DUVAL Math Parent Tips

DUVAL COUNTY PUBLIC SCHOOLS

Fraction Equivalence, Ordering, and Operations

In this 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, students use what they know to be true about whole number operations to apply to fractions and mixed number operations.

What Comes 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 their 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.

Fourth Grade, Module 5

Special points of interest:

✓ Words to Know

✓ Fractions: Number Bonds, Tape Diagrams, Area Model

✓ Fractions: Visual Models, Sums and differences

✓ Mathematical Practices

✓ Want to learn more about DUVAL Math?

Words to Know

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
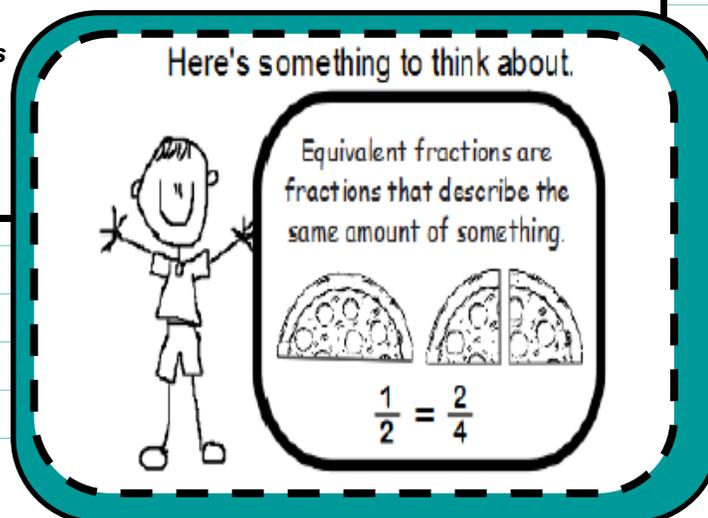*Fractional unit*
Unit fraction
Non-unit fraction
=, <, >

Questions?

Mrs. Wendy Dobson

Supervisor, Mathematics K-5

dobsonw@duvalschools.org

Here's something to think about.

Equivalent fractions are fractions that describe the same amount of something.

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

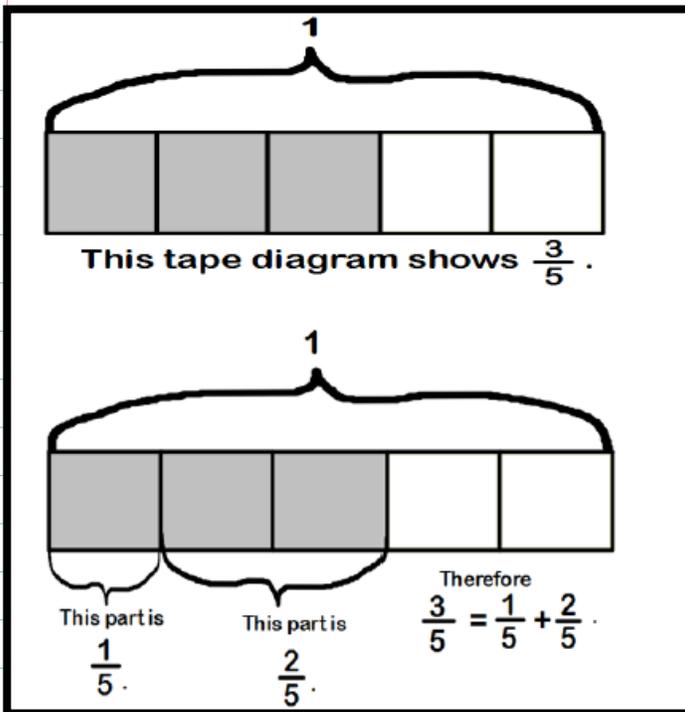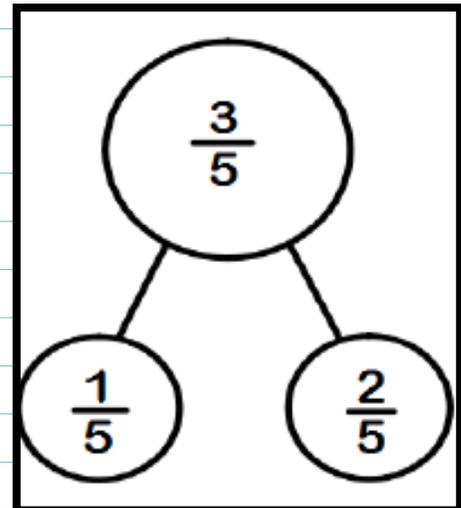# Fractions: Number Bonds, Tape Diagrams, Area Model

Number Bonds and Tape Diagrams with Fractions

Students decompose fractions as unit fractions, drawing tape diagrams to represent them as sums of fractions with the same denominator in different ways .

1

This tape diagram shows $\frac{3}{5}$.

A number bond is a graphic showing a part/part/whole relationship. In this case, the fractions 1/2 and 2/5 and combine to make 3/5.

1

This part is $\frac{1}{5}$.   This part is $\frac{2}{5}$.

Therefore $\frac{3}{5} = \frac{1}{5} + \frac{2}{5}$.

$\frac{3}{5}$

$\frac{1}{5}$ $\frac{2}{5}$

Example Problem and Answer

Students will be asked to decompose the shaded fraction into smaller units using an area model. Then they will need to express the equivalent fraction in a number sentence using multiplication. Below is one way to solve. Can you think of another way?

Before   After

$\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$
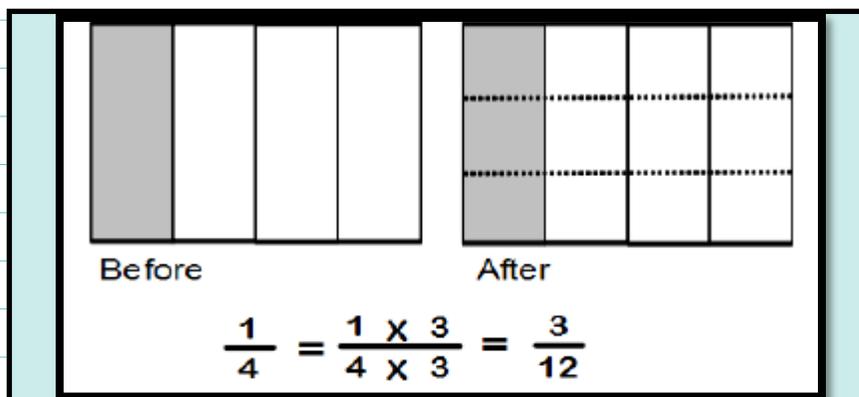
Fractions: Visual Models, Sums and Differences

At the start of **Topic E,** students use decomposition and visual models to add and subtract fractions less than 1 to or from whole numbers (e.g., 4 + 3/4= 4 3/4 and 4 – 3/4= (3 + 1) – 3/4). They use addition and multiplication to build fractions greater than 1 and represent them on the number line.

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

We can use a number bond to show how $2\frac{1}{6}$ can be decomposed into the parts $\frac{12}{6}$ and $\frac{1}{6}$.

$$\frac{12}{6} \qquad \frac{1}{6}$$

The number bond helps students see that $2\frac{1}{6}$ is equal to $\frac{13}{6}$.

$$2\frac{1}{6} = \frac{12}{6} + \frac{1}{6} = \frac{13}{6}$$

Students may also use a number line to reason about the equivalence of $2\frac{1}{6}$ and $\frac{13}{6}$.

In Topic F, students estimate sums and differences of mixed numbers, rounding before performing the actual operation to determine what a reasonable outcome will be.

Each box or each unit represents 1 fourth. $\frac{1}{4}$ is our unit fraction.

1 whole

It takes 4 boxes or units to make 1 whole.

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

filled in parts ← 6
units needed for 1 whole ← 4

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

Standards for Mathematical Practice

Mathematical Practices Addressed in this Module:

MP.2   **Reason abstractly and quantitatively.** Students will reason both abstractly and quantitatively throughout this module. They will draw area models, number lines, and tape diagrams to represent fractional quantities as well as word problems.

MP.3   **Construct viable arguments and critique the reasoning of others.** Much of the work in this module is centered on multiple ways to solve fraction and mixed number problems. Students explore various strategies and participate in many *turn and talk* and *explain to your partner* activities. In doing so, they construct arguments to defend their choice of strategy, as well as think about and critique the reasoning of others.

MP.4   **Model with mathematics.** Throughout this module, students represent fractions with various models. Area models are used to investigate and prove equivalence. The number line is used to compare and order fractions as well as model addition and subtraction of fractions. Students also use models in problem solving as they create line plots to display given sets of fractional data and solve problems requiring the interpretation of data presented in line plots.

MP.7   **Look for and make use of structure.** As they progress through this fraction module, students will look for and use patterns and connections that will help them build understanding of new concepts. They relate and apply what they know about operations with whole numbers to operations with fractions.

Want to learn more about DUVAL Math? A great resource can be found following the link below:

http://www.duvalschools.org/Page/17706

Elementary Mathematics: Parent Partnerships for Success Grades K-2 and 3-5