Common Core Georgia Performance Standards CCGPS

Mathematics

Comprehensive Course Overview

CCGPS 7th Grade

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"Making Education Work for All Georgians"

The Teaching Guides are designed to provide teachers with clarification of Mathematics CCGPS, grounded in GPS language when appropriate. The Teaching Guides are for teacher use during the CCGPS transition years. These documents are the result of a nine month precision review process involving over 4,000 Georgia mathematics educators. Many thanks to those who provided comments, feedback, and time in the precision review process.

CCGPS 7th Grade

The middle school standards specify the mathematics that all students should study in order to be high school ready. The middle school standards are listed in conceptual categories including Number Sense, Algebra, Expressions and Equations, Geometry, and Statistics and Probability.

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

Although the units in this instructional framework emphasize key standards and big ideas at specific times of the year, routine topics such as estimation, mental computation, and basic computation facts should be addressed on an ongoing basis. Ideas related to the eight practice standards should be addressed constantly as well. To assure that these units are taught with the appropriate emphasis, depth, and rigor, it is important that the tasks listed under "Evidence of Learning" be reviewed early in the planning process. A variety of resources should be utilized to supplement these units. These units provide much needed content information, but excellent learning activities as well. The tasks in these units illustrate the types of learning activities that should be utilized from a variety of sources.

FLIPBOOKS

The Common Core "FlipBooks" are a compilation of research, "unpacked" standards from many states, instructional strategies and examples for each standard at each grade level. The intent is to show the connections to the Standards of Mathematical Practices for the content standards and to get detailed information at each level. The **Middle School Flipbook** is an interactive document arranged by the content domains listed on the following pages.

Mathematics | Middle School—Number Sense

Numbers and Number Systems.
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

MCC7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

MCC7.NS.1a Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*

MCC7.NS.1b Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

MCC7.NS.1c Understand subtraction of rational numbers as adding the additive inverse,

p - q = p+(-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

MCC7.NS.1d **Apply properties of operations as strategies to add and subtract rational numbers.**

MCC7.NS.2 **Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**

MCC7.NS.2a **Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1) (-1) = 1and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.**

MCC7.NS.2b **Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers then –(p/q) = (-p)/q = p / (-q). Interpret quotients of rational numbers by describing real-world contexts.**

MCC7.NS.2c **Apply properties of operations as strategies to multiply and divide rational numbers.**

MCC7.NS.2d **Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.**

MCC7.NS.3 **Solve real-world and mathematical problems involving the four operations with rational numbers.**

Mathematics | Middle School—Algebra

Expressions.
Use properties of operations to generate equivalent expressions.
MCC7.EE.1 **Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.**

MCC7.EE.2 **Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.** *For example, a + 0.05a = 1.05a means that "increase by5%" is the same as "multiply by 1.05."*

Equations and inequalities.
MCC7.EE.3 **Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.** *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

MCC7.EE.4 **Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**

MCC7.EE.4a **Solve word problems leading to equations of the form px + q = r and p(x+q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.** *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

MCC7.EE.4b **Solve word problems leading to inequalities of the form px+q › r or px+q ‹ r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.** *For example, as a*

salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Mathematics | Middle School—Geometry

Draw, construct, and describe geometrical figures and describe the relationships between them.

MCC7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

MCC7.G.2 Draw (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.

MCC7.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.

MCC7.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.

MCC7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

MCC7.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.

Mathematics | Middle School—Statistics and Probability

Use random sampling to draw inferences about a population.

MCC7.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.

MCC7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, 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.*

Draw informal comparative inferences about two populations.
MCC7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variability's, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, 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.*

MCC7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, 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.*

Investigate chance processes and develop, use, and evaluate probability models.
MCC7.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.

MCC7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, 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.*

MCC7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

MCC7.SP.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, 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.*

MCC7.SP.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, 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?*
MCC7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

MCC7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

MCC7.SP.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

MCC7.SP.8c Design and use a simulation to generate frequencies for compound events. *For example, 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?*

Mathematics | Standards for Mathematical Practice

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

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

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. $6 + 2x = 3 (2 + x)$ 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.*

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the

mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards which set an expectation of understanding are potential "points of intersection" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

CLASSROOM ROUTINES

The importance of continuing the established classroom routines cannot be overstated. Daily routines must include such obvious activities as estimating, analyzing data, describing patterns, and answering daily questions. They should also include less obvious routines, such as how to select materials, how to use materials in a productive manner, how to put materials away, how to access classroom technology such as computers and calculators. An additional routine is to allow plenty of time for children to explore new materials before attempting any directed activity with these new materials. The regular use of routines is important to the development of students' number sense, flexibility, fluency, collaborative skills and communication. These routines contribute to a rich, hands-on standards based classroom and will support students' performances on the tasks in this unit and throughout the school year.

STRATEGIES FOR TEACHING AND LEARNING

- Students should be actively engaged by developing their own understanding.
- Mathematics should be represented in as many ways as possible by using graphs, tables, pictures, symbols and words.
- Interdisciplinary and cross curricular strategies should be used to reinforce and extend the learning activities.
- Appropriate manipulatives and technology should be used to enhance student learning.
- Students should be given opportunities to revise their work based on teacher feedback, peer feedback, and metacognition which includes self-assessment and reflection.
- Students should write about the mathematical ideas and concepts they are learning.
- Consideration of all students should be made during the planning and instruction of this unit. Teachers need to consider the following:
    - What level of support do my struggling students need in order to be successful with this unit?
    - In what way can I deepen the understanding of those students who are competent in this unit?
    - What real life connections can I make that will help my students utilize the skills practiced in this unit?

TASKS

The following tasks represent the level of depth, rigor, and complexity expected of all 7th Grade students. These tasks, or tasks of similar depth and rigor, should be used to demonstrate evidence of learning. It is important that all elements of a task be addressed throughout the learning process so that students understand what is expected of them. While some tasks are identified as a performance task, they may also be used for teaching and learning (learning/scaffolding task).

Scaffolding Task	Tasks that build up to the learning task.
Learning Task	Constructing understanding through deep/rich contextualized problem solving tasks.

Practice Task	Tasks that provide students opportunities to practice skills and concepts.
Performance Task	Tasks which may be a formative or summative assessment that checks for student understanding/misunderstanding and or progress toward the standard/learning goals at different points during a unit of instruction.
Culminating Task	Designed to require students to use several concepts learned during the unit to answer a new or unique situation. Allows students to give evidence of their own understanding toward the mastery of the standard and requires them to extend their chain of mathematical reasoning.
Short Cycle Task	Designed to exemplify the performance targets that the standards imply. The tasks, with the associated guidance, equip teachers to monitor overall progress in their students' mathematics.
Formative Assessment Lesson (FAL)	Lessons that support teachers in formative assessment which both reveal and develop students' understanding of key mathematical ideas and applications. These lessons enable teachers and students to monitor in more detail their progress towards the targets of the standards.
Achieve CCSS- CTE Classroom Tasks	Designed to demonstrate how the Common Core and Career and Technical Education knowledge and skills can be integrated. The tasks provide teachers with realistic applications that combine mathematics and CTE content.

Formative Assessments Lessons (FALs)

What is a Formative Assessment Lesson (FAL)? The Formative Assessment Lesson is designed to be part of an instructional unit typically implemented approximately two-thirds of the way through the instructional unit. The results of the tasks should then be used to **inform** the instruction that will take place for the remainder of the unit.

Formative Assessment Lessons are intended to support teachers in formative assessment. They both reveal and develop students' understanding of key mathematical ideas and applications. These lessons enable teachers and students to monitor in more detail their progress towards the targets of the standards. They assess students' understanding of important concepts and problem solving performance, and help teachers and their students to work effectively together to move each student's mathematical reasoning forward.

What does a Formative Assessment Lesson look like in action? Videos of Georgia Teachers implementing FALs can be accessed HERE and a sample of a FAL lesson may be seen HERE

Where can I find more information on FALs? More information on types of Formative Assessment Lessons, their use, and their implementation may be found on the Math Assessment Project's guide for teachers.

Where can I find samples of FALs?

Formative Assessment Lessons can also be found at the following sites:
Mathematics Assessment Project
Kenton County Math Design Collaborative
MARS Tasks by grade level

A **sample FAL** with extensive dialog and suggestions for teachers may be found HERE. This resource will help teachers understand the flow and purpose of a FAL.

Where can I find more training on the use of FALs? The Math Assessment Project has developed Professional Development Modules that are designed to help teachers with the practical and pedagogical challenges presented by these lessons.

Module 1 introduces the model of *formative assessment* used in the lessons, its theoretical background and practical implementation. Modules 2 & 3 look at the two types of *Classroom Challenges* in detail. Modules 4 & 5 explore two crucial pedagogical features of the lessons: asking probing questions and collaborative learning.

All of our Georgia RESAs have had a math specialist trained to provide instruction on the use of formative assessment lessons in the classroom. The request should be made through the teacher's local RESA and can be referenced by asking for more information on the Mathematics Design Collaborative (MDC).
Also, if done properly, these lessons should take about 120-150 minutes, 2-3 classroom periods.

Sources of Information: Vicki Mixon, Former MDC (Math Design Collaborative) trainer, http://www.reneeyates2math.com/ and from The Mathematics Assessment Project and http://melissatabor.wikispaces.com/Formative+Assessment+Lessons+%28FALs%29

CCGPS 7th Grade: Unit Descriptions

The fundamental purpose of 7th Grade Math is to formalize and extend the mathematics that students learned in the previous grades. The critical areas, organized into units, deepen and extend understanding of linear relationships, in part by contrasting them with exponential phenomena, and in part by applying linear models to data that exhibit a linear trend. Seventh grade standards use algebra to deepen and extend understanding of geometric knowledge from prior grades. The final unit in the course ties together the algebraic and geometric ideas studied. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

Unit 1 This unit builds upon the students understanding of rational numbers that was developed in 6th grade. In Grade 7, learning now moves to exploring and ultimately formalizing rules for operations (addition, subtraction, multiplication and division) with integers. Using both contextual and numerical problems, students should explore what happens when negative numbers and positive numbers are combined. Repeated opportunities over time will allow students to compare the results of adding, subtracting, multiplying and dividing pairs of numbers, leading to the generalization of the rules. Fractional rational numbers and whole numbers should be used in computations and explorations. Students will be able to give contextual examples of integer operations, write and solve equations for real-world problems and explain how the properties of operations apply. Real-world situations could include: profit/loss, money, weight, sea level, debit/credit, football yardage, etc.

Unit 2 This unit builds on what that the students learned in 6th grade regarding mathematical properties. They will continue to build on their knowledge of order of operations and other mathematical properties, and use these properties of operations to rewrite equivalent numerical expressions. The students should continue to use properties that were used with whole numbers in Grade 6 and understand that these properties apply to integers, rational and real numbers as well. Students will also have the opportunity to write expressions and equations in more than one format and understand that they are still equal. They will be given the opportunity to use variables to represent quantities in a real-world problems.

Unit 3 This unit builds on the students' knowledge and understandings of rate and unit concepts that were developed in Grade 6. This includes the need to develop proportional relationships through the analysis of graphs, tables, equations, and diagrams. Grade 7 will push for the students' to develop a deep understanding of the characteristics of a proportional relationship. Mathematics should be represented in as many ways as possible in this unit by using graphs, tables, pictures, symbols and words. Some examples of providing the students with this opportunity are the following:

researching newspaper ads, constructing their own questions, keeping a log of prices (particularly sales) and determining savings by purchasing items on sale.

Unit 4 This unit builds on students' knowledge and understanding of statistics from the 6th grade. Students begin to use random samples to make predictions about an entire population and judge the possible discrepancies of the predictions. Opportunities are provided for students to use real-life situations from science and social studies to show the purpose for using random sampling to make inferences about a population.

Unit 5 This unit focuses on how to teach students to draw geometric figures using rulers and protractor with an emphasis on triangles. Students will also explore two-dimensional cross-sections of cylinders, cones, pyramids, and prisms. Their knowledge from 6th grade will help when they are learning to write and solve equations involving angle relationships and when solving engaging problems that require determining the area, volume, and surface area of fundamental solid figures. This unit also requires students to know and use the formula for the circumference and area of a circle.

Unit 6 In this unit, students will begin to understand the probability of chance (simple and compound). Along with the understanding of probability, they will develop probability models to be used to find the probability of events. They will make predictions and use the information from simulations for predictions. The students will begin to expand their knowledge and understanding of the probability of simple events.

Assessment and Task Links

The information contained in the following links is aligned to Common Core; however, please review each question for rigor and alignment with the GA Frameworks.

http://middlemathccss.wordpress.com/2012/02/13/

http://www.sfps.info/index.aspx?NID=1390

http://www.rda.aps.edu/mathtaskbank/fi_html/68tasks.htm

http://eucc2011.wikispaces.com/7th+Grade+Mathematics

http://schools.nyc.gov/Academics/CommonCoreLibrary/TasksUnitsStudentWork/default.htm

http://www.free-test-online.com/ccss/ccss.html

https://njctl.org/courses/math/

http://www.orglib.com/3.nbt.1-worksheet-viewtestquestions_0d1520c2bb_0dc42638b5a545f89af14d077dd81f43_157.html

http://www.xpmath.com/

http://www.mathscore.com/math/practice/

http://www.internet4classrooms.com/common_core/index.htm

http://mdk12.org/instruction/curriculum/mathematics/assessments_msa.html

http://www.orecity.k12.or.us/staff/curriculum_resources/mathematics/instructional_resources

Georgia Department of Education

http://www.warsaw.k12.ny.us/district.cfm?subpage=1392433

http://www.p12.nysed.gov/assessment/common-core-sample-questions/

http://www.doe.virginia.gov/testing/sol/practice_items/index.shtml

www.khanacademy.org/

http://www.uen.org/core/math/

*Unit 3 does not require the use of positive and negative numbers. It is up to the discretion of the county whether or not to move this unit before unit 1.

Common Core Georgia Performance Standards
Seventh Grade – At a Glance

Common Core Georgia Performance Standards: Curriculum Map						
1st Semester			2nd Semester			
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Operations with Rational Numbers	**Expressions & Equations**	**Ratios and Proportional Relationships**	**Inferences**	**Geometry**	**Probability**	**Show What We Know**
MCC7.NS.1a MCC7.NS.1b MCC7.NS.1c MCC7.NS.1d MCC7.NS.2a MCC7.NS.2b MCC7.NS.2c MCC7.NS.2d MCC7.NS.3 3	MCC7.EE.1 MCC7.EE.2 MCC7.EE.3 MCC7.EE.4a MCC7.EE.4b	MCC7.RP.1 MCC7.RP.2a MCC7.RP.2b MCC7.RP.2c MCC7.RP.2d MCC7.RP.3 MCC7.G.1	MCC7.SP.1 MCC7.SP.2 MCC7.SP.3 MCC7.SP.4	MCC7.G.2 MCC7.G.3 MCC7.G.4 MCC7.G.5 MCC7.G.6	MCC7.SP.5 MCC7.SP.6 MCC7.SP.7a MCC7.SP.7b MCC7.SP.8a MCC7.SP.8b MCC7.SP.8c	ALL
Incorporated Standards						
	MCC7.NS.1 *MCC7.NS.2* *MCC7.NS.3*	*MCC7.EE.3* *MCC7.NS.1* *MCC7.NS.2* *MCC7.NS.3*	*MCC7.NS.1* *MCC7.NS.2* *MCC7.NS.3*	*MCC7.G.1*		
These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units. All units will include the Mathematical Practices and indicate skills to maintain.						

NOTE: Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.

Grades 6-8 Key: NS = The Number System, RP = Ratios and Proportional Relationships, EE = Expressions and Equations, G = Geometry, SP = Statistics and Probability

Common Core Georgia Performance Standards
Seventh Grade – 1st Semester

Common Core Georgia Performance Standards: Curriculum Map

Standards for Mathematical Practice

1 Make sense of problems and persevere in solving them.	**5** Use appropriate tools strategically.
2 Reason abstractly and quantitatively.	**6** Attend to precision.
3 Construct viable arguments and critique the reasoning of others.	**7** Look for and make use of structure.
4 Model with mathematics.	**8** Look for and express regularity in repeated reasoning.

1st Semester

Unit 1	Unit 2	Unit 3
Operations with Rational Numbers	**Expressions & Equations**	**Ratios and Proportional Relationships**
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. **MCC7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **MCC7.NS.1a** Describe situations in which opposite quantities combine to make 0. **MCC7.NS.1b** Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **MCC7.NS.1c** Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. **MCC7.NS.1d** Apply properties of operations as strategies to add and subtract rational numbers. **MCC7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **MCC7.NS.2a** Understand that multiplication is extended from fractions to rational numbers by requiring that operations	**Use properties of operations to generate equivalent expressions.** **MCC7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **MCC7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. **Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** **MCC7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. **MCC7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **MCC7.EE.4a** Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. **MCC7.EE.4b** Solve word problems leading to inequalities of	**Analyze proportional relationships and use them to solve real-world and mathematical problems.** **MCC7.RP.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. **MCC7.RP.2** Recognize and represent proportional relationships between quantities. **MCC7.RP.2a** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **MCC7.RP.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **MCC7.RP.2c** Represent proportional relationships by equations. **MCC7.RP.2d** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate. **MCC7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **Draw, construct, and describe geometrical figures and describe the relationships between them.** **MCC7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and

continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. **MCC7.NS.2b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. **MCC7.NS.2c** Apply properties of operations as strategies to multiply and divide rational numbers. **MCC7.NS.2d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. **MCC7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.	the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	areas from a scale drawing and reproducing a scale drawing at a different scale.
	Incorporated Standards	
	MCC7.NS.1 *MCC7.NS.2* *MCC7.NS.3*	*MCC7.EE.3* *MCC7.NS.1* *MCC7.NS.2* *MCC7.NS.3*

Common Core Georgia Performance Standards
Seventh Grade – 2nd Semester

Common Core Georgia Performance Standards: Curriculum Map			
Standards for Mathematical Practice			
1 Make sense of problems and persevere in solving them. **2** Reason abstractly and quantitatively. **3** Construct viable arguments and critique the reasoning of others. **4** Model with mathematics.		**5** Use appropriate tools strategically. **6** Attend to precision. **7** Look for and make use of structure. **8** Look for and express regularity in repeated reasoning.	
2nd Semester			
Unit 4	Unit 5	Unit 6	Unit 7
Inferences	**Geometry**	**Probability**	**Show What We Know**
Use random sampling to draw inferences about a population. **MCC7.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. **MCC7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions **Draw informal comparative inferences about two populations.** **MCC7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. **MCC7.SP.4** Use measures of center and measures of variability for numerical data from random samples to draw informal	**Draw, construct, and describe geometrical figures and describe the relationships between them.** **MCC7.G.2** Draw (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. **MCC7.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. **Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.** **MCC7.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. **MCC7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**Investigate chance processes and develop, use, and evaluate probability models.** **MCC7.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. **MCC7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. **MCC7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **MCC7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events **MCC7.SP.7b** Develop a probability model	**ALL**

comparative inferences about two populations.	**MCC7.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.	(which may not be uniform) by observing frequencies in data generated from a chance process. **MCC7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **MCC7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. **MCC7.SP.8b** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. **MCC7.SP.8c** Design and use a simulation to generate frequencies for compound events.	
Incorporated Standards			
MCC7.NS.1 *MCC7.NS.2* *MCC7.NS.3*	*MCC7.G.1*		