Common Core State Standards for Mathematics
Grade 8: The Big Picture

Domains	The Number System	Expressions and Equations	Functions	Geometry	Statistics & Probability
Clusters	• Know that there are numbers that are not rational, and approximate them by rational numbers	• Work with radicals and integer exponents • Understand the connections between proportional relationships, lines, and linear equations • Analyze and solve linear equations and pairs of simultaneous linear equations	• Define, evaluate, and compare functions • Use functions to model relationships between quantities	• Understand congruence and similarity using physical models, transparencies, or geometry software • Understand and apply the Pythagorean Theorem • Solve real-world and mathematical problems involving volume of cylinders, cones and spheres	• Investigate patterns of association in bivariate data
Mathematical Practices	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively.	3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics.	5. Use appropriate tools strategically. 6. Attend to precision.	7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	

In Grade 8, instructional time should focus on three critical areas:

1. ***Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations***

   - Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \cdot A$. Students also use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship (such as slope and y-intercept) in terms of the situation.

   - Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. Students use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve problems.

2. ***Grasping the concept of a function and using functions to describe quantitative relationships***

   - Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.

3. ***Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem***

   - Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.NS.1	Understand informally that every number has a decimal expansion; rational numbers have decimal expansions that terminate in 0s or eventually repeat, and conversely.	No HCPS III benchmark at this grade level.	N/A	This Common Core Standard is a new learning expectation for this grade level.
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of sqrt2 (square root of 2), show that sqrt2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	8.1.2: Compare and order rational numbers and square roots. 8.3.2: Estimate a reasonable range (i.e., upper and lower limit) for the solution to a problem.	1	The taxonomic level of this CC standard is considerably different from the cognitive demand of the related HCPS III benchmarks. HCPS III benchmark emphasized ordering a list of numbers, but the CC standard does not. This CC standard focuses on estimating and approximating irrational numbers.
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \bullet 3^{(-5)} = 3^{(-3)} = {}^{1}/_{(3^3)} = {}^{1}/_{27}$.	8.3.1: Add, subtract, multiply, and divide numbers with whole number exponents.	2	This CC standard goes beyond the HCPS III benchmark to include integer exponents (0 and negative exponents were not an expectation in HCPS III). This CC standard builds upon students prior experiences with exponents (6.EE.1) and with integers (e.g., 6.NS.5 and 6.NS.6). Eighth grade teachers should refer to the learning expectations in preceding grades to appropriate scaffold instruction that connects to students' prior knowledge of exponents. An understanding of the properties of exponents should be developed.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that sqrt2 (square root of 2) is irrational.	8.2.2: Demonstrate the inverse relationship between square numbers and square roots, and cubes and cubed roots.	2	This CC standard goes slightly beyond the HCPS III benchmark in that to "know that sqrt2 is irrational," the student must distinguish between the results of finding the square root of a perfect square number and the square root of a number that is not a perfect square. "Small perfect squares" means 1, 4, 9, 16, 25, 36, 49, 81, and 100. "Small perfect cubes" means 1, 8, 27, 64, and 125.

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.	No HCPS III benchmark at this grade level. *Related benchmark at another grade level: 7.1.2: Identify situations that require the use of large numbers and represent them using scientific notation.*	N/A	This Common Core Standard is a new learning expectation for this grade level. This topic was an HCPS III 7th grade benchmark, however, it only addressed "the use of large numbers" (thus, "very small quantities" is a new expectation entirely).
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	No HCPS III benchmark at this grade level. *Related benchmark at another grade level: 7.1.2: Identify situations that require the use of large numbers and represent them using scientific notation.*	N/A	This Common Core Standard is a new learning expectation for this grade level. Performing operations on numbers expressed in scientific notation is a new expectation for middle grades mathematics. This should be learned as an extension to 8.EE.1. Interpreting scientific notation that has been generated on a calculator (for example, when "4.13E15" shows up on the screen as the result of a computation) is a great opportunity to address the Mathematical Practices of quantitative reasoning and sense making.
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	8.10.3: Use tables and graphs to represent and compare linear relationships. 8.10.4: Use the slope of a line to describe a constant rate of change. 8.4.2: Express rates of change as a ratio of two different measures, where units are included in the ratio, and use the derived rate to solve problems. 8.1.3: Use ratios and proportions to represent the relationship between two quantities.	2	"Proportional relationships" refers to situations that can be modeled by the equation ***y = mx*** (e.g., the total cost, ***y***, is proportional to the number of items purchased when ***x*** cans of tuna are purchased at a constant price, ***m***). The CC standard implies an emphasis on being able to interpret the meaning of the unit rate (i.e., the slope) in terms of a given real-world context. Additionally, the relationships being compared can be presented in the same way (e.g., both graphically), or in different ways (e.g., an equation compared to a table of values). This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas and how these ideas can be used to make sense of real-world contexts.

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y =mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	8.10.4: Use the slope of a line to describe a constant rate of change. *Related benchmarks at another grade level: AI.10.4: Determine the equation of a line when given the graph of the line, the slope and a point on the line, or two points on the line; and, AI.10.9: Analyze transformations of lines and understand how the transformation are represented in equations.*	1	The CC standard goes beyond the HCPS III benchmark to include the specific use of similar triangles to demonstrate and understand the notion that the slope of the graph of a linear equation is constant.
8.EE.7	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	No HCPS III benchmark at this grade level. *Related benchmarks at another grade level: 7.10.3: Solves linear equations and inequalities with one variable using algebraic methods, manipulatives, or model; and, AI.10.1: Solve linear equations and inequalities in one variable using a variety of strategies (e.g., algebraically, by graphing, by using a graphing calculator).*	N/A	This Common Core Standard is a new learning expectation for this grade level. This standard (particularly part a) is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas.
8.EE.8	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.	No HCPS III benchmark at this grade level. *Related benchmark at another grade level: AI.10.5: Solve systems of two linear equations in two variables algebraically and graphically.*	N/A	This Common Core Standard is a new learning expectation for this grade level. This CC standard has numerous components. Eighth teachers should refer to learning expectations in preceding grades in order to scaffold instruction that builds on students' prior knowledge and learning experiences. For example, writing and solving equations in grades 6 and 7 (Expressions and Equations domain) and understanding what a solution means (6.EE.5).

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)	No HCPS III benchmark at this grade level.	N/A	This Common Core Standard is a new learning expectation for this grade level.
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	8.10.3: Use tables and graphs to represent and compare linear relationships. 8.10.1: Translate among tables, graphs (including graphing technology when available), and equations involving linear relationships.	3	This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas and how these ideas can be used to make sense of real-world contexts.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line.	8.9.3: Identify functions as linear or nonlinear and contrast their properties from tables, graphs (including graphing technology when available), or equations.	3	
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	8.9.1: Represent a variety of patterns with tables, graphs (including graphing technology), words and symbolic rules. 8.9.2: Use linear relationships with two variables to solve problems. 8.10.1: Translate among tables, graphs (including graphing technology when available), and equations involving linear relationships. 8.10.3: Use tables and graphs to represent and compare linear relationships. 8.10.4: Use the slope of a line to describe a constant rate of change.	2	"Initial value" of a function refers to the y-value of the coordinates of the y-intercept (e.g., my initial weight of 175 pounds would be expressed as the point (0, 175) when I begin a 10-week exercise program to help me lose weight. Students should have experiences working with several real-world examples to help make sense of this idea and to utilize it in a variety of contexts. This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas and how these ideas can be used to make sense of real-world contexts.

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	8.9.3: Identify functions as linear or nonlinear and contrast their properties from tables, graphs (including graphing technology when available), or equations.	1	The CC standard and the HCPS III benchmark are similar in terms of identifying linear vs. non-linear relationships. However, taxonomic levels are much different, and the CC standard goes much farther as its focus is upon recognizing and describing functional behavior.Although domain and range are not specifically mentioned here, asking students to describe "where the function is increasing or decreasing," requires the students to determine for what values of x (i.e., an interval of the domain) is the function behaving a certain way. This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas.
8.G.1	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	8.6.1: Perform a transformation (reflection, rotation, translation) when given a figure and necessary parameters. 8.8.1: Use coordinate geometry to represent transformations in the coordinate plane.	2	The taxonomic level of the CC standard is considerably different from the cognitive demand of the related HCPS III benchmarks.
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	8.6.2: Describe the size, position, and orientation of shapes under transformations and compositions of transformations	1	The taxonomic level of the CC standard is considerably different from the cognitive demand of the related HCPS III benchmarks.
8.G.3	Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	8.6.2: Describe the size, position, and orientation of shapes under transformations and compositions of transformations 8.8.1: Use coordinate geometry to represent transformations in the coordinate plane.	3	

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	No HCPS III benchmark at this grade level.	N/A	This Common Core Standard is a new learning expectation for this grade level.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the three angles appear to form a line, and give an argument in terms of transversals why this is so.	No HCPS III benchmark at this grade level. *Related benchmarks at another grade level: 5.5.2: Apply the understanding that the sum of the measures of the angles in any triangle is 180°; G.5.4: Use the relationship between pairs of angles (e.g., complementary, supplementary, vertical, exterior, interior) to determine unknown angle measures or definitions of properties.*	N/A	This Common Core Standard is a new learning expectation for this grade level.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	No HCPS III benchmark at this grade level. *Related benchmark at same grade level: 8.5.1: Apply the Pythagorean Theorem to solve problems involving right triangles.*	N/A	This Common Core Standard is a new learning expectation for this grade level.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	8.5.1: Apply the Pythagorean Theorem to solve problems involving right triangles.	3	
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	8.5.1: Apply the Pythagorean Theorem to solve problems involving right triangles.	2	While the application of the Pythagorean Theorem is not new for this grade level, using it specifically to find distances in the coordinate plane was not an explicit learning expectation in HCPS III.
8.G.9	Know the formulas for the volume of cones, cylinders and spheres and use them to solve real-world and mathematical problems.	8.4.4: Use known measurements to determine the surface area and volume of selected prisms, cylinders, and pyramids.	2	The CC standard limits the expectation to volume only (the HCPS III benchmark included surface area).

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8 MATHEMATICS: Crosswalk between the Common Core State Standards (CCSS) and the Hawaii Content and Performance Standards (HCPS) III

Code	Common Core State Standard	Matched HCPS III Benchmark	Match*	Comments
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	8.13.1: Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatterplots. *Related benchmark at another grade level: AI.12.2: Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists).*	2	The CC standard and the HCPS III benchmark are very similar; however, the CC standard specifies several concepts that may not have been implied in HCPS III. This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas.
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	8.13.1: Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatterplots. *Related benchmark at another grade level: AI.12.2: Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists).*	2	"Informally fit a straight line" implies that the student should be able to sketch a possible line-of-best-fit and then discuss the appropriateness of the sketch in light of the spread of the data around the line. Determining an equation for the line-of-best-fit (using the slope and y-intercept) provides an opportunity for students to make sense of the mathematical representation of the relationship in terms of the real-world situation it is attempting to describe.
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	8.13.1: Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatterplots. *Related benchmark at another grade level: AI.12.2: Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists).*	1	The CC standard implies an emphasis on being able to interpret the meaning of the unit rate (i.e., the slope) in terms of a given real-world context.
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	8.13.1: Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatterplots.	2	This standard is a great opportunity to address the Mathematical Practices by incorporating the strategic use of technology to promote students' sense-making about mathematical ideas and how these ideas can be used to make sense of real-world contexts.

* Degree of Match: 1 = WEAK (major aspect of the CC not addressed in HCPS III); 2 = GOOD (minor aspect of the CC not addressed in HCPS III); 3 = EXCELLENT

GRADE 8

HCPS III Code	HCPS III Benchmark	Related Common Core Standard
~~8.1.1~~	~~Identify situations represented by square roots and cube roots~~	None
8.1.2	Compare and order rational numbers and square roots	8.NS.2
8.1.3	Use ratios and proportions to represent the relationship between two quantities	8.EE.5
~~8.2.1~~	~~Apply the order of operations when calculating with rational numbers~~	None
8.2.2	Demonstrate the inverse relationship between square numbers and square roots, and cubes and cubed roots	8.EE.2
8.3.1	Add, subtract, multiply, and divide numbers with whole number exponents	8.EE.1
8.3.2	Estimate a reasonable range (i.e., upper and lower limit) for the solution to a problem	8.NS.2
~~8.4.1~~	~~Select and use appropriate units to measure the surface area and volume of solids~~	None
8.4.2	Express rates of change as a ratio of two different measures, where units are included in the ratio**,** and use the derived rate to solve problems	8.EE.5
~~8.4.3~~	~~Use ratios and proportions to solve measurement problems~~	None
8.4.4	Use formulas to determine the surface area and volume of selected prisms, cylinders, and pyramids	8.G.9
8.5.1	Apply the Pythagorean theorem to solve problems involving right triangles	8.G.6, 8.G.7, 8.G.8
8.6.1	Perform a transformation (reflection, rotation, translation) when given a figure and necessary parameters	8.G.1
8.6.2	Describe the size, position, and orientation of shapes under transformations and compositions of transformations	8.G.2, 8.G.3
~~8.7.1~~	~~Use two-dimensional representations of pyramids, prisms, and cylinders to solve problems involving these figures~~	None
8.8.1	Use coordinate geometry to represent transformations in the coordinate plane	8.G.1, 8.G.3
8.9.1	Represent a variety of patterns (including recursive patterns) with tables, graphs (including graphing technology when available), words, and when possible, symbolic rules	8.F.4
8.9.2	Use linear relationships with two variables to solve problems	8.F.4
8.9.3	Identify functions as linear or nonlinear and contrast their properties from tables, graphs (including graphing technology when available), or equations	8.F.3, 8.F.5
8.10.1	Translate among tables, graphs (including graphing technology when available), and equations involving linear relationships	8.F.2, 8.F.4
8.10.2	Solve linear equations ~~and inequalities~~ with two variables using algebraic methods, ~~manipulatives, or models~~	8.EE.8
8.10.3	Use tables and graphs to represent and compare linear relationships	8.EE.5, 8.F.2, 8.F.4
8.10.4	Use the slope of a line to describe a constant rate of change	8.EE.5, 8.EE.6, 8.F.4
~~8.11.1~~	~~Design a study that compares two samples, collect data, and select the appropriate representation (e.g., double bar graph, back-to-back stem and leaf plot, parallel box and whisker plots, scatter plot) to compare the sets of data~~	None
~~8.11.2~~	~~Judge the validity of data based on the data collection method~~	None
~~8.12.1~~	~~Recognize situations appropriate for scatter plots~~	None
~~8.12.2~~	~~Analyze different representations of the same data to describe how representations can be used to skew a person's interpretation of the data~~	None
8.13.1	Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatter plots	8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4
~~8.14.1~~	~~Judge the validity of conjectures that are based on experiments or simulations~~	None