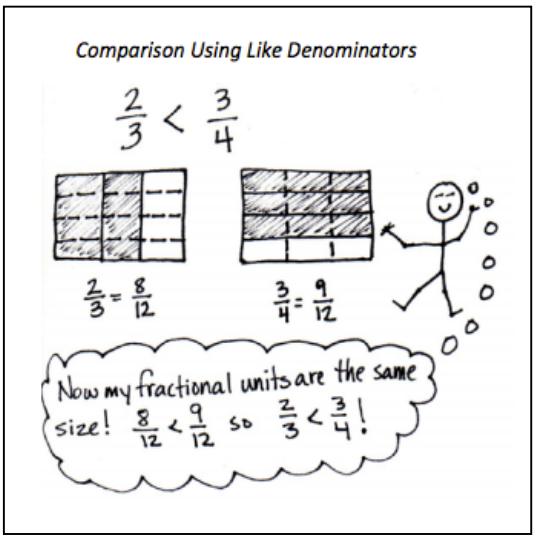
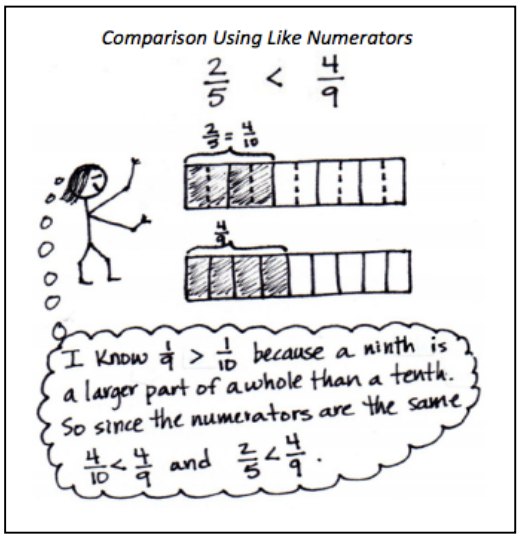
Eureka Math tips for Parents

Grade 4 Module 5

Fraction Equivalence, Ordering, and Operations

In this 41-lesson module, students explore fraction equivalence and extend this understanding to mixed numbers. They compare and represent fractions and mixed numbers using a variety of models. Toward the end of the module, they use what they know to be true about whole number operations to apply to fractions and mixed number operations.





What Came Before this Module: Students were introduced to many new geometrical terms and the relationships between them. They also learned to compose and classify two-dimensional figures.

What Comes After this Module: In Module 6, students will use the understanding of fractions developed throughout Module 5, apply the same reasoning to decimal numbers, and build a solid foundation for later work with decimal operations.

New Terms in this Module:

Benchmark Fraction- a known reference fraction by which other fractions can be measured, e.g. 0, ½, ¼, ¾. 1

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

Denominator- bottom number in a fraction

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

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

Numerator- top number in a fraction

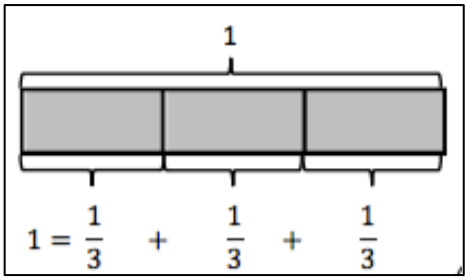
Familiar Terms:
Compose
Decompose
Equivalent fractions
Fractional unit
Unit fraction
Non-unit fraction
=, <, >

+ How you can help at home:

- Continue to practice and review multiplication and division math facts – this greatly supports work with fractions!
- Look for opportunities in daily life to discuss fractional parts and divide objects into equal parts

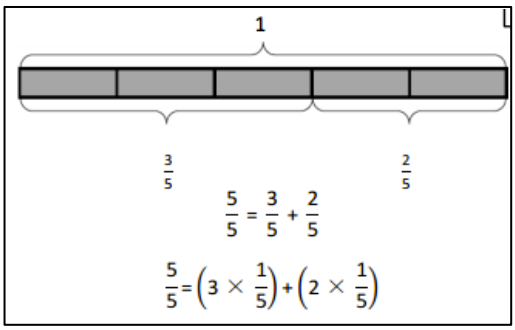
Key Common Core Standards:

- *Generate and analyze patterns*
  - Generate a number or shape pattern that follows a given rule
- *Extend understanding of fraction equivalence and ordering*
  - Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models
  - Compare two fractions with different numerators and different denominators
- *Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers*
  - Understand a fraction a/b with a > 1 as a sum of fractions 1/b, e.g. 3/5 = 1/5 + 1/5 + 1/5
  - Apply and extend previous understandings of multiplication to multiply a fraction by a whole number
- *Represent and interpret data*
  - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).



The tape diagram above shows a simple fraction addition problem in which each part of the tape is equal to one-third of the whole.

The tape diagram below shows how to break one whole into fifths, and then how those fifths can be grouped and added together to create the whole.



Spotlight on Math Models:

Tape Diagrams

You will often see this mathematical representation in *A Story of Units*.

A Story of Units has several key mathematical "models" that will be used throughout a student's elementary years.

The tape diagram is a powerful model that students can use to solve various kinds of problems. Beginning in first grade, tape diagrams are used as simple models of addition and subtraction. Now in this fourth grade module, we will use them to model operations on fractions as well.

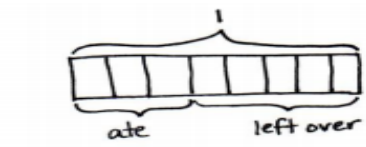
Tape diagrams are also called "bar models" and consist of a simple bar drawing that students make and adjust to fit a word or computation problem. They then use the drawing to discuss and solve the problem.

As students move through the grades, tape diagrams provide an essential bridge to algebra and solving for an unknown quantity. They are a flexible mathematical tools that grow to fit students' needs as elementary mathematics increases in complexity.

Sample Problem from Module 5:

Mr. Salazar cut his son's birthday cake into 8 equal pieces. Mr. Salazar, Mrs. Salazar, and the birthday boy each ate 1 piece of cake. What fraction of the cake was left?

(Example taken from Lesson 19; note the use of a tape diagram to solve the problem)



Solution 1

$1 - \frac{3}{8} = \frac{8}{8} - \frac{3}{8} = \frac{5}{8}$

$\frac{5}{8}$ of the cake is left.

Solution 2

$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + x = \frac{8}{8}$

$\frac{3}{8} + x = \frac{8}{8}$

$\frac{3}{8} + \frac{5}{8} = \frac{8}{8}$ $x = \frac{5}{8}$