Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

Collaboration / Math 5* / Grade 5 (Math Regional Curriculum)

Wednesday, October 31, 2012, 11:08AM

Standard/Module: Proficiency in Fractions 5.NF.1 (F) (Week 14, 7 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Connects to 5.NF.2

5th Grade Map.pdf

Standards

NYS: CCLS:Mathematics, NYS: 5th Grade , Number & Operations—Fractions

5.NF Use equivalent fractions as a strategy to add and subtract fractions.

- 1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Enduring Understandings

1. Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value.
2. Numbers can be used for different purposes, can be classified, and represented in different ways.
3. Fractions, both larger and smaller than one whole, can be added or subtracted just like whole numbers, but unlike whole numbers, they often require an extra step of making common denominators.
4. Any two fractions (or mixed numbers) can be added or subtracted.
5. Equivalency plays a key role in adding and subtracting fractions (or mixed numbers).
6. There is more than one algorithm for each operation with rational numbers.
7. The set of real numbers is infinite and ordered. Whole numbers, mixed numbers, and fractions are real numbers. Each real number can be associated with a unique point on a number line.

Essential Questions

1. Why must we make common denominators?
2. Why can't we add or subtract across numerators or denominators?
3. How is the sum or difference equivalent to the parts that are being combined or subtracted?
4. What does it mean to add and subtract fractions with unlike denominators?
5. Why do we need to find equivalent fractions?
6. Why must we find common multiples of numbers?
7. Why is it helpful to find the least common denominator of fractions?
8. How are mixed numbers and improper fractions related?
9. How can we solve problems using number sentences or equations?
10. How can a number line be used to find common denominators?

Critical Content

1. Equivalent Fractions

-the same fractional amount can be represented different but equivalent fractions

-a fraction is in simplest form when 1 is the only common factor of the numerator and denominator

2.) Algorithms

-fractions with unlike denominators can be added or subtracted by replacing fractions with equivalent fractions with like denominators.

-The product of the denominators of two fractions is a common denominator of both.

3.) Fractions

-numerator/denominator

-what a fraction represents

-mixed numbers/improper fractions

-locations of fractions on number line

4.) Equivalent Sums and Differences

-add/subtract with like denominators

-add/subtract with unlike denominators

5.) Multiples

-common multiples

-lowest common multiples

Skills	**Vocabulary**
1. Students must be able to write equivalent fractions. 2. Students must be able to identify (and find) fractions in simplest form.	Tier 2: simplify, represent, common, form, unlike

3. Students must be able to use common factors to divide the numerator and denominator to write a fraction in simplest form. 4. Students must be able to find the lowest common multiple of numbers. 5. Students must be able to find common denominators for fractions. 6. Students must be able to fluently add and subtract whole numbers. 7. Students must be able to use models and computation to add/subtract fractions (and mixed numbers) with unlike denominators. 8. Students must be able to solve problems using addition and subtraction of fractions (and mixed numbers) with like and unlike denominators. 9. Students must be able to solve problems using pictures and/or an equation.	Tier 3: equivalent , denominator, numerator, LCM, LCD, multiple, improper fraction, mixed number, equation

Stage 2: Assessment Evidence

Assessments

Add and Subtract Fractions with Unlike Denominators
Formative: Test: Written

Students add and subtract fractions with unlike denominators and justify their responses with drawings, or other models such as number lines.

Stage 3: Learning Plan

Learning Activities	Resources
This standard builds on the work in fourth grade where students add fractions with like denominators. In fifth grade, the example provided in the standard has students find a common denominator by finding the product of both denominators. For 1/3 + 1/6, a common denominator is 18, which is the product of 3 and 6. This process should be introduced using visual fraction models (area models, number lines, etc.) to build understanding before moving into the standard algorithm.	www.illustrativemathematics.org www.illuminations.nctm.org

Students should apply their understanding of equivalent fractions developed in fourth grade and their ability to rewrite fractions in an equivalent form to find common denominators. They should know that multiplying the denominators will always give a common denominator but may not result in the smallest denominator. **Example:** Present students with the problem 1/3 + 1/6. Encourage students to use the clock face as a model for solving the problem. Have students share their approaches with the class and demonstrate their thinking using the clock model. Pattern blocks can also be used with the yellow hexagon representing 1 whole and the blue rhombus representing 1/3 and the green equilateral triangle representing 1/6. To add or subtract fractions with unlike denominators, students use their understanding of equivalent fractions to create fractions with the same denominators. Start with problems that require the changing of one of the fractions and progress to changing both fractions. Allow students to add and subtract fractions using different strategies such as number lines, area models, fraction bars or strips. Have students share their strategies and discuss commonalities in them. **Students need to develop the understanding that when adding or subtracting fractions, the fractions must refer to the same whole. Any models used must refer to the same whole. This is not easily seen when student are only taught the algorithm or a set of steps for adding and subtracting fractions with unlike denominators.** Students may find that a circular model might not be	

the best model when adding or subtracting fractions. As with solving word problems with whole number operations, regularly present word problems involving addition or subtraction of fractions. The concept of adding or subtracting fractions with unlike denominators will develop through solving problems. Mental computations and estimation strategies should be used to determine the reasonableness of answers. Students need to prove or disprove whether an answer provided for a problem is reasonable. Estimation is about getting useful answers, it is not about getting the right answer. It is important for students to learn which strategy to use for estimation. Students need to think about what might be a close answer and then explain their reasoning.	

Differentiation Opportunities

Students often mix models when adding, subtracting or comparing fractions. Students will use a

circle for thirds and a rectangle for fourths when comparing fractions with thirds and fourths. Remind

students that the representations need to be from the same whole models with the same shape and

size.

Students often want to add numerators together and denominators together. When students give answers that are unreasonable due to using this incorrect procedure, draw them into looking at the answer and where it relates to the original two fractions that they were operating on. For example, if a student says that the answer to 1/2 + 1/4 is 2/6, have them locate 1/2 on a number line and show what happens when 1/4 is added on. Compare that to where 2/6 (or 1/3) falls on the number line. This can also be done with fraction pieces, pattern blocks, or drawings. If students are making the mistake of using an incorrect procedure like this, they are likely seeing the numerator as a whole number and the denominator as a whole number in each fraction. Help students to see that the fractions being added together are numbers themselves and can be located on a number line. It is often helpful to have students model addition and subtraction problems without writing down algorithms for common denominators for a week or two until they can see how adding positive fractions will result in larger fractions and subtraction of positive fractions will result in smaller fractions (at this grade level).

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