MATH NEWS

Grade 4, Module 5, Topic C

LAFAYETTE PARISH SCHOOL SYSTEM

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 C: *Fraction Comparison*

Words to Know:

Common denominator - when two or more fractions have the same denominator

Comparing fractions – determining which fraction is greater than the other and using symbols to express the comparison

- symbol for greater than >
- symbol for less than <
- symbol for equal to =

Benchmark - standard or reference point by which something is measured → example benchmarks 0, $\frac{1}{2}$, 1.

Using Benchmarks to Compare Fractions

Students use benchmarks to compare fractions with different numerators and different denominators. The use of benchmarks is modeled using a number line. Students use the relationship between the numerator and denominator of a fraction to compare to a known benchmark and then use that information to compare the given fractions.

Example of Benchmark Use

Students might need to compare $\frac{4}{7}$ and $\frac{2}{5}$. They reason that 4 sevenths is more than 1 half, while 2 fifths is less than 1 half. They then conclude that 4 sevenths is greater than 2 fifths.

OBJECTIVES OF TOPIC C

- Reason using benchmarks to compare two fractions on the number line.
- Find common units or number of units to compare two fractions.

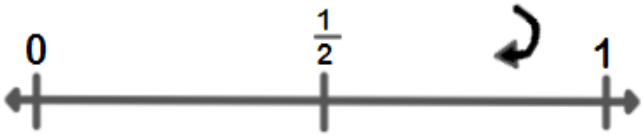
Focus Area – Topic C: *Fraction Comparison*

Using Benchmarks on a Number Line to Compare Fractions

Here is an example of how students can reason about the size of a fraction compared to $\frac{1}{2}$. If they want to know the relative size of $\frac{2}{6}$, they can use a number line.

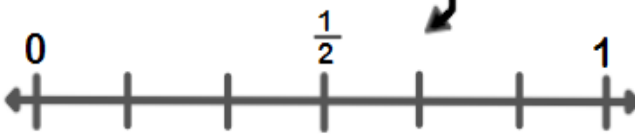
Is $\frac{2}{6}$ greater than or less than $\frac{1}{2}$?

First, draw a numer line and label it with the benchmarks zero, half, and one whole.



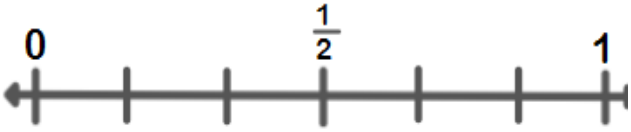
How many sixths are in 1 whole?

6 sixths



3/6 3 sixths is the same as 1/2

Is $\frac{2}{6}$ greater than or less than $\frac{3}{6}$?



2/6 3/6 2 sixths is less than 3 sixths

Therefore $\frac{2}{6} < \frac{1}{2}$

Focus Area – Topic C: *Fraction Comparison*

Comparing Fractions using Related Numerators

Students learn to use like numerators to compare fractions. They compare using the size of the fractional units as in this example: 3 fifths is less than 3 fourths because fifths are smaller than fourths. This reasoning is extended as students learn to find an equivalent fraction when they see a relationship between the numerators.

Let's say we want to compare 2 eighths and 4 tenths.

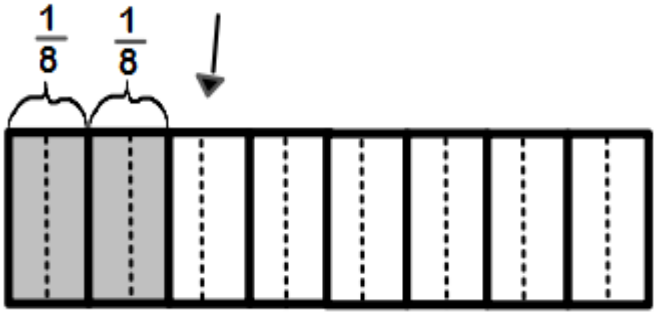
$$\frac{2}{8} \_\_\_\_ \frac{4}{10}$$

First, notice the relationship between the numerators.
We can make them the same if we multiply the numerator two by 2. If we multiply the numerator by 2, then we have to multiple the denominator by 2.
That will give us an equivalent fraction.

$$\frac{2}{8} = \frac{2 \times 2}{8 \times 2} = \frac{4}{16}$$

$$\frac{2}{8} = \frac{4}{16}$$

This tape diagram shows $\frac{2}{8}$ shaded.



The dotted lines show how each eighth gets partitioned into 2 parts when we multiply $\frac{2 \times 2}{8 \times 2}$. Now we have $\frac{4}{16}$ shaded.
We can compare using the numerators.

$$\frac{4}{16} \_\_\_\_ \frac{4}{10}$$

We think about the size of the fractional units.
$\frac{4}{16}$ is less than $\frac{4}{10}$ because sixteenths are smaller than tenths.

Therefore

$$\frac{2}{8} < \frac{4}{10}$$

Module 5: Fraction Equivalence, Ordering, and Operations

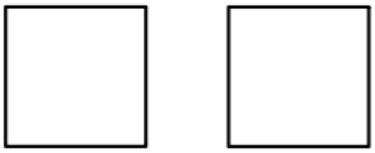
Compare fractions with unrelated denominators using area models

Students compare fractions by finding like units or common denominators. In this method, the unit fractions are the same in each model or equation. Since the units are equal, students can easily compare. Throughout this topic, it is important for students to continue drawing area models, tape diagrams, and number lines. Students need to able to compare fractions and justify their comparisons by using a visual fraction model. Notice how the area model is used in the following example.

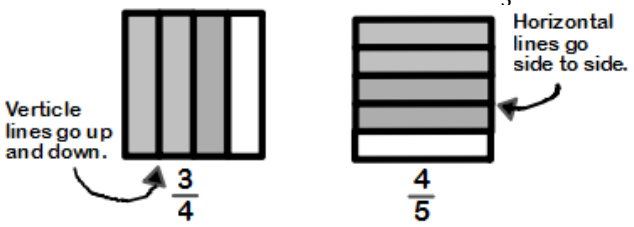
Let's say we want to compare 3 fourths and 4 fifths.

$$\frac{3}{4} \_\_\_\_ \frac{4}{5}$$

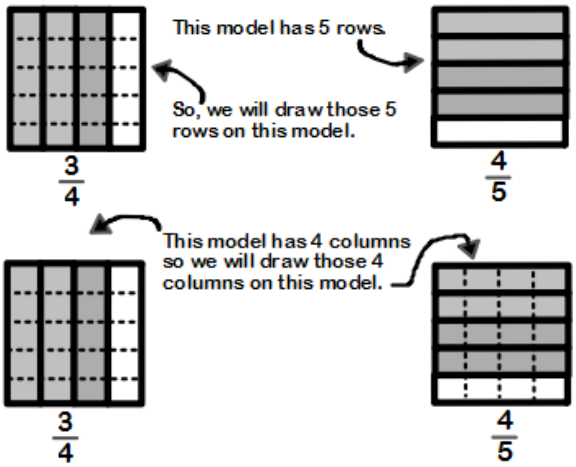
First, we draw 2 almost square rectangles that are the same size. These squares are our models. Each model represents 1 whole.



We will partition one rectangle with vertical lines into 4 parts and shade to show $\frac{3}{4}$. The other rectangle will be partitioned into 5 parts using horizontal lines and shaded to show $\frac{4}{5}$.



Since our fractions do not have like denominators, we will find equivalent fractions that do.



Now, both models have the same number of units, 20. That means we can compare. Our $\frac{3}{4}$ model is now showing $\frac{15}{20}$ and our $\frac{4}{5}$ model is now showing $\frac{16}{20}$.

$\frac{15}{20}$ is less than $\frac{16}{20}$ → **Therefore**

$$\frac{3}{4} \_\_\_\_ < \frac{4}{5}$$