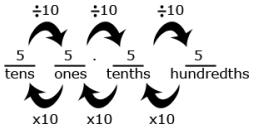
<table>
<tr><td>Grade: 5

Unit 2 – Measurement and Data Collection With Addition and Subtraction Using Decimals</td><td colspan="2">Subject: Math
Time Frame: 20 days
Domains: Numbers and Base Ten & Measurement and Data</td></tr>
<tr><td>Standards</td><td>Content Standards:
5.NBT.1, 5.NBT.3, 5.NBT.3a, 5.NBT.3b, 5.NBT.7, 5.MD.1
http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf</td><td>Practice Standards:
MP 1, 2, 3, 4, 5, 6, 7, 8</td></tr>
<tr><td>Enduring Understandings</td><td colspan="2">1. Understand decimals as equal division of a whole.
2. Read, write, and model whole and decimal numbers.
3. Model adding and subtracting decimals.
4. Add whole numbers and decimals to hundredths.
5. Subtract whole and decimal numbers to hundredths.
6. Use the Commutative, Associative, and Distributive Properties to compute mentally.
7. Estimate decimal sums and differences.
8. Use the Common Core Content Standards and Practices in a variety of real world problem solving situations.</td></tr>
<tr><td>Essential Questions</td><td colspan="2">1. What is division with decimals?
2. How does a digit’s position affect its value?
3. How can we model adding and subtracting decimals?
3. How do we round decimals?
4. How do we compare decimals?
5. What patterns occur in our number system?</td></tr>
</table>

Vocabulary	place value, place value names (ones, tens, hundreds, tenths, hundredths, etc), digit

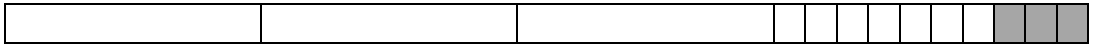
Priority and Supporting CCSS	Explanations and Examples*
5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	**5.NBT.1** In fourth grade, students examined the relationships of the digits in numbers for whole numbers only. This standard extends this understanding to the relationship of decimal fractions. Students use base ten blocks, pictures of base ten blocks, and interactive images of base ten blocks to manipulate and investigate the place value relationships. They use their understanding of unit fractions to compare decimal places and fractional language to describe those comparisons. Before considering the relationship of decimal fractions, students express their understanding that in multi-digit whole numbers, a digit in one place represents 10 times what it represents in the place to its right and 1/10 of what it represents in the place to its left. A student thinks, "I know that in the number 5555, the 5 in the tens place (5555) represents 50 and the 5 in the hundreds place (5555) represents 500. So a 5 in the hundreds place is ten times as much as a 5 in the tens place or a 5 in the tens place is 1/10 of the value of a 5 in the hundreds place. To extend this understanding of place value to their work with decimals, students use a model of one unit; they cut it into 10 equal pieces, shade in, or describe 1/10 of that model using fractional language ("This is 1 out of 10 equal parts. So it is 1/10". I can write this using 1/10 or 0.1"). They repeat the process by finding 1/10 of a 1/10 (e.g., dividing 1/10 into 10 equal parts to arrive at 1/100 or 0.01) and can explain their reasoning, "0.01 is 1/10 of 1/10 thus is 1/100 of the whole unit." In the number 55.55, each digit is 5, but the value of the digits is different because of the placement. For 5<u>5</u>.55, the underlined 5 is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the ones place is 1/10 of 50 and 10 times five tenths.

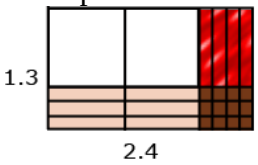
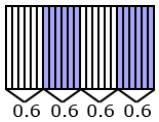
*Source – Connecticut Core Standards for Mathematics as adapted from the Arizona Academic Content Standards

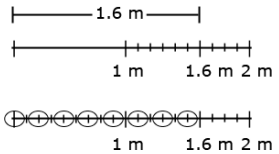
	For 55.55, the underlined 5 is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the tenths place is 10 times five hundredths. 

Priority and Supporting CCSS	Explanations and Examples*
5.NBT.3 Read, write, and compare decimals to thousandths. **a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form*, e.g., 347.392 = 3 × 100 + 4 ×10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).*** **b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.**	**5.NBT.3** Students build on the understanding they developed in fourth grade to read, write, and compare decimals to thousandths. They connect their prior experiences with using decimal notation for fractions and addition of fractions with denominators of 10 and 100. They use concrete models and number lines to extend this understanding to decimals to the thousandths. Models may include base ten blocks, place value charts, grids, pictures, drawings, manipulatives, technology-based, etc. They read decimals using fractional language and write decimals in fractional form, as well as in expanded notation as show in the standard 3a. This investigation leads them to understanding equivalence of decimals (0.8 = 0.80 = 0.800). **Example**: Some equivalent forms of 0.72 are: 72/100 70/100 + 2/100 7/10 + 2/100 0.720 7 × (1/10) + 2 × (1/100) 7 × (1/10) + 2 × (1/100) + 0 × (1/1000) 0.70 + 0.02 720/1000

	Students need to understand the size of decimal numbers and relate them to common benchmarks such as 0, 0.5 (0.50 and 0.500), and 1. Comparing tenths to tenths, hundredths to hundredths, and thousandths to thousandths is simplified if students use their understanding of fractions to compare decimals. **Example**: Comparing 0.25 and 0.17, a student might think, "25 hundredths is more than 17 hundredths". They may also think that it is 8 hundredths more. They may write this comparison as $0.25 > 0.17$ and recognize that $0.17 < 0.25$ is another way to express this comparison. Comparing 0.207 to 0.26, a student might think, "Both numbers have 2 tenths, so I need to compare the hundredths. The second number has 6 hundredths and the first number has no hundredths so the second number must be larger. Another student might think while writing fractions, "I know that 0.207 is 207 thousandths (and may write 207/1000). 0.26 is 26 hundredths (and may write 26/100) but I can also think of it as 260 thousandths (260/1000). So, 260 thousandths is more than 207 thousandths.

Priority and Supporting CCSS	Explanations and Examples*
5.NBT.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.	**5.NBT.7** 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 wholes must be divided into tenths.  The answer is 3 and 7/10 or 3.7.

	Example: An area model can be useful for illustrating products.  2.4 x 1.3 .12 .60 .40 + 2.00 3.12 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 of division: finding the number in each group or share • Students should be encouraged to apply a fair sharing model separating decimal values into equal parts such as 

	Example of division: 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." Technology Connections: Create models using Interactive Whiteboard software (such as SMART Notebook)

Priority and Supporting CCSS	Explanations and Examples*
5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	**5.MD.1.** In fifth grade, students build on their prior knowledge of related measurement units to determine equivalent measurements. Prior to making actual conversions, they examine the units to be converted, determine if the converted amount will be more or less units than the original unit, and explain their reasoning. They use several strategies to convert measurements.

Resources
Math Expressions – Unit 2, Lessons 1-10 Soar to Success Math Intervention Mega Math Destination Math Common Core Mathematics-Newmark Learning- Units-1 Xtramath.org Connecticut State Department of Education http://www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=320872

Unit Assessments
Unit Test Formative Assessments Quick Quizzes Performance Task **Alternate Assessments from other sources:** **http://3-5cctask.ncdpi.wikispaces.net/5.MD.1,** **http://3-5cctask.ncdpi.wikispaces.net/5.NBT.1-5.NBT4** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.NBT.1** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.NBT.3** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.NBT.5** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.MD.1**

Technology: Videos, Websites, Links
www.learnzillion.com https://grade5commoncoremath.wikispaces.hcpss.org/5.NBT.1 https://grade5commoncoremath.wikispaces.hcpss.org/5.NBT.3 https://grade5commoncoremath.wikispaces.hcpss.org/5.NBT.7 https://grade5commoncoremath.wikispaces.hcpss.org/5.MD.1