Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

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

Wednesday, October 31, 2012, 11:19AM

Standard/Module: Proficiency in Fractions 5.NF.7 (Week 21, 6 Weeks)

Stage 1: Desired Results

Standards Focus

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

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.

- 7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
- 7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
- 7b. Interpret division of a whole number by a unit fraction, and compute such quotients.
- 7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Enduring Understandings

1. Multiplication and division have an inverse relationship.
2. When a greater fraction is divided by a smaller fraction, the quotient is greater than 1.
3. When a smaller fraction is divided by a greater fraction, the quotient is less than 1.
4. Information in a problem can often be shown with a diagram and used to solve the problem.
5. Some problems can be solved by writing and completing a number sentence or equation.
6. Drawing a picture can help organize the information in a problem.

Essential Questions

1. What does a fraction represent?
2. How are division and multiplication related?
3. How can you divide by a fraction?
4. How can you find the quotient of mixed numbers?
5. How can we model dividing a unit fraction by a whole number?
6. How can the inverse relationship between multiplication and division allow easier division of unit fractions by whole numbers?
7. How can the information in a problem help us make an accurate drawing and write an algebraic equation to solve it?
8. How does drawing a picture help us solve a problem?

Critical Content

Fractions

-equivalence

-simplify

-multiplication/division

-inverse relationships

-estimation

-algebraic equations

-mixed numbers/improper fractions

Problem Solving

-4 step process:

Understand the problem, Devise a plan, Carry

out your plan, Look back

-reasonableness

Skills	**Vocabulary**
1. Students must be able to divide whole numbers by fractions. 2. Students must be able to simplify fractions. 3. Students must be able to multiply fractions. 4. Students must be able to divide fractions. 5. Students must be able to use visual fraction models and write equations to solve problems. 6. Students must be able to use information in a problem to write an appropriate equation for a given situation. 7. Students must be able to check their answers for reasonableness.	Tier 2-reciprocal, estimation, equivalence Tier 3- inverse, compatible numbers, algebraic equation, reasonableness

Stage 2: Assessment Evidence

Assessments

Dividing fractions
Formative: Test: Written

Students solve problems in which they are asked to show a fraction divided by a whole number and a whole number divided by a fraction using visual models and equations.

Stage 3: Learning Plan

Learning Activities	Resources
5.NF.7 is the first time that students are dividing with fractions. In fourth grade students divided whole numbers, and multiplied a whole number by a fraction. In fifth grade, students experience division problems with whole number divisors and unit fraction dividends (fractions with a numerator of 1) or with unit fraction divisors and whole number dividends. For example, the fraction 3/5 is 3 copies of the *unit fraction* 1/5. 1/5+1/5+1/5=3/5 = 1/5 x 3 or 3 x 1/5 Students extend their understanding of the meaning of fractions, how many unit fractions are in a whole, and their understanding of multiplication and division as involving equal groups or shares and the number of objects in each group/share. In sixth grade, they will use this foundational understanding to divide into and by more complex fractions and develop abstract methods of dividing by fractions. It's important that students *represent* the problems they are solving, have a visual image of the "why" behind the algorithm and can explain their reasoning. **5.NF.7a** This standard asks students to work with story contexts where a *unit fraction* is divided by a non-zero whole number. Students should use various fraction models and reasoning about fractions. **Example:** You have 1/8 of a bag of pens and you need to share them among 3 people. How much of the bag does each person get?	www.illustrativemathematics.org www.illuminations.nctm.org

5.NF.7b This standard calls for students to create story contexts and visual fraction models for division situations where a whole number is being divided by a unit fraction. **Example:** Create a story context for 5 ÷ 1/6. Find your answer and then draw a picture to prove your answer and use multiplication to reason about whether your answer makes sense. How many 1/6's are there in 5? **Example:** Knowing the number of groups/shares and finding how many/much in each group/share. Four students sitting at a table were given 1/3 of a pan of brownies to share. How much of a pan will each student get if they share the pan of brownies equally? A diagram can show the 1/3 pan divided into 4 equal shares with each share equaling 1/12 of the pan. **5.NF.7c** Extends students' work from other standards in 5.NF.7. Students should continue to use visual fraction models and reasoning to solve these real-world problems. **Example:** How many 1/3-cup servings are in 2 cups of raisins?	

Student: I know that there are three 1/3 cup servings in 1 cup of raisins. Therefore, there are 6 servings in 2 cups of raisins. I can also show this since 2 divided by 1/3 = 2 x 3 = 6 servings of raisins. **Example:** Knowing how many in each group/share and finding how many groups/shares Angelo has 4 lbs of peanuts. He wants to give each of his friends 1/5 lb. How many friends can receive 1/5 lb of peanuts? A diagram for 4 ÷ 1/5 can be made. Students explain that since there are five fifths in one whole, there must be 20 fifths in 4 lbs. **Example:** How much rice will each person get if 3 people share 1/2 lb of rice equally? -A student may think or draw ½ and cut it into 3 equal groups then determine that each of those part is 1/6. -A student may think of ½ as equivalent to 3/6. 3/6 divided by 3 is 1/6.	
Differentiation Opportunities	

It’s important that students *represent* the problems they are solving, have a visual image of the "why" behind the algorithm and can explain their reasoning

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Last Updated: Wednesday, October 3, 2012, 4:05PM

Atlas Version 7.2.6
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