Georgia
Standards of Excellence
Curriculum Map

Mathematics

GSE Grade 7

Georgia Department of Education

Richard Woods, Georgia's School Superintendent
"Educating Georgia's Future"

Georgia Department of Education

GSE Grade 7 Curriculum Map						
1st Semester			**2nd Semester**			
Click on the link in the table to view a video that shows instructional strategies for teaching each standard.						
Unit 1 *(4 – 5 weeks)*	**Unit 2** *(4 – 5 weeks)*	**Unit 3** *(4 – 5 weeks)*	**Unit 4** *(4 – 5 weeks)*	**Unit 5** *(4 – 5 weeks)*	**Unit 6** *(3 – 4 weeks)*	**Unit 7** *(3 – 4 weeks)*
Operations with Rational Numbers	**Expressions and Equations**	**Ratios and Proportional Relationships**	**Geometry**	**Inferences**	**Probability**	Show What We Know
MGSE7.NS.1 MGSE7.NS.1a MGSE7.NS.1b MGSE7.NS.1c MGSE7.NS.1d MGSE7.NS.2 MGSE7.NS.2a MGSE7.NS.2b MGSE7.NS.2c MGSE7.NS.2d MGSE7.NS.3	MGSE7.EE.1 MGSE7.EE.2 **MGSE7.EE.3** MGSE7.EE.4 MGSE7.EE.4a MGSE7.EE.4b MGSE7.EE.4c	MGSE7.RP.1 **MGSE7.RP.2** MGSE7.RP.2a MGSE7.RP.2b MGSE7.RP.2c MGSE7.RP.2d **MGSE7.RP.3** **MGSE7.G.1**	**MGSE7.G.2** **MGSE7.G.3** MGSE7.G.4 MGSE7.G.5 **MGSE7.G.6**	MGSE7.SP.1 **MGSE7.SP.2** **MGSE7.SP.3** MGSE7.SP.4	MGSE7.SP.5 MGSE7.SP.6 **MGSE7.SP7** MGSE7.SP.7a MGSE7.SP.7b MGSE7.SP.8 MGSE7.SP.8a MGSE7.SP.8a MGSE7.SP.8b **MGSE7.SP.8c**	ALL
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.

Georgia Standards of Excellence Grade 7 Mathematics
Curriculum Map Rationale

Unit 1: Building upon the understanding of rational numbers developed in 6th grade, this unit moves to exploring and ultimately formalizing rules for operations (addition, subtraction, multiplication and division) with integers. Using both contextual and numerical problems, students 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 rules. Fractional rational numbers and whole numbers should be used in computations and explorations.

Unit 2: Students build on what was learned in previous grades regarding mathematical properties such as commutative, associative, and distributive properties, and conventions, such as order of operations. Students use these conventions and properties of operations to rewrite equivalent numerical expressions. Students continue to use properties used with whole numbers, extending their use to integers, rational, and real numbers. Students write expressions and equations in more than one format, demonstrating that they are still equal. Variables are used to represent quantities in real-world problems.

Unit 3: This unit builds on student knowledge and understanding of rate and unit concepts, including the need to develop proportional relationships through the analysis of graphs, tables, equations, and diagrams. Grade 7 pushes the student 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.

Unit 4: Students learn to draw geometric figures using rulers and protractors with an emphasis on triangles. Students explore two-dimensional cross-sections of cylinders, cones, pyramids, and prisms. Students write and solve equations involving angle relationships and solve problems that require determining the area, volume, and surface area of solid figures. This unit also introduces students to the formula for the circumference and area of a circle.

Unit 5: Building on the knowledge of statistics from sixth grade, students use random samples to make predictions about an entire population and judge the possible discrepancies of the predictions. Students use real-life situations from science and social studies to show the purpose for using random sampling to make inferences about a population. Note- Units 5 and 6 were combined in the revised curriculum map providing an uninterrupted exploration of statistics.

Unit 6: Students begin to understand the probability of chance (simple and compound). They develop models to find the probability of simple events, and make predictions using information from simulations.

GSE Grade 7 Expanded Curriculum Map – 1st Semester

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.

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.	**Use properties of operations to generate equivalent expressions.**	**Analyze proportional relationships and use them to solve real-world and mathematical problems.**
MGSE7.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.	**MGSE7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**MGSE7.RP.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.*
MGSE7.NS.1a Show that a number and its opposite have a sum of 0 (are additive inverses). Describe situations in which opposite quantities combine to make 0. *For example, your bank account balance is -$25.00. You deposit $25.00 into your account. The net balance is $0.00.*	**MGSE7.EE.2** Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related. *For example a + 0.05a = 1.05a means that adding a 5% tax to a total is the same as multiplying the total by 1.05.*	**MGSE7.RP.2** Recognize and represent proportional relationships between quantities.
MGSE7.NS.1b Understand p + q as the number located a distance from p, in the positive or negative direction depending on whether q is positive or negative. Interpret sums of rational numbers by describing real world contexts.	**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**	**MGSE7.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.
MGSE7.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**.**	**MGSE7.EE.3** Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.	**MGSE7.RP.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MGSE7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.	*For example:*	**MGSE7.RP.2c** Represent proportional relationships by equations.
MGSE7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	• *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.*	**MGSE7.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.
MGSE7.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) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts	• *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.*	**MGSE7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, and fees.
MGSE7.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	**MGSE7.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. **MGSE7.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	**Draw, construct, and describe geometrical figures and describe the relationships between them.** **MGSE7.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.

quotients of rational numbers by describing real-world contexts.
MGSE7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.
MGSE7.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.
MGSE7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

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?*
MGSE7.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.*
MGSE7.EE.4c Solve real-world and mathematical problems by writing and solving equations of the form $x+p = q$ and $px = q$ in which p and q are rational numbers.

GSE Grade 7 Expanded Curriculum Map – 2ⁿᵈ Semester

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.
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Unit 4	Unit 5	Unit 6	Unit 7
Geometry	**Inferences**	**Probability**	**Show What We Know**
<u>**Draw, construct, and describe geometrical figures and describe the relationships between them.**</u> **MGSE7.G.2** Explore various geometric shapes with given conditions. Focus on creating triangles from three measures of angles and/or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **MGSE7.G.3** Describe the two-dimensional figures (cross sections) that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms, right rectangular pyramids, cones, cylinders, and spheres. <u>**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**</u> **MGSE7.G.4** Given the formulas for the area and circumference of a circle, use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. **MGSE7.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. **MGSE7.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.-	<u>**Use random sampling to draw inferences about a population.**</u> **MGSE7.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. **MGSE7.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 <u>**Draw informal comparative inferences about two populations.**</u> **MGSE7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the medians by expressing it as a multiple of the interquartile range. **MGSE7.SP.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	<u>**Investigate chance processes and develop, use, and evaluate probability models.**</u> **MGSE7.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. **MGSE7.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. 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.* **MGSE7.SP.7** Develop a probability model and use it to find probabilities of events. Compare experimental and theoretical probabilities of events. If the probabilities are not close, explain possible sources of the discrepancy. **MGSE7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events **MGSE7.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*	ALL

| . | | *open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?* **MGSE7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **MGSE7.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. **MGSE7.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. **MGSE7.SP.8c** Explain ways to set up a simulation and use the simulation to generate frequencies for compound events. For example, if 40% of donors have type A blood, create a simulation to predict the probability that it will take at least 4 donors to find one with type A blood. | |