



MATH NEWS

Grade 5 | Module 4 | Topic G | Division of Fractions and Decimal Fractions

Welcome

This document is created to give parents and students a better understanding of the math concepts found in the Eureka Math (© 2013 Common Core, Inc.) that is also posted in the Engage New York material taught in the classroom. Grade 5 Module 4 of Eureka Math (Engage New York) covers Multiplication and Division of Fractions and Decimal Fractions. This newsletter will address exploring the meaning of division with fractions and decimal fractions.

Objectives

- Divide a whole number by a unit fraction.
- Divide a unit fraction by a whole number.
- Solve problems involving fraction division.
- Write equations and word problems corresponding to tape and number diagrams.
- Connect division by a unit fraction to division by 1 tenth and 1 hundredth.
- Divide decimal dividends by non-unit decimal divisors.

Important Information

Words to Know

- divide/division
- quotient
- divisor
- dividend
- unit fraction
- decimal fraction
- decimal divisor
- tenths
- hundredths

Things to Remember

Quotient: The **answer** of dividing one quantity by another

Unit Fraction: A fraction with a numerator of 1

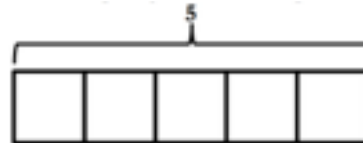
Decimal Fraction: A fraction whose denominator is a power of 10 (Examples: 0.7 0.23 4.58)

Decimal Divisor: The number that divides the dividend (whole) and has nats of tenths, hundredths, thousandths, etc.

Divide a Whole Number by a Unit Fraction

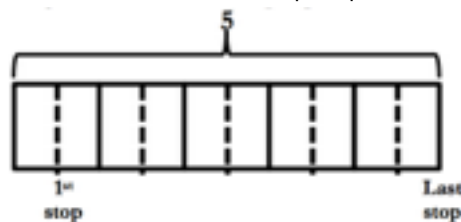
Garret is running a 5-K race. There are water stops every 1/2 kilometer, including at the finish line. How many water stops will there be? Number Sentence: $5 \div \frac{1}{2}$

Step 1: Draw a tape diagram to model the problem.



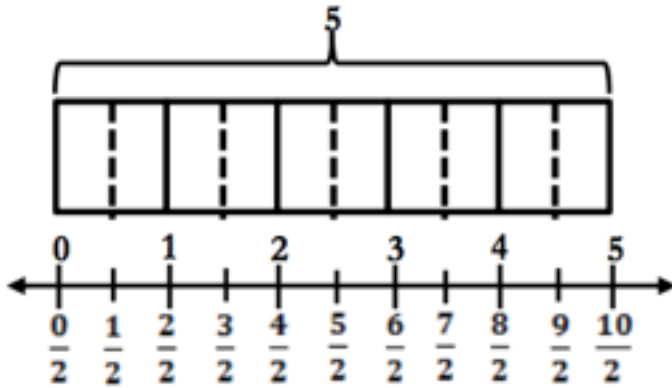
The tape diagram is partitioned into 5 equal units. Each uno represents 1 kilometer of the race.

Step 2: Since water stops are every 1/2 kilometer, each unit of the tape diagram is divided into 2 equal parts.



When you count the number of halves in the tape diagram, you will determine that there are a total of 10. Therefore, there will be 10 water stop during the 5-K race.

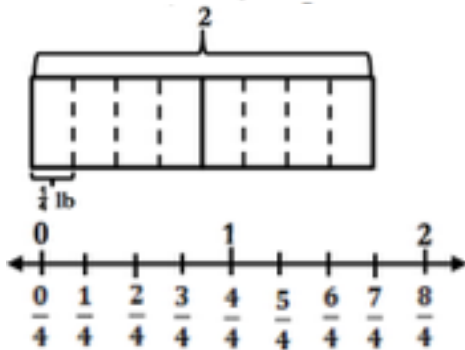
Step 3: Draw a number line under the tape diagram to show that there are 10 halves in 5 wholes.



Misconception: Students may believe that the quotient in division is always smaller than the dividend (whole) and the divisor. It is about asking how many group there are of a certain size. For example, what happens to the number of pieces if we cut a carrot into 6 equal pieces? (There are more pieces of carrot.) This is the meaning of dividing a whole by a unit fraction.

Practice Problem: Francois picked 2 pounds of blackberries. If he wants to separate the blackberries into 1/4 pound bags, how many bags can he make?

Number Sentence: $2 \div \frac{1}{4} = 8$



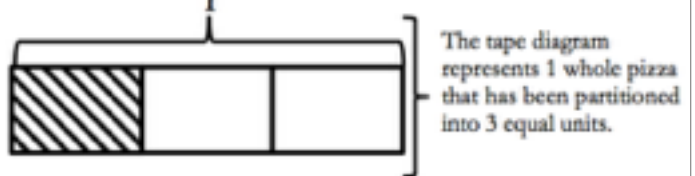
One whole has 4 fourths and 2 wholes has 8 fourths.

Francois can make 8 bags with 1/4 out of blackberries in each.

Divide a Unit Fraction by a Whole Number

Practice Problem: Randy and his friends will share a pizza equally. What fraction / portion of the pizza will each get?

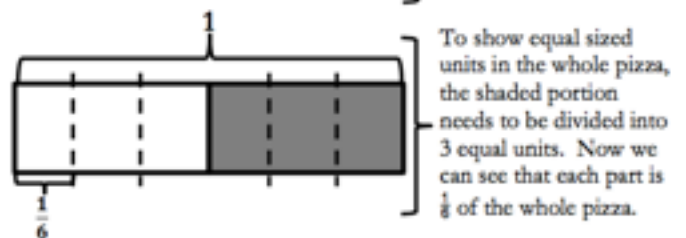
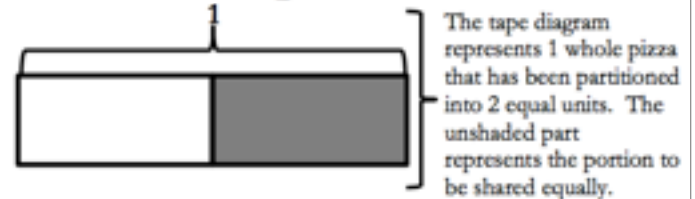
Number Sentence: $1 \div 3$



Each will receive $\frac{1}{3}$ of the whole pizza.

Now suppose there is only 1/2 of a pizza that is shared equally among Randy and his 2 friends. What fraction/portion of the pizza does each person get?

Number Sentence: $\frac{1}{2} \div 3$



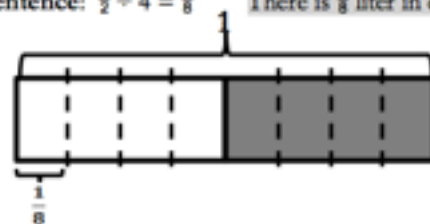
$$\frac{1}{2} \div 3 = \frac{1}{6}$$

3 sixths \div 3 = 1 sixth (The unshaded part is showing 3 sixths.)

Each person will receive $\frac{1}{6}$ of the pizza.

Practice Problem: If Bridget poured 1/2 liter of lemonade equally into 4 bottles, how many liters of lemonade are in each bottle?

Number Sentence: $\frac{1}{2} \div 4 = \frac{1}{8}$ There is $\frac{1}{8}$ liter in each bottle.



Divide by Decimal Divisors

$$0.24 \div 0.4$$

Step 1: Rewrite the division expression as a fraction.

$$\frac{0.24}{0.4}$$

Step 2: Rename the divisor/denominator as a whole number by multiplying by a fraction equal to 1.

$$\frac{0.24}{0.4} \times \frac{10}{10} = \frac{2.4}{4}$$

Step 3: Divide.

$$4 \overline{) 2.4} \\ \underline{2.4} \\ 0$$

Step 1: $\frac{2.7}{0.03} \quad 2.7 \div 0.03$

Step 3: $3 \overline{) 270} \\ \underline{27} \\ 00 \\ \underline{0}$

Step 2: $\frac{2.7}{0.03} \times \frac{100}{100} = \frac{270}{3}$

Application Problem: $18 \div 2 = 9$

Explain why it is true that $1.8 \div 0.2$ and $0.18 \div 0.02$ have the same quotient.

$$\frac{1.8}{0.2} \times \frac{10}{10} = \frac{18}{2} = 18 \div 2 = 9 \qquad \frac{0.18}{0.02} \times \frac{100}{100} = \frac{18}{2} = 18 \div 2 = 9$$

They all have the same quotient because I can rename each fraction without changing their value by multiplying each by a fraction that equals 1. In the first fraction since both the numerator and denominator being whole numbers. In the second fraction both the numerator and denominator are in the hundredths. When I multiply each by $\frac{100}{100}$, it resulted in fraction parts being whole numbers. Each fraction resulted in $18 \div 2$.

Application Problem: Mrs. Morgan has 21.6 pounds of peaches to pack for shipment. She plans to pack 2.4 lb of peaches in each box. How many boxes are required to ship all the peaches?

$$21.6 \div 2.4 \qquad \frac{21.6}{2.4} \times \frac{10}{10} = \frac{216}{24} \qquad 24 \overline{) 216} \\ \underline{216} \\ 0$$

Mrs. Morgan needs 9 boxes to ship all the peaches.

District Mathematics Website

Be sure to visit our District 97 5th Grade Math Resources Website. It has a ton of resources that can further assist your 5th Grade Family! Some of the specific elements are detailed below.

Website: <http://op97mathgrade5.weebly.com/module-4.html>

Video Help and Homework Helper

Flipped learning is a great way to review topics that your student is learning in the classroom. The following are links to videos that give detailed explanations for each lesson in this topic.

Website: <https://www.tes.com/lessons/ahONa5NczU7C7Q/video-help-module-4>

Click below to access written homework help specific for each lesson in this Topic.

Website: http://op97mathgrade5.weebly.com/uploads/2/2/9/1/22918938/homework_helper-grade_5_module_4.pdf

Module 4 Parent Tips

Eureka Math has created a guide to this Module specifically for parents.

Website: http://op97mathgrade5.weebly.com/uploads/2/2/9/1/22918938/eureka_math_module_4_parent_tip_sheet.pdf