

# Gwinnett County Public Schools Mathematics: Grade 5 CCGPS – At A Glance 2014-2015

## Standards for Mathematical Practice

- 1 Make sense of problems and persevere in solving them.
- 2 Reason abstractly and quantitatively.
- 3 Construct viable arguments and critique the reasoning of others.

- 4 Model with mathematics.
- 5 Use appropriate tools strategically.
- 6 Attend to precision.

- 7 Look for and make use of structure.
- 8 Look for and express regularity in repeated reasoning.

### 1<sup>st</sup> 9 weeks: Units 1-3

#### Unit 1: Whole Numbers

##### Write and interpret numerical expressions.

- **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  $2 \times (8 + 7)$ ) and recognize that  $3 \times (18932 + 921)$  is three times as large as  $18932 + 921$ , without having to calculate the indicated sum or product

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

- **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

#### Unit 2: Decimals

##### Understand the place value system.

- **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.,  $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$ )
- **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

#### Unit 3: Decimals, Multiply & Divide

##### Understand the place value system.

- **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 \*\*

### 2<sup>nd</sup> 9 weeks: Units 3-4

#### Unit 4: Fractions, part 1

##### Use equivalent fractions as a strategy to add and subtract fractions.

- **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
- **15.NF.2** solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators

##### Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

- **16.NF.3** interpret a fraction as division of the numerator by the denominator ( $a/b = a \div b$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers
- **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  $(a/b) \times q$  as a parts of a partition of  $q$  into  $b$  equal parts; equivalently, as the result of a sequence of operations  $a \times q/b$
- **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,  $a/b = (n \times a)/(n \times b)$ , 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

**Unit 4 Part 2: Fractions**

**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**

- **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  $(1/3) \div 4$  and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $(1/3) \div 4 = 1/12$  because  $(1/12) \times 4 = 1/3$ )
- **26. NF.7\_b.** interpret division of a whole number by a unit fraction and compute such quotients
- **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.

**Unit 5: Geometry and Coordinate Plane**

**Graph points on the coordinate plane to solve real-world and mathematical problems.**

- **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

**Analyze patterns and relationships.**

- **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

**Unit 6: 2D Figures**

**Classify two-dimensional figures into categories based on their properties**

- **39.G.3** demonstrate that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category
- **40.G.4** classify two-dimensional figures in a hierarchy based on properties

**Unit 7: Volume and Measurement**

**Convert like measurement units within a given measurement system.**

- **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)

**Represent and interpret data.**

- **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

**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**

- **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 ( $V = l \times w \times h$  and  $V = b \times h$ ) 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