South Carolina
Curricular Standards
Mathematics - Grade 6
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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**	• *Show the relationship among fractions, decimals, and percents.*	**Appetizers 1 A & E; Main Dish Objective 1 (Number Concepts) Lessons 1 & 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.**			
1	• *Use order symbols to compare two fractions, two decimals, or two percents.*	**Appetizers 1 C; Main Dish Objective 1 (Number Concepts) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
C.	**Develop meaning for percents greater than 100 and less than 1.**			
1	• *Use models to represent percents greater than 100 percent and solve problems involving them.*	**Appetizers 1 E; Main Dish Objective 1 (Number Concepts) Lesson 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
D.	**Understand and use ratios and proportions to represent quantative relationships.**			
1	• *Connect the concept of ratio and fractions by determining the equivalence of two ratios.*	**Appetizers 1 E; 5 D; Main Dish Objectives 1 (Number Concepts) Lesson 5; 5 (Probability/Statistics) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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E.	**Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.**			
1	• *Evaluate powers of ten up to 10^6.*	**Appetizers 1 F; 8 C; Main Dish Objectives 1 (Number Concepts) Lesson 6; 8 (Multiplication) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
F.	**Use factors, multiples, prime factorization, and relatively prime numbers to solve problems.**			
1	• *Solve problems using prime factorization, common multiples, and common factors and then explain the reasoning used.*	**Appetizers 1 D; Main Dish Objective 1 (Number Concepts) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
G.	**Develop meaning for integers and represent and compare quantities with them.**			
1	• *Use integers to describe real-world phenomena in order to develop meanings for integers.*	**Appetizers 1 A; 2 F; Main Dish Objectives 1 (Number Concepts) Lesson 1; 2 (Mathematical Relations) Lesson 6; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
	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	• *Explain the meaning and effects of adding, subtracting, multiplying, and dividing.*	**Appetizers 6 A, B, C, & D; 7 A, B, C, & D; 8 A, B, C, & D; 9 A, B, C, D, E, & F; Main Dish Objectives 6 (Addition) Lessons 1, 2, 3, & 4; 7 (Subtraction) Lessons 1, 2, 3, & 4; 8 (Multiplication) Lessons 1, 2, 3, & 4; 9 (Division) Lessons 1, 2, 3, 4, 5, & 6; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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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	• *Apply the commutative, associative, and distributive properties to simplify computations with whole numbers, fractions, and decimals.*	**Appetizers 2 A; 9 A; 12 B; Main Dish Objectives 2 (Mathematical Relations) Lesson 1; 9 (Division) Lesson 1; 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
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.**			
	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	• *Select appropriate methods and tools to solve problems requiring the addition and subtraction of fractions and decimals.*	**Appetizers 6 C & D; 7 B & C; 11 A; Main Dish Objectives 6 (Addition) Lessons 3 & 4; 7 (Subtraction) Lessons 2 & 3; 11 (Problem Solving) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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B.	**Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.**			
1	• *Using models, divide commonly used fractions (including decimals).*	**Appetizers 9 E; Main Dish Objective 9 (Division) Lesson 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
***2**	• *Use models and numbers to develop and analyze algorithms with fractions and decimals.*	**Appetizers 2 A; 6 C & D; 7 B & C; 8 D; 9 E & F; Main Dish Objectives 2 (Mathematical Relations) Lesson 1; 6 (Addition) Lessons 3 & 4; 7 (Subtraction) Lessons 2 & 3; 8 (Multiplication) Lesson 4; 9 (Division) Lessons 5 & 6; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
***3**	• *Add, subtract, multiply, and divide fractions (including decimals) to solve a variety of applied and mathematical problems.*	**Appetizers 2 A; 6 C & D; 7 B & C; 8 D; 9 E & F; 11 A; 12 B; Main Dish Objectives 2 (Mathematical Relations) Lesson 1; 6 (Addition) Lessons 3 & 4; 7 (Subtraction) Lessons 2 & 3; 8 (Multiplication) Lesson 4; 9 (Division) Lessons 5 & 6; 11 (Problem Solving) Lesson 1; 12 (Mathematical Representation) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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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	• *Estimate the sums and differences of fractions, describe the method used, and determine the reasonableness of results.*	**Appetizers 10 A, B, C, D, E, F, & G; 13 A & B; Main Dish Objectives 10 (Estimation) Lessons 1, 2, 3, 4, 5, 6, & 7; 13 (Reasonableness) Lessons 1 & 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
D.	**Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.**			
	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**	• *Describe, extend, and write rules for a wide variety of patterns.*	**Appetizers 2 B; Main Dish Objective 2 (Mathematical Relations) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Relate and compare different forms of representations for a relationship.**			
C.	**Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.**			

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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**	• *Use order of operations to evaluate numerical expressions.*	**Appetizers 2 A; Main Dish Objective 2 (Mathematical Relations) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.**			
1	• *Write simple equations and inequalities accurately to represent relationships.*	**Appetizers 2 D; 12 A; Main Dish Objectives 2 (Mathematical Relations) Lesson 1; 12 (Mathematical Representation) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
C.	**Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.**			
D.	**Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.**			
1	• *Use commutative, associative, and distributive properties to examine equivalence of a variety of simple algebraic expressions.*	**Appetizers 2 A; Main Dish Objective 2 (Mathematical Relations) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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	III. Use mathematical models to represent and understand quantative relationships.			
A.	**Model and solve contextualized problems using various representations, such as graphs, tables, and equations.**			
1	• *Use graphs and tables to solve applied problems.*	**Appetizers 2 E; 5 B; 12 C; Main Dish Objectives 2 (Mathematical Relations) Lesson 5; 5 (Probability/Statistics) Lesson 2; 12 (Mathematical Representations) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
	IV. Analyze change in various contexts.			
A.	**Use graphs to analyze the nature of changes in quantities in linear relationships.**			
	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	• *Compare and contrast prisms, cylinders, and pyramids with the polygons or circles that constitute their faces.*	**Appetizers 3 A; Main Dish Objective 3 (Geometry) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.**			
1	• *Describe relationships among angles, side lengths, perimeters, and areas of similar polygons.*	**Appetizers 3 A & D; Main Dish Objective 3 (Geometry) Lessons 1 & 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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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	• *Identify and describe point and line symmetry in two-dimensional shapes.*	**Appetizers 3 C; Main Dish Objective 3 (Geometry) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
2	• *Distinguish between similarity and congruence.*	**Appetizers 3 C; 11 C; Main Dish Objectives 3 (Geometry) Lesson 3; 11 (Problem Solving) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
	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	• *Given the coordinates of three vertices of a rectangle or square oriented horizontally or vertically, use the first quadrant of the rectangular coordinate system to locate the other vertex.*	**Appetizers 2 E; Main Dish Objective 2 (Mathematical Relations) Lesson 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Use coordinate geometry to examine special geometric shapes, such as rectangular polygons or those with pairs of parallel or perpendicular sides.**			
1	• *Plot the vertices of squares and rectangles and determine the relationship among the coordinates.*	**Appetizers 2 E; Main Dish Objective 2 (Mathematical Relations) Lesson 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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	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	• *Describe the transformation used to move a polygon from one location to another in the first quadrant.*	**Appetizers 3 B; Main Dish Objective 3 (Geometry) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.**			
***1**	• *Apply a transformation to a polygon and describe how it has changed.*	**Appetizers 3 B; Main Dish Objective 3 (Geometry) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
	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	• *Use symbols for parallel lines and perpendicular lines to describe polygons and figures where appropriate.*			
B.	**Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.**			
***1**	• *Given the top, side, and front views, construct a three-dimensional model using cubes.*			
C.	**Use visual tools such as networks to represent and solve problems.**			

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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	• *Identify and apply geometric concepts in a variety of practical contexts.*	**Appetizers 3 A, B, C, & D; 11 C; Main Dish Objectives 3 (Geometry) Lessons 1, 2, 3, & 4; 11 (Problem Solving) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
	Measurement			
	I. Understand measurable attributes of objects and the units, systems, and processes of measurement.			
A.	**Understand both metric and customary systems of measurement.**			
B.	**Understand relationships among units and convert from one unit to another within the same system.**			
C.	**Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.**			
1	• *Estimate angle measure using 45 degrees, 90 degrees, 180 degrees, 270 degrees, and 360 degrees as referents and use the appropriate tools to measure any angle.*	**Appetizers 3 D; Main Dish Objective 3 (Geometry) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
2	• *Use appropriate units of measure to label angles, perimeter, and area.*	**Appetizers 3 D; Main Dish Objective 3 (Geometry) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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	II. Apply appropriate techniques, tools, and formulas to determine measurements.			
A.	**Use common benchmarks to select appropriate methods for estimating measurements.**			
***1**	• *Using standard and nonstandard units of measure, estimate and then determine length, weight/mass, area, and volume/capacity.*	**Appetizers 3 A, B, & C; Main Dish Objective 3 (Geometry) Lessons 1, 2, & 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
2	• *Estimate and justify estimates of perimeter and area of irregular shapes.*	**Appetizers 4 D & F; 11 B; Main Dish Objectives 4 (Measurement) Lessons 4 & 6; 11 (Problem Solving) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.**			
1	• *Select and use appropriate tools and units to measure to the degree of accuracy required in a particular situation.*	**Appetizers 4 A, B, & C; Main Dish Objective 4 (Measurement) Lessons 1, 2, & 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
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	• *Investigate and describe the relationship between areas of rectangles and triangles or other quadrilaterals.*	**Appetizers 3 D; Main Dish Objective 3 (Geometry) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
***2**	• *Develop and apply the formulas for the area of triangles and parallelograms.*	**Appetizers 3 D; Main Dish Objective 3 (Geometry) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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D.	**Develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders.**			
E.	**Solve problems involving scale factors, using ratio and proportion.**			
1	• *Use a scale to find distance.*			
F.	**Solve simple problems involving rates and derived measurements for such attributes as velocity and density.**			
	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	• *Given a problem situation involving one population, collect, analyze, and interpret data.*	**Appetizers 5 A; Main Dish Objective 5 (Probability/Statistics) Lesson 1; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.**			
1	• *Organize and display data in a variety of ways including frequency tables, histograms, and stem-and-leaf plots.*	**Appetizers 5 B; Main Dish Objective 5 (Probability/Statistics) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		

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	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	• *Create and solve problems involving the mean, median, mode, and range of a set of data.*	**Appetizers 5 E; Main Dish Objective 5 (Probability/Statistics) Lesson 5; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
B.	**Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.**			
1	• *Interpret histograms and stem-and-leaf plots.*			
***2**	• *Describe the relationships between a data set and its corresponding histogram or stem-and-leaf plot.*			
	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	• *Analyze and list the differences between two data sets.*	**Appetizers 5 B; Main Dish Objective 5 (Probability/Statistics) Lesson 2; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
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.**			

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	IV. Understand and apply basic concepts of probability.			
A.	**Understand and use appropriate terminology to describe complementary and mutually exclusive events.**			
1	• *Identify and describe complementary events.*			
B.	**Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.**			
1	• *Create a sample space for one- and two-stage events and represent it in the form of a list, chart, picture, or tree diagram.*	**Appetizers 5 C; Main Dish Objective 5 (Probability/Statistics) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
***2**	• *From a given sample space, determine, and interpret the probability of an event.*	**Appetizers 5 D; Main Dish Objective 5 (Probability/Statistics) Lesson 4; Applications; Final Tests; Reasonableness Problems; Journal Topics**		
C.	**Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.**			
1	• *Making a tree diagram or using models, determine the number of possible outcomes in two-stage events.*	**Appetizers 5 C; Main Dish Objective 5 (Probability/Statistics) Lesson 3; Applications; Final Tests; Reasonableness Problems; Journal Topics**		