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| **Gwinnett County Public Schools Mathematics: Fifth Grade – Instructional Calendar 2013-2014 (1st Semester)** | | | |
| **Standards for Mathematical Practice #s 1-8 taught throughout all units.** | | | |
| 1st Quarter | | | 2nd Quarter |
| GCPS Unit 1 (GA Unit 1) | GCPS Unit 2 (GA Unit 2) | GCPS Unit 3 (GA Unit 3) | GCPS Unit 4 (GA Unit 4) |
| **Whole Numbers** | **Decimals** | **Decimals, Multiply & Divide** | **Fractions, Part 1** |
| 1.OA.1 use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols  2.OA.2 write simple expressions that record calculations with numbers and interpret numerical expressions without evaluating them (e.g., express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7)) and recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product  9.NBT.5 multiply multi-digit whole numbers fluently using the standard algorithm  10.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 | 4.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  6.NBT.3\_a. read, write, order, and compare place value of 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))  7.NBT.3\_b. compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons  8.NBT.4 round decimals to any place using tools such as a number line and/or charts  12.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.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  12.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 \*\* | 13.NF.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 (e.g., 2/3 + 5/4 = 8/12 + 15/12 = 23/12)  14.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 (e.g., recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2)  16.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 fractions models or equations to represent the problem. (e.g., 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?  18.NF.4 apply and extend previous understanding of multiplication to multiply a fraction by a whole number  19.NF.4\_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 (e.g., 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)  20.NF.4\_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  21.NF.5 relate the principle of fraction equivalence, a/b = (n x a)/(n x b), to the effect of multiplying a/b by 1  22.NF.5\_a. interpret multiplication as scaling by comparing the size of the product to the sizes of the factors without multiplying  23.NF.5\_b. explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and why multiplying a given number by a fraction less than 1 results in a product smaller than the given number  24.NF.6 solve real world problems involving multiplication of fractions and mixed numbers by using visual fraction models or equations to represent the problem |

G—Geometry, MD—Measurement and Data, NBT—Number and Operations in Base Ten, NF—Number and Operations Fractions, OA—Operations and Algebraic Thinking \*\*AKS 12 is taught in Unit 2 & 3

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| **Gwinnett County Public Schools Mathematics: Fifth Grade – Instructional Calendar 2013-2014 (2nd Semester)** | | | |
| **Standards for Mathematical Practice #s 1-8 taught throughout all units.** | | | |
| 3rd Quarter | | | 4th Quarter |
| GCPS Unit 4 (GA Unit 4) | GCPS Unit 5 (GA Unit 5) | Unit 6 GA (Unit 6) | GCPS Unit 7 (GA Unit 7) |
| **Fractions, Part 2** | **Geometry and Coordinate Plane** | **2D Figures** | **Volume and Measurement** |
| 25.NF.7\_a. interpret division of a unit fraction by a non-zero whole number and compute such quotients (e.g., 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) x 4 = 1/3) *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.*  26.NF.7\_b. interpret division of a whole number by a unit fraction and compute such quotients (e.g., 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 x (1/5) = 4)  27.NF.7\_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?) | 37.G.1 create, label, and use a coordinate grid system  38.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  3.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 (e.g., 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) | 39.G.3 demonstrate that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category (e.g., all rectangles have four right angles and squares are rectangles so all squares have four right angles)  40.G.4 classify two-dimensional figures in a hierarchy based on properties | 28.MD.1 convert among different-sized measurement units within a given measurement system and use these conversions in solving multi-step, real world problems (e.g., convert 5 cm to 0.05 m, 3 ft to 36 in, 120 minutes to 2 hours)  29.MD.2 make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8) and solve problems using the line plot data  30.MD.3\_a. use words, pictures, or numbers to show a cubic unit is represented by a cube in which each edge has a length of one unit  31.MD.3\_b. apply concepts of volume measurement to explain volume as an attribute of solid figures packed without gaps or overlaps using "n" unit cubes  32.MD.4 measure volume as cubic centimeters, cubic meters, cubic inches, cubic feet, and cubic yards  33.MD.5 relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume  34.MD.5\_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  35.MD.5\_b. estimate, derive and apply the formula(V= l x w x h and V= b x h) for the volume of a cube and a right rectangular prism using manipulatives and relate volume to the operations of multiplication and addition to solve real world and mathematical problems  36.MD.5\_c. recognize and calculate volume as additive when 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  **Unit 8: Preview—Number System .** |

G—Geometry, MD—Measurement and Data, NBT—Number and Operations in Base Ten, NF—Number and Operations Fractions, OA—Operations and Algebraic Thinking

**Standards for Mathematical Practice - Fifth Grade Specific**

*Mathematical Practices are listed with each grade’s mathematical content standards to reflect the need to connect the mathematical practices to mathematical content in instruction.*

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy). ***Students are expected to:***

**1. Make sense of problems and persevere in solving them.**

Students solve problems by applying their understanding of operations with whole numbers, decimals, and fractions including mixed numbers. They solve problems related to volume and measurement conversions. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve the problem?”, “Does this make sense?”, and “Can I solve the problem in a different way?”

**2. Reason abstractly and quantitatively.**

Fifth graders should recognize that a number represents a specific quantity. They connect quantities to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities. They extend this understanding from whole numbers to their work with fractions and decimals. Students write simple expressions that record calculations with numbers and represent or round numbers using place value concepts.

**3. Construct viable arguments and critique the reasoning of others.**

In fifth grade, students may construct arguments using concrete referents, such as objects, pictures, and drawings. They explain calculations based upon models and properties of operations and rules that generate patterns. They demonstrate and explain the relationship between volume and multiplication. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like “How did you get that?” and “Why is that true?” They explain their thinking to others and respond to others’ thinking.

**4. Model with mathematics.**

Students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Fifth graders should evaluate their results in the context of the situation and whether the results make sense. They also evaluate the utility of models to determine which models are most useful and efficient to solve problems.

**5. Use appropriate tools strategically.**

Fifth graders consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use unit cubes to fill a rectangular prism and then use a ruler to measure the dimensions. They use graph paper to accurately create graphs and solve problems or make predictions from real world data.

**6. Attend to precision.**

Students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to expressions, fractions, geometric figures, and coordinate grids. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the volume of a rectangular prism they record their answers in cubic units.

**7. Look for and make use of structure.**

In fifth grade, students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to add, subtract, multiply and divide with whole numbers, fractions, and decimals. They examine numerical patterns and relate them to a rule or a graphical representation.

**8. Look for and express regularity in repeated reasoning.**

Fifth graders use repeated reasoning to understand algorithms and make generalizations about patterns. Students connect place value and their prior work with operations to understand algorithms to fluently multiply multi-digit numbers and perform all operations with decimals to hundredths. Students explore operations with fractions with visual models and begin to formulate generalizations.