

**South Carolina
Curricular Standards
Mathematics - Grade 7
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Benchmark Number	Benchmark • Instructional Targets	Gourmet Resource	Taught	Tested
	Number and Operations			
	I. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.			
A.	Work flexibly with fractions, decimals, and percents to solve problems.			
1	• <i>Write and use the appropriate equivalent forms of whole numbers, fractions, decimals, and percents.</i>	Appetizers 1 A & C; (Number Concepts)		
B.	Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.			
1	• <i>Identify, represent, and find the approximate location of fractions, decimals, percents, and square roots of perfect squares on a number line and then justify the reasoning used.</i>	Appetizers 2 F; (Mathematical Relations)		
2	• <i>Use order symbols to compare fractions, decimals, percents, and square roots of perfect squares and then justify the reasoning used.</i>	Appetizers 1 A; (Number Concepts)		
C.	Develop meaning for percents greater than 100 and less than 1.			
1	• <i>Use models to represent percents less than 1 percent and solve problems involving them.</i>	Appetizers 1 C; (Number Concepts)		
D.	Understand and use ratios and proportions to represent quantitative relationships.			
*1	• <i>Create and write ratios and proportions from applied situations and explain the reasoning used.</i>	Appetizers 2 B; 10 B; (Mathematical Relations); (Estimation)		

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E.	Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.			
1	• <i>Translate to standard form a number written in exponential form, in scientific notation, and in calculator notation.</i>	Appetizers 1 D & G; (Number Concepts)		
F.	Use factors, multiples, prime factorization, and relatively prime numbers to solve problems.			
1	• <i>Apply primes, composites, factors, multiples, and relatively prime numbers in a variety of applied and mathematical situations and explain the reasoning used.</i>	Appetizers 1 E & F; (Number Concepts)		
G.	Develop meaning for integers and represent and compare quantities with them.			
1	• <i>Compare and order integers.</i>	Appetizers 1 A & C; (Number Concepts)		
	II. Understand meanings of operations and how they relate to one another.			
A.	Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.			
1	• <i>Explain the meaning and effects of arithmetic operations with integers.</i>	Appetizers 6 A; 7 A; 8 A; 9 A; 11 A; 14 A; (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving); (Mathematical Language, Representations, and Models)		
B.	Use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals.			
1	• <i>Apply the associative, commutative, and distributive properties for operations on integers, fractions, and decimals.</i>	Appetizers 2 A; 12 A; 15 B; (Mathematical Relations); (Mathematical Representation); (Make Conjectures and Verify Conclusions)		

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C.	Understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.			
1	• <i>Using models and numbers, explain the inverse relationships between squaring and finding square roots of perfect squares.</i>	Appetizers 1 G; (Number Concepts)		
III. Compute fluently and make reasonable estimates.				
A.	Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.			
1	• <i>Applying all operations to fractions, decimals, and integers, select appropriate methods and tools to solve problems.</i>	Appetizers 1 C & F; 6 A; 7 A; 8 A; 9 A; 11 A; 15 B; (Number Concepts); (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving); (Make Conjectures and Verify Conclusions)		
B.	Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.			
*1	• <i>Use models and numbers to develop and analyze the algorithms for computing with integers.</i>	Appetizers 2 A, B, & G; 14 A; 15 A & B; (Mathematical Relations); (Mathematical Language, Representations, and Models); (Make Conjectures and Verify Conclusions)		
*2	• <i>Add, subtract, multiply, and divide integers to solve a variety of applied and mathematical problems.</i>	Appetizers 6 A; 7 A; 8 A; 9 A; 11 A; 12 A; 15 A & B; (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving); (Mathematical Representation); (Make Conjectures and Verify Conclusions)		

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C.	Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.			
1	• <i>Estimate the products, and quotients of fractions and decimals, describe the method used, and determine the reasonableness of results.</i>	Appetizers 10 A & B; (Estimation)		
2	• <i>Estimate the sums and differences of integers, describe the method used, and determine the reasonableness of results.</i>	Appetizers 10 A & B; 13 A; 15 A & B; (Estimation); (Reasonableness); (Make Conjectures and Verify Conclusions)		
D.	Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.			
1	• <i>Explain the equivalent ratio method of solving problems involving proportions.</i>	Appetizers 2 C; 10 B; 14 A; (Mathematical Relations); (Estimation); (Mathematical Language, Representations, and Models)		
Algebra				
I. Understand patterns, relations, and functions.				
A.	Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.			
1	• <i>Describe, extend, analyze, and create a wide variety of patterns to investigate relationships and to solve problems.</i>	Appetizers 2 D; 15 A & B; (Mathematical Relations); (Make Conjectures and Verify Conclusions)		
B.	Relate and compare different forms of representations for a relationship.			
1	• <i>Use different forms of representing information (e.g., graphical, symbolic, tabular).</i>	Appetizers 1 D; 2 B, F, G, & H; (Number Concepts); (Mathematical Relations)		
C.	Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.			
1	• <i>Examine tables and graphs to determine if there is a constant rate of change between the quantities.</i>			

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	II. Represent and analyze mathematical situations and structures using algebraic symbols.			
A.	Develop an initial conceptual understanding of different uses of variables.			
1	<ul style="list-style-type: none"> <i>Explain the use of a variable as a quantity that can change its value, as a quantity on which other values depend, and as generalization of patterns.</i> 	Appetizers 2 D & G; 14 A; 15 B; (Mathematical Relations); (Mathematical Language, Representations, and Models); (Make Conjectures and Verify Conclusions)		
B.	Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.			
1	<ul style="list-style-type: none"> <i>Analyze quantitative changes by comparing and contrasting numerical patterns in tables with their respective graphs in the coordinate plane.</i> 	Appetizers 2 E; 12 B; 14 A; (Mathematical Relations); (Mathematical Representation); (Mathematical Language, Representations, and Models)		
2	<ul style="list-style-type: none"> <i>state the coordinates of the x and y intercepts from a graph.</i> 	Appetizers 2 E; (Mathematical Relations)		
C.	Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.			
1	<ul style="list-style-type: none"> <i>Use variables to describe numerical expressions and relationships.</i> 	Appetizers 2 D; 12 A; (Mathematical Relations); (Mathematical Representation)		
D.	Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.			
1	<ul style="list-style-type: none"> <i>Recognize and apply the additive and multiplicative inverses.</i> 	Appetizers 2 A; 12 A; (Mathematical Relations); (Mathematical Representation)		
2	<ul style="list-style-type: none"> <i>Use models and numbers to solve one-step linear equations and inequalities in one variable.</i> 	Appetizers 2 D; 12 A; 14 A; (Mathematical Relations); (Mathematical Representation); (Mathematical Language, Representations, and Models)		

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	III. Use mathematical models to represent and understand quantitative relationships.			
A.	Model and solve contextualized problems using various representations, such as graphs, tables, and equations.			
*1	<ul style="list-style-type: none"> Use graphs, tables, and equations to solve applied problems involving tips, discounts, sales tax, and simple interest. 	Appetizers 2 B; 12 B; 14 A; (Mathematical Relations); (Mathematical Representation); (Mathematical Language, Representations, and Models)		
	IV. Analyze change in various contexts.			
A.	Use graphs to analyze the nature o changes in quantities in linear relationships.			
1	<ul style="list-style-type: none"> From a graph, describe a linear relationship as positive or negative. 	Appetizers 2 E & H; (Mathematical Relations)		
	Geometry			
	I. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.			
A.	Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties.			
1	<ul style="list-style-type: none"> Classify polygons as regular or nonregular and investigate relationships between the number of diagonals and the number of sides of a regular polygon. 	Appetizers 3 A & E; 11 B; 15 A; (Geometry); (Problem Solving); (Make Conjectures and Verify Conclusions)		
B.	Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.			
*1	<ul style="list-style-type: none"> Describe relationships between the edge lengths and the volume of similar prisms. 	Appetizers 4 E; (Measurement)		

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C.	Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.			
*1	• <i>Compare and contrast attributes of similar figures and the attributes of congruent figures.</i>	Appetizers 3 A & C; 11 C; (Geometry); (Problem Solving)		
	II. Specify locations and describe spatial relationships using coordinate geometry and other representational systems.			
A.	Use coordinate geometry to represent and examine the properties of geometric shapes.			
1	• <i>Identify and graph ordered pairs in the four quadrants of a coordinate plane.</i>	Appetizers 2 E; (Mathematical Relations)		
B.	Use coordinate geometry to examine special geometric shapes, such as rectangular polygons or those with pairs of parallel or perpendicular sides.			
*1	• <i>State relationships among the coordinates of the vertices of rectangles, squares, parallelograms, trapezoids, and rhombuses oriented horizontally.</i>	Appetizers 2 E; 3 B; 15 B; (Mathematical Relations); (Geometry); (Make Conjectures and Verify Conclusions)		
	III. Apply transformations and use symmetry to analyze mathematical situations.			
A.	Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.			
1	• <i>Describe the transformation used to move a polygon in one quadrant to another quadrant in the coordinate plane.</i>	Appetizers 3 B & H; (Geometry)		
B.	Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.			
1	• <i>Determine the type of symmetry (point or line) found in a reflection or rotation.</i>	Appetizers 3 B; (Geometry)		

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	IV. Use visualization, spatial reasoning, and geometry modeling to solve problems.			
A.	Draw geometric objects with specified properties, such as side lengths or angle measures.			
*1	• <i>Draw two-dimensional objects from a geometric description and write a description of geometric properties for a given object.</i>	Appetizers 3 F & G; (Geometry)		
B.	Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.			
1	• <i>Construct nets for three-dimensional figures.</i>	Appetizers 3 G; (Geometry)		
2	• <i>Compare and contrast the number of faces, vertices, and edges of three-dimensional figures.</i>	Appetizers 3 A; 11 B; 14 A; (Geometry); (Problem Solving); (Mathematical Language, Representations, and Models)		
C.	Use visual tools such as networks to represent and solve problems.			
1	• <i>Given a network with up to six vertices, determine the number of paths.</i>	Appetizers 3 G; (Geometry)		
D.	Use geometric models to represent and explain numerical and algebraic relationships.			
E.	Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.			
1	• <i>Identify transformations in tessellations, use transformations to draw tessellations, and describe relationships among figures that tessellate.</i>	Appetizers 3 B; (Geometry)		

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	Measurement			
	I. Understand measurable attributes of objects and the units, systems, and processes of measurement.			
A.	Understand both metric and customary systems of measurement.			
1	<ul style="list-style-type: none"> Explain the relationship between the metric system and the base-ten number system. 	Appetizers 4 A; (Measurement)		
B.	Understand relationships among units and convert from one unit to another within the same system.			
1	<ul style="list-style-type: none"> Compare and convert units of measure for length, weight/mass, and volume within the U.S. customary system and the metric system. 	Appetizers 4 A, B, C, D, & E; (Measurement)		
2	<ul style="list-style-type: none"> Add and subtract mixed units of measure and express answers in appropriate form. 			
C.	Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.			
1	<ul style="list-style-type: none"> Use appropriate units of measure to label surface area and volume. 	Appetizers 3 G; 4 E; (Geometry); (Measurement)		
	II. Apply appropriate techniques, tools, and formulas to determine measurements.			
A.	Use common benchmarks to select appropriate methods for estimating measurements.			
1	<ul style="list-style-type: none"> Use appropriate methods to approximate the surface area and volume of irregular figures. 	Appetizers 10 B; (Estimation)		
B.	Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.			
1	<ul style="list-style-type: none"> Analyze a variety of measurement situations to determine the necessary degree of accuracy and precision. 	Appetizers 4 A; 15 B; (Measurement); (Make Conjectures and Verify Conclusions)		

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C.	Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes.			
1	• <i>Use measurements and formulas to solve real-world and mathematical problems.</i>	Appetizers 4 E; 15 B; (Measurement); (Make Conjectures and Verify Conclusions)		
2	• <i>Using concrete materials or computer models, derive approximations for pi from measurements for circumference and diameter.</i>	Appetizers 2 H; 4 E; (Mathematical Relations); (Measurement)		
*3	• <i>Create and solve problems by finding the circumference and/or area of a circle when given the diameter or radius.</i>	Appetizers 2 H; 4 D & E; (Mathematical Relations); (Measurement)		
D.	Develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders.			
*1	• <i>Investigate and describe the relationship between the area of the base and the volume of a prism, pyramid, and cylinder.</i>	Appetizers 14 A; 15 A; (Mathematical Language, Representations, and Models); (Make Conjectures and Verify Conclusions)		
E.	Solve problems involving scale factors, using ratio and proportion.			
*1	• <i>Determine the unit rate.</i>	Appetizers 2 B; (Mathematical Relations)		
F.	Solve simple problems involving rates and derived measurements for such attributes as velocity and density.			
1	• <i>Apply rates to solve problems in real-world situations.</i>	Appetizers 10 B; (Estimation)		

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Data Analysis and Probability				
I. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.				
A. Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.				
1	• <i>Given a problem situation involving two populations, collect, analyze, and interpret data.</i>	Appetizers 5 C; (Probability/Statistics)		
B. Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.				
1	• <i>Organize, display, and interpret data in a variety of ways including box-and-whisker plots.</i>	Appetizers 5 D; (Probability/Statistics)		
2	• <i>Construct circle graphs and interpret the meaning.</i>	Appetizers 5 D; (Probability/Statistics)		
II. Select and use appropriate statistical methods to analyze data.				
A. Find, use, and interpret measures of center and spread, including mean and interquartile range.				
1	• <i>Compute, describe, and interpret the interquartile range.</i>			
B. Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.				
*1	• <i>Describe the relationship between a data set and its corresponding box plot or circle graph.</i>	Appetizers 5 D; (Probability/Statistics)		

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	III. Develop and evaluate inferences and predictions that are based on data.			
A.	Use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.			
1	• <i>Make inferences and predictions based on the analysis of sample data.</i>	Appetizers 5 C; (Probability/Statistics)		
B.	Make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit.			
C.	Use conjectures to formulate new questions and plan new studies to answer them.			
	IV. Understand and apply basic concepts of probability.			
A.	Understand and use appropriate terminology to describe complementary and mutually exclusive events.			
1	• <i>Identify and describe mutually exclusive events.</i>			
B.	Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.			
1	• <i>Investigate and describe the difference between the probability of an event found through simulation and the theoretical probability of that same event.</i>	Appetizers 5 B; (Probability/Statistics)		
C.	Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.			
1	• <i>Using the fundamental counting principle or other techniques, determine the number of possible outcomes in a multistage event.</i>	Appetizers 5 A; (Probability/Statistics)		
*2	• <i>Compute the probability of two independent events.</i>	Appetizers 5 B; (Probability/Statistics)		