5th Grade Math

Module 4: Multiplication and Division of Fractions and Decimal Fraction

Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is 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 fractions as division.

Topic B.   Fractions as Division
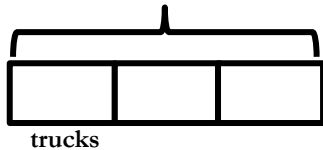
Words to know

- Tape Diagram
- Algorithm
- Unit/Unit Form
- Equation

Things to Remember:

Tape Diagram- Drawing that looks like a segment of tape, used to illustrate number relationships.

- **Examples of Tape Diagram**

Two hundred seventy-three vehicles were parked in a parking lot. One-third of the vehicles were trucks. How many trucks were in the parking lot?

273 vehicles

trucks

3 **units**(sections) = 273
1 **unit** (section)   = 273 ÷ 3
                    = 91 trucks

OBJECTIVES OF TOPIC B

- Interpret a fraction as division.
- Use tape diagrams to model fractions as division.
- Solve word problems involving the division of whole numbers with answers in the form of fractions or whole numbers.
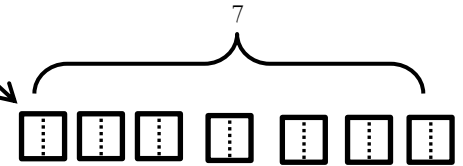
Focus Area– Topic B

Module 4: Fractions as Division

Regg has 7 crackers that he wants to share between his friend Gabe and himself equally.

Think: If there are 7 crackers, you could give each boy 3 crackers. Then take the last cracker and split it in half and give each boy one of the halves.
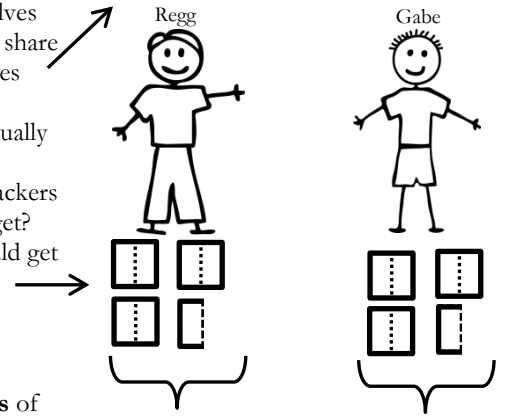
Regg   Gabe
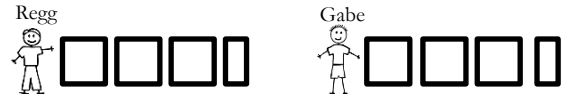
Or you could split all the crackers in half first, and then share.

7

How many halves do we have to share in all? 14 halves

Regg   Gabe

Share them equally with each boy. How many crackers did each boy get? Each boy would get 7 halves.

Although the crackers were shared in **units** of one-half, what is the total amount of crackers each boy receives?
3 whole crackers and ½ of another cracker.

$$\frac{7}{2} = 3\frac{1}{2} \qquad\qquad \frac{7}{2} = 3\frac{1}{2}$$

Division **Equation**: $7 \div 2 = \frac{7}{2} = 3\frac{1}{2}$

Unit Form: 14 halves ÷ 2 = 7 halves

Each boy would get 3 ½ crackers.

$$check: 2 \times 3\frac{1}{2}$$
$$= 3\frac{1}{2} + 3\frac{1}{2}$$
$$= 6 + \frac{2}{2}$$
$$= 7 \text{ crackers}$$

Application Problems

Using a picture, show how friends Sally, Adam, and Mandy could share two candy bars. Write an **equation**, solve, and check.

Strategy:
Draw two **tape diagrams** since there are 2 candy bars. Divide each candy bar into 3 equal parts and then share among the three friends.

$$1$$

Sally	Adam	Mandy

$$\frac{1}{3} \quad \frac{1}{3} \quad \frac{1}{3}$$

$$1$$

Sally	Adam	Mandy

$$\frac{1}{3} \quad \frac{1}{3} \quad \frac{1}{3}$$
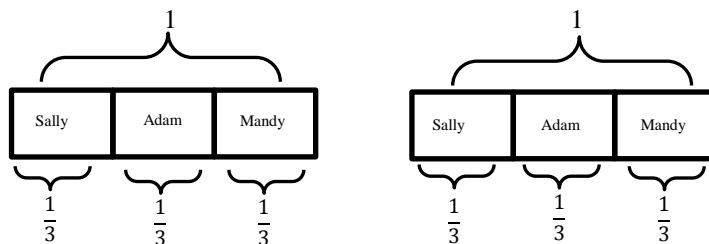
Unit Form: 6 thirds ÷ 3 = 2 thirds

Division **Equation**: $2 \div 3 = \frac{2}{3}$

check:
$$3 \, x \, \frac{2}{3} = \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$$
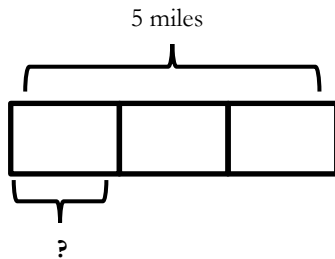$$= \frac{6}{3}$$
$$= 2 \; candy \; bars$$

Each friend gets $\frac{2}{3}$ of the candy bars.

Mark ran a total of 5 miles in 3 days. If Mark runs the same distance every day, how many miles does he run each day?

To solve this problem use a tape diagram.

We know that 3 **units** are equal to 5 miles.
We want to know what 1 **unit** is equal to.

5 miles

?

Algorithm
$$\begin{array}{r} 1\frac{2}{3} \\ 3\overline{)5} \\ -3 \\ \hline 2 \end{array}$$

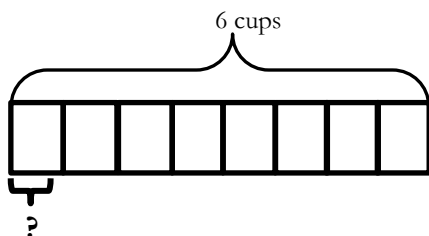*Check:*
$$3 \, x \, 1\frac{2}{3}$$
$$= 1\frac{2}{3} + 1\frac{2}{3} + 1\frac{2}{3}$$
$$= 3 + \frac{6}{3}$$
$$= 3 + 2$$
$$= 5 \text{ miles}$$

3 **units** = 5

1 **unit** = $5 \div 3 = \frac{5}{3}$

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

Mark ran $1\frac{2}{3}$ miles each day.

American Cookie Company uses 6 cups of chocolate chips to make 8 batches of mini chocolate chip cookies. If each batch uses the same amount of chocolate chips, how many cups of chocolate chips are used? **(Solve using drawing, algorithm, and check your answer.)**

6 cups shared equally in 8 batches of cookies

6 cups

?

Algorithm
$$\begin{array}{r} 0\frac{6}{8} = \frac{3}{4} \\ 8\overline{)6} \\ 0 \\ \hline 6 \end{array}$$

Check:
$$8 \times \frac{3}{4}$$
$$= \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4}$$
$$= \frac{24}{4} = \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{4}{4}$$
$$= 1 + 1 + 1 + 1 + 1 + 1$$
$$= 6 \text{ cups}$$

8 **units** = 6 cups

1 **unit** = $6 \div 8$

$$= \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$$

$\frac{3}{4}$ cup of chocolate chips is used in each batch.