July 9, 2013

Common Core State Standards for Mathematics
SAU 16 Grade 5 Quarterly Guidelines
July 9, 2013

QUARTER 1

Unit 1: Place Value of Decimals
Unit 2: Addition and subtraction of Decimals
Unit 3: Using and Applying Multiplication with Whole Numbers and Decimals

QUARTER 2

Unit 4: Dividing Whole Numbers and Decimals
Unit 5: Problem Solving with Whole Numbers and Decimals
Unit 6: Classifying 2-Dimensional Figures
Unit 7: Understanding Volume

QUARTER 3

Unit 8: Relating Volume to Multiplication and Addition
Unit 9: Using Ordered Pairs
Unit 10: Seeing Fractions as Division
Unit 11: Strategies for Addition and Subtraction of Fractions with Unlike Denominators

QUARTER 4

Unit 12: Multiplying Fractions
Unit 13: Dividing Fractions
Unit 14: Problem-Solving with Fractions
Unit 15: Representing and Interpreting Data with Fractions

QUARTER 1

UNIT 1: PLACE VALUE OF DECIMALS
STANDARDS FOR MATHEMATICAL CONTENT: **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.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. **5.NBT.3.a.b** 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 X 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (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.4** Use place value understanding to round decimals to any place.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #6 – Attend to precision. Practice #7 – Look for and make use of structure.
SUGGESTED DAYS 12 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 2.5 – Estimate Reaction Time GAME – High Number Toss – Decimal Version 5.5 – Journal p. 139 & 140, plus SL 5.5 GAME – Estimation Squeeze GAME – Number Top-It (3-Place Decimals) 7.1 – Exponential Notation 7.2 – Exponential Notation and Powers of 10 7.3 – Scientific Notation

UNIT 2: ADDITION AND SUBTRACTION OF DECIMALS
STANDARDS FOR MATHEMATICAL CONTENT: **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.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #1 – Make sense of problems and persevere in solving them. Practice #2 – Reason abstractly and quantitatively.
SUGGESTED DAYS 14 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 2.2 – Addition of Whole Numbers and Decimals GAME – Addition Top-It (decimal version) 2.3 – Subtraction of Whole Numbers and Decimals GAME – Subtraction Target Practice (decimal version) 2.4 – Addition and Subtraction Number Stories 7.4 – Parenthesis in Number Sentences 7.5 – Order of Operations Algorithm Project #2 Algorithm Project #4

UNIT 3: USING AND APPLYING MULTIPLICATION WITH WHOLE NUMBERS AND DECIMALS
STANDARDS FOR MATHEMATICAL CONTENT: **5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm. **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.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.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #1 – Make sense of problems and persevere in solving them. Practice #2 – Reason abstractly and quantitatively.
SUGGESTED DAYS 14 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 2.8 – Multiplication of Whole Numbers and Decimals 2.10 – Comparing Millions, Billions, and Trillions Algorithm Project 5 Algorithm Project 6

QUARTER 2

UNIT 4: DIVIDING WHOLE NUMBERS AND DECIMALS
STANDARDS FOR MATHEMATICAL CONTENT: **5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **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.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.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice # 1 – Make sense of problems and persevere in solving them. Practice # 8 – Look for and express regularity in repeated reasoning.
SUGGESTED DAYS 12 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 4.5 – Division of Decimal Numbers 4.6 – Interpreting the Remainder 4.7 – Skills Review – First to 100 – Journal p. 115 only Algorithm Project 7 Algorithm Project 8 Algorithm Project 9

UNIT 5: PROBLEM SOLVING WITH DECIMALS AND WHOLE NUMBERS
STANDARDS FOR MATHEMATICAL CONTENT: **5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* **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.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice # 2 – Reason abstractly and quantitatively Practice # 5 – Use appropriate tools strategically
SUGGESTED DAYS 10 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: Need to supplement

UNIT 6: CLASSIFYING TWO-DIMENSIONAL FIGURES
STANDARDS FOR MATHEMATICAL CONTENT: **5.G.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.* **5.G.4** Classify two-dimensional figures in a hierarchy based on properties.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #3 – Construct viable arguments and critique the reasoning of others. Practice #6 – Attend to precision.
SUGGESTED DAYS 10 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 3.3 – Exploring Angle Measures 3.4 – Using a Protractor 3.5 – Using a Compass 3.6 – Congruent Triangles 3.7 – Properties of Polygons 3.8 – Tessellations GAME – Angle Tangle 3.9 – Angles of Polygons (optional)

UNIT 7: UNDERSTANDING VOLUME

STANDARDS FOR MATHEMATICAL CONTENT:

5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.

b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.

5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice #4 – Model with mathematics.

Practice #6 – Attend to precision.

SUGGESTED DAYS
14 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
9.8 Volume of Rectangular Prisms
9.9 – Volume of Right Prisms
9.10 – Capacity: Liter, Milliliter, and Cubic Centimeter
11.1 – Review of Geometric Solids – Part 1

QUARTER 3

UNIT 8: RELATING VOLUME TO MULTIPLICATION AND ADDITION
STANDARDS FOR MATHEMATICAL CONTENT: **5.MD.5.a.b.c** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas *V = l x w x h* and *V = b x h* for rectangular prisms to find volumes of right rectangular prisms with whole--number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #4 – Model with mathematics. Practice #8 – Look for and express regularity in repeated reasoning.
SUGGESTED DAYS 7 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: Project 9

UNIT 9: USING ORDERED PAIRS

STANDARDS FOR MATHEMATICAL CONTENT:

5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., ***x-axis*** and ***x-coordinate, y-axis*** and ***y-coordinate).***

5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice # 2 – Reason abstractly and quantitatively.

Practice # 7 – Look for and make use of structure.

SUGGESTED DAYS
11 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
9.1 – Hidden Treasure: A Coordinate Game
9.2 – Coordinate Graphs: Part 1
9.3 – Coordinate Graphs: Part 2
10.3 – Algebraic Expressions
10.4 – Rules, Tables, and Graphs: Part 1
10.6 – Rules, Tables, and Graphs: Part 2

UNIT 10: SEEING FRACTIONS AS DIVISION
STANDARDS FOR MATHEMATICAL CONTENT: **5.NF.3** Interpret a fraction as division of the numerator by the denominator *(a/b = a ÷ b).* Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50---pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice #1 – Make sense of problems and persevere in solving them. Practice #6 – Attend to precision.
SUGGESTED DAYS 5 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 5.1 – Fraction Review GAME – Fraction Top-It 5.2 – Mixed Numbers (more than 1 day)

UNIT 11: STRATEGIES FOR ADDITION AND SUBTRACTION OF FRACTIONS WITH UNLIKE DENOMINATORS

STANDARDS FOR MATHEMATICAL CONTENT:

5NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. In general, a/b + c/d = (ad + bc)/bd.*

5NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice #3 - Construct viable arguments and critique the reasoning of others.

Practice #4 - Model with mathematics.

SUGGESTED DAYS
12 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
5.3 – Comparing and Ordering Fractions (more than 1 day)
GAME – Fraction Top-It
5.4 – Two Rules for Finding Equivalent Fractions
5.5 – Fractions & Decimals: Part 1 – Journal p. 137 and 138 only
5.6 – Fractions & Decimals: Part 2
6.8 – Using Benchmarks with Fraction Addition and Subtraction
6.9 – Clock Fractions and Common Denominators
6.10 – Quick Common Denominators
8.1 – Review: Comparing Fractions
8.2 – Adding Mixed Numbers
8.3 – Subtracting Mixed Numbers
GAME – Mixed Number Spin

UNIT 12: MULTIPLYING FRACTIONS

STANDARDS FOR MATHEMATICAL CONTENT:

5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

a. Interpret the product *(a/b) x q* as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations *a x q ÷ b. For example, use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15.* In *general, (a/b) x (c/d) = ac/bd.*

b. 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.

5.NF.5 Interpret multiplication as scaling (resizing), by:
a. 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.

b. 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 = (nxa)/(nxb)* to the effect of multiplying *a/b* by 1.

5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice # 1 – Make sense of problems and persevere in solving them.

Practice # 6 – Attend to precision.

SUGGESTED DAYS
12 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
8.5 – Fractions of Fractions
GAME – Fraction Spin
8.6 – An Area Model for Fraction Multiplication
8.7 – Multiplication of Fractions and Whole Numbers
8.8 – Multiplication of Mixed Numbers

QUARTER 4

UNIT 13: DIVIDING FRACTIONS

STANDARDS FOR MATHEMATICAL CONTENT:

5.NF.7.a.b.c Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*

b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*

c. 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. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice # 1 – Make sense of problems and persevere in solving them.

Practice # 2 – Reason abstractly and quantitatively.

SUGGESTED DAYS
10 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
8.12 – Fraction Division

UNIT 14: PROBLEM SOLVING WITH FRACTIONS

STANDARDS FOR MATHEMATICAL CONTENT:

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NF.7.c Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

c. 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. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3---cup servings are in 2 cups of raisins?*

Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. **But division of a fraction by a fraction is not a requirement at this grade.**

CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES:

Practice # 3 – Construct viable arguments and critique the reasoning of others.

Practice # 5 – Use appropriate tools strategically.

SUGGESTED DAYS
13 DAYS

GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS:
Need to supplement

UNIT 15: REPRESENTING AND INTERPRETING DATA WITH FRACTIONS
STANDARDS FOR MATHEMATICAL CONTENT: **5MD.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*
CONSIDER HIGHLIGHTING THE FOLLOWING MATHEMATICAL PRACTICES: Practice # 3 – Construct viable arguments and critique the reasoning of others. Practice # 4 – Model with mathematics.
SUGGESTED DAYS 7 DAYS
GENERAL ALIGNMENT WITH EVERYDAY MATHEMATICS: 2.5 – Estimate Your Reaction Time 6.1 – Organizing Data 7.10 – Line Plots