

*South Carolina  
Curricular Standards  
Mathematics - Grade 8  
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| <i>Benchmark Number</i> | <i>Benchmark</i><br>• <i>Instructional Targets</i>   | <i>Gourmet Resource</i>   | <i>Taught</i> | <i>Tested</i> |
|-------------------------|--|---|---------------|---------------|
|                         | <b>Number and Operations</b>   |   |               |               |
|                         | <b>I. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.</b>                           |   |               |               |
| <b>A.</b>               | <b>Work flexibly with fractions, decimals, and percents to solve problems.</b>   |   |               |               |
| <b>1</b>                | • <i>Solve real-world problems involving fractions, decimals, and percents.</i>  | <b>Appetizers 2 A; 6 A; 7 A; 8 A; 9 A; 11 A; (Mathematical Relations); (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving)</b> |               |               |
| <b>B.</b>               | <b>Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.</b>          |   |               |               |
| <b>1</b>                | • <i>Compare and order rational and irrational numbers and find their approximate locations on a number line.</i>                      | <b>Appetizers 1 C &amp; E; 2 B; 13 B; (Number Concepts); (Mathematical Relations); (Reasonableness)</b>   |               |               |
| <b>C.</b>               | <b>Develop meaning for percents greater than 100 and less than 1.</b>  |   |               |               |
| <b>1</b>                | • <i>Solve real-world problems involving the use of percents greater than 100 percent or less than 1 percent.</i>                      | <b>Appetizers 1 E; 11 B; (Number Concepts); (Problem Solving)</b>   |               |               |
| <b>D.</b>               | <b>Understand and use ratios and proportions to represent quantitative relationships.</b>  |   |               |               |
| <b>E.</b>               | <b>Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.</b> |   |               |               |
| <b>1</b>                | • <i>Use scientific notation to write very large numbers and numbers less than one.</i>  | <b>Appetizers 1 A; (Number Concepts)</b>  |               |               |

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| F.                      | Use factors, multiples, prime factorization, and relatively prime numbers to solve problems.  |   |               |               |
| G.                      | Develop meaning for integers and represent and compare quantities with them.  |   |               |               |
|                         | <b>II. Understand meanings of operations and how they relate to one another.</b>  |   |               |               |
| A.                      | Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.   |   |               |               |
| 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 to simplify expressions.</i>   | Appetizers 2 A & F; 11 A; 12 A; 13 A & C; (Mathematical Relations); (Problem Solving); (Mathematical Representation); (Reasonableness)  |               |               |
| 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>Approximate to the nearest tenth the square root of a number that falls between two perfect squares.</i>   |   |               |               |
|                         | <b>III. Compute fluently and make reasonable estimates.</b>   |   |               |               |
| 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>Select appropriate methods and tools to solve problems requiring the use of rational numbers.</i>  | Appetizers 1 C; 2 A; 6 A; 7 A; 8 A; 9 A; 11 A; 12 A; 13 C; (Number Concepts); (Mathematical Relations); (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving); (Mathematical Representation); (Reasonableness) |               |               |

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|-------------------------|---|--|---------------|---------------|
| <b>B.</b>               | <b>Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.</b>  |  |               |               |
| <b>*1</b>               | <ul style="list-style-type: none"> <li>• <i>Compute with rational numbers to solve a variety of applied and mathematical problems.</i></li> </ul>                           | <b>Appetizers 2 A &amp; G; 6 A; 7 A; 8 A; 9 A; 11 A; 12 A; (Mathematical Relations); (Addition); (Subtraction); (Multiplication); (Division); (Problem Solving); (Mathematical Representation)</b> |               |               |
| <b>C.</b>               | <b>Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.</b>                                      |  |               |               |
| <b>1</b>                | <ul style="list-style-type: none"> <li>• <i>Justify the reasonableness of an estimate of rational number computations.</i></li> </ul>                                       | <b>Appetizers 1 C; 2 A; 10 A; 12 A; 13 C; (Number Concepts); (Mathematical Relations); (Estimation); (Mathematical Representation); (Reasonableness)</b>   |               |               |
| <b>D.</b>               | <b>Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.</b>                                     |  |               |               |
| <b>*1</b>               | <ul style="list-style-type: none"> <li>• <i>Analyze and explain each method for solving a proportion (equivalent ratios, unit rates, and cross-multiplying).</i></li> </ul> | <b>Appetizers 2 D; 8 B; (Mathematical Relations); (Multiplication)</b>   |               |               |
| <b>*2</b>               | <ul style="list-style-type: none"> <li>• <i>Use proportional reasoning to solve applied problems and then justify the solution.</i></li> </ul>                              | <b>Appetizers 2 D; 8 B; 13 A &amp; B; (Mathematical Relations); (Multiplication); (Reasonableness)</b>   |               |               |

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|                         | <b>Algebra</b>   |   |               |               |
|                         | <b>I. Understand patterns, relations, and functions.</b>   |   |               |               |
| A.                      | Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.   |   |               |               |
| B.                      | Relate and compare different forms of representations for a relationship.  |   |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Describe the merits and limitations of graphical, symbolic, and tabular representations.</li> </ul>   | Appetizers 5 D; 12 B; 13 B & C; (Probability/Statistics); (Mathematical Representation); (Reasonableness)   |               |               |
| C.                      | <b>Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.</b>  |   |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Examine tables, graphs, or simple equations to classify relationships as linear or nonlinear.</li> </ul>  | Appetizers 2 F & G; 5 D; 11 C; 12 A & B; 13 A; (Mathematical Relations); (Probability/Statistics); (Problem Solving); (Mathematical Representation); (Reasonableness) |               |               |
|                         | <b>II. Represent and analyze mathematical situations and structures using algebraic symbols.</b>   |   |               |               |
| A.                      | Develop an initial conceptual understanding of different uses of variables.  |   |               |               |
| *1                      | <ul style="list-style-type: none"> <li>Evaluate simple algebraic expressions for given values of variables by using the substitution principle and the rules for order of operations.</li> </ul> | Appetizers 2 F & G; 12 A; (Mathematical Relations); (Mathematical Representation)   |               |               |
| 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"> <li>Explain the impact of coefficients and constants on linear equations as they reflect simple applications.</li> </ul>                                      | Appetizers 2 F & G; 12 A; (Mathematical Relations); (Mathematical Representation)   |               |               |

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|-------------------------|--|--|---------------|---------------|
| <b>C.</b>               | <b>Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.</b>                   |  |               |               |
| <b>1</b>                | • <i>Write or model a linear equation to solve a simple applied problem.</i>   | <b>Appetizers 2 G;<br/>(Mathematical Relations)</b>  |               |               |
| <b>D.</b>               | <b>Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.</b>                                      |  |               |               |
| <b>*1</b>               | • <i>Simplify a variety of algebraic expressions using properties of real numbers and rules for order of operations.</i>                         | <b>Appetizers 2 A &amp; G; 12 A;<br/>(Mathematical Relations);<br/>(Mathematical Representation)</b> |               |               |
| <b>*2</b>               | • <i>Using strategies that involve inverse operations, solve one- and two-step linear equations and inequalities in one variable.</i>            | <b>Appetizers 2 A &amp; D;<br/>(Mathematical Relations)</b>  |               |               |
|                         | <b>III. Use mathematical models to represent and understand quantitative relationships.</b>  |  |               |               |
| <b>A.</b>               | <b>Model and solve contextualized problems using various representations, such as graphs, tables, and equations.</b>                             |  |               |               |
| <b>*1</b>               | • <i>Use one or more representations to model and to analyze the relationship in applied problems to determine if it is linear or nonlinear.</i> | <b>Appetizers 12 A;<br/>(Mathematical Representation)</b>  |               |               |
|                         | <b>IV. Analyze change in various contexts.</b>   |  |               |               |
| <b>A.</b>               | <b>Use graphs to analyze the nature o changes in quantities in linear relationships.</b>   |  |               |               |
| <b>1</b>                | • <i>Use tables and graphs to model and analyze linear relationships between variables.</i>  | <b>Appetizers 12 B;<br/>(Mathematical Representation)</b>  |               |               |

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|                         | <b>Geometry</b>   |                                       |               |               |
|                         | <b>I. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.</b>     |                                       |               |               |
| A.                      | Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties.                         |                                       |               |               |
| 1                       | • <i>Identify the necessary and sufficient properties that characterize quadrilaterals.</i>   | Appetizers 3 A & B;<br>(Geometry)     |               |               |
| B.                      | Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.   |                                       |               |               |
| *1                      | • <i>Describe how a change in the edge length affects the angle measures, perimeters, and areas of similar regular polygons.</i>                                      | Appetizers 3 C, E, & I;<br>(Geometry) |               |               |
| C.                      | Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship. |                                       |               |               |
| 1                       | • <i>Given the length of three segments, determine and explain whether or not they can form a triangle.</i>   | Appetizers 3 C & E;<br>(Geometry)     |               |               |
| 2                       | • <i>Apply the Pythagorean relationship to determine if a triangle is a right triangle.</i>   | Appetizers 3 C & D;<br>(Geometry)     |               |               |
| *3                      | • <i>Apply the Pythagorean theorem to find the missing length of a side of a right triangle.</i>  | Appetizers 3 D & E;<br>(Geometry)     |               |               |

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|                         | <b>II. Specify locations and describe spatial relationships using coordinate geometry and other representational systems.</b>  |                                |               |               |
| A.                      | Use coordinate geometry to represent and examine the properties of geometric shapes.   |                                |               |               |
| *1                      | <ul style="list-style-type: none"> <li>Given the coordinates of a vertex and the length of adjacent sides of a polygon, use the rectangular coordinate system to locate other vertices of a square, rectangle, or right triangle.</li> </ul> | Appetizers 3 E & H; (Geometry) |               |               |
| B.                      | Use coordinate geometry to examine special geometric shapes, such as rectangular polygons or those with pairs of parallel or perpendicular sides.  |                                |               |               |
|                         | <b>III. Apply transformations and use symmetry to analyze mathematical situations.</b>   |                                |               |               |
| A.                      | Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.  |                                |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Apply dilations and describe their results.</li> </ul>  | Appetizers 3 H; (Geometry)     |               |               |
| B.                      | Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.  |                                |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Determine the equivalence, if any, between multiple applications of one transformation and the application of a different transformation.</li> </ul>  | Appetizers 3 B; (Geometry)     |               |               |
|                         | <b>IV. Use visualization, spatial reasoning, and geometry modeling to solve problems.</b>  |                                |               |               |
| A.                      | Draw geometric objects with specified properties, such as side lengths or angle measures.  |                                |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Identify the congruent and supplementary relationships of the angles formed by parallel lines and a transversal.</li> </ul>   | Appetizers 3 A & B; (Geometry) |               |               |

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| <b>B.</b>               | <b>Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.</b>       |   |               |               |
| <b>1</b>                | • <i>Use isometric drawings of three-dimensional figures to build the model with cubes.</i>  | <b>Appetizers 3 G; (Geometry)</b>   |               |               |
| <b>*2</b>               | • <i>Determine the changes in volume and surface area of three-dimensional figures that can be built with cubes when one or more measurements are changed.</i> | <b>Appetizers 4 F; 11 D; (Measurement); (Problem Solving)</b>             |               |               |
| <b>C.</b>               | <b>Use visual tools such as networks to represent and solve problems.</b>  |   |               |               |
| <b>1</b>                | • <i>Construct a network to solve a problem situation.</i>   | <b>Appetizers 11 D; 13 C; (Problem Solving); (Reasonableness)</b>         |               |               |
| <b>D.</b>               | <b>Use geometric models to represent and explain numerical and algebraic relationships.</b>  |   |               |               |
| <b>1</b>                | • <i>Use an area model to analyze probability.</i>   |   |               |               |
| <b>E.</b>               | <b>Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.</b>              |   |               |               |
| <b>1</b>                | • <i>Identify applications of transformations such as tiling, fabric design, art, and scaling.</i>   | <b>Appetizers 3 B; (Geometry)</b>   |               |               |
| <b>Measurement</b>      |  |   |               |               |
|                         | <b>I. Understand measurable attributes of objects and the units, systems, and processes of measurement.</b>  |   |               |               |
| <b>A.</b>               | <b>Understand both metric and customary systems of measurement.</b>  |   |               |               |
| <b>B.</b>               | <b>Understand relationships among units and convert from one unit to another within the same system.</b>   |   |               |               |
| <b>1</b>                | • <i>Use dimensional analysis to convert from one unit to another.</i>   | <b>Appetizers 4 A, B, &amp; C; 11 C; (Measurement); (Problem Solving)</b> |               |               |

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| C.                      | Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.  |   |               |               |
|                         | <b>II. Apply appropriate techniques, tools, and formulas to determine measurements.</b>   |   |               |               |
| A.                      | Use common benchmarks to select appropriate methods for estimating measurements.  |   |               |               |
| B.                      | Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.   |   |               |               |
| 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                      | • Find the area of irregular shapes.  | Appetizers 4 E; 11 C; (Measurement); (Problem Solving)            |               |               |
| 2                       | • Find the area of a trapezoid using the formula.   | Appetizers 4 E; (Measurement)                                     |               |               |
| D.                      | Develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders.  |   |               |               |
| 1                       | • Investigate and describe the relationship between the area of the faces and the surface area of prisms, pyramids, and cylinders.  | Appetizers 4 E & F; (Measurement)                                 |               |               |
| E.                      | Solve problems involving scale factors, using ratio and proportion.   |   |               |               |
| *1                      | • Use the properties of similar figures to determine the length of a missing side.  | Appetizers 3 F; (Geometry)  |               |               |
| F.                      | Solve simple problems involving rates and derived measurements for such attributes as velocity and density.   |   |               |               |
| 1                       | • Use measurements and formulas to solve real-world and mathematical problems.  | Appetizers 4 D, E, F, & H; 11 C; (Measurement); (Problem Solving) |               |               |

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| <b>Data Analysis and Probability</b>                                       |   |   |               |               |
|  | <b>I. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.</b>  |   |               |               |
| A.   | Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.                |   |               |               |
| B.   | Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.   |   |               |               |
| 1  | • <i>Use a matrix to organize and describe data.</i>  |   |               |               |
| 2  | • <i>Create and use a scatterplot and estimate its line of fit.</i>   | Appetizers 5 D; 11 E; (Probability/Statistics); (Problem Solving) |               |               |
| 3  | • <i>Explain what type of graph would be appropriate for a given data set.</i>  | Appetizers 11 E; (Problem Solving)                                |               |               |
| <b>II. Select and use appropriate statistical methods to analyze data.</b> |   |   |               |               |
| A.   | Find, use, and interpret measures of center and spread, including mean and interquartile range.   |   |               |               |
| 1  | • <i>Determine which measure of center is the most appropriate for a given situation and explain the reasoning used.</i>  | Appetizers 5 D; (Probability/Statistics)                          |               |               |
| 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>Explain how different graphical representations of data can bias the interpretation of these data.</i>   |   |               |               |

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|                         | <b>III. Develop and evaluate inferences and predictions that are based on data.</b>   |   |               |               |
| A.                      | Use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.   |   |               |               |
| 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.  |   |               |               |
| *1                      | <ul style="list-style-type: none"> <li>Use a scatterplot and its line of fit to determine if a positive relationship, a negative relationship, or no relationship exists between two sets of data and then use them to make predictions.</li> </ul> | Appetizers 12 C;<br>(Mathematical Representation)                               |               |               |
| C.                      | Use conjectures to formulate new questions and plan new studies to answer them.   |   |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Formulate a hypothesis and then design and carry out an experiment to test it.</li> </ul>  | Appetizers 5 A & B;<br>(Probability/Statistics)                                 |               |               |
| 2                       | <ul style="list-style-type: none"> <li>Formulate new areas of investigation based on the results of prior experiments.</li> </ul>   | Appetizers 5 A;<br>(Probability/Statistics)                                     |               |               |
|                         | <b>IV. Understand and apply basic concepts of probability.</b>  |   |               |               |
| A.                      | Understand and use appropriate terminology to describe complementary and mutually exclusive events.   |   |               |               |
| B.                      | Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.   |   |               |               |
| 1                       | <ul style="list-style-type: none"> <li>Make inferences and convincing arguments based on analysis of theoretical or experimental probability.</li> </ul>  | Appetizers 5 A & B; 11 E & F;<br>(Probability/Statistics);<br>(Problem Solving) |               |               |
| C.                      | Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.  |   |               |               |
| *1                      | <ul style="list-style-type: none"> <li>Compute the probability of two dependent events.</li> </ul>  | Appetizers 5 B;<br>(Probability/Statistics)                                     |               |               |
| 2                       | <ul style="list-style-type: none"> <li>Determine the odds of a given event.</li> </ul>  | Appetizers 5 A;<br>(Probability/Statistics)                                     |               |               |