Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

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

Wednesday, October 31, 2012, 11:17AM

Standard/Module: Proficiency in Fractions 5.NF.5 (Week 21, 6 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Connects to 5.NF.3, 5.NF.4, 5.NF.6, and 5.NF.7

5th Grade Map.pdf

Standards

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

5.NF Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

- 5. Interpret multiplication as scaling (resizing), by:
- 5a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- 5b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1.

Enduring Understandings

1. The product of a whole number and a fraction can be interpreted in different ways.
2. A fraction represents an equal part of a whole or a set.
3. Estimation can be done by using compatible numbers or rounding of numbers.
4. Compatible numbers make mental math easier.
5. When working with fractions, compatible numbers are ones in which the denominator of the fraction is a factor of the whole number.
6. The relative size of the factors can be used to determine the relative size of the product.
7. Multiplication does not always mean "bigger."

Essential Questions

1. Why is the product of two fractions smaller than 1 multiplied together smaller than either of the original fractions?
2. Why do we change mixed numbers to improper fractions before multiplying?
3. Why do we use compatible numbers to estimate?
4. How does multiplying by a fraction change the second factor?
5. What does it mean to scale something up or down?
6. Why does multiplying by a number greater than 1 result in a product greater than a starting number?
7. Why does multiplying by a number less than 1 result in a product less than the starting number?
8. Why does multiplying by a fraction equal to 1 result in a product equal to the original number?

Critical Content

Estimation

-rounding

-compatible numbers

Fractions

-equivalence

-simplify

-mixed numbers/improper fractions

Multiplication

-Identity property

-fractions

-mixed numbers

-scale

Skills	Vocabulary
1. Students must be able to multiply two fractions. 2. Students must be able to simplify fractions. 3. Students must be able to multiply mixed numbers. 4. Students must be able to convert mixed numbers to improper fractions. 5. Students must be able to use compatible numbers and rounding to estimate products of fractions and mixed numbers. 6. Students should be able to use multiplication to scale or resize something.	Tier 2- interpret, convert, simplify Tier 3- equivalent, compatible numbers, scaling, resizing

Stage 2: Assessment Evidence

Assessments

Multiplication as Scaling
Formative: Test: Written

Example:

Mrs. Bennett is planting two flower beds. The first flower bed is 5 meters long and 6/5 meters wide. The second flower bed is 5 meters long and 5/6 meters wide. How do the areas of these two flower beds compare? Is the value of the area larger or smaller than 5 square meters? Draw pictures to prove your answer.

Example:

2 2/3 x 8 must be more than 8 because 2 groups of 8 is 16 and 2 2/3

is almost 3 groups of 8. So the answer must be close to, but less than 24.

Stage 3: Learning Plan

Learning Activities	Resources
This standard calls for students to examine the magnitude of products in terms of the relationship between two types of problems. This extends the work with 5.OA.1. **Example 1:** Mrs. Jones teaches in a room that is 60 feet wide and 40 feet long. Mr. Thomas teaches in a room that is half as wide, but has the same length. How do the dimensions and area of Mr. Thomas' classroom compare to Mrs. Jones' room? Draw a picture to prove your answer. **Example 2:** How does the product of 225 x 60 compare to the product of 225 x 30?	www.illustrativemathematics.org www.illuminations.nctm.org

How do you know?

Since 30 is half of 60, the product of 225x 60 will be double or twice as

large as the product of 225 x 30.

5.NF.5b

This standard asks students to examine how numbers change when we multiply by fractions. Students should have ample opportunities to examine both cases in the standard: a) when multiplying by a fraction greater than 1, the number increases and b) when multiplying by a fraction less the one, the number decreases. This standard should be explored and discussed while students are working with 5.NF.4, and **should not** be taught in isolation.

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Differentiation Opportunities

Students may believe that multiplication always results in a larger number.

Using models when multiplying with fractions will enable students to see that the

results will be smaller.

Additionally, students may believe that division always results in a smaller number.

Using models when dividing with fractions will enable students to see that the results

will be larger.

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