

South Carolina Academic Standards for Mathematics	Boardworks Middle School Math Presentations
Grade 6	
Number and Operations	
Standard 6-2: The student will demonstrate through the mathematical processes an understanding of the concepts of whole-number percentages, integers, and ratio and rate; the addition and subtraction of fractions; accurate, efficient, and generalizable methods of multiplying and dividing fractions and decimals; and the use of exponential notation to represent whole numbers. Indicators:	
6-2.1 Understand whole-number percentages through 100.	Introducing percentages Equivalent fractions, decimals and percentages
6-2.2 Understand integers.	Ordering integers Adding and subtracting integers Adding and subtracting integers activities Multiplying and dividing integers Using negative numbers in context
6-2.3 Compare rational numbers and whole-number percentages through 100 by using the symbols \leq , \geq , $<$, $>$, and $=$.	Inequalities
6-2.4 Apply an algorithm to add and subtract fractions.	Adding and subtracting simple fractions Methods for adding and subtracting fractions Written methods for addition and subtraction
6-2.5 Generate strategies to multiply and divide fractions and decimals.	Multiplying fractions Dividing by fractions Multiplying and dividing by 0.1 and 0.01 Multiplying by numbers between 0 and 1 Mental multiplication Mental division Mental math puzzles Written methods for multiplication Written methods for division
6-2.6 Understand the relationship between ratio/rate and multiplication/division.	Ratio and rate Dividing in a given ratio Direct proportion

6-2.7 Apply strategies and procedures to determine values of powers of 10, up to 106.	Scientific notation
6-2.8 Represent the prime factorization of numbers by using exponents.	Prime factorization
6-2.9 Represent whole numbers in exponential form.	Powers Scientific notation
Algebra	
Standard 6-3: The student will demonstrate through the mathematical processes an understanding of writing, interpreting, and using mathematical expressions, equations, and inequalities. Indicators:	
6-3.1 Analyze numeric and algebraic patterns and pattern relationships.	Introducing sequences Sequences from geometrical patterns Describing and continuing sequences
6-3.2 Apply order of operations to simplify whole-number expressions.	Order of operations and PEMDAS
6-3.3 Represent algebraic relationships with variables in expressions, simple equations, and simple inequalities.	Writing expressions Solving simple equations Introducing formulas Solving linear inequalities
6-3.4 Use the commutative, associative, and distributive properties to show that two expressions are equivalent.	Properties of numbers
6-3.5 Use inverse operations to solve one-step equations that have whole-number solutions and variables with whole-number coefficients.	Solving simple equations
Geometry	
Standard 6-4: The student will demonstrate through the mathematical processes an understanding of shape, location, and movement within a coordinate system; similarity, complementary, and supplementary angles; and the relationship between line and rotational symmetry. Indicators:	
6-4.1 Represent with ordered pairs of integers the location of points in a coordinate grid.	Introducing coordinates
6-4.2 Apply strategies and procedures to find the coordinates of the missing vertex of a square, rectangle, or right triangle when given the coordinates of the polygon's other vertices.	Introducing coordinates Quadrilaterals on a coordinate grid
6-4.3 Generalize the relationship between line symmetry and rotational symmetry for two-dimensional shapes.	Reflection symmetry Rotation symmetry
6-4.4 Construct two-dimensional shapes with line or rotational symmetry.	Reflection symmetry Rotation symmetry
6-4.5 Identify the transformation(s) used to move a polygon from one location to another in the coordinate plane.	Translation Combining transformations
6-4.6 Explain how transformations affect the location of the original polygon in the coordinate plane.	Translation Combining transformations

	Angles in a triangle Angles in polygons Triangles Quadrilaterals Congruence
6-4.7 Compare the angles, side lengths, and perimeters of similar shapes.	
6-4.8 Classify shapes as similar.	Congruence
6-4.9 Classify pairs of angles as either complementary or supplementary.	Calculating angles
Measurement	
Standard 6-5: The student will demonstrate through the mathematical processes an understanding of surface area; the perimeter and area of irregular shapes; the relationships among the circumference, diameter, and radius of a circle; the use of proportions to determine unit rates; and the use of scale to determine distance. Indicators:	
6-5.1 Explain the relationships among the circumference, diameter, and radius of a circle.	Circles Circumference of a circle
6-5.2 Apply strategies and formulas with an approximation of pi (3.14, or 22/7) to find the circumference and area of a circle.	Circumference of a circle Area of a circle
6-5.3 Generate strategies to determine the surface area of a rectangular prism and a cylinder.	Surface area Cylinders, cones and spheres
6-5.4 Apply strategies and procedures to estimate the perimeters and areas of irregular shapes.	Perimeter Area of irregular shapes
6-5.5 Apply strategies and procedures of combining and subdividing to find the perimeters and areas of irregular shapes.	Perimeter Area of irregular shapes
6-5.6 Use proportions to determine unit rates.	Ratio and rate Dividing in a given ratio Ratio and proportion problems
6-5.7 Use a scale to determine distance.	Scale drawings
Data Analysis and Probability	
Standard 6-6: The student will demonstrate through the mathematical processes an understanding of the relationships within one population or sample. Indicators:	
6-6.1 Predict the characteristics of one population based on the analysis of sample data.	Population and sampling Collecting data
6-6.2 Organize data in frequency tables, histograms, or stem-and-leaf plots as appropriate.	Calculating statistics Organizing data Histograms Appropriate graphs

6-6.3 Analyze which measure of central tendency (mean, median, or mode) is the most appropriate for a given purpose.	Finding the mode Finding the median Calculating the mean Calculating statistics
6-6.4 Use theoretical probability to determine the sample space and probability for one- and two-stage events such as tree diagrams, models, lists, charts, and pictures.	Probability diagrams Calculating probability part 1
6-6.5 Apply procedures to calculate the probability of complementary events.	Calculating probability part 2
Grade 7	
Number and Operations	
Standard 7-2: The student will demonstrate through the mathematical processes an understanding of the representation of rational numbers, percentages, and square roots of perfect squares; the application of ratios, rates, and proportions to solve problems; accurate, efficient, and generalizable methods for operations with integers; the multiplication and division of fractions and decimals; and the inverse relationship between squaring and finding the square roots of perfect squares. Indicators:	
7-2.1 Understand fractional percentages and percentages greater than one hundred.	Percentage change
7-2.2 Represent the location of rational numbers and square roots of perfect squares on a number line.	Ordering integers Ordering fractions Using negative numbers in context
7-2.3 Compare rational numbers, percentages, and square roots of perfect squares by using the symbols \leq , \geq , $<$, $>$, and $=$.	Inequalities Square roots
7-2.4 Understand the meaning of absolute value.	Absolute value
7-2.5 Apply ratios, rates, and proportions to discounts, taxes, tips, interest, unit costs, and similar shapes.	Ratio and rate Dividing in a given ratio Direct proportion Using scale factors Percentage change
7-2.6 Translate between standard form and exponential form.	Powers
7-2.7 Translate between standard form and scientific notation.	Scientific notation

7-2.8 Generate strategies to add, subtract, multiply, and divide integers.	Adding and subtracting integers Adding and subtracting integers activities Multiplying and dividing integers Mental addition and subtraction Mental multiplication Mental division Written methods for addition and subtraction Written methods for multiplication Written methods for division
7-2.9 Apply an algorithm to multiply and divide fractions and decimals.	Multiplying fractions Dividing by fractions Written methods for multiplication Written methods for division
7-2.10 Understand the inverse relationship between squaring and finding the square roots of perfect squares.	Square roots Nonlinear equations Nonlinear equations and spreadsheets
Algebra	
Standard 7-3: The student will demonstrate through the mathematical processes an understanding of proportional relationships. Indicators:	
7-3.1 Analyze geometric patterns and pattern relationships.	Introducing sequences Sequences from geometrical patterns Describing and continuing sequences
7-3.2 Analyze tables and graphs to describe the rate of change between and among quantities.	Describing and continuing sequences Distance-time graphs Interpreting graphs
7-3.3 Understand slope as a constant rate of change.	Graphs of functions The equation of a straight line Direct variations
7-3.4 Use inverse operations to solve two-step equations and two-step inequalities.	Solving simple equations Inverse functions Inequalities Solving linear inequalities
7-3.5 Represent on a number line the solution of a two-step inequality.	Inequalities on a number line Solving linear inequalities

	Mapping functions Graphs of functions The equation of a straight line Reading and plotting graphs Conversion graphs Distance-time graphs Interpreting graphs Ratio and proportion problems Direct variations
7-3.6 Represent proportional relationships with graphs, tables, and equations.	
7-3.7 Classify relationships as either directly proportional, inversely proportional, or nonproportional.	Direct proportion
Geometry	
Standard 7-4: The student will demonstrate through the mathematical processes an understanding of proportional reasoning, tessellations, the use of geometric properties to make deductive arguments. the results of the intersection of geometric shapes in a plane, and the relationships among angles formed when a transversal intersects two parallel lines. Indicators:	
	Triangles Quadrilaterals Congruence Combining transformations Reflection Rotation Translation Dilation
7-4.1 Analyze geometric properties and the relationships among the properties of triangles, congruence, similarity, and transformations to make deductive arguments.	
7-4.2 Explain the results of the intersection of two or more geometric shapes in a plane.	-
7-4.3 Illustrate the cross section of a solid.	Cross sections
	Solid shapes 2-D representations of 3-D spaces Views of 3-D shapes Nets
7-4.4 Translate between two- and three-dimensional representations of compound figures.	
7-4.5 Analyze the congruent and supplementary relationships-specifically, alternate interior, alternate exterior, corresponding, and adjacent-of the angles formed by parallel lines and a transversal.	Calculating angles Angles made with parallel lines
7-4.6 Compare the areas of similar shapes and the areas of congruent shapes.	
	Congruence Dilation
7-4.7 Explain the proportional relationship among attributes of similar shapes.	

7-4.8 Apply proportional reasoning to find missing attributes of similar shapes.	Dilation Finding missing lengths Using scale factors
7-4.9 Create tessellations with transformations.	Tessellations Combining transformations
7-4.10 Explain the relationship of the angle measurements among shapes that tessellate.	-
Measurement	
Standard 7-5: The student will demonstrate through the mathematical processes an understanding of how to use ratio and proportion to solve problems involving scale factors and rates and how to use one-step unit analysis to convert between and within the U.S. Customary System and the metric system. Indicators:	
7-5.1 Use ratio and proportion to solve problems involving scale factors and rates.	Using scale factors Ratio and proportion problems Direct proportion Dividing in a given ratio
7-5.2 Apply strategies and formulas to determine the surface area and volume of the three-dimensional shapes prism, pyramid, and cylinder.	Surface area Volume Cylinders, cones and spheres
7-5.3 Generate strategies to determine the perimeters and areas of trapezoids.	Perimeter Area problems
7-5.4 Recall equivalencies associated with length, mass and weight, and liquid volume: 1 square yard = 9 square feet, 1 cubic meter = 1 million cubic centimeters, 1 kilometer = 5/8 mile, 1 inch = 2.54 centimeters; 1 kilogram = 2.2 pounds; and 1.06 quarts = 1 liter.	Converting metric units Customary unit conversions
7-5.5 Use one-step unit analysis to convert between and within the U.S. Customary System and the metric system.	Converting metric units Customary unit conversions
Data Analysis and Probability	
Standard 7-6: The student will demonstrate through the mathematical processes an understanding of the relationships between two populations or samples. Indicators:	
7-6.1 Predict the characteristics of two populations based on the analysis of sample data.	Population and sampling
7-6.2 Organize data in box plots or circle graphs as appropriate.	Circle graphs Quartiles and box plots Organizing data Appropriate graphs
7-6.3 Apply procedures to calculate the interquartile range.	Quartiles and box plots Interquartile range
7-6.4 Interpret the interquartile range for data.	Quartiles and box plots Interquartile range

7-6.5 Apply procedures to calculate the probability of mutually exclusive simple or compound events.	Calculating probability part 1 Calculating probability part 2 Probability diagrams
7-6.6 Interpret the probability of mutually exclusive simple or compound events.	Calculating probability part 1 Calculating probability part 2 Probability diagrams
7-6.7 Differentiate between experimental and theoretical probability of the same event.	Experimental probability
7-6.8 Use the fundamental counting principle to determine the number of possible outcomes for a multistage event.	Probability diagrams
Grade 8	
Number and Operations	
Standard 8-2: The student will demonstrate through the mathematical processes an understanding of operations with integers, the effects of multiplying and dividing with rational numbers, the comparative magnitude of rational and irrational numbers, the approximation of cube and square roots, and the application of proportional reasoning. Indicators:	
8-2.1 Apply an algorithm to add, subtract, multiply, and divide integers.	Adding and subtracting integers Multiplying and dividing integers Written methods for addition and subtraction Written methods for multiplication Written methods for division
8-2.2 Understand the effect of multiplying and dividing a rational number by another rational number.	Multiplying fractions Dividing by fractions Mental multiplication Mental division Multiplying by numbers between 0 and 1 Multiplying and dividing by 0.1 and 0.01 Mental math and place value
8-2.3 Represent the approximate location of irrational numbers on a number line.	-
8-2.4 Compare rational and irrational numbers by using the symbols \leq , \geq , $<$, $>$, and $=$.	Rational and irrational numbers Inequalities
8-2.5 Apply the concept of absolute value.	Absolute value
8-2.6 Apply strategies and procedures to approximate between two whole numbers the square roots or cube roots of numbers less than 1,000.	Square roots Cubes and cube roots Estimation and approximation

8-2.7 Apply ratios, rates, and proportions.	Ratio and rate Dividing in a given ratio Comparing proportions Direct proportion Using scale factors Ratio and proportion problems
Algebra	
Standard 8-3: The student will demonstrate through the mathematical processes an understanding of equations, inequalities, and linear functions. Indicators:	
8-3.1 Translate among verbal, graphic, tabular, and algebraic representations of linear functions.	Graphs of functions Mapping functions Interpreting graphs Function notation and relations Function machines Inverse functions
8-3.2 Represent algebraic relationships with equations and inequalities.	Introducing formulas Using formulas Transforming formulas Deriving formulas Graphs of functions Inequalities Writing expressions Solving linear inequalities
8-3.3 Use commutative, associative, and distributive properties to examine the equivalence of a variety of algebraic expressions.	Properties of numbers Writing expressions Factoring expressions Multiplying algebraic terms
8-3.4 Apply procedures to solve multistep equations.	Equations with variables on both sides Equations involving parentheses and division Nonlinear equations Combining like terms Multiplying algebraic terms Dividing algebraic terms Factoring expressions Nonlinear equations and spreadsheets

8-3.5 Classify relationships between two variables in graphs, tables, and/or equations as either linear or nonlinear.	Mapping functions Graphs of functions Nonlinear equations Graphs of nonlinear functions Exploring nonlinear graphs
8-3.6 Identify the coordinates of the x- and y-intercepts of a linear equation from a graph, equation, and/or table.	The equation of a straight line
8-3.7 Identify the slope of a linear equation from a graph, equation, and/or table.	The equation of a straight line
Geometry	
Standard 8-4: The student will demonstrate through the mathematical processes an understanding of the Pythagorean theorem; the use of ordered pairs, equations, intercepts, and intersections to locate points and lines in a coordinate plane; and the effect of a dilation in a coordinate plane. Indicators:	
8-4.1 Apply the Pythagorean theorem.	Pythagorean theorem Calculating the sides of right triangles
8-4.2 Use ordered pairs, equations, intercepts, and intersections to locate points and lines in a coordinate plane.	Graphs of functions The equation of a straight line Systems of linear equations
8-4.3 Apply a dilation to a square, rectangle, or right triangle in a coordinate plane.	Dilation
8-4.4 Analyze the effect of a dilation on a square, rectangle, or right triangle in a coordinate plane.	Dilation
Measurement	
Standard 8-5: The student will demonstrate through the mathematical processes an understanding of the proportionality of similar figures; the necessary levels of accuracy and precision in measurement; the use of formulas to determine circumference, perimeter, area, and volume; and the use of conversions within and between the U.S. Customary System and the metric system.. Indicators:	
8-5.1 Use proportional reasoning and the properties of similar shapes to determine the length of a missing side.	Dilation Finding missing lengths
8-5.2 Explain the effect on the area of two-dimensional shapes and on the volume of three-dimensional shapes when one or more of the dimensions are changed.	
8-5.3 Apply strategies and formulas to determine the volume of the three-dimensional shapes cone and sphere.	Cylinders, cones and spheres Formulas for shapes
8-5.4 Apply formulas to determine the exact (π) circumference and area of a circle.	Circumference of a circle Area of a circle
8-5.5 Apply formulas to determine the perimeters and areas of trapezoids.	Perimeter Area problems

8-5.6 Analyze a variety of measurement situations to determine the necessary level of accuracy and precision.	Estimating measurements Reading scales Rounding
8-5.7 Use multistep unit analysis to convert between and within U.S. Customary System and the metric system.	Converting metric units Customary unit conversions
Data Analysis and Probability	
Standard 8-6: The student will demonstrate through the mathematical processes an understanding of the relationships between two variables within one population or sample. Indicators:	
8-6.1 Generalize the relationship between two sets of data by using scatterplots and lines of best fit.	Scatter plots
8-6.2 Organize data in matrices or scatterplots as appropriate.	Scatter plots
8-6.3 Use theoretical and experimental probability to make inferences and convincing arguments about an event or events.	Calculating probability part 1 Calculating probability part 2 Experimental probability The language of probability
8-6.4 Apply procedures to calculate the probability of two dependent events.	-
8-6.5 Interpret the probability for two dependent events.	-
8-6.6 Apply procedures to compute the odds of a given event.	Calculating probability part 1 Calculating probability part 2 Experimental probability
8-6.7 Analyze probability using area models.	-
8-6.8 Interpret graphic and tabular data representations by using range and the measures of central tendency (mean, median, and mode).	Finding the mode Finding the median Finding the range Calculating the mean Calculating statistics