Gwinnett County Public Schools Mathematics: Seventh Grade Accelerated – Instructional Calendar 2013-2014 (1st Semester)		
Standards for Mathematical Practice #s 1- 8 taught throughout all units.		
1st Quarter		
GCPS Unit 1 (GA Unit 1)	GCPS Unit 2 (GA Unit 2)	GCPS Unit 3 (GA Unit 3)
Inferences	**Geometry**	**Probability**
48.SP.1 understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences 49.SP.2 generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. Draw inferences from a random sample about a population with an unknown characteristic of interest. Compare and contrast multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions (e.g., estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be) 52.SP.3 compare and contrast the degree of visual overlap of two numerical data distributions with similar variabilities, informally measuring the difference between the centers by expressing it as a multiple of a measure of variability (mean absolute deviation) (e.g., the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable) 53.SP.4 use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations (e.g., decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book)	28.G.2 comstruct (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions; focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle 29.G.3 describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids 30.G.4 know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle 33.G.5 write and solve equations for an unknown angle in a figure using facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem 34.G.6 solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms	54.SP.5 understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event 55.SP.6 explain how experimental probability approaches theoretical probability when the number of trials is large (e.g., when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times) 56.SP.7 conduct trials/simulations and analyze the relationship between experimental and theoretical probability. Compare probabilities from a model to observed frequencies and explain possible sources of discrepancy, if present. 58.SP.7a develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events (e.g., if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected) 59.SP.7b develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process (e.g., find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?) 60.SP.8 determine the probability of compound simple events using organized lists, tables, tree diagrams, and simulation 61.SP.8a explain that a compound event is the fraction of outcomes in the sample space for which the compound event occurs 62.SP.8b represent sample spaces using tree diagrams, lists, simulations, and tables to identify the outcomes in the sample space which compose the event; for an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event 63.SP.8c design and use simulation to generate frequencies for compound events (e.g., use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?)

NS—Number System, RP—Ratio and Proportional Relationships, EE—Expressions and Equations, G—Geometry, SP—Statistics and Probability

Gwinnett County Public Schools Mathematics: Seventh Grade Accelerated – Instructional Calendar 2013-2014 (1st Semester)	
Standards for Mathematical Practice #s 1- 8 taught throughout all units.	
2nd Quarter	
GCPS Unit 4 (GA Unit 4) **AKS in this unit are from MCC8**	GCPS Unit 5 (GA Unit 5) **AKS in this unit are from MCC8**
Transformations	**Exponents**
36.G.1 verify experimentally the properties of rotations, reflections, and translations: (lines are taken to lines, and line segments to line segments of the same length; angles are taken to angles of the same measure; parallel lines are taken to parallel lines) 37.G.2 understand that a two-dimensional figure as congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations describe a sequence of transformations, that when given, proves congruences between two figures 39.G.3 describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates 40.G.4 understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations and dilations; describe a sequence of transformations, that when given, proves similarity between two figures 42.G.5 use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. (e.g., arrange three copies of the same triangle so that the three angles appear to form a line, and give an argument in terms of transversals why this is so)	3.EE.1 apply and know the properties of integer exponents to generate equivalent numerical expressions (e.g., $3^2 \times 3^{-5} = 3^3 = 1/3^3 = 1/27$) 4.EE.2 use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational 5.EE.3 express and use numbers in scientific notation to estimate very large or very small numbers; compare numbers in scientific notation and determine how many times greater one value is than the other (e.g., estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger) 7.EE.4 perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Interpret and use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading) (Interpret scientific notation that has been generated by technology) 13.EE.7 solve linear equations in one variable 14.EE.7a give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions; show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equation in the form x = a, a = a, or a = b results (where a and b are different numbers)) 14.EE.7b solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms 1.NS.1 know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number 2.NS.2 use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2) (e.g., by truncating the decimal expansion of √2 (square root of 2), show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations)

NS—Number System, RP—Ratio and Proportional Relationships, EE—Expressions and Equations, G—Geometry, SP—Statistics and Probability

Gwinnett County Public Schools Mathematics: Seventh Grade Accelerated – Instructional Calendar 2013-2014 (2nd Semester)		
Standards for Mathematical Practice #s 1- 8 taught throughout all units.		
3rd Quarter-**AKS in these units are from MCC8**		4th Quarter
GCPS Unit 6 (GA Unit 6)	GCPS Units 7 and 8 (GA Units 7 and 8)	GCPS Units 9 and 10 (GA Units 9 and 10) **AKS in this unit are from MCC8**
Exponents in Geometry	**Functions and Linear Functions**	**Linear Models and Tables, Solving Systems of Equations and Review/Preview**
44.G.6 explain a proof of the Pythagorean Theorem, and its converse 45.G.7 apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions 46.G.8 explain and apply the distance formula as an application of the Pythagorean Theorem 47.G.9 solve real-world and mathematical problems involving the volume of cylinders, cones, and spheres	**Unit 7: Functions** 19.F.1 understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. 20.F.1 Describe functions in a variety of representations, including the graph of a function that is the set of ordered pairs consisting of an input and the corresponding output. 21.F.2 compare properties of two functions each represented among verbal, tabular, graphic and algebraic representations of functions (e.g., given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change) **Unit 8: Linear Functions** 9.EE.5 graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented as verbal, tabular, graphic and algebraic representations of functions (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed) 11.EE.6 determine the meaning of slope by using similar right triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; 12.EE6a. derive and graph linear equations in slope intercept form y = mx + b 22.F.3 interpret the equation y = mx + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear (e.g., the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line)	**Unit 9: Linear Models** 23.F.4 construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values 25.F.5 describe qualitatively the functional relationship between two quantities by analyzing a graph.(e.g., where the function is increasing or decreasing, linear or nonlinear) Sketch a graph that exhibits the qualitative features of a function that has been described vertically. 64.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association 67.SP.2 know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line 68.SP.3 apply the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting slope and intercept (e.g., in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height) 69.SP.4 recognize that patterns of association can be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables (e.g., collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?) **Unit 10: Solving Systems of Equations** 15.EE.8 analyze and solve pairs of simultaneous linear equations 16.EE.8a understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously 17.EE.8b solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations; solve simple cases by inspection (e.g., $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6) 18.EE.8c solve real world mathematical problems leading to two linear equations in two variables (e.g., given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair) **Unit 11: Review/Preview** 27.F.PRE simplify, add, subtract, multiply, and divide radical expressions to include rationalizing denominators

NS—Number System, RP—Ratio and Proportional Relationships, EE—Expressions and Equations, G—Geometry, SP—Statistics and Probability

Mathematics | Standards for Mathematical Practice

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.
In grade 7, students solve problems involving ratios and rates and discuss how they solved them. Students solve real world problems through the application of algebraic and geometric concepts. 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.
In grade 7, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

3 Construct viable arguments and critique the reasoning of others.
In grade 7, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like "How did you get that?", "Why is that true?" "Does that always work?". They explain their thinking to others and respond to others' thinking.

4 Model with mathematics.
In grade 7, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students explore covariance and represent two quantities simultaneously. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions. Students use experiments or simulations to generate data sets and create probability models. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.

5 Use appropriate tools strategically.
Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 7 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Students might use physical objects or applets to generate probability data and use graphing calculators or spreadsheets to manage and represent data in different forms.

6 Attend to precision.
In grade 7, 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 define variables, specify units of measure, and label axes accurately. Students use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities.

7 Look for and make use of structure.
Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph. Students apply properties to generate equivalent expressions (i.e. $6 + 3x = 3 (2 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$, $2c = 12$ by subtraction property of equality), $c=6$ by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume. Students examine tree diagrams or systematic lists to determine the sample space for compound events and verify that they have listed all possibilities.

8 Look for and express regularity in repeated reasoning.
In grade 7, students use repeated reasoning to understand algorithms and make generalizations about patterns.
During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. They extend their thinking to include complex fractions and rational numbers. Students formally begin to make connections between covariance, rates, and representations showing the relationships between quantities. They create, explain, evaluate, and modify probability models to describe simple and compound events.