Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

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

Wednesday, October 31, 2012, 10:58AM

Standard/Module: Proficiency in Base 10 5.NBT.7(F) (Week 1, 12 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Connects to 5.NBT.5 and 5.NBT.7

5th Grade Map.pdf

Standards

NYS: CCLS:Mathematics, NYS: 5th Grade , Number & Operations in Base Ten

5.NBT Perform operations with multi-digit whole numbers and with decimals to hundredths.

- 7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Enduring Understandings

1. Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways. For some relationships, mathematical expressions and equations can be used to describe how members of one set are related to members of a second set
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 with mentally. Some measurements can be approximated using known referents as the unit in the measurement process.
3. There is more than one algorithm for each of the operation with rational numbers. Most algorithm for operations with rational numbers, both mental math and paper and pencil, use equivalent to transform calculations into simpler ones.
4. Mathematics content and practices can be applied to solve problems.
5. 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 with mentally. Some measurements can be approximated using known referents as the unit in the measurement process.
6. Numbers, expressions, measures, and objects

Essential Questions

1. What are some ways to estimate products with decimals?
2. How can number sense be used to determine the location of decimal points in decimal multiplication calculations?
3. How do you multiply a decimal by a whole number?
4. How can you multiply two decimals?
5. How can you solve a multi-step problem?
6. How can numbers in division calculations be change to other numbers that are easy to compute with mentally?
7. How can you use reasoning to correctly place the decimal point in the quotient?
8. How can you divide a decimal by a whole number?
9. How can you divide a whole number by a decimal?
10. How can you divide a decimal by another decimal?
11. How do you solve multiple-step problems?

can be compared and related to other numbers, expressions, measures, and objects in different ways. 7. There is more than one algorithm for each of the operations with rational numbers. Some strategies for basic facts and most algorithms for operations with rational numbers, both mental math and paper and pencil, use equivalent to transform calculations into simpler ones. 8. Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have to same value. 9. Mathematics content and practices can be applied to solve problems.	

Critical Content

<u>Decimals</u>

-patterns of base 10

-placing decimal point

-rounding/compatible numbers

-algorithm

-basic facts

-place value

<u>Problem Solving</u>

-multi-step

-reasonableness

-hidden questions

<u>Estimation</u>

-compatible numbers

-rounding

-underestimate and overestimate

Skills	Vocabulary
1. Students will use rounding and compatible numbers to estimate products of whole numbers and decimals. 2. Students will identify estimates as overestimates or underestimates. 3. Students will use number sense and place value to multiply decimals. 4. Students will find products of whole numbers and decimals to ten thousandths. 5. Students will use a standard algorithm to multiply a whole number and a decimal. 6. Students will use the standard algorithm to multiply decimals by decimals. 7. Students will find the hidden question(s) to solve multiple-step problems. 8. Student will estimate quotients involving decimals, and to use reasoning to understand how the size of the quotient relates to the dividend and divisor. 9. Students will use reasoning to correctly place the decimal point in a quotient. 10. Students will find quotients where the dividend and/or the quotient is a decimal. 11. Students will divide whole numbers by decimals. 12. Students will find quotients of two decimals. 13. Students will use multiple steps to solve a variety of problem.	Tier 2- rounding, compatible, estimate, reasoning Tier 3- Equivalent fractions, mixed numbers, factors, product, algorithm, underestimate, overestimate, quotient, dividend, divisor

Stage 2: Assessment Evidence

Assessments

Operations with decimals
Formative: Test: Written

Student add, subtract, multiply and divide decimals and use drawings, models, and explanations to justify their strategies and their answers.

Stage 3: Learning Plan

Learning Activities	Resources
This standard builds on the work from fourth grade where students are introduced to decimals and compare them. In fifth grade, students begin adding, subtracting, multiplying and dividing decimals. This work should	www.illustrativemathematics.org www.illuminations.nctm.org

focus on concrete models and pictorial representations, rather than relying solely on the algorithm. The use of symbolic notations involves having students record the answers to computations (2.25 x 3= 6.75), but this work should not be done without models or pictures. This standard includes students' reasoning and explanations of how they use models, pictures, and strategies. This standard requires students to extend the models and strategies they developed for whole numbers in grades 1-4 to decimal values. Before students are asked to give exact answers, they should estimate answers based on their understanding of operations and the value of the numbers. **Examples**: • 3.6 + 1.7 A student might estimate the sum to be larger than 5 because 3.6 is more than 3 ½ and 1.7 is more than 1 ½. • 5.4 – 0.8 A student might estimate the answer to be a little more than 4.4 because a number less than 1 is being subtracted. • 6 x 2.4 A student might estimate an answer between 12 and 18 since 6 x 2 is 12 and 6 x 3 is 18. Another student might give an estimate of a little less than 15 because s/he figures the answer to be very close, but smaller than 6 x 2 ½ and think of 2 ½	

groups of 6 as 12 (2 groups of 6) + 3 (½ of a group of 6). Students should be able to express that when they add decimals they add tenths to tenths and hundredths to hundredths. So, when they are adding in a vertical format (numbers beneath each other), it is important that they write numbers with the same place value beneath each other. This understanding can be reinforced by connecting addition of decimals to their understanding of addition of fractions. Adding fractions with denominators of 10 and 100 is a standard in fourth grade. **Example:** 4 - 0.3 3 tenths subtracted from 4 wholes. The 4 wholes must be divided into tenths. **Example:** An area model can be useful for illustrating products. Students should be able to **describe** the partial products displayed by the area model. For example, 3/10 times 4/10 is 12/100. 3/10 times 2 is 6/10 or 60/100. 1 group of 4/10 is 4/10 or 40/100. 1 group of 2 is 2.	

Example: for division: find the number in each group or share. Students should be encouraged to apply a fair sharing model separating decimal values into equal parts <u>*Example of division:*</u> find the number of groups Joe has 1.6 meters of rope. He has to cut pieces of rope that are 0.2 meters long. How many can he cut? To divide to find the number of groups, a student might: -draw a segment to represent 1.6 meters. In doing so, s/he would count in tenths to identify the 6 tenths, and be able identify the number of 2 tenths within the 6 tenths. The student can then extend the idea of counting by tenths to divide the one meter into tenths and determine that there are 5 more groups of 2 tenths. -count groups of 2 tenths without the use of models or diagrams. Knowing that 1 can be thought of as 10/10, a student might think of 1.6 as 16 tenths. Counting 2 tenths, 4 tenths, 6 tenths, . . .16 tenths, a student can count 8 groups of 2 tenths. -use their understanding of multiplication and think, —8 groups of 2 is 16, so 8 groups of 2/10 is 16/10 or 1 6/10.‖	

Differentiation Opportunities

Students might compute the sum or difference of decimals by lining up the right-hand digits as they would whole number. For example, in computing the sum of 15.34 + 12.9, students will write the problem in this manner:

```
   15.34
+   12.9
   16.63
```

To help students add and subtract decimals correctly, have them **first estimate** the sum or difference. Providing students with a decimal-place value chart will enable them to place the digits in the proper place.

<< Previous Year

Last Updated: Thursday, October 25, 2012, 1:13PM

Atlas Version 7.2.6
© Rubicon International 2012. All rights reserved