Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

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

Wednesday, October 31, 2012, 11:09AM

Standard/Module: Proficiency in Fractions 5.NF.2 (Week 14, 7 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Connects to 5.NF.1

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.

- 2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

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 approximated by numbers that are close. Numerical calculations can be approximated by replacing numbers with other numbers that are close and easy to compute mentally.
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. There is more than one algorithm for each operation with rational numbers.
5. Math content can be applied to solve problems.
6. 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 do we need to find equivalent fractions?
2. Why do we use a number line to determine the nearest half and whole a fraction is closest to?
3. Why do we use estimation to check the reasonableness of answers?
4. How do we explain math using words, pictures, numbers, or symbols?
5. How can diagrams help us solve a problem?
6. Why is it useful to estimate sums and differences?

Critical Content

1. Equivalent Fractions

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

2. Algorithms

-fractions and mixed numbers 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

-locations of fractions and mixed numbers on a number line

4. Equivalent Sums and Differences

-add/subtract with like denominators

-add/subtract with unlike denominator

5. Estimation

-sums and differences of fractions and mixed numbers

Skills	**Vocabulary**
1. Students must be able to write equivalent fractions. 2. Students must be able to find the simplest form of a fraction. 3. Students must be able to find common denominators for fractions. 4. Students must be able to fluently add and subtract whole numbers. 5. Students must be able to use models and computation to add/subtract fractions and mixed numbers with unlike denominators. 6. Students must be able to solve problems using addition and subtraction of fractions and mixed numbers with like and unlike denominators. 7. Students must be able to explain math using, words, pictures, numbers, and symbols. 8. Students must be able to use estimation to	Tier 2: compatible, estimation, expression Tier 3: equivalent , denominator, numerator, equation

solve problems and check the reasonableness of answers.	

Stage 2: Assessment Evidence

Assessments

Add and Subtract Fractions in Word Problems
Formative: Test: Written

Students add and subtract fractions with unlike denominators and justify their responses with drawings, or other models such as number lines. Students justify their answers using benchmark fractions to show the reasonableness of their answers.

Stage 3: Learning Plan

Learning Activities	Resources
This standard refers to number sense, which means students' **understanding of** **fractions** as numbers that lie between whole numbers on a number line. Number sense in fractions also includes moving between decimals and fractions to find equivalents, also being able to use reasoning such as 7/8 is greater than 3/4 because 7/8 is missing only 1/8 and 3/4 is missing 1/4 so 7/8 is closer to a whole. Also, students should use **benchmark fractions** to estimate and examine the reasonableness of their answers. Example, 5/8 is greater than 6/10 because 5/8 is 1/8 larger than ½ (4/8) and 6/10 is only 1/10 larger than 1/2 (5/10). **Example:** Your teacher gave you 1/7 of the bag of candy. She also gave your friend 1/3 of the bag of candy. If you and your friend combined your candy, what fraction of the bag would you have? Estimate your answer and then	www.illustrativemathematics.org www.illuminations.nctm.org

calculate. How reasonable was your estimate? **Student 1:** 1/7 is really close to 0. 1/3 is larger than 1/7, but still less than 1/2. If we put them together we might get close to 1/2. 1/7 + 1/3= 3/21 + 7/21 = 10/21. The fraction does not simplify. I know that 10 is half of 20, so 10/21 is a little less than ½. **Student 2:** 1/7 is close to 1/6 but less than 1/6, and 1/3 is equivalent to 2/6, so I have a little less than 3/6 or ½. **Example:** Jerry was making two different types of cookies. One recipe needed ¾ cup of sugar and the other needed 2/3 cup of sugar. How much sugar did he need to make both recipes? -Mental estimation: A student may say that Jerry needs more than 1 cup of sugar but less than 2 cups. An explanation may compare both fractions to ½ and state that both are larger than ½ so the total must be more than 1. In addition, both fractions are slightly less than 1 so the sum cannot be more than 2. -Area model A student may draw a rectangle to represent the 3/4 and another rectangle to represent the 2/3 and	

partition them into the same size (12ths) regions. -Linear Model A student may draw the problem on two number lines and see that the parts would need to be the same size. -Bar diagram A student may draw two bar diagrams to represent a comparison, then partition both into the same type of segments (12ths) to add the parts together. **Examples:** -Melisa had 2 1/3 candy bars. She promised her brother that she would give him ½ of a candy bar. How much will she have left after she gives her brother the amount she promised? -If Mary ran 3 miles every week for 4 weeks, she would reach her goal for the month. The first day of the first week she ran 1 ¾ miles. How many miles does she still need to run the first week?	

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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