PowerTeaching i3: Grade 6 Mathematics

Alignment to the
Common Core State Standards for Mathematics

Standards for Mathematical Practice
and
Standards for Mathematical Content for Grade 6

Section I: Alignment to the Standards for Mathematical Practice

Grade 6

Key Ideas and Details

Standard for Mathematical Practice 1: Make sense of problems and persevere in solving them.

The PowerTeaching curriculum consistently encourages students to ask questions, plan for solutions, assess their reasoning and the reasonableness of their answers, and to check their work. The students focus on these good habits as a part of the daily PowerTeaching lesson routine as well as specific strategy lessons throughout the curriculum.

- Team Huddle—During daily Team Huddle activities, students work with their teammates to discuss, plan for, and solve math problems. Within the team, they must work through disagreements, ensure that each teammate understands and can explain the solution, and encourage each other when problems seem difficult.

- Problem Solving Strategies—Students practice the various problem-solving strategies at multiple points. Specific lessons introduce and have students practice the strategies: identify extraneous data, make a model, find a pattern, guess and check, work backwards, and solve a simpler problem.

- Constructed Response—Many PowerTeaching learning cycles culminate in a constructed response lesson. The math problems in these lessons are complex and combine multiple math topics. The teacher modeling, teamwork activities, and individual practice are all centered on solving these real-world problems in steps: understand the problem, find the parts, make a plan, estimate the answer, find the solution, and assess the reasonableness and correctness of the solution.

Standard for Mathematical Practice 2: Reason abstractedly and quantitatively.

Throughout PowerTeaching students will routinely approach math concepts using both concrete and abstract tools and methods.

- Problem Solving Strategies—The problem solving strategies that students learn help them break apart word problems and real-world math scenarios into the important information, then represent this information as numeric and algebraic models.

- Problem Solving Practice—In each cycle, students will apply the problem solving strategies they have learned. Many lessons include real-world math problems. The students learn to represent the solutions to these problems concretely and abstractly. Students are also routinely asked to design a math story for a numeric or algebraic model.

- Project-Based Learning—The PowerTeaching curriculum includes quarterly project-based learning opportunities. These activities will be multi-day cycles of learning that include planning, research, modeling, reporting, and presenting. Students will be required to represent their project topic mathematically, use the math to find a solution to the problem they researched or an answer to the question they asked, and then explain how the mathematical model relates back to their original problem or question.

Standard for Mathematical Practice 3: Construct viable arguments and critique the reasoning of others.

Students will support their arguments with sound reasoning as well as critique or support the reasoning of others. They will construct their supports and critiques both in writing as well as verbally.

- Get the Goof—Each lesson includes a *Get the Goof* activity. Students will discuss a completed

problem related to recently studied math topics. They will work with their teams to identify the error in think that led to a mistake in the math work. The students will explain the error and correct the math.

- Random Reporter—A part of the daily PowerTeaching routine includes teamwork and team discussion to solve problems. At various points during each lesson, the teacher will use Random Reporter to have a student from each team share their answer and support that answer with their team's reasoning.

- Constructed Response—One type of constructed response math problem will have students critique the math reasoning presented in the problem, correctly solve the problem, and construct a viable argument to support their reasoning. These types of constructed response situations will represent about one third of the PowerTeaching constructed response experiences.

Standard for Mathematical Practice 4: Model with mathematics.

Students will use tables, graphs, charts and diagrams to represent mathematical information. They will also use number sentences, expressions, and equations to describe a situation. Students will also use the information they gather in tables, graphs, charts, and diagrams to identify patterns, determine relationships, and draw conclusion.

- Problem Solving Strategy: Modeling—Students will receive specific and targeted instruction on modeling as a strategy to solve math problems.

- Problem Solving Practice—The ongoing problem solving experiences, word problems, real-world scenarios, and constructed response, often require students to represent the data as a model. Students must determine which model would best help them find the solution or answer the question.

Standard for Mathematical Practice 5: Use appropriate tools strategically.

Throughout the PowerTeaching curriculum, students will be guided to use various tools to solve math problems and answer math questions. They will also be faced with opportunities to choose which tool would best help them solve more complex math problems or real-world scenarios. The students will more often be faced with choices when completing constructed response and project-based learning activities.

Standard for Mathematical Practice 6: Attend to precision.

Students will use symbols, math vocabulary, and clear explanations in their team discussions and written and oral explanations. Students will also make choices to best represent their solution and reasoning clearly and efficiently.

- Rubrics—Students will use rubrics to assess the completeness and clarity of their oral and written explanations. They will also use the rubrics to critique the explanations of their peers. Complete explanations include the correct answer stated as a complete sentence that identifies the question and a clear explanation in words, as a diagram, using symbols.

- Vocabulary—PowerTeaching key vocabulary is highlighted in each lesson. The definition is built into the lesson instead of only existing in a separate glossary. Students will see the vocabulary used correctly within the teacher modeling and be expected to use key vocabulary to support their mathematical thinking.

Standard for Mathematical Practice 7: Look for and make use of structure.

Specific targeted skills in the PowerTeaching curriculum address the topics of structure and patterns.

- Problem Solving Strategy: Look for a Pattern—Students will learn to identify problems that can be solved by finding and describing a pattern. They will learn how to represent the data to most

efficiently identify the pattern. In later lessons, students will apply this strategy to new and more complex problem solving situations.

- Expressions and Equations—Within the Expressions and Equations content area students will consistently work to make sense of data by defining any patterns they notice and translating those patterns into expressions, equations, and graphs.
- Formulas and Mathematical Rules—In the PowerTeaching curriculum, students will be guided through instruction, modeling, teamwork, and individual practice, to define rules and formulas based on work with multiple examples. Instead of being given the rule, they will have to write the rule, and then prove it by applying it to new situations.

Standard for Mathematical Practice 8: Look for and express regularity in repeated reasoning.

Specific targeted skills in the PowerTeaching curriculum address the topic of repeated reasoning to find shortcuts, processes, and formulas.

- Expressions and equations—Within the Expressions and Equations content area, students will prove expressions equivalent, prove or disprove solutions to equations and inequalities, and use the properties of addition and multiplication.
- Geometry—Within the Geometry content area of PowerTeaching, students will apply their knowledge of expressions and equations to geometry and derive formulas for area, volume, and surface area.

Section II: Alignment to the Standards for Mathematical Content

Grade 6
Key Ideas and Details
Standard for Mathematical Content 6.RP 1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
Unit 5 Cycle 1 Lesson 1—What Are Ratios? Objective: Write ratios in simplest form and explain what given ratios mean.
Standard for Mathematical Content 6.RP 2: Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship.
Unit 5 Cycle 1 Lesson 3—Rates and Unit Rate Objective: Identify and write rates; find unit rates.
Standard for Mathematical Content 6.RP 3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.   a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
Unit 5 Cycle 1 Lesson 2—Ratios and Tables Objectives: Use tables to find equivalent ratios and compare different ratios. Unit 5 Cycle 1 Lesson 4—Comparing Rates Objective: Compare two rates. Unit 6 Cycle 1 Lesson 3—Graphing Equivalent Ratios Objective: Make tables of equivalent ratios and plot the values on a coordinate plane.
b. Solve unit rate problems including those involving unit pricing and constant speed.
Unit 6 Cycle 1 Lesson 2—Problem Solving with Unit Rates Objective: Students will solve unit rate problems. Unit 6 Cycle 1 Lesson 4—Problem Solving with Ratios and Tape Diagrams Students will solve multi-step ratio problems using tape diagrams. Unit 6 Cycle 1 Lesson 5—Ratio and Rate Problem Solving Objective: Solve multi-step real-world problems involving rates and ratios.
c. Find a percent of a quantity as a rate per 100 (e.g. 30$ of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
Unit 6 Cycle 2 Lesson 6—Understanding Percents Objective: Represent parts of a whole as fractions, decimals, and percents, and convert between fractions, decimals, and percents. Unit 6 Cycle 2 Lesson 7—Comparing and Ordering Percents, Fractions, and Decimals Objective: Students will compare and order percents, fractions, and decimals. Unit 6 Cycle 2 Lesson 8—Solving Percent Problems Objective: Solve one-step word problems involving percents.

Unit 6 Cycle 2 Lesson 9—Problem Solving with Percents
Objective: Solve multi-step real-world problems involving percents.

<table>
<tr><td>d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</td></tr>
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Unit 6 Cycle 1 Lesson 1—Converting Measurements
Objective: Convert a measurement of one unit to a measurement of another unit, and determine the conversion rate of two equivalent measures.

Unit 12 Cycle 1 Lesson 4—Convert Metric Units of Measure
Objective: Convert metric units of measure using ratio reasoning as well as multiplication and division by multiples of 10.

Unit 12 Cycle1 Lesson 5—Convert Customary Units of Measure
Objective: Convert customary units of measure using ratio reasoning; conversions will require multiple steps (e.g. converting from fluid ounces to gallons).

Unit 12 Cycle 1 Lesson 6—Measurement in Problem Solving
Objective: Solve multi-step, real-world problems involving measurements including conversion of measurements and adding, subtracting, multiplying, and dividing measurements.

Standard for Mathematical Content 6.NS 1: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

Unit 3 Cycle 2 Lesson 4—Estimating the Value of Fractions
Objective: Students will estimate the value of a fraction using the benchmarks 0, ½, and 1.

Unit 3 Cycle 2 Lesson 5—Ordering Fractions, Mixed Numbers, and Decimals
Objective: Students will order fractions, mixed numbers, and decimals.

Unit 3 Cycle 2 Lesson 6—Multiplying with Fractions and Mixed Numbers
Objective: Students will multiply with fractions and mixed numbers.

Unit 3 Cycle 3 Lesson 7—Divide Whole Numbers by Fractions
Objective: Divide whole numbers by fractions and mixed numbers.

Unit 3 Cycle 3 Lesson 8—Divide Fractions by Fractions
Objective: Students will divide fractions by fractions.

Unit 3 Cycle 3 Lesson 9—Problem Solving with Multiplying and Dividing Fractions
Objective: Solve word problems using multiplication and division of fractions, whole numbers, and mixed numbers.

Standard for Mathematical Content 6.NS 2: Fluently divide multi-digit numbers using the standard algorithm.

Unit 2 Cycle 1 Lesson 1—Mental Math
Objective: Use mental math strategies for multiplication and division.

Unit 2 Cycle 1 Lesson 2—Estimation
Objective: Estimate products and quotients; determine if an estimate or exact answer is more appropriate.

Unit 2 Cycle 1 Lesson 3—Whole Number Division 1
Objective: Use the standard algorithm to divide multi-digit whole numbers.

Unit 2 Cycle 1 Lesson 4—Whole Number Division 2 Objective: Divide multi-digit numbers using the standard algorithm and show remainder in appropriate forms.
Standard for Mathematical Content 6.NS 3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
Unit 2 Cycle 2 Lesson 5—Estimating with Decimals Objective: Estimate the value of a decimal. Estimate sums, differences, products, and quotients of decimals beyond the thousandths. Unit 2 Cycle 2 Lesson 6—Adding and Subtracting Decimals Objective: Add and subtract decimals beyond the thousandths place using the standard algorithm. Unit 2 Cycle 2 Lesson 7—Multiplying Decimals Objective: Multiply decimals beyond the thousandths place using the standard algorithm. Unit 2 Cycle 2 Lesson 8—Dividing Decimals Objective: Divide decimals beyond the thousandths place using the standard algorithm. Unit 2 Cycle 2 Lesson 9—Decimal Computation Objective: Solve multi-step word problems using decimal computation.
Standard for Mathematical Content 6.NS 4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
Unit 3 Cycle 1 Lesson 1—Greatest Common Factor Objective: Find the greatest common factor for two numbers. Unit 3 Cycle 1 Lesson 2—LCM Objective: Find the least common multiple of two numbers. Unit 3 Cycle 1 Lesson 3—Problem Solving with GCF and LCM Objective: Find the GCF and/or LCM to solve word problems.
Standard for Mathematical Content 6.NS 5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
Unit 4 Cycle 1 Lesson 1—Exploring Integers Objective: Use positive and negative integers to represent the solution to real-world situations.
Standard for Mathematical Content 6.NS 6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.   a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $^-(^-3) = 3$, and that 0 is its own opposite.
Unit 4 Cycle 1 Lesson 1—Exploring Integers. Objective: Use positive and negative integers to represent the solution to real-world situations.
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across on or both axes.

Unit 4 Cycle 1 Lesson 2—Graphing Ordered Pairs in All Quadrants Objective: Locate and plot points in all quadrants of a coordinate plane.
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
Unit 4 Cycle 1 Lesson 1—Exploring Integers. Objective: Use positive and negative integers to represent the solution to real-world situations. Unit 4 Cycle 1 Lesson 2—Graphing Ordered Pairs in All Quadrants Objective: Locate and plot points in all quadrants of a coordinate plane.
Standard for Mathematical Content 6.NS 7: Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
Unit 4 Cycle 2 Lesson 4—Compare and Order Integers Objective: Compare and order integers.
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.
Unit 4 Cycle 2 Lesson 4—Compare and Order Integers Objective: Compare and order integers.
c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative number in a real-world situation.
Unit 4 Cycle 2 Lesson 5—Absolute Value Objective: Identify the absolute value of rational numbers.
d. Distinguish comparisons of absolute value from statements about order.
Unit 4 Cycle 2 Lesson 5—Absolute Value Objective: Identify the absolute value of rational numbers.
Standard for Mathematical Content 6.NS 8: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
Unit 4 Cycle 2 Lesson 6—Problem Solving with Coordinates Objective: Students will be able to problem solve using coordinates.
Standard for Mathematical Content 6.EE 1: Write and evaluate numerical expressions involving whole-number exponents.
Unit 7 Cycle 1 Lesson 1—Understanding Exponents Objective: Use real-world examples, such as area and arrays, to understand and simplify exponents. Unit 7 Cycle 1 Lesson 2—Order of Operations Objective: Use the Order of Operations to simplify numeric expressions with the four operations, parentheses, and exponents. Unit 7 Cycle 1 Lesson 3—Write and Evaluate Numeric Expressions Objective: Given a real-world problem or math story, write and find the value of the numeric expression.
Standard for Mathematical Content 6.EE 2: Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and letters standing for numbers.

Unit 7 Cycle 2 Lesson 4—Introduction to Variables
Objective: Understand that variables are letters used to represent unknown quantities in a math situation.

Unit 7 Cycle 2 Lesson 6—Writing Expression 1
Objective: Write one-step algebraic expressions to represent math statements with variables.

Unit 7 Cycle 2 Lesson 7—Writing Expression 2
Objective: Write multi-step algebraic expressions to represent math statements with variables.

b. Identify parts of an expression using mathematical terms (sum, term, product, factor, variable, constant, and quotient); view one or more parts of an expression as a single entity.

Unit 7 Cycle 2 Lesson 5—Algebraic Expressions and Vocabulary
Objective: Understand the vocabulary associated with algebraic expressions: variable, constant, term, and coefficient. Identify those terms as parts of algebraic expressions.

c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

Unit 7 Cycle 3 Lesson 8—Evaluate Expressions 1
Objective: Evaluate single- and multi-step expressions at specific values of the variable.

Unit 7 Cycle 3 Lesson 9—Evaluate Expressions 2
Objective: Use geometric formulas to explore algebraic expressions with exponents. Then evaluate the expressions for given values.

Unit 7 Cycle 3 Lesson 10—Expressions and Patterns
Objective: Use a table of values to determine how changing the value of the variable affects the value of the expression and make predictions based on observations from the table.

Unit 7 Cycle 3 Lesson 11—Write and Evaluate Expressions
Objective: Write an expression to represent a real-world situation. Then evaluate the expression at a specific value.

Standard for Mathematical Content 6.EE 3: Apply the properties of operations to generate equivalent expressions.

Unit 8 Cycle 1 Lesson 1—Properties of Addition 1
Objective: Identify the Properties of Addition and use them to rewrite and simplify numeric expressions.

Unit 8 Cycle 1 Lesson 2—Properties of Addition 2
Objective: Use the Properties of Addition to make equivalent expressions with variables.

Unit 8 Cycle 2 Lesson 5—Properties of Multiplication 1
Objective: Identify the Properties of Multiplication and use them to rewrite and simplify numeric expressions.

Unit 8 Cycle 2 Lesson 6—Properties of Multiplication 2
Objective: Use the Properties of Multiplication to make equivalent expressions with variables.

Unit 8 Cycle 2 Lesson 7—Greatest Common Factor in Expressions
Objective: Find the greatest common factor of two algebraic terms.

Unit 8 Cycle 2 Lesson 8—The Distributive Property
Objective: Use the Distributive Property to rewrite algebraic expressions with variables.

Standard for Mathematical Content 6.EE 4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
Unit 8 Cycle 1 Lesson 4—Proving Expressions Equivalent 1 Objective: Evaluate two expressions and determine whether they are equivalent. Then use the Properties of Addition to describe why they are equivalent. Unit 8 Cycle 2 Lesson 9—Proving Expressions Equivalent 2 Objective: Evaluate two expressions and determine whether they are equivalent. Then use the Properties of Multiplication to describe why they are equivalent.
Standard for Mathematical Content 6.EE 5: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any make the equation or inequality true? Use substitution to determine whether the given number is a specified set makes an equation or inequality true.
Unit 9 Cycle 1 Lesson 1—Defining Equations Objective: Understand that the two sides of an equation are equal and balanced. Use objects and numeric expressions to make equations. Unit 10 Cycle 1 Lesson 1—Equations and Inequalities Objective: Understand the differences between equations and inequalities.
Standard for Mathematical Content 6.EE 6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Unit 7 Cycle 2 Lesson 4—Introduction to Variables Objective: Understand that variables are letters used to represent unknown quantities in a math situation. Unit 7 Cycle 3 Lesson 11—Write and Evaluate Expressions Objective: Write an expression to represent a real-world situation. Then evaluate the expression at a specific value.
Standard for Mathematical Content 6.EE 7: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all non-negative rational numbers.
Unit 9 Cycle 2 Lesson 6—Inverse Operations Objective: Define and identify inverse operations. Use inverse operations to solve equations equal to zero. Unit 9 Cycle 2 Lesson 7—Solving Addition and Subtraction Equations Objective: Use inverse operations to solve one-step addition and subtraction equations with whole numbers. Unit 9 Cycle 2 Lesson 8—Solving Multiplication and Division Equations Objective: Use inverse operations to solve one-step multiplication and division equations with whole numbers. Unit 9 Cycle 2 Lesson 9—Solve Equations to Answer Questions Objective: Solve a given one-step equation to answer a real-world math problem. Unit 9 Cycle 3 Lesson 10—Choose the Correct Equation 1 Objective: Given a choice of three equations, choose the one that correctly represents the addition or subtraction situation.

Unit 9 Cycle 3 Lesson 11—Choose the Correct Equation 2
Objective: Given the choice of three equations, choose the one that correctly represents the multiplication or division situation.

Unit 9 Cycle 3 Lesson 12—Write and Solve Equations
Objective: Write an equation to represent a real-world problem. Then solve the equation to answer the problem's question.

Standard for Mathematical Content 6.EE 8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Unit 10 Cycle 1 Lesson 1—Equations and Inequalities
Objective: Understand the differences between equations and inequalities.

Unit 10 Cycle 1 Lesson 2—Graphing Inequalities
Objective: Graph simple inequalities, such as $x > 4$, on a number line. Then answer questions about the inequality and its graph.

Unit 10 Cycle 1 Lesson 3—Write and Graph Inequalities
Objective: Write simple inequalities to represent real-world problems. Then graph the inequalities on a number line to find possible solutions.

Unit 10 Cycle 1 Lesson 4—Solutions to Inequalities
Objective: Substitute given values for the variable in a one-step inequality, such as $x – 4 > 7$, to determine if they are a possible solution.

Unit 10 Cycle 1 Lesson 5—Use number sense and guess-and-check to define a solution set for a one-step inequality.

Standard for Mathematical Content 6.EE 9: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent variable and independent variables using graphs and tables, and relate these to the equation.

Unit 11 Cycle 1 Lesson 1—Dependent and Independent Relationships
Objective: Establish and understand the definition for dependent and independent events and variables. Decide whether given events/variables are dependent on independent.

Unit 11 Cycle 1 Lesson 2—Patterns and Number Tables
Objective: Name the mathematical relationship between x and y of a given number table and express it as an algebraic expression.

Unit 11 Cycle 1 Lesson 3—Dependent and Independent Data
Look at data in a table that represents a real-world situation; name the dependent and independent variable then describe the relationship between the two variables.

Unit 11 Cycle 2 Lesson 4—Tables and Equations 1
Objective: Make a table of values from a linear equation. Use a table of values to write an equation.

Unit 11 Cycle 2 Lesson 5—Tables and Equations 2
Objective: Use a table of values to understand and write the formulas for area and perimeter of rectangles and volume of a rectangular prism.

Unit 11 Cycle 2 Lesson 6—Tables and Graphs
Objective: Use a table of values to graph a relationship between two variables. Use the graph to describe the relationship between the two variables.

Unit 11 Cycle 2 Lesson 7—Linear Relationships
Objective: Given a real-world situation, make a table of values, write an equation, and graph the relationship of the two variables.

Standard for Mathematical Content 6.G 1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solve real-world and mathematical problems.

Unit 12 Cycle 2 Lesson 7—Properties of Polygons
Objective: Explore the properties of various polygons (triangles, quadrilaterals, etc.). Define a polygon by its properties and identify polygons by sight and description.

Unit 12 Cycle 2 Lesson 8—Area of Rectangles and Triangles
Objective: Review the formula for area of a rectangle. Derive the area of a triangle from the area of a rectangle.

Unit 12 Cycle 2 Lesson 9—Area of Quadrilaterals
Objective: Find the area of special quadrilaterals (parallelogram, trapezoid, and rhombus) by composing rectangles or decomposing into rectangles and/or triangles.

Unit 12 cycle 2 Lesson 10—Area on the Coordinate Plane
Objective: Find the area of rectangles, triangles, and special quadrilaterals on the coordinate plane.

Standard for Mathematical Content 6.G 2: Find the volume of a right rectangular prism with fractional edge length by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find the volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Unit 13 Cycle 1 Lesson 1—Find Volume 1
Objective: Estimate the volume of a container/object shaped like a rectangular prism in unit cubes. Then find the actual measure in unit cubes.

Unit 13 Cycle 1 Lesson 2—Derive the Formula
Objective: Derive the formula for volume ($V = lwh$) by making a data table that includes the volume, length, width, and height of a rectangular prism in unit cubes.

Unit 13 Cycle 1 Lesson 3—Find the Volume 2
Objective: Estimate and find the volume of rectangular prisms using the formulas for volume ($V = lwh$ and $V = Bh$).

Unit 13 Cycle 1 Lesson 4—Volume and Problem Solving
Objective: Solve real-world problems related to volume.

Standard for Mathematical Content 6.G 3: Draw polygons in the coordinate plane given coordinates for the vertices; use the coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Unit 4 Cycle 2 Lesson 6—Problem Solving with Coordinates
Objective: Students will be able to problem solve using coordinates.

Unit 12 cycle 2 Lesson 10—Area on the Coordinate Plane
Objective: Find the area of rectangles, triangles, and special quadrilaterals on the coordinate plane.

Standard for Mathematical Content 6.G 4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Unit 13 Cycle 2 Lesson 5—Solid Figures and Nets
Objective: Name a solid figure when given its net. Construct/draw a net to represent a given solid figure.

Unit 13 Cycle 2 Lesson 6—Surface area of Rectangular Prisms and Triangular Prisms
Objective: Draw or construct nets of triangular and rectangular prisms and label the measures of the sides. Find the area of each face to find the surface area of the figure then use surface area calculations to determine how to find surface area of triangular and rectangular prisms without the net.

Unit 13 Cycle 2 Lesson 7—Surface area of Pyramids
Objective: Draw or construct nets of triangular and rectangular pyramids and label the measures of the sides. Find the area of each face to find the surface area of the figure then use surface area calculations to determine how to find surface area of triangular and rectangular pyramids without the net.

Unit 13 Cycle 2 Lesson 8—Problem Solving with Surface Area
Objective: Use nets and/or processes to find the surface area in order to solve real-world problems.

Standard for Mathematical Content 6.SP 1: Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

Unit 14 Cycle 1 Lesson 1—Collecting Data
Objective: Student teams work to gather and organize data for a given statistical question using the proper data gathering techniques.

Unit 14 Cycle 1 Lesson 2—Variability and Statistical Questions
Objective: Analyze the results from the data surveys and identify any variability in the data. Discuss the importance of statistical data.

Unit 14 Cycle 1 Lesson 3—Writing Statistical Questions
Objective: Write statistical questions about topics of interest then use the questions to gather and analyze additional data.

Standard for Mathematical Content 6.SP 2: Understand a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

Unit 15 Cycle 1 Lesson 1—Shapes of Data Sets
Objective: Use the shape of a data set to describe the data set. Compare different graphs for the same data set or for different data sets.

Unit 15 Cycle 1 Lesson 2—Numerical Data Sets
Objective: Describe the data set depicted on a histogram by analyzing its shape, center, and spread.

Unit 15 Cycle 1 Lesson 4—Comparing Box Plots
Objective: Describe a data set depicted on a box plot by analyzing its shape, center, and spread.

Unit 15 Cycle 2 Lesson 5—Measures of Center 1
Objective: Understand mean, median, and mode and how to calculate each. Use these measures of center to answer questions about a data set.

Unit 15 Cycle 2 Lesson 7—Measures of Variability
Objective: Understand and calculate interquartile range and mean absolute deviation. Use give or calculated measures of variability to describe a data set.

Standard for Mathematical Content 6.SP 3: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Unit 15 Cycle 2 Lesson 5—Measures of Center 1
Objective: Understand mean, median, and mode and how to calculate each. Use these measures of center to answer questions about a data set.

Unit 15 Cycle 2 Lesson 6—Measures of Center 2
Objective: Understand and predict how measures of center will change when a data set changes, use given measures of center to describe a data set, and determine which measure of center is best to describe given data sets.

Unit 15 Cycle 2 Lesson 7—Measures of Variability
Objective: Understand and calculate interquartile range and mean absolute deviation. Use give or calculated measures of variability to describe a data set.

Standard for Mathematical Content 6.SP 4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

Unit 14 Cycle 2 Lesson 4—Displays of Categorical Data
Objective: Define categorical data and display the data on bar graphs, circle graphs, and stem-and-leaf plots. Analyze given categorical data.

Unit 14 Cycle 2 Lesson 5—Displays of Numerical Data
Objective: Define numerical data and display the data on line plots, dot plots, stem-and-leaf plots, and histograms. Analyze given numerical data.

Unit 14 Cycle 2 Lesson 6—Line Graphs
Objective: Understand what makes line graphs a special type of numerical data. Identify data appropriate for a line graph and analyze data given in a line graph.

Unit 14 Cycle 2 Lesson 7—Histograms
Objective: Create histograms from given data.

Unit 15 Cycle 1 Lesson 3—Box Plots
Objective: Create box plots when given a simple data set.

Standard for Mathematical Content 6.SP 5: Summarize numerical data sets in relation to their context, such as by:
      a. Reporting the number of observations.

Unit 15 Cycle 3 Lesson 9—Define the Investigation
Objective: Use a data set on a topic of interest or create a data set. Organize the data and determine what questions you want to answer with the data set.

Unit 15 Cycle 3 Lesson 10—Present the Data
Objective: Use the type of data in the chosen data set to choose the best graphical display. Then create the graphical display.

Unit 15 Cycle 3 Lesson 11—Reporting 1
Objective: Calculate the measures of center and measures of variability for the chosen data set. Use the measures to describe the data and reasons for the results of the measures.

Unit 15 Cycle 3 Lesson 12—Reporting 2
Objective: Use your data set, graphical display, and measures of center and variability to answer the original questions posited about the data set.

b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Unit 15 Cycle 3 Lesson 9—Define the Investigation
Objective: Use a data set on a topic of interest or create a data set. Organize the data and determine what questions you want to answer with the data set.

Unit 15 Cycle 3 Lesson 10—Present the Data
Objective: Use the type of data in the chosen data set to choose the best graphical display. Then create the graphical display.

Unit 15 Cycle 3 Lesson 11—Reporting 1
Objective: Calculate the measures of center and measures of variability for the chosen data set. Use the measures to describe the data and reasons for the results of the measures.

Unit 15 Cycle 3 Lesson 12—Reporting 2
Objective: Use your data set, graphical display, and measures of center and variability to answer the original questions posited about the data set.

c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

Unit 15 Cycle 3 Lesson 9—Define the Investigation
Objective: Use a data set on a topic of interest or create a data set. Organize the data and determine what questions you want to answer with the data set.

Unit 15 Cycle 3 Lesson 10—Present the Data
Objective: Use the type of data in the chosen data set to choose the best graphical display. Then create the graphical display.

Unit 15 Cycle 3 Lesson 11—Reporting 1
Objective: Calculate the measures of center and measures of variability for the chosen data set. Use the measures to describe the data and reasons for the results of the measures.

Unit 15 Cycle 3 Lesson 12—Reporting 2
Objective: Use your data set, graphical display, and measures of center and variability to answer the original questions posited about the data set.

d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Unit 15 Cycle 3 Lesson 9—Define the Investigation
Objective: Use a data set on a topic of interest or create a data set. Organize the data and determine what questions you want to answer with the data set.

Unit 15 Cycle 3 Lesson 10—Present the Data
Objective: Use the type of data in the chosen data set to choose the best graphical display. Then create the graphical display.

Unit 15 Cycle 3 Lesson 11—Reporting 1
Objective: Calculate the measures of center and measures of variability for the chosen data set. Use the measures to describe the data and reasons for the results of the measures.

Unit 15 Cycle 3 Lesson 12—Reporting 2
Objective: Use your data set, graphical display, and measures of center and variability to answer the original questions posited about the data set.