



# MATH NEWS



Grade 4, Module 5, Topic G

## 4<sup>th</sup> Grade Math

*Module 5: Fraction Equivalence, Ordering, and Operations*

### 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. Module 5 of Eureka Math (Engage New York) covers fraction equivalence, ordering, and operations.



### Focus Area Topic G:

*Repeated Addition of Fractions as Multiplication*

#### Words to Know:

**Compose** - change a group of unit fractions with the same denominator to a single non-unit fraction or mixed number

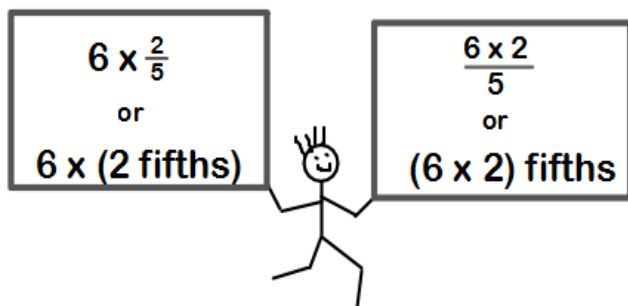
**Decompose** - change a non-unit fraction or mixed number to the sum of its parts or unit fractions

**Mixed number** - number made up of a whole number and a fraction

**Line plot** - display of data on a number line, using an x or another mark to show frequency



Here's something to think about.



### OBJECTIVES OF TOPIC G

- ▶ Represent the multiplication of  $n$  times  $a/b$  as  $(n \times a)/b$  using the associative property and visual models.
- ▶ Find the product of a whole number and a mixed number using the distributive property.
- ▶ Solve multiplicative comparison word problems involving fractions.
- ▶ Solve word problems involving the multiplication of a whole number and a fraction including those involving line plots.

### Focus Area Topic G:

*Repeated Addition of Fractions as Multiplication*

#### Using the Associative Property

Multiplying a whole number times a fraction was introduced in Topic A. Here's an example of how a fraction can be decomposed and rewritten as a multiplication sentence.

$$\frac{3}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = 3 \times \frac{1}{5}$$

Now students will use the associative property to multiply a whole number times a mixed number.

Consider this example.  $5 \times (3 \times \frac{1}{2})$

Each plate has  $\frac{1}{2}$  of a cake on it. There are 3 plates on each table. There are 5 tables in the room. To find out how much cake there is, first we can think about the plates on each table and write  $3 \times \frac{1}{2}$  which would give us the amount of cake on each table,  $\frac{3}{2}$ . Now, we can multiply the amount of cake on each table,  $\frac{3}{2}$  by 5, the number of tables in the room.  $5 \times \frac{3}{2}$

$$5 \times \frac{3}{2} = 5 \times (3 \text{ halves})$$

$$(5 \times 3) \text{ halves} = 15 \text{ halves}$$

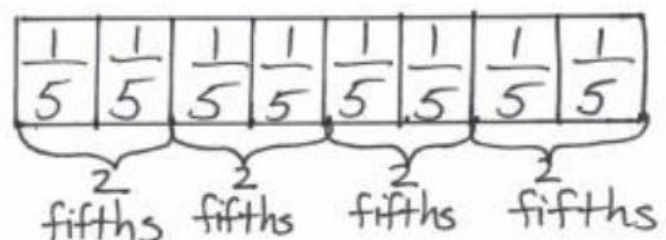
$$15 \text{ halves} = 7\frac{1}{2} \text{ cakes in the room}$$



#### Example Problem and Answer

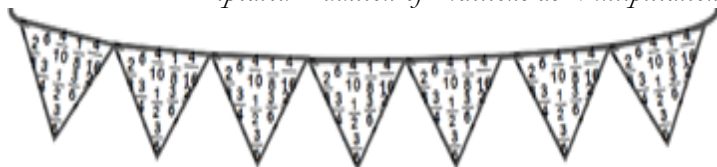
Draw and label a tape diagram to show the following are true.

$$8 \text{ fifths} = 4 \times (2 \text{ fifths}) = (4 \times 2) \text{ fifths}$$



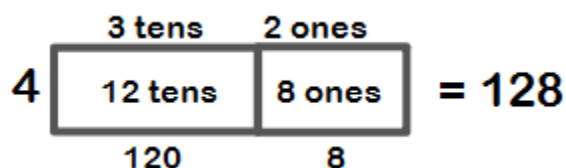
## Focus Area – Topic G:

### Repeated Addition of Fractions as Multiplication



### Using the Distributive Property

Students will explore the use of the distributive property to multiply a whole number by a mixed number. We can use the distributive property to show  $4 \times 32$  as  $(4 \times 3 \text{ tens}) + (4 \times 2 \text{ ones})$ . The following area model uses the distributive property.

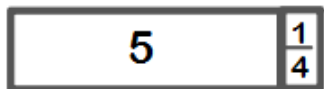


Students begin to see the multiplication of each part of a mixed number by the whole number and use the appropriate strategies to do so.

In the following example, we use a tape diagram.

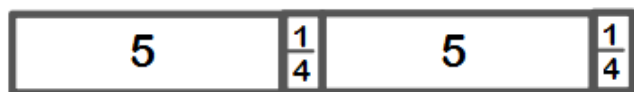
Let's say we want to multiply  $2 \times 5 \frac{1}{4}$ .

We can create a tape diagram to show  $5 + \frac{1}{4}$ .

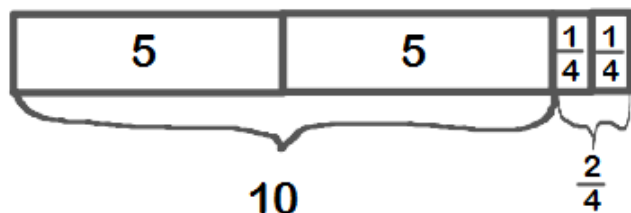


Since we are multiplying by 2, we will draw our tape diagram 2 times.

as in multiply



We rearrange the parts of our tape diagram to show our wholes together and our parts together.



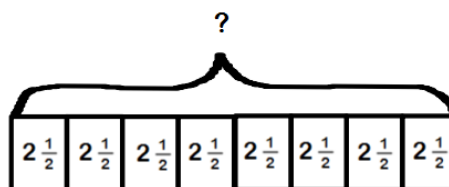
Therefore

$$2 \times 5 \frac{1}{4} = (2 \times 5) + (2 \times \frac{1}{4}) = 10 \frac{2}{4}$$

## Module 5: Fraction Equivalence, Ordering, and Operations

### Example Problems and Answers

A grocery store had a sale on rice. Eight families each bought  $2 \frac{1}{2}$  pounds of rice. How many pounds of rice did the store sell to these families?



$$\begin{aligned} 8 \times 2 \frac{1}{2} &= (8 \times 2) + (8 \times \frac{1}{2}) \\ &= 16 + \frac{8}{2} \\ &= 16 + 4 \\ &= 20 \end{aligned}$$

The store sold 20 pounds of rice to these families.

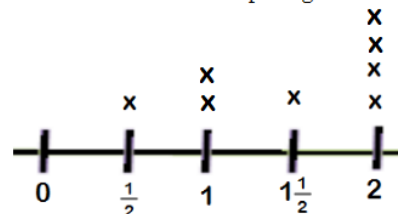
### Understanding Line Plots

A line plot is a graph that shows frequency of data along a number line.

This chart shows the height in cm of 8 plants.

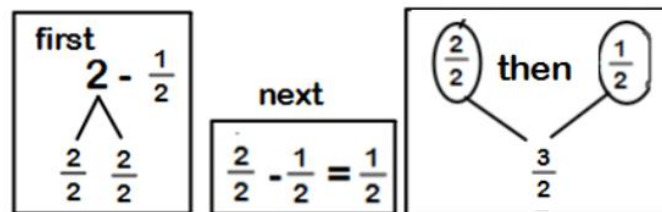
Plant	Height in cm
A	2
B	2
C	$\frac{1}{2}$
D	1
E	2
F	$1 \frac{1}{2}$
G	1
H	2

The line plot below shows the number of plants that grew a certain amount of cm. Each x represents a plant. The number on the number line represents the amount of cm the plant grew.



### Example Problems and Answers

What is the difference in growth of the tallest and shortest plant?



Therefore

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