



MATH NEWS



Grade 4, Module 5, Topic D

4th 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 D:

Fraction Addition and Subtraction

Words to Know:

Mixed number - number made up of a whole number and a fraction less than one

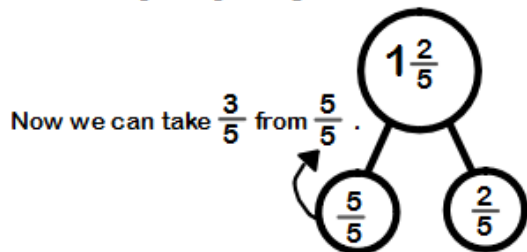
Unit fraction - fractions with numerator 1

Non-unit fraction - fractions with numerators other than 1

Compose and Decompose Whole Numbers

In both the addition and subtraction of fractions, students will need to compose and decompose whole numbers into fractions. In this example, we use a number bond to rename 1 whole as $\frac{5}{5}$.

$$1\frac{2}{5} - \frac{3}{5} = \frac{4}{5}$$



Focus Area Topic D:

Fraction Addition and Subtraction

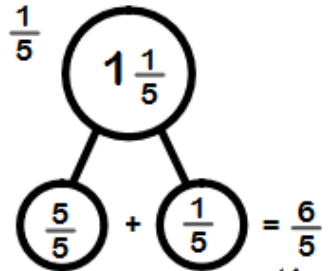
Subtraction of Fractions

Students need to see the addition and subtraction of fractions as joining and separating parts referring to the same whole. In the following example, we will use a number line to model our thinking.

Let's find the value of $1\frac{1}{5} - \frac{2}{5}$.

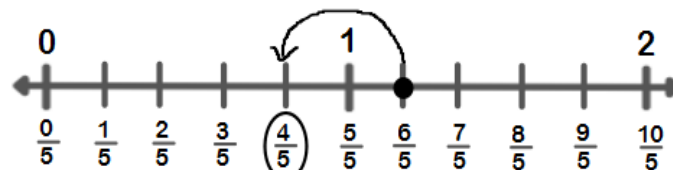
This number bond shows how 1 whole and $\frac{1}{5}$ can be written as

$$\frac{5}{5} + \frac{1}{5}$$



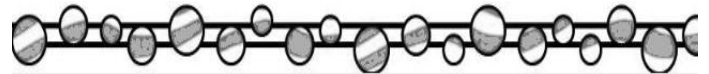
We can see that $1\frac{1}{5} = \frac{6}{5}$.

Now we will mark $\frac{6}{5}$ on our number line and subtract $\frac{2}{5}$.



Therefore

$$1\frac{1}{5} - \frac{2}{5} = \frac{4}{5}$$



OBJECTIVES OF TOPIC D

- ▶ Use visual models to add and subtract two fractions with the same units.
- ▶ Use visual models to add and subtract two fractions with the same units, including subtracting from one whole.
- ▶ Add and subtract more than two fractions.
- ▶ Solve word problems involving addition and subtraction of fractions.
- ▶ Use visual models to add two fractions with related units using the denominators 2, 3, 4, 5, 6, 8, 10, and 12.

Here's something to think about.

7 ones - 4 ones = 3 ones
 7 apples - 4 apples = 3 apples
 7 cats - 4 cats = 3 cats
 7 fifths - 4 fifths = 3 fifths
 $\frac{7}{5} - \frac{4}{5} = \frac{3}{5}$

Focus Area – Topic D:

Fraction Addition and Subtraction



Addition of Fractions

In this topic, students create tape diagrams and/or number lines to represent and solve fraction addition and subtraction word problems. Consider this example:

Mark mixed $\frac{3}{4}$ cup of apple juice, $\frac{2}{4}$ cup of orange juice, and $\frac{1}{4}$ cup of grape juice for his fruit punch. How many cups of juice did he put in his fruit punch in all?

We will begin by writing a number sentence.

$$\frac{3}{4} + \frac{2}{4} + \frac{1}{4} = ?$$

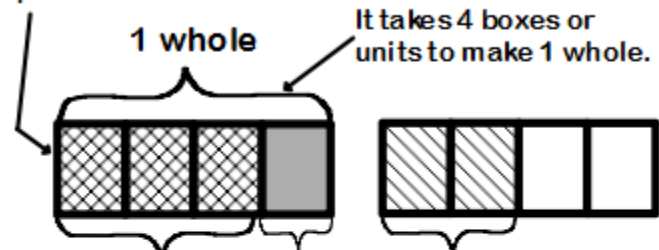
When counting, we consider the items being counted units as in one tree, two trees, three trees, and so on. Fractional units work the same way. In our example, the fractional units are fourths. Imagine if they were cars. Our number sentence would read like this:

$$\begin{aligned} & 3 \text{ cars} + 2 \text{ cars} + 1 \text{ car} = ? \\ & \text{or} \\ & \frac{3}{\text{cars}} + \frac{2}{\text{cars}} + \frac{1}{\text{car}} = ? \end{aligned}$$

If we wanted to solve and find the total number of cars, we would add 3 plus 2 plus 1. We would not add the word car, would we? That's just silly. It works the same with our fractions. The denominator (fourths) is telling us how many parts we need to make 1 whole. It's telling the unit being counted. Let's model this problem using a tape diagram.

Each box or each unit represents 1 fourth.

$\frac{1}{4}$ is our unit fraction.



$$\frac{3}{4} + \frac{1}{4} + \frac{2}{4} = \frac{6}{4}$$

filled in parts $\leftarrow \frac{6}{4}$
units needed for 1 whole $\leftarrow \frac{4}{4}$

$$\frac{6}{4} = 1 \text{ whole and 2 fourths} = 1\frac{2}{4} \text{ cups of juice}$$

Module 5: Fraction Equivalence, Ordering, and Operations

Example Problems and Answers

Problem

Students are asked to use three fractions to write two subtraction and two addition number sentences.

$$\frac{15}{16}, \frac{8}{16}, \frac{7}{16}$$

Answer

$$\frac{15}{16} - \frac{8}{16} = \frac{7}{16}$$

$$\frac{7}{16} + \frac{8}{16} = \frac{15}{16}$$

$$\frac{15}{16} - \frac{7}{16} = \frac{8}{16}$$

$$\frac{8}{16} + \frac{7}{16} = \frac{15}{16}$$

Problem

Students are asked to find the difference in two ways and use a number bond to show the decomposition.

$$\begin{array}{c} 1\frac{2}{7} - \frac{5}{7} = \\ \text{Answer} \swarrow \quad \searrow \\ \frac{7}{7} \quad \frac{2}{7} \end{array}$$

First Way

$$\frac{7}{7} + \frac{2}{7} = \frac{9}{7}$$

$$\frac{9}{7} - \frac{5}{7} = \left(\frac{4}{7}\right)$$

Another Way

$$\frac{7}{7} - \frac{5}{7} = \frac{2}{7}$$

$$\frac{2}{7} + \frac{2}{7} = \left(\frac{4}{7}\right)$$

Problem

Show one way to solve each problem. Express sums and differences as a mixed number when possible.

$$\frac{3}{6} + \frac{1}{6} + \frac{3}{6}$$

$$\frac{3}{6} + \frac{1}{6} + \frac{3}{6} =$$

$$= \frac{6}{6} + \frac{1}{6} = 1 + \frac{1}{6}$$

$$= 1\frac{1}{6}$$