

Middle



Mathematics Curriculum Guide for Parents

2009-2010

Fulton
County Schools
Where Students Come First

**Mathematics Curriculum Guide for Parents
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Introduction

Fulton County Schools has implemented a blended mathematics curriculum. A blended mathematics curriculum consists of a mixture of math skills and application of those skills. Curriculum materials utilized reflect a blended curriculum. The math curriculum areas of focus include:

- Computational Skills
- Problem Solving Skills
- Conceptual Understanding
- Mastery of Math Facts

Students are placed according to ability in on-level, advanced, accelerated curriculum. The middle school mathematics textbooks used to support the blended curriculum include:

- *Pearson/Prentice Hall-**Mathematics**, Georgia edition*
- Holt– **Mathematics**, Georgia edition
- McDougal-Little **Georgia High School Mathematics**
- *Pearson/ Prentice Hall – **Connected Mathematics 2***

Georgia Performance Standards

The Georgia Performance Standards (GPS) which are determined by the Georgia Department of Education (GADOE), provide clear expectations for instruction, assessment, and student work. They define the level of work that demonstrates achievement of the standards, enabling a teacher to know “how good is good enough.” The performance standards isolate and identify the skills needed to use the knowledge and skills to problem-solve, reason, communicate, and make connections with other information. They also tell the teacher how to assess the extent to which the student knows the material or can manipulate and apply the information.

The Georgia Mathematics Curriculum focuses on actively engaging the students in the development of mathematical understanding by using manipulatives and a variety of representations, working independently and cooperatively to solve problems, estimating and computing efficiently, and conducting investigations and recording findings. There is a shift towards applying mathematical concepts and skills in the context of authentic problems and for the student to understand concepts rather than merely follow a sequence of procedures. In mathematics classrooms, students will learn to think critically in a mathematical way with an understanding that there are many different ways to a solution and sometimes more than one right answer in applied mathematics. Mathematics is the economy of information. The central idea of all mathematics is to discover how knowing some things well, via reasoning, permit students to know much else—without having to commit the information to memory as a separate fact. It is the connections, the reasoned, logical connections that make mathematics manageable. As a result, implementation of Georgia’s Performance Standards places a greater emphasis on problem solving, reasoning, representation, connections, and communication. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

Curriculum Content for Middle School Mathematics

The Fulton County mathematics curriculum is based on the Georgia Performance Standards which are implemented through the Continuous Achievement Model. The goal of Continuous Achievement is to have all students challenged at their highest level. Instruction and assessment includes the use of manipulatives and appropriate technology. Topics are represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts are introduced and used in the context of real world phenomena.

By the end of grade six, students will understand the four arithmetic operations as they relate to positive rational numbers; convert between and compute with different forms of rational numbers; understand the concept of ratio and solve problems using proportional reasoning; understand and use line and rotational symmetry; determine the surface area and volume of solid figures; use variables to represent unknown quantities in formulae, algebraic expressions and

equations; utilize data to make predictions; and determine the probability of a given event.

By the end of grade seven, students will understand and use rational numbers, including signed numbers; solve linear equations in one variable; sketch and construct plane figures; demonstrate understanding of transformations; use and apply properties of similarity; examine properties of geometric shapes in space; describe and sketch solid figures, including their cross-sections; represent and describe relationships between variables in tables, graphs, and formulas; analyze the characteristics of linear relationships; and represent and analyze data using graphical displays, measures of central tendency, and measures of variation. Instruction and assessment should include the appropriate use of manipulatives and technology.

By the end of grade eight, students will understand various numerical representations, including square roots, exponents and scientific notation; use and apply geometric properties of plane figures, including congruence and the Pythagorean theorem; use symbolic algebra to represent situations and solve problems, especially those that involve linear relationships; solve linear equations, systems of linear equations and inequalities; use equations, tables and graphs to analyze and interpret linear functions; use and understand set theory and simple counting techniques; determine the theoretical probability of simple events; and make inferences from statistical data, particularly data that can be modeled by linear functions.

Reading Standard

After the elementary years, students are seriously engaged in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas *in context*.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

What are the significant differences between the Quality Core Curriculum and the Georgia Performance Standards, particularly in the math curriculum?

GPS sets high expectations for all students by defining the level of work that demonstrates mastery of mathematical concepts. The Quality Core Curriculum was an objective-based curriculum which was sufficient at the time it was developed. However, QCC objectives were a checklist of concepts to be covered by teachers. QCC objectives did not measure the depth of knowledge that a student attained while learning the concepts.

GPS uses the curriculum to guide teaching and learning. Teachers use performance assessments to determine what students know and the extent to which the student understands the concepts and can apply them. Application of concepts, integration of strands (numbers & operations, geometry, data analysis & probability, algebra, measurement, and process standards) in performance tasks allow students the opportunity to solve real-world problems with the mathematical tools that they have developed.

GPS also aligns assessment and accountability. QCC tests were so broad that teachers were required to prioritize the curriculum and focus their efforts on what the teacher decided were the most important topics. Teacher prioritization of topics did not always match DOE prioritization of topics. GPS focuses on what we expect students to know and be able to do and then designs the curriculum to meet that goal. The goals are very specific for each grade level.

6th Grade Math FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Number and Operations		
Apply factors and multiples.	Add and subtract fractions and mixed numbers with unlike denominators.	Understands and computes with integers using models and manipulatives, and using algorithms: a) finding absolute value and opposite of any real number b) for addition c) for subtraction d) for multiplication e) for division (Math 7)
Decompose numbers into their prime factorization (Fundamental Theorem of Arithmetic).	Multiply and divide fractions and mixed numbers.	Understands and evaluates exponents (<i>Grade 6 does squares and cubes the rest in Math 8</i>) b) understands powers of ten, including scientific notation (conversion of a whole number to a decimal multiplied by a power of ten) c) understands square roots (Math 8)
Determine the greatest common factor (GCF) and the least common multiple (LCM) for a set of numbers.		Classifies numbers and sets of numbers according to subsets of real numbers (e.g. 9 is a real number, an integer, and a rational number). (Math 8)
Use fractions, decimals, and percents interchangeably.		Identifies and graphs an ordered pair of integers on a four-quadrant coordinate plane. (One quadrant in Grade 4, 5 and Math 6) (Four quadrants Math 7)
Solve problems involving fractions, decimals, and percents.		
Measurement		
Convert from one unit to another within one system of measurement (customary or metric) by using proportional relationships.	Compare and contrast units of measure for perimeter, area, and volume.	Finds the perimeter and area of polygons, and develops an understanding of the appropriate formulas. (Grade 3 and Grade 5)
Select and use units of appropriate size and type to measure length, perimeter, area and volume.	Measure length to the nearest half, fourth, eighth and sixteenth of an inch.	Finds the circumference and area of a circle, and develops an understanding of the appropriate formulas. (Grade 5)
Determine the formula for finding the volume of fundamental solid figures.	Estimate the volumes of simple geometric solids.	
Compute the volumes of fundamental solid figures, using appropriate units of measure.	Estimate the surface areas of simple geometric solids.	
Solve application problems involving the volume of fundamental solid figures.		
Find the surface area of right rectangular prisms and cylinders using manipulatives and constructing nets.		
Compute the surface area of right rectangular prisms and cylinders using formulae.		

6th Grade Math FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Solve application problems involving surface area of right rectangular prisms and cylinders.		
Geometry		
Determine and use lines of symmetry.	Interpret and sketch simple scale drawings.	Understands and classifies angles: a) Identifies acute, right, obtuse and straight angles. b) Names angles using points, numbers and letters. (Grade 2, 3 and 4) c) Measures (Grade 4) and Constructs angles using appropriate tools. (Math 7)
Investigate rotational symmetry, including degree of rotation.	Solve problems involving scale drawings.	Analyzes the effects of basic transformations on basic shapes (reflections, and translations). (Math 7)
Use the concepts of ratio, proportion and scale factor to demonstrate the relationships between similar plane figures.	Compare and contrast right prisms and pyramids.	Compares and contrasts simple plane geometric figures with respect to properties such as number of sides, number of angles (Grade 2, 3, and 5)
	Compare and contrast cylinders and cones.	Uses characteristics and properties of lines and line segments to compare/contrast and establish relationships such as parallel, perpendicular, horizontal, vertical and intersecting. (Grade 4)
	Interpret and sketch front, back, top, bottom and side views of solid figures.	
	Construct nets for prisms, cylinders, pyramids, and cones.	
Algebra		
Understand the concept of ratio and use it to represent quantitative relationships.	Use manipulatives or draw pictures to solve problems involving proportional relationships.	Understands inequalities and can graph them on a number line (e.g. $x < 6$). (Math 8)
Analyze and describe patterns arising from mathematical rules, tables, and graphs.	Describe proportional relationships mathematically using $y = kx$, where k is the constant of proportionality.	Uses order of operations to simplify numeric expressions in all basic operations, with and without parenthesis (Grade 4)
Use proportions ($a/b=c/d$) to describe relationships and solve problems, including percent problems.	Graph proportional relationships in the form $y = kx$ and describe characteristics of the graphs.	
Evaluate algebraic expressions, including those with exponents, and solve simple one-step equations using each of the four basic operations.	Use proportional reasoning ($y = kx$) to solve problems.	

6th Grade Math FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
	In a proportional relationship expressed as $y = kx$, solve for one quantity given values of the other two. Given quantities may be whole numbers, decimals, or fractions. Solve problems using the relationship $y = kx$.	
Data Analysis & Probability		
Formulate questions that can be answered by data. Students should collect data by using samples from a larger population (surveys), or by conducting experiments.	Discover that experimental probability approaches theoretical probability when the number of trials is large.	Uses mean, median, mode to describe central tendencies of a data set, and uses range to describe the spread of the data. (Grade 4 and 5)
Using data, construct frequency distributions, frequency tables, and graphs.		
Choose appropriate graphs to be consistent with the nature of the data (categorical or numerical). Graphs should include pictographs, histograms, bar graphs, line graphs, circle graphs, and line plots.		
Use tables and graphs to examine variation that occurs within a group and variation that occurs between groups.		
Relate the data analysis to the context of the questions posed.		
Predict the probability of a given event through trials/simulations (experimental probability), and represent the probability as a ratio.		
Determine, and use a ratio to represent, the theoretical probability of a given event.		
Process Standards		
	M6P1. Students will solve problems (using appropriate technology).	
	a. Build new mathematical knowledge through problem solving.	
	b. Solve problems that arise in mathematics and in other contexts.	
	c. Apply and adapt a variety of appropriate strategies to solve problems.	
	d. Monitor and reflect on the process of mathematical problem solving.	
	M6P2. Students will reason and evaluate mathematical arguments.	

6th Grade Math FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
	a. Recognize reasoning and proof as fundamental aspects of mathematics.	
	b. Make and investigate mathematical conjectures.	
	c. Develop and evaluate mathematical arguments and proofs.	
	d. Select and use various types of reasoning and methods of proof.	
	M6P3. Students will communicate mathematically.	
	a. Organize and consolidate their mathematical thinking through communication.	
	b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	
	c. Analyze and evaluate the mathematical thinking and strategies of others.	
	d. Use the language of mathematics to express mathematical ideas precisely.	
	M6P4. Students will make connections among mathematical ideas and to other disciplines.	
	a. Recognize and use connections among mathematical ideas.	
	b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	
	c. Recognize and apply mathematics in contexts outside of mathematics.	
	M6P5. Students will represent mathematics in multiple ways.	
	a. Create and use representations to organize, record, and communicate mathematical ideas.	
	b. Select, apply, and translate among mathematical representations to solve problems.	
	c. Use representations to model and interpret physical, social, and mathematical phenomena.	

7th Grade Pre-Algebra FCS/QCC vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Number and Operations		
Understand the meaning of positive and negative rational numbers and use them in computation.		Identifies place value for whole numbers and decimals and compares and orders decimals (Grade 3 and 4)
Find the absolute value of a number and understand it as the distance from zero on a number line.		Estimates sums, differences, products, and quotients using rounding and compatible numbers (division) (Grade 3 and 4)
Compare and order rational numbers, including repeating decimals.		Identifies factors, primes and composites (Grade 5 and Math 6)
Add, subtract, multiply, and divide positive and negative rational numbers.		Writes a given integer as the product of a unique set of prime numbers (Math 6)
Solve problems using rational numbers.		Identifies and applies divisibility, factors, prime factors, greatest common factor (Math 6)
		Identifies subsets of real numbers and determines all subsets of which a given number is a member. (Math 8)
		Expresses standard numerals in scientific notation and expresses scientific notation as a standard numeral. (Math 8)
		Identifies and applies the least common multiple to compare and order fractions (Math 6)
		Uses fractions and decimals interchangeably and recognizes equivalent representations (Math 6)
Measurement		
		Selects appropriate metric units of measurement for length, area, volume, capacity, weight, /mass (Math 6)
		Converts from one metric unit to another metric unit (Math 6)
Geometry		
Demonstrate understanding of translations, dilations, rotations, reflections, and relate symmetry to appropriate transformations.	Perform basic constructions using both compass and straight edge, and appropriate technology. Constructions should include copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	Identifies physical and symbolic representations using appropriate labeling of geometric figures, such as points, lines, line segments, rays, polygons, vertices, angles, and diagonals. (Grade 2, 3, and 4)

7th Grade Pre-Algebra FCS/QCC vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Understand the meaning of similarity, visually compare geometric figures for similarity, and describe similarities by listing corresponding parts.	Recognize that many constructions are based on the creation of congruent triangles.	Measures and draws angles using a protractor and classifies angles by their measures (e.g. acute, obtuse, right, straight, complementary, supplementary) (Grade 4)
	Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.	Classifies plane figures based on their properties and characteristics, including triangles and quadrilaterals, pentagons, and hexagons (Grade 2, 3 and 4)
	Understand the relationships among scale factors, length ratios, and area ratios between similar figures. Use scale factors, length ratios, and area ratios to determine side lengths and areas of similar geometric figures.	Solves problems by using the property that the sum of the measure of the angles in a triangle is 180 degrees (Grade 4)
	Understand congruence of geometric figures as a special case of similarity: The figures have the same size and shape.	Applies formulas (e.g. area, circumference) (Grade 5, 6) , including investigating and <i>using the Pythagorean Theorem (Math 8)</i>
	Describe three-dimensional figures formed by translations and rotations of plane figures through space.	Classifies solid geometric figures based on their properties and characteristics (Grade 2 and 4) and applies formulas (e.g. surface area, volume) (Grade 5 and Math 6)
	Sketch, model, and describe cross-sections of cones, cylinders, pyramids, and prisms.	
Algebra		
Translate verbal phrases to algebraic expressions.	Describe patterns in the graphs of proportional relationships, both direct ($y = kx$) and inverse ($y = k/x$).	Graphs simple inequalities on a number line (Math 8)
Simplify and evaluate algebraic expressions, using commutative, associative, and distributive properties as appropriate.		Solves one step inequalities by adding, subtracting, multiplying, and dividing (Math 6)
Add and subtract linear expressions.		Solves practical problems using ratio and proportion (Math 6)
Given a problem, define a variable, write an equation, solve the equation, and interpret the solution.		Solves practical problems using percents (e.g. sales tax, sale price, commission, and discount) (Math 6)
Use the addition and multiplication properties of equality to solve one- and two-step linear equations.		
Plot points on a coordinate plane.		
Represent, describe, and analyze relations from tables, graphs, and formulas.		
Describe how change in one variable affects the other variable.		

7th Grade Pre-Algebra FCS/QCC vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Data Analysis and Probability		
Construct frequency distributions.	Formulate questions and collect data from a census of at least 30 objects and from samples of varying sizes.	Identifies possible outcomes of simple experiments and predicts or describes the probability of a given event, expressed as a rational number from 0 through 1 (Math 6)
Analyze data using measures of central tendency (mean, median, and mode), including recognition of outliers.	Analyze data with respect to measures of variation (range, quartiles, inter-quartile range).	
Analyze data using appropriate graphs, including pictographs, histograms, bar graphs, line graphs, circle graphs, and line plots introduced earlier, and using box and-whisker plots and scatter plots.	Compare measures of central tendency and variation from samples to those from a census. Observe that sample statistics are more likely to approximate the population parameters as sample size increases.	
	Analyze and draw conclusions about data, including describing the relationship between two variables.	
Process Standards		
	<p>M7P1. Students will solve problems (using appropriate technology).</p> <p>a. Build new mathematical knowledge through problem solving.</p> <p>b. Solve problems that arise in mathematics and in other contexts.</p> <p>c. Apply and adapt a variety of appropriate strategies to solve problems.</p> <p>d. Monitor and reflect on the process of mathematical problem solving.</p> <p>M7P2. Students will reason and evaluate mathematical arguments.</p> <p>a. Recognize reasoning and proof as fundamental aspects of mathematics.</p> <p>b. Make and investigate mathematical conjectures.</p> <p>c. Develop and evaluate mathematical arguments and proofs.</p> <p>d. Select and use various types of reasoning and methods of proof.</p> <p>M7P3. Students will communicate mathematically.</p> <p>a. Organize and consolidate their mathematical thinking through communication.</p> <p>b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.</p>	

7th Grade Pre-Algebra FCS/QCC vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
	<p>c. Analyze and evaluate the mathematical thinking and strategies of others.</p> <p>d. Use the language of mathematics to express mathematical ideas precisely.</p> <p>M7P4. Students will make connections among mathematical ideas and to other disciplines.</p> <p>a. Recognize and use connections among mathematical ideas.</p> <p>b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p> <p>c. Recognize and apply mathematics in contexts outside of mathematics.</p> <p>M7P5. Students will represent mathematics in multiple ways.</p> <p>a. Create and use representations to organize, record, and communicate mathematical ideas.</p> <p>b. Select, apply, and translate among mathematical representations to solve problems.</p> <p>c. Use representations to model and interpret physical, social, and mathematical phenomena.</p>	

8th Grade Algebra I FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Number and Operations		
Find square roots of perfect squares.	Recognize the (positive) square root of a number as a length of a side of a square with a given area.	Graphs real numbers on a number line (Grade K-7)
Recognize and use the radical symbol to denote the positive square root of a positive number.	Recognize square roots as points and as lengths on a number line.	Adds subtracts multiplies and divides integers and other rational numbers (Math 7)
Estimate square roots of positive numbers.	Understand that the square root of 0 is 0 and that every positive number has two square roots that are opposite in sign.	
Simplify, add, subtract, multiply, and divide expressions containing square roots.		
Distinguish between rational and irrational numbers.		
Simplify expressions containing integer exponents.		
Express and use numbers in scientific notation.		
Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.		
Geometry		
	Apply properties of right triangles, including the Pythagorean Theorem.	
	Investigate characteristics of parallel and perpendicular lines both algebraically and geometrically .	
	Apply properties of angle pairs formed by parallel lines cut by a transversal.	
	Understand the properties of the ratio of segments of parallel lines cut by one or more transversals.	
	Understand the meaning of congruence: that all corresponding angles are congruent and all corresponding sides are congruent.	
	Recognize and interpret the Pythagorean Theorem as a statement about areas of squares on the sides of a right triangle.	
Algebra		
Represent a given situation using algebraic expressions or equations in one variable.	Interpret solutions in problem contexts.	Graphs quadratic functions and analyzes the relationship of the coefficient to the graph (IAA/AIAA) .
Simplify and evaluate algebraic expressions.	Use tables to describe sequences recursively and with a formula in closed form.	Solves problems involving ratios, proportions, and percents; expresses rational numbers as decimals or fractions, and expresses terminating or repeating decimals as fractions (Math 6 and Math 7)
Solve algebraic equations in one variable, including equations involving absolute values.	Understand and recognize arithmetic sequences as linear functions with whole number input values.	Solves quadratic equations using the quadratic formula, scientific, or graphing calculator, or computer. (IAA/AIAA)

8th Grade Algebra I FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
Solve equations involving several variables for one variable in terms of the others.	Translate among verbal, tabular, graphic, and algebraic representations of functions.	Identifies and performs basic operations with polynomials. (IAA/AIAA)
Represent a given situation using an inequality in one variable.	Given a problem context, write an appropriate system of linear equations or inequalities.	Solves rational equations (IAA/AIAA)
Use the properties of inequality to solve inequalities.		Solves simple radical equations (IAA/AIAA)
Graph the solution of an inequality on a number line.		Multiply, divide, add and subtract rational expressions (IAA/AIAA)
Interpret solutions in problem contexts.		Converse of the Pythagorean Theorem (IAA/AIAA)
Recognize a relation as a correspondence between varying quantities.		
Recognize a function as a correspondence between inputs and outputs where the output for each input must be unique.		
Distinguish between relations that are functions and those that are not functions.		
Recognize functions in a variety of representations and a variety of contexts.		
Interpret the constant difference in an arithmetic sequence as the slope of the associated linear function.		
Identify relations and functions as linear or nonlinear.		
Interpret slope as a rate of change.		
Determine the meaning of the slope and y-intercept in a given situation.		
Graph equations of the form $y = mx + b$.		
Graph equations of the form $ax + by = c$.		
Graph the solution set of a linear inequality, identifying whether the solution set is an open or a closed half-plane.		
Determine the equation of a line given a graph, numerical information that defines the line, or a context involving a linear relationship.		
Solve problems involving linear relationships.		
Solve systems of equations graphically and algebraically, using technology as appropriate.		
Graph the solution set of a system of linear inequalities in two variables.		
Data Analysis and Probability		
Estimate and determine a line of best fit from a scatter plot.	Demonstrate relationships among sets through use of Venn diagrams.	
	Determine subsets, complements, intersection, and union of sets.	

8th Grade Algebra I FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
	<p>Use set notation to denote elements of a set.</p> <p>Use tree diagrams to find the number of outcomes.</p> <p>Apply the addition and multiplication principles of counting.</p> <p>Find the probability of simple independent events.</p> <p>Find the probability of compound independent events.</p> <p>Gather data that can be modeled with a linear function.</p>	
Process Skills		
	<p>M8P1. Students will solve problems (using appropriate technology).</p> <p>a. Build new mathematical knowledge through problem solving.</p> <p>b. Solve problems that arise in mathematics and in other contexts.</p> <p>c. Apply and adapt a variety of appropriate strategies to solve problems.</p> <p>d. Monitor and reflect on the process of mathematical problem solving.</p> <p>M8P2. Students will reason and evaluate mathematical arguments.</p> <p>a. Recognize reasoning and proof as fundamental aspects of mathematics.</p> <p>b. Make and investigate mathematical conjectures.</p> <p>c. Develop and evaluate mathematical arguments and proofs.</p> <p>d. Select and use various types of reasoning and methods of proof.</p> <p>M8P3. Students will communicate mathematically.</p> <p>a. Organize and consolidate their mathematical thinking through communication.</p> <p>b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.</p> <p>c. Analyze and evaluate the mathematical thinking and strategies of others.</p> <p>d. Use the language of mathematics to express mathematical ideas precisely.</p> <p>M8P4. Students will make connections among mathematical ideas and to other disciplines.</p> <p>a. Recognize and use connections among mathematical ideas.</p>	

8th Grade Algebra I FCS/QCCs vs. GPS Content Summary

What Stays	What's New/Enhanced	What Goes
	<p>b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	
	<p>c. Recognize and apply mathematics in contexts outside of mathematics.</p>	
	<p>M8P5. Students will represent mathematics in multiple ways.</p>	
	<p>a. Create and use representations to organize, record, and communicate mathematical ideas.</p>	
	<p>b. Select, apply, and translate among mathematical representations to solve problems.</p>	
	<p>c. Use representations to model and interpret physical, social, and mathematical phenomena.</p>	

Essential Math Terms

Grade 6

Frequency: The number of times an item, number, or event occurs in a set of data.

Ungrouped Frequency Table: A table for organizing a set of data that shows the number of times each item or number appears.

Grouped Frequency Table: The organization of raw data in table form with classes and frequencies.

Arrays: rectangular arrangements that have equal numbers in the rows and columns.

Decompose: The process of factoring terms and numbers in an expression.

Exponent: The number of times a number or expression (called base) is used as a factor of repeated multiplication. Also called the power.

Factor: When two or more integers are multiplied, each number is a factor of the product. "To factor" means to write the number or term as a product of its factors.

Fundamental Theorem of Arithmetic: Every integer, $N > 1$, is either prime or can be uniquely written as a product of primes.

GCF: Greatest Common Factor: The largest factor that two or more numbers have in common.

Identity property of multiplication: A number that can be multiplied by any second number without changing the second number. The Identity for multiplication is "1".

LCM: Least Common Multiple: The smallest multiple (other than zero) that two or more numbers have in common.

Multiple: A number that is a product of a given whole number and another whole number.

Prime factorization: The expression of a composite number as a product of prime numbers.

Prime number: A positive number that is divisible only by itself and the number one.

Square number: A number that is the product of a whole number and itself. This is also known as a "Perfect Square".

Proportion: An equation which states that two ratios are equal.

Ratio compares two quantities that share a fixed, multiplicative relationship.

Rational number: A number that can be written as a/b where a and b are integers, but b is not equal to 0.

Asymmetrical: Describes any figure that cannot be divided into two parts that are mirror images of each other. In other words, asymmetrical means "not symmetrical."

Axis of Symmetry: A line that a figure can be folded over so that one-half of the figure matches the other half perfectly; a line about which a figure is symmetrical.

Line of Symmetry: A line that divides a figure into two parts, each of which is a mirror image of the other.

Line Symmetry: Figures that match exactly when folded in half have line symmetry.

Reflectional Symmetry: A figure has reflectional symmetry if, after reflecting the figure over a line, the figure lines back up with itself.

Essential Math Terms

Rotation: A transformation that turns a figure about a fixed point at a given angle and a given direction.

Rotational Symmetry: A figure has rotational symmetry if, after rotating it by an angle of 180 degrees or less about its center, the figure lines

Symmetry: The property of a figure or expression that allows for parts of it to be interchanged without forcing a change in the whole

Scale Drawings : Drawings that represent relative sizes and placements of real objects or places.

Scale Factor : The ratio of corresponding lengths of the sides of two similar figures.

Similar Figures: Figures that have the same shape but not necessarily the same size.

Base of a Cone: The flat, circular portion of the cone.

Base of a Pyramid: The face that does not intersect the other faces at the vertex. The base is a polygonal region.

Bases of a Cylinder: The two congruent and parallel circular regions that form the ends of the cylinder.

Bases of a Prism: The two faces formed by congruent polygons that lie in parallel planes, all of the other faces being parallelograms.

Cone: A three dimensional figure with a circular or elliptical base and one vertex.

Cube: A regular polyhedron whose six faces are congruent squares.

Cylinder: A three dimensional object with two parallel, congruent, circular bases.

Edge: The intersection of a pair of faces in a three-dimensional figure.

Face: One of the polygons that makes up a polyhedron.

Lateral Faces: In a prism, a face that is not a base of the figure. In a pyramid, faces that intersect at the vertex.

Net: A two-dimensional figure that, when folded, forms the surfaces of a three-dimensional object.

Polyhedron: A 3-dimensional figure that has polygons as faces.

Prism: A polyhedron with two parallel and congruent faces, called bases, and all other faces that are parallelograms.

Pyramid: A polyhedron with one base and the same number of triangular faces as there are sides of the base.

Surface area: The total area of the 2-dimensional surfaces that make up a 3-dimensional object.

Volume: The amount of space occupied by an object.

Constant of proportionality: The constant value of the ratio of two proportional quantities x and y ; usually written $y = kx$, where k is the constant of proportionality. In a proportional relationship, $y=kx$, k is the constant of proportionality, which is the value of the ratio between y and x .

Direct Proportion (Direct Variation): The relation between two quantities whose ratio remains constant. When one variable increases the other increases proportionally: When one variable doubles the other doubles, when one variable triples the other triples, and so on. When A changes by some factor, then B changes by the same factor: $A=kB$, where k is the constant of proportionality.

Equation: A mathematical sentence that contains an equal sign

Essential Math Terms

Event: Any possible outcome of an experiment in probability.

Experimental Probability: The ratio of the number of times an outcome occurs to the total amount of trials performed. Experimental Probability = (The number of times event occurrence)/(The total number of trials)

Probability: A measure of the likelihood of an event. It is the ratio of the number of ways a certain event can occur to the number of possible outcomes.

Theoretical Probability: The mathematical calculation that an event will happen in theory.

Grade 7

Census: Collection of data from every member of a population.

Sample: A selected part of a population.

Outlier: A value that is very far away from most of the values in a data set.

Quartile: When data in a set are arranged in order, quartiles are the numbers that split the data into quarters (or fourths).

Interquartile range: The difference between the first and third quartiles. (Note that the first and third quartiles are sometimes called *upper* and *lower* quartiles.)

Parameter: A measured characteristic of a population

Statistic: A measured characteristic of a sample.

Variable: A symbol (often a letter) that represents a number.

Proportion: An equation that states two ratios are equal.

Rational Number: A number that can be written as a/b where a and b are integers, but b is not equal to 0.

Equation: A mathematical sentence that contains an equal sign.

Variable: A symbol (often a letter) that represents a number.

Proportion: An equation that states two ratios are equal.

Rational Number: A number that can be written as a/b where a and b are integers, but b is not equal to 0.

Algebraic Expression: A mathematical phrase involving at least one variable and sometimes numbers and operation symbols.

Absolute value: The distance between a number and zero on the number line.

The symbol for absolute value is shown in this equation $|-88| = 88$

Associative property: In addition or multiplication, the result of the expression will remain the same regardless of grouping. Examples: $a + (b+c) = (a+b) + c$; $a(bc) = (ab)c$

Commutative property: The sum or product of numbers is the same no matter how the numbers are arranged. Examples: $a + b = b + a$; $ab = ba$

Distributive property: The sum of two addends multiplied by a number will be the sum of the product of each addend and the number. Example: $a(b + c) = ab + ac$

Integers: The set of whole numbers and their opposites $\{\dots -3, -2, -1, 0, 1, 2, 3, \dots\}$

Natural numbers: The set of numbers $\{1, 2, 3, 4, \dots\}$. Natural numbers can also be called counting numbers.

Essential Math Terms

Negative Numbers: The set of numbers less than zero.

Opposite Numbers: Two different numbers that have the same absolute value. Example: 4 and -4 are opposite numbers because both have an absolute value of 4.

Positive Numbers: The set of numbers greater than zero.

Rational Numbers: The set of numbers that can be written in the form a/b where a and b are integers and $b \neq 0$.

Sign: a symbol that indicates whether a number is positive or negative. Example: in -4 , the $(-)$ sign shows this number is read "negative four".

Whole numbers: The set of all natural numbers and the number zero.

Transformation: The mapping, or movement, of all the points of a figure in a plane according to a common operation.

Reflection: A transformation that "flips" a figure over a line of reflection

Reflection Line: A line that acts as a mirror or perpendicular bisector so that corresponding points are the same distance from the mirror.

Translation: A transformation that "slides" each point of a figure the same distance in the same direction

Rotation: A transformation that turns a figure about a fixed point through a given angle and a given direction.

Bisector: A bisector divides a segment or angle into two equal parts.

Parallel lines: Two lines are parallel if they lie in the same plane and they do not intersect. $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ denotes that \overleftrightarrow{AB} is parallel to \overleftrightarrow{CD} .

Perpendicular lines: Two lines are perpendicular if they intersect to form right angles. $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ denotes that \overleftrightarrow{AB} is perpendicular to \overleftrightarrow{CD} .

Congruent: Having the same size, shape and measure. $\angle A \cong \angle B$ denotes that $\angle A$ is congruent to $\angle B$.

Point: One of the basic undefined terms of geometry. Traditionally thought of as having no length, width, or thickness, and often a dot is used to represent it.

Line: One of the basic undefined terms of geometry. Traditionally thought of as a set of points that has no thickness but its length goes on forever in two opposite directions. \overleftrightarrow{AB} denotes a line that passes through point A and B.

Plane: One of the basic undefined terms of geometry. Traditionally thought of as going on forever in all directions (in two-dimensions) and is flat (i.e., it has no thickness).

Line segment or segment: The part of a line between two points on the line.

\overline{AB} denotes a line segment between the points A and B.

Endpoints: The points at an end of a line segment

Intersection: The point at which two or more lines intersect or cross.

Ray: A ray begins at a point and goes on forever in one direction.

Dilation : Transformation that changes the size of a figure, but not the shape.

Proportion: An equation which states that two ratios are equal.

Ratio : Comparison of two quantities by division and may be written as

$\frac{r}{s}$, $r:s$, or r to s .

Essential Math Terms

Scale Factor : The ratio of any two corresponding lengths of the sides of two similar figures.

Similar Figures : Figures that have the same shape but not necessarily the same size.

Congruent Figures : Figures that have the same size and shape.

Variation and proportion are defined to be the relationship between two or more variables with regard to a constant of proportionality.

- x and y are directly proportional, if $y = kx$ where k denotes a constant of proportionality and $k \neq 0$.
- x and y are inversely proportional, if $xy = k$ where k denotes a constant of proportionality and $k \neq 0$.
- Variation problems describe the proportional relationship between two (or more) different values. In direct variation problems, we usually see the phrase “is directly proportional to” or “varies directly as”. For example, we can state a scale drawing problem two ways:

Real size is directly proportional to scale size.

Real size varies directly as scale size.

We can use either one of these statements to write a general formula about real size and scale size. The real size (r) is equal to some number (k) times scale size (s). That is $r = ks$.

Cone: A three-dimensional object with a circular or elliptical base and one vertex.

Base of a cone: The flat circular or elliptical portion of the cone.

Oblique cone: A cone with a vertex that is not aligned directly above the center of the base.

Right circular cone: A cone with a circular base and with a vertex that is aligned directly above the center of the base.

Cross section: A plane figure obtained by slicing a solid with a plane.

Cube: A regular polyhedron whose six faces are congruent squares.

Cylinder: A three-dimensional object with two parallel congruent circular bases.

Bases of a cylinder: The two congruent and parallel circular regions that form the ends of the cylinder.

Oblique cylinder: A cylinder with bases that are not aligned one directly above the other.

Right circular cylinder: A cylinder with circular bases that are aligned one directly above the other.

Polyhedron: A collection of polygons joined at their edges. Each of these polygons is called a “face.”

Prism: A polyhedron with two parallel and congruent faces and all other faces that are parallelograms.

Bases of a prism: The two faces formed by congruent polygons that lie in parallel planes, all of the other faces being parallelograms.

Lateral faces of a prism: A face that is not the base of the solid.

Rectangular prism: A prism whose bases are rectangles.

Right rectangular prism: A prism whose faces and bases are rectangles.

Essential Math Terms

Pyramid: A pyramid is a polyhedron with one face (the “base”) a polygon and all the other faces triangles meeting at a common point called the vertex.

Base of a pyramid: The face that does not intersect the other faces at the vertex. The base is a polygonal region.

Lateral faces of a pyramid: Faces that intersect at the vertex.

Right pyramid: A pyramid that has its vertex aligned directly above the center of its base.

Grade 8

Independent events: Events for which the occurrence of one has no impact on the occurrence of the other.

Relative frequency: The number of times an outcome occurs divided by the total number of trials.

Sample space: All possible outcomes of a given experiment.

Event: A subset of a sample space.

Simple Event: An event consisting of just one outcome. A simple event can be represented by a single branch of a tree diagram.

Compound Event: A sequence of simple events.

Complement: The complement of event E , sometimes denoted E' (E prime), occurs when E doesn't. The probability of E' equals 1 minus the probability of E : $P(E') = 1 - P(E)$.

Counting Principle: If an event A can occur in m ways and for each of these m ways, an event B can occur in $m \cdot n$ ways, then events A and B can occur in $m \cdot n$ ways. This counting principle can be generalized to more than two events that happen in succession. So, if for each of the m and n ways A and B can occur respectively, there is also an event C that can occur in s ways, then events A , B , and C can occur in $m \cdot n \cdot s$ ways.

Tree diagram: A tree-shaped diagram that illustrates sequentially the possible outcomes of a given event.

Additive Inverse: The sum of a number and its additive inverse is zero. Also called the opposite of a number. Example: 5 and -5 are additive inverses of each other.

Exponent: The number of times a base is used as a factor of repeated multiplication.

Exponential Notation: See *Scientific Notation* below.

Hypotenuse: The side opposite to the right angle in a right triangle.

Irrational: A real number whose decimal form is non-terminating and non-repeating that cannot be written as the ratio of two integers.

Leg: Either of the two shorter sides of a right triangle. The two legs form the right angle of the triangle.

Pythagorean Theorem: A theorem that relates the lengths of the sides of a right triangle: The sum of the squares of the lengths of the legs of a right triangle equals the square of the length of the hypotenuse.

Radical: A symbol $\sqrt{\quad}$ that is used to indicate square roots.

Essential Math Terms

Rational: A number that can be written as the ratio of two integers with a nonzero denominator.

Scientific Notation: A representation of real numbers as the product of a number between 1 and 10 and a power of 10, used primarily for very large or very small numbers.

Significant Digits: A way of describing how precisely a number is written.

Square root: One of two equal factors of a nonnegative number. For example, 5 is a square root of 25 because $5 \cdot 5 = 25$. Another square root of 25 is -5 because $(-5) \cdot (-5) = 25$. The +5 is called the principle square root of 25 and is always assumed when the radical symbol is used.

Absolute Value: The distance a number is from zero on the number line.

Examples: $|-4| = 4$ and $|3| = 3$

Addition Property of Equality: For real numbers a , b , and c , if $a = b$, then $a + c = b + c$. In other words, adding the same number to each side of an equation produces an equivalent equation.

Additive Inverse: Two numbers that when added together equal 0. Example, 3.2 and -3.2

Algebraic Expression: A mathematical phrase involving at least one variable. Expressions can contain numbers and operation symbols.

Equation: A mathematical sentence that contains an equals sign.

Evaluate an Algebraic Expression: To perform operations to obtain a single number or value.

Inequality: A mathematical sentence that contains the symbols $>$, $<$, \geq , or \leq .

Inverse Operation: Pairs of operations that undo each other. Examples: Addition and subtraction are inverse operations and multiplication and division are inverse operations.

Like Terms: Monomials that have the same variable raised to the same power. In other words, only coefficients of terms can be different.

Linear Equation in One Variable: an equation that can be written in the form $ax + b = c$ where a , b , and c are real numbers and $a \neq 0$

Multiplication Property of Equality: For real numbers a , b , and c ($c \neq 0$), if $a = b$, then $ac = bc$. In other words, multiplying both sides of an equation by the same number produces an equivalent expression.

Multiplicative Inverses: Two numbers that when multiplied together equal 1.

Example: 4 and $\frac{1}{4}$.

Solution: The value or values of a variable that make an equation a true statement

Solve: Identify the value that when substituted for the variable makes the equation a true statement.

Variable: A letter or symbol used to represent a number.

Closed Form of a Sequence: (This is also known as the explicit form of a sequence.)

For an arithmetic sequence, use $a_n = a_1 + (n - 1)d$ as the explicit or closed form.

For a geometric sequence, use $a_n = a_1 \cdot r^{n-1}$ as the explicit or closed form.

Essential Math Terms

a_n represents the n^{th} term of the sequence;
 a_1 represents the first term in the sequence;
 d is the common difference for the arithmetic sequence;
 r is the common ratio for the geometric sequence; and
 n represents the number of a term (for the 7th term, n would be 7).

This form should be simplified whenever possible.

Complement of a Set: (This is also known as the absolute complement of a set and/or the relative complement of a set.) If a universal set, \mathbf{U} , is defined; the complement of A in \mathbf{U} is the collection of all items in \mathbf{U} *not* in A and may be denoted by A^C or A' .

Element: A member or item in a set

Explicit Form of a Sequence: See Closed Form of a Sequence

Function: A special dependence between two quantities where the independent variable (or input) produces the dependent variable (or output). A function relates precisely one output to each of its acceptable inputs.

Intersection of Sets: The set of all elements contained in all of the given sets, but no additional elements

Null Set: A subset which has no elements; also called the 'empty set'

Proper Subset: A subset that does not contain every element of the parent set

Recursive Sequence: A type of sequence in which the values of terms originate from other terms in the sequence

Relation: A set

Set: A collection of numbers, geometric figures, letters, or other objects that have some characteristic in common

Subset: A collection of items drawn entirely from a single set. A subset can consist of any number of items from a set ranging from none at all (a null subset) all the way up to the entire set (every set is a subset of itself).

Union of Sets: The set of all elements that belong to at least one of the given two or more sets

Venn Diagram: A picture that illustrates the relationship between two or more sets $\{ \}$: "Curly braces" are often used to denote members of a set. For example, the positive, single-digit, even numbers are $\{2,4,6,8\}$.

Arithmetic sequence: A sequence of numbers in which the difference between any two consecutive terms is the same

Constant function: A function that is written $y = k$, where k is a real number. The y value is constant for all values of x . The graph of a constant function is a horizontal line.

Function: A relation (set of ordered pairs) such that each x value is associated with only one y value.

Graph of a linear inequality: The solutions of a linear inequality, forming a half-plane on one side of a line and may or may not also form the line itself.

Half-plane: The portion of a plane on one side of a line.

Line of best fit: The line that best represents the trend established by the points in a particular scatter plot.

Essential Math Terms

Point-slope form: Derived from the fact that if one point on a line and the slope of that same line are known, the line may be determined or drawn, $y - y_1 = m(x - x_1)$

Scatter plot: The graph of a collection of ordered pairs.

Slope: The steepness of a line, which may be calculated by finding the ratio of the difference between the y values of two points on the line to the difference between the corresponding x values of those two points on the line.

Slope-intercept form: One way to write an equation of a line; uses the form $y = mx + b$, where m is the slope and b is the y -intercept.

Standard form: Also known as 'General form' for a linear equation in two variables, x and y . It is usually given as $Ax + By = C$ where, if at all possible, A , B , and C are integers, and A is non-negative, and, A , B , and C have no common factors other than 1.

Adjacent Angles: Angles in the same plane that have a common vertex and a common side, but no common interior points.

Alternate Exterior Angles: Alternate exterior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are outside the other two lines. When the two other lines are parallel, the alternate exterior angles are equal.

Alternate Interior Angles: Alternate interior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are in between the other two lines. When the two other lines are parallel, the alternate interior angles are equal.

Coincidental: Two equivalent linear equations overlap when graphed.

Complementary Angles: Two angles whose sum is 90 degrees.

Congruent: Having the same size, shape and measure. Two figures are congruent if all of their corresponding measures are equal.

Corresponding Angles: Angles that have the same relative positions in geometric figures.

Equiangular: The property of a polygon whose angles are all congruent.

Equilateral: The property of a polygon whose sides are all congruent.

Intersecting Lines: Two lines in a plane that cross each other. Unless two lines are coincidental, parallel, or skew, they will intersect at one point.

Linear Pair: Adjacent, supplementary angles. Excluding their common side, a linear pair forms a straight line.

Parallel Lines: Two lines are parallel if they lie in the same plane and they do not intersect.

Perpendicular Lines: Two lines are perpendicular if they intersect at a right angle.

Reflection Line: A line that is the perpendicular bisector of the segment with endpoints at a pre-image point and the image of that point after a reflection.

Regular Polygon: A polygon that is both equilateral and equiangular.

Same-Side Interior Angles: Pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on the same side of the transversal and are between the other two lines. When the two other lines are parallel, same-side interior angles are supplementary.

Essential Math Terms

Same-Side Exterior Angles: Pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on the same side of the transversal and are outside the other two lines. When the two other lines are parallel, same-side exterior angles are supplementary.

Skew Lines: Two lines that do not lie in the same plane (therefore, they cannot be parallel or intersect).

Supplementary Angles: Two angles whose sum is 180 degrees.

Transversal: A line that crosses two or more lines.

Vertical Angles: Two nonadjacent angles formed by intersecting lines or segments. Also called opposite angles.

System of equations: Two or more equations that together define a relationship between variables

Support Resources for Middle School Mathematics

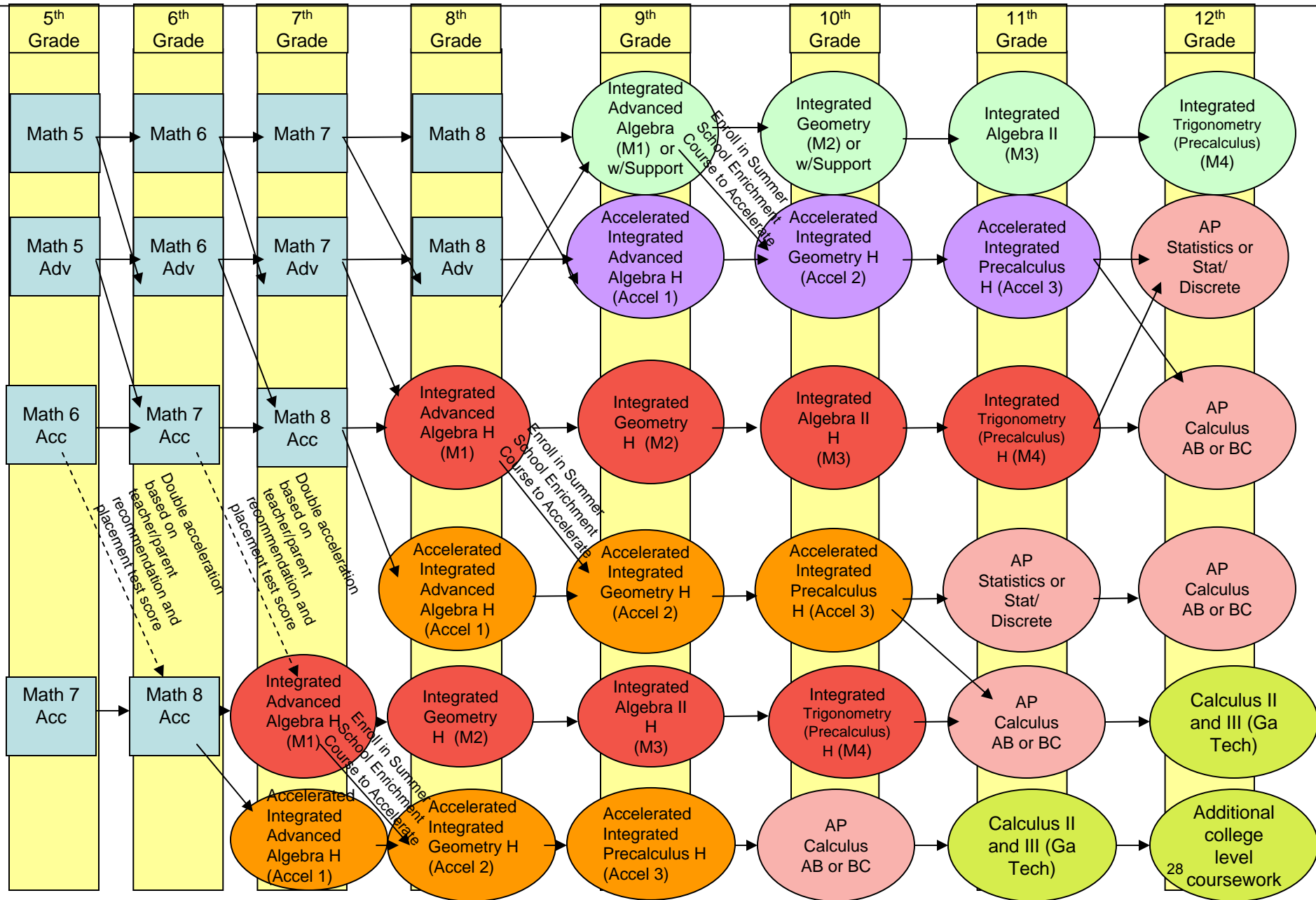
Georgia Academic Support Program(ASP) (Walch Education, publisher) is the series adopted for use in middle school. ASP topics are built around Georgia Performance Standards. The ASP includes components that review, instruct as needed, provide practice, and assess students' skills. Instructional tools and strategies are embedded throughout.

Georgia Virtual School Middle School Remediation

The Georgia Virtual School Middle School Remediation Resource is an online resource designed to offer teachers and students the entire curriculum of GPS aligned math for grades 6-8, organized by strand. It is designed to be a resource for teachers where they can direct students to the online lessons for extra reinforcement or use lessons in the classroom. This is a resource for teachers to use to assist students in acquiring the math skills they need before entering high school.

Fulton County Schools 2008-2009+ Mathematics Sequence

Routes to GT Calculus II & III: 1) 7th grade students who take Accelerated Integrated Advanced Algebra H or Integrated Advanced Algebra H. **2)** 8th grade students who take Accelerated Integrated Advanced Algebra H. **3)** 8th grade students who take Integrated Advanced Algebra H and enroll in summer enrichment course. **4)** Must meet enrollment requirements for GT Calculus II and II **5)** Complete AB or BC calculus (both not required) BC includes everything in AB plus additional topics. Score 4 on AB AP Exam or score 3 on BC AP Exam.



5th Grade Placement Guidelines for 2009-2010 School Year			
Current Grade Level	Student's Current Course	Student's Current Performance	Next Year Placement
5th Grade	Math 5 On-Level	Level 2 on Grade 4 OR Grade 5 CRCT	Math 6 On-Level
		Math 5 On-level Unit Assessment Average ($\geq 88\%$) OR ITBS ($\geq 90\%$) AND Level 3 on Grade 4 OR Grade 5 CRCT	Math 6 Advanced
	Math 5 Advanced	Math 5 Advanced Unit Assessment Average ($\geq 70\%$) Advanced AND Level 3 on Grade 4 OR Grade 5 CRCT	Math 6 Advanced
		Math 5 Advanced Unit Assessment Average ($\geq 70\%$) AND Level 2 on Grade 4 CRCT OR Grade 5 CRCT	Math 6 On-Level
		Math 6 Accelerated Assessment ($\geq 90\%$)	Math 7 Accelerated
	Math 6 Accelerated or Advanced Accelerated	Math 6 Accelerated Summative Assessment Average ($\geq 70\%$) AND Level 3 on Grade 4 OR Grade 5 CRCT	Math 7 Accelerated
		Math 6 Accelerated Summative Assessment Average ($\geq 70\%$) AND Level 1 or 2 on Grade 4 OR Grade 5 CRCT	Math 7 Advanced Accelerated
			Math 6 Advanced
6th Grade Placement Guidelines for 2009-2010 School Year			
Current Grade Level	Student's Current Course	Student's Current Performance	Next Year Placement
6th Grade	Math 6 On-Level	Math 6 On-level Summative Assessment Average ($\geq 70\%$) Level 2 on Grade 5 AND Grade 6 CRCT	Math 7 On-Level
		Math 6 On-level Summative Assessment Average ($\geq 90\%$) AND Level 3 on Grade 5 OR Grade 6 CRCT	Math 7 Advanced
	Math 6 Advanced	Math 6 Advanced Summative Assessment Average ($\geq 70\%$) AND Level 3 on Grade 5 OR Grade 6 CRCT	Math 7 Advanced
		Math 6 Advanced Summative Assessment Average ($\geq 70\%$) AND Level 2 on Grade 5 OR Grade 6 CRCT	Math 7 On-Level
		Math 7 Accelerated Assessment ($\geq 90\%$)	Math 8 Accelerated
	Math 7 Accelerated or Advanced Accelerated	Math 7 Accelerated Summative Assessment Average ($\geq 70\%$) AND Level 3 on Grade 5 OR Grade 6 CRCT	Math 8 Accelerated
		Math 7 Accelerated Summative Assessment Average ($\geq 70\%$) AND Level 1 or 2 on Grade 5 OR Grade 6 CRCT	Math 8 Advanced Accelerated
			Math 7 Advanced

7th Grade Placement Guidelines for 2009-2010 School Year			
Current Grade Level	Student's Current Course	Student's Current Performance	Next Year Placement
7th Grade	Math 7 On-Level	Math 7 On-level Summative Assessment Average \geq 70% Level 2 on Grade 6 OR Grade 7 CRCT	Math 8 On-Level
		Math 7 On-level Summative Assessment Average \geq 90% AND Level 3 on Grade 6 OR Grade 7 CRCT	Math 8 Advanced
	Math 7 Advanced	Math 7 Advanced Summative Assessment Average (\geq 70%) AND Level 3 on Grade 6 OR Grade 7 CRCT	Math 8 Advanced
		Math 7 Advanced Summative Assessment Average (\geq 70%) AND Level 2 on Grade 6 OR Grade 7 CRCT	Math 8 On-Level
		Math 8 Accelerated Assessment (\geq 90%)	Integrated Advanced Algebra Honors
	Math 8 Accelerated or Advanced Accelerated	Math 8 Accelerated Summative Assessment Average (\geq 90%) AND Level 3 on Grade 6 OR Grade 7 CRCT	Accelerated Integrated Advanced Algebra Honors (High School Course Credit)
Math 8 Accelerated Summative Assessment Average ($<$ 90%) AND Level 2 on Grade 6 OR Grade 7 CRCT		Integrated Advanced Algebra Honors (High School Course Credit)	
8th Grade Placement Guidelines for 2009-2010 School Year			
Current Grade	Student's Current Course	Student's Current Performance	Next Year Placement
8th Grade	Math 8 On-Level	Math 8 On-level Summative Assessment Average (\geq 70%) AND Level 2 on Grade 7 OR Grade 8 CRCT This student can handle the rigor of a math course without additional support.	Integrated Advanced Algebra
		Math 8 On-level Summative Assessment Average (\geq 70%) AND Level 1 on Grade 7 OR Grade 8 CRCT	Integrated Advanced Algebra w/Support
		Math 8 On-level Summative Assessment Average (\geq 90%) AND Level 3 on Grade 7 OR Grade 8 CRCT	Accelerated Integrated Advanced Algebra Honors
	Math 8 Advanced	Math 8 Advanced Summative Assessment Average (\geq 70%) AND Level 3 on Grade 7 OR Grade 8 CRCT	Accelerated Integrated Advanced Algebra Honors
		Math 8 Advanced Summative Assessment Average (\geq 70%) AND Level 2 on Grade 7 OR Grade 8 CRCT	Integrated Advanced Algebra
	Integrated Advanced Algebra Honors	IAAH Summative Assessment Average (\geq 70%) AND Level 2 or 3 on Grade 7 OR Grade 8 CRCT	Integrated Geometry Honors
		IAAH Summative Assessment Average (\geq 70%) AND Level 1 on Grade 7 OR Grade 8 CRCT	Integrated Geometry
		IAAH Summative Assessment Average (\geq 70%) AND Level 1 on Grade 7 OR Grade 8 CRCT	Integrated Geometry with Support
	Accelerated Integrated Advanced Algebra Honors	AIAAH Summative Assessment Average (\geq 70%) AND Level 2 on Grade 7 OR Grade 8 CRCT	Accelerated Integrated Geometry Honors
		AIAAH Summative Assessment Average (\geq 70%) AND Level 2 on Grade 7 OR Grade 8 CRCT	Integrated Geometry Honors

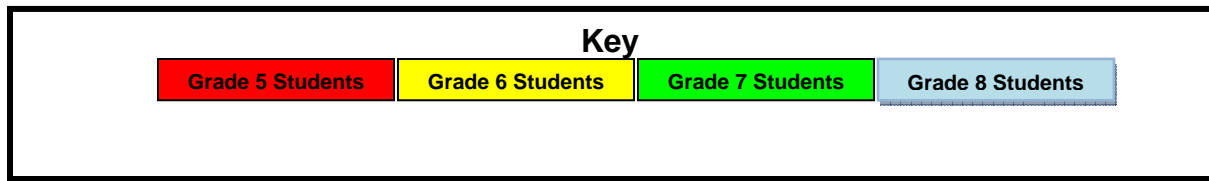
Continuous Achievement

The Fulton County School Board supports our mission statement that each child should be given the opportunity to reach their full potential. To that end, the Fulton County School System has long embraced a framework for advancement called Continuous Achievement. Fulton County Schools supports a framework for advancement that allows each child to progress in language arts and math at their optimum pace and depth, expanding and compacting the curriculum as appropriate. While no child will be placed below their current grade level, given the different developmental needs of students, depending, upon their age/grade level, advancement within the curriculum will be provided differently in the primary and intermediate grade levels.

Grades 6-8

Middle grade students are afforded opportunities to be placed in an advanced or accelerated curriculum provided they meet the placement criteria. In mathematics, the curriculum is written so that the advanced and the accelerated students learn at a much deeper level, a faster pace, and use different instructional resources to support their learning. Like elementary grades, a student's placement in a course will be considered at a minimum of 18 weeks to ascertain if the student is in the appropriate level to meet his or her learning need.

Textbook Course Alignment



Math 5 On-Level	→	Scott Foresman/Addison Wesley Georgia Mathematics & Investigations in Number, Data and Space
Math 5 Advanced		
Math 6 Accelerated	→	Pearson 1 + CMP2
Math 6 Adv Accelerated	→	Holt 2 + CMP2
Math 6 Advanced	→	Holt 2 + CMP2
Math 6 On-Level	→	Pearson 1 + CMP2
Math 7 Accelerated	→	Pearson 2 + CMP2
Math 7 Adv Accelerated	→	Holt 3 + CMP2
Math 7 Advanced	→	Holt 3 + CMP2
Math 7 On-Level	→	Pearson 2 + CMP2
Math 8 Accelerated	→	Pearson 3 + CMP2
Math 8 Adv Accelerated	→	Holt Algebra I + CMP2
Math 8 Advanced	→	Holt Algebra I + CMP2
Math 8 On-Level	→	Pearson 3 + CMP2
Integrated Advanced Algebra Honors	→	McDougal-Littel Course 1 GADOE Math I Frameworks
Accelerated Integrated Advanced Algebra Honors	→	McDougal-Littel Course 1 & 2 GADOE Math I Frameworks

Pearson = Prentice Hall/Pearson Georgia Mathematics
 Holt = Holt Georgia Mathematics
 McDougal-Littel = McDougal-Littel Georgia High School Mathematics

Description of High School Courses offered in Middle School

Integrated Advanced Algebra (*IAA - Mathematics I*):

Algebra/Geometry/Statistics

This is the first in a sequence of mathematics courses designed to ensure that students are college and work ready. It requires students to:

- explore the characteristics of basic functions utilizing tables, graphs, and simple algebraic techniques;
- operate with radical, polynomial, and rational expressions;
- solve a variety of equations, including quadratic equations with leading coefficient of one, radical equations, and rational equations;
- investigate properties of geometric figures in the coordinate plane;
- use the language of mathematical argument and justification;
- discover, prove, and apply properties of polygons;
- utilize counting techniques and determine probability;
- use summary statistics to compare samples to populations; and
- explore the variability of data.

Course Materials: Georgia High School Mathematics 1, McDougal-Littel 2008
Georgia Department of Education Math I Frameworks

Accelerated Integrated Advanced Algebra (*AIAA - Accelerated Mathematics I*):

Geometry/Algebra II/Statistics

This is the first in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school career, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics. It requires students to:

- represent and operate with complex numbers;
- explore the characteristics of basic functions utilizing tables, graphs, and simple algebraic techniques;
- operate with radical, polynomial, and rational expressions;
- solve equations, including quadratic, radical, and rational equations;
- investigate properties of geometric figures in the coordinate plane;
- use the language of mathematical argument and justification;
- discover, prove, and apply properties of polygons, circles and spheres;
- utilize counting techniques and determine probability;
- use summary statistics to compare sample data distributions and to relate sample statistics to corresponding population parameters;
- explore variability of data; and
- fit curves to data and examine the issues related to curve fitting.

Course Materials: Georgia High School Mathematics 1, McDougal-Littel 2008
Georgia High School Mathematics 2, McDougal-Littel 2008
Georgia Department of Education Accelerated Math I Frameworks

Accelerated Integrated Advanced Algebra (AIAA) Enrichment Course HS Summer School

Purpose:

This course may allow current 8th grade students who are currently enrolled in Integrated Advanced Algebra to move to the Accelerated course track in the next school year. It will also provide enrichment for students who are currently enrolled in Accelerated Integrated Advanced Algebra.

Eligibility to Enroll in Summer Course:

- Currently enrolled in Integrated Advanced Algebra
- Currently enrolled in Accelerated Integrated Advanced Algebra
- 90% Assessment average in Integrated Advanced Algebra
- Scored above level one on the 8th grade Math CRCT
- Recommendation from current Math Teacher
- Ability to pay the regular high school summer school tuition

Course Content:

Students will explore the characteristics complex numbers; investigate step and piecewise functions including greatest integer and absolute value functions; investigate the relationships between lines and circles; recognize, analyze, and graph the equations of conic sections; investigate planes and spheres; investigate the issues of curve fitting by finding good linear fits to data; explore the processes of linear and quadratic regression for curve fitting.

This is a **fast paced course**, where students will have to complete work equivalent to three Units in the Accelerated Integrated Advanced Algebra course. The course is offered one period per day during the regular 16 day summer school program. Students **will not** receive credit for this course.

Eligibility to Enroll in Accelerated Integrated Geometry:

- 90% assessment average in the Summer Accelerated Integrated Advanced Algebra Enrichment class
- 100% of assignments must be completed and submitted ON TIME.
- Recommendation from the Accelerated Integrated Advanced Algebra Enrichment summer school teacher.

On-line Resources for Students and Parents

- Resources for Pearson/Prentice-Hall Textbooks:
http://www.phschool.com/atschool/phmath07/program_page_ms.html
- Resources for Connected Mathematics 2:
http://www.phschool.com/atschool/cmp2/program_page.html
- Georgia Mathematics Standards:
<https://www.georgiastandards.org/Standards/Pages/BrowseStandards/MathStandards.aspx>
- National Council of Teachers of Mathematics: <http://nctm.org/>
- The Georgia Council of Teachers of Mathematics: <http://gctm.org/>
- Illuminations: <http://illuminations.nctm.org/>
- National Library of Virtual Manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html>
- Center for Education Integrating Science, Mathematics and Computing website with mathematics resources that are aligned to Georgia Performance Standards.
<http://www.ceismc.gatech.edu/CSI/homepg.html>
- GADOE Online Assessment System:
<https://www.georgiaoas.org/servlet/a2l>
Login and password are available through the school.