Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

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

Wednesday, October 31, 2012, 11:16AM

Standard/Module: Proficiency in Fractions 5.NF.4 (Week 21, 11 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Connects to 5.NF.3, 5.NF.5, 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.

- 4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- 4a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b.
- 4b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Enduring Understandings

1. There are multiple interpretations of addition, subtraction, multiplication, and division of rational numbers and each operation is related to other operations.
2. The product of a whole number and a fraction can be interpreted in different ways.
3. A unit square can be used to show the area meaning of fraction multiplication.
4. A fraction represents an equal part of a whole or a set.
5. The area of a figure is the number of square units inside the figure.

Essential Questions

1. Why do we interpret the product of a whole number and a fraction in different ways?
2. Why is the product of two fractions smaller than 1 multiplied together smaller than either of the original fractions?
3. Why is the product of a fraction and a whole number less than the whole number?
4. How can you find the area of a rectangle?
5. Why are square units used to measure area?
6. How does the area of a square relate to the area of a rectangle?
7. Why do we change mixed numbers to improper fractions before multiplying?

Critical Content

Multiplication of Fractions

-fraction times a whole number

-whole number times a fraction

-fraction times a fraction

-repeated addition

-changing mixed numbers to improper fractions

<u>Simplify fractions</u>

-reduce cross product factors

<u>Rectangles</u>

-a rectangle has a length and width

-A square is a rectangle

-area is found by multiplying the length and the width

Skills	**Vocabulary**
1. Students must be able to multiply a fraction by a whole number. 2. Students must be able to multiply two fractions. 3. Students must be able to simplify fractions. 4. Students must be able to find the area of a rectangle. 5. Students must be able to multiply mixed numbers. 6. Students must be able to convert mixed numbers to improper fractions.	Tier 2- interpret, convert, simplify Tier 3- equivalent, area

Stage 2: Assessment Evidence

<u>Assessments</u>

Multiply and Divide Fractions
Formative: Test: Written

Students solve fraction multiplication and division problems with visual models and equations.

Stage 3: Learning Plan

Learning Activities	**Resources**
Students need to develop a fundamental	

understanding that the multiplication of a fraction by a whole number could be represented as repeated addition of a unit fraction. For example: 2 x (1/4) = 1/4 + 1/4. This standard extends student's work of multiplication from earlier grades. In fourth grade, students worked with recognizing that a fraction such as 3/5 actually could be represented as 3 pieces that are each one-fifth (3 x (1/5)). In fifth grade, students are expected to multiply fractions including proper fractions, improper fractions, and mixed numbers. They multiply fractions efficiently and accurately as well as solve problems in both contextual and non-contextual situations. This standard references both the multiplication of a fraction by a whole number and the multiplication of two fractions. Visual fraction models (area models, tape diagrams, number lines) should be used and created by students during their work with this standard. **It is important that students understand conceptually what they are doing with fraction multiplication, and not just taught an algorithm or set of steps.** As they multiply fractions such as 3/5 x 6, they can think of the operation in more than one way. • 3 x (6 ÷ 5) or (3 x 6/5) • (3 x 6) ÷ 5 or 18 ÷ 5 (18/5) Students create a story problem for 3/5 x 6 such as, • Isabel had 6 feet of wrapping paper. She used 3/5 of the paper to wrap some presents. How much does she have left? • Every day Tim ran 3/5 of mile. How far did he run after 6 days? (Interpreting this as repeated addition 3/5 added together 6 times or 6 x 3/5) **Example (multiplication)**:	www.illustrativemathematics.org www.illuminations.nctm.org

Three-fourths of the class is boys. Two-thirds of the boys are wearing tennis shoes. What fraction of the class are boys with tennis shoes? This question is asking what 2/3 of 3/4 is, or what is 2/3 x 3/4. In this case you have 2/3 groups of size 3/4. (a way to think about it in terms of the language for whole numbers is 4 x 5 you have 4 groups of size 5. **Examples (division):** -An entire season of your favorite TV show on Blue Ray Discs is 9 hours long. If each episode is 1/2 hour, how many episodes are in the season? 9 hours x 2 episodes per hour is 18 episodes. This is an easy way to help students discover the division algorithm: 9 ÷ 1/2 = 18. -A boy scout troop is making a fire during a camping trip. They have 5 large logs (all about the same size) that must each be split into fourths. How many log pieces will they have after they split the logs? 5 logs ÷ 1/4 each = 20 log pieces (5 logs, each split into 4 equal pieces = 5 x 4 = 20 log pieces)	

Differentiation Opportunities

The array model is very transferable from whole number work and then to fractions.

<< Previous Year

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