $\frac{1}{4}$ of $\frac{2}{3}$?

How would you represent $\frac{1}{4} \times \frac{2}{3}$ on a number line?

How would you represent $\frac{3}{4} \times \frac{2}{3}$ on a number line?

Frank has plans to make small cheese pizzas to sell at a school fundraiser. He has nine blocks of cheese. How many pizzas can he make if each pizza needs the given amount of cheese?

a) 1/3 bar

b) $\frac{1}{4}$ bar

c) 1/7 bar

d) 3/3 bar

e) 4/3 bar

Solve the following problems. Write a number sentence for each. Use illustrations, models, and words to explain your thinking for each problem.

1. Seth runs $\frac{1}{4}$ of a $\frac{1}{2}$-mile relay race. What fraction of the race does he run?

2. Jennifer owns 4/5 of an acre of land. She uses 1/3 of it for her dog kennel. What fraction of an acre is used for the kennel?

4.1 Preparing Food

There are times when the amounts given in a division situation are not whole numbers but fractions. First, you need to understand what division of fractions means. Then you can learn how to calculate quotients when the divisor or the dividend, or both, is a fraction.

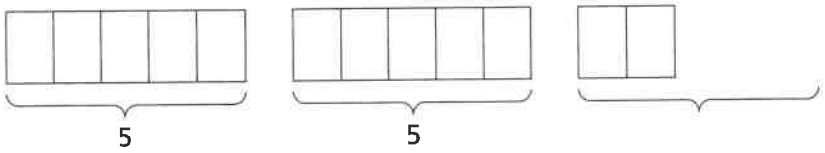
When you do the division $12 \div 5$, what does the answer mean?

The answer should tell you how many fives are in 12 wholes. Because there is not a whole number of fives in 12, you might write:

$$12 \div 5 = 2\frac{2}{5}$$

Now the question is, what does the *fractional part* of the answer mean?

The answer means you can make 2 fives and $\frac{2}{5}$ *of another five.*



Suppose you ask, "How many $\frac{3}{4}$'s are in 14?" You can write this as a division problem, $14 \div \frac{3}{4}$.

Can you make a whole number of $\frac{3}{4}$'s out of 14 wholes?

If not, what does the fractional part of the answer mean?

As you work through the problems in this investigation, keep these two questions in mind.

What does the answer to a division problem mean?

What does the fractional part of the answer to a division problem mean?

1. Explain why $8 \div 1/3 = 24$ and $8 \div 2/3 = 12$.

2. Why is the answer to $8 \div 2/3$ exactly half the answer to $8 \div 1/3$? Show or explain why that is.

Name _____

Use the information given below to answer Part A and Part B.

For a family gathering, Jill made 5 meat loaves using 11 pounds of ground beef. She also made 14 hamburgers using 4 pounds of ground beef.

Part A

Each meat loaf was made with the same amount of ground beef.

Use number line and an illustration/model to find the amount of ground beef she used in each meat loaf. Write your answer as a complete sentence.

Part B

Each hamburger was made with the same amount of ground beef.

Use a number line and an illustration/model to find the amount of ground beef she used in each hamburger. Write your answer as a complete sentence.

How Much of the Pan Have We Sold?

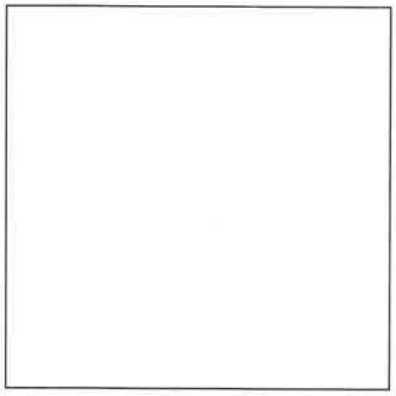
A Model for Multiplication

All the pans of brownies are square. A pan of brownies costs \$12. You can buy any fractional part of a pan of brownies and pay that fraction of \$12. For example, $\frac{1}{2}$ of a pan costs $\frac{1}{2}$ of \$12.

A. Mr. Williams asks to buy $\frac{1}{2}$ of a pan that is $\frac{2}{3}$ full.

1. Use a copy of the brownie pan model shown at the right. Draw a picture to show how the brownie pan might look before Mr. Williams buys his brownies.
2. Use a different colored pencil to show the part of the brownies that Mr. Williams buys. Note that Mr. Williams buys *a part of a part* of the brownie pan.
3. What fraction of a whole pan does Mr. Williams buy? What does he pay?

Model of a Brownie Pan



B. Aunt Serena buys $\frac{3}{4}$ of another pan that is half full.

1. Draw a picture to show how the brownie pan might look before Aunt Serena buys her brownies.
2. Use a different colored pencil to show the part of the brownies that Aunt Serena buys.
3. What fraction of a whole pan does Aunt Serena buy? How much did she pay?

C. When mathematicians write $\frac{1}{2}$ of $\frac{1}{4}$, they mean the operation of multiplication, or $\frac{1}{2} \times \frac{1}{4}$. When you multiply a fraction by a fraction, you are finding "a part of a part." Think of each example below as a brownie-pan problem in which you are buying part of a pan that is partly full—a part of a part.

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

D. Use estimation to decide if each product is greater than or less than 1. To help, use the "of" interpretation for multiplication. For example, in part (1), think "$\frac{5}{6}$ of $\frac{1}{2}$."

1. $\frac{5}{6} \times \frac{1}{2}$
2. $\frac{5}{6} \times 1$
3. $\frac{5}{6} \times 2$
4. $\frac{3}{7} \times 2$
5. $\frac{3}{4} \times \frac{3}{4}$
6. $\frac{1}{2} \times \frac{9}{3}$
7. $\frac{1}{2} \times \frac{10}{7}$
8. $\frac{9}{10} \times \frac{10}{7}$