COMMON CORE ESSENTIAL ELEMENTS AND RANGE OF COMPLEXITY FOR
EIGHTH GRADE

Eighth Grade Mathematics Standards: *The Number System*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Know that there are numbers that are not rational, and approximate them by rational numbers		**AA Student Will:**
8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	**EE8.NS.1.** Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.	**EE8.NS.1.** Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends that may be greater than one. Ex. Subtract two fractions with like denominators with models or numbers. Ex. If I have 1 3/4 and I take 1/4 away, how many wholes and fourths are left? **EE8.NS.1.** Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one. Ex. Use fraction bars or fraction circles to add and match a numerical representation to the model so the answer is less than or equal to one. Ex. Given 3/4, take 1/4 away and tell or show how many fourths are left. Ex. Given 7/10, recognize that 3/10 are needed to make a whole. (Connect to money – 10 dimes = one whole dollar) **EE8.NS.1.** Use models to subtract halves, thirds, and fourths. Ex. Given a whole divided into thirds, tell me how many times they can take a third out of the whole. Ex. Presented a rectangle with 1/3 of the whole shaded, tell how many thirds are left. **EE8.NS.1.** Use models to identify the whole and find the missing pieces of a whole using halves. Ex. Presented an object with a piece missing and a whole object, identify the whole. Ex. Given 1/2 of a pizza, identify the missing part (concrete model or touch board). Ex. Given a whole with 1/2 shaded, identify the missing part.
8.NS.2. Use rational approximations of irrational numbers to compare the size of irrational	**EE8.NS.2.** Represent different forms and values of decimal numbers using fractions with	**EE8.NS.2.** Represent different forms and values of decimal numbers to the hundreds place (decimal, fraction, hundreds grid, and money representation). Ex. Given a hundreds grid, shade in an approximation to a given decimal or fraction. Ex. Given a picture of a shaded hundreds grid, determine the decimal or fractional part. Ex. When given coins representing 60 cents, write the decimal amount as $0.60.

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Know that there are numbers that are not rational, and approximate them by rational numbers		**AA Student Will:**
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 $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*	numerators that are multiples of five and a denominator of 100.	**EE8.NS.2.** Represent different forms and values of decimal numbers using fractions with numerators that are multiples of five and a denominator of 100. Ex. Given a hundreds grid with one fourth shaded-in, identify the correct decimal representation from choices 25/100, 10/100, or 100/100. Ex. When given coins representing 50 cents, write the decimal value as $0.50. **EE8.NS.2.** Distinguish between a part represented by a decimal and a whole number without decimals. Ex. Given a dollar and two quarters, identify which represents the whole (dollar) and the decimal part (two quarters). Ex. Given a fully shaded-in hundreds grid and a partially shaded-in hundreds grid, identify which represents the whole and which represents the decimal (part of a whole). **EE8.NS.2.** Identify a part of a whole in concrete real-world objects. Ex. When shown an apple with a missing piece, identify the part that is missing. Ex. When given a student's schedule for the day with one activity missing, identify what activity is missing from their schedule**.** Ex. Show which piece is missing from a familiar object.

Eighth Grade Mathematics Standards: *Expressions and Equations*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Expressions and Equations. Work with radicals and integer exponents		**AA Student Will:**
8.EE.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. **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	**EE8.EE.1-4.** Compose and decompose numbers to three digits.	**EE8.EE.1-4.** Use powers of 10 to compose and decompose numbers. Ex. Recognize 3 x 10^2 = 300 as another way to state 3 x 100 = 300. Ex. 5 x 10^1 = ___. **EE8.EE.1-4.** Compose and decompose numbers to three digits. Ex. 300 + 50 + 7 = ___. Ex. 57 = ___ + ___. Ex. Show that twelve is one 10 and two ones, or 12 ones, or seven ones and five ones, etc.

Eighth Grade Mathematics Standards: *Expressions and Equations*

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Expressions and Equations. Work with radicals and integer exponents		AA Student Will:
cube roots of small perfect cubes. Know that √2 is irrational. **8.EE.3.** Use numbers expressed in the form of a single digit times a whole-number 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 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.* **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.		**EE8.EE.1-4.** Use models to represent the composition of numbers. Ex. Illustrate a number using models. Ex. Show that 12 is one 10 and two ones. Ex. Compose numbers to five. Ex. Compose numbers to 10. Ex. Model numbers using base ten blocks. Ex. Distinguish the value of the digits in 134 (e.g., 1 = 100, 3 = 30, and 4 = 1). Ex. Given two nickels, show the correct number to represent that value. **EE8.EE.1-4.** Recognize the specific value a number represents. Ex. Recognize a number using pictorial representations. Ex. Match a numerical value with a pictorial representation or concrete objects. Ex. Look at a model and determine the numeric value. Ex. Given a jig or a model with 10 spaces, put one object per space and assemble a group of 10. Ex. Given three bears, select the number three card.

Eighth Grade Mathematics Standards: *Expressions and Equations*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Understand the connections between proportional relationships, lines, and linear equations		AA Student Will:
8.EE.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships	**EE8.EE.5-6.** Graph a simple ratio using the x and y axis points when given the ratio in	**EE8.EE.5-6.** Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and expand on the ratio by two or more points. Ex. Given a ratio 2:1 (there are two balloons for every child), graph the linear equation on a graph labeled x axis and the y axis. This equation would have a slope of 2. Ex. Given there is one boy for every one girl, graph points for the ratio of 1:1 (this linear

Eighth Grade Mathematics Standards: *Expressions and Equations*

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Understand the connections between proportional relationships, lines, and linear equations		**AA Student Will:**
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.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*.	standard form (2:1) and convert to 2/1.	equation will have a slope of 1). Ex. Given two plotted data points, plot a third point using pictures. Ex. Given a ratio of 3:1 indicating that each student needs three items, convert the ratio to fraction form (2/1) and plot on a pre-labeled graph this point and two additional points that are functions of the original ratio (3:1, 6:2, 9:3). **EE8.EE.5-6.** Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and convert to 2/1. Ex. Given two pieces of data, place on a graph. Ex. Given a ratio of 3:1 indicating that each student needs three items, guide student in converting ratio to fraction form (2/1) and plot on a pre-labeled graph. **EE8.EE.5-6.** Identify a specific data point when given the coordinates. Ex. Read and plot coordinates on a map. Ex. Given three widespread data points and coordinates, identify named point. Ex. Given a standard multiplication chart, find the product of two numbers using coordinate skills. Ex. Indicate with coordinates what data points mean or the data revealed by the specify point. **EE8.EE.5-6.** Place or locate data on a simple two-category graph. Ex. Use distance landmark to tell if something is close or far away. Ex. Finds objects after movement (searches a small area comprehensively). Ex. Locate objects on a map (with or without coordinates).

Eighth Grade Mathematics Standards: *Expressions and Equations*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Analyze and solve linear equations and pairs of simultaneous linear equations		**AA Student Will:**
8.EE.7. Solve linear equations in one variable. ▪ Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the	**EE8.EE.7.** Solve algebraic expressions using simple addition	**8.EE.7.** Solve algebraic expressions using two-digit addition and subtraction. Ex. Solve 20 + x, when x =25. Ex. Solve 35 – x, when x = 12.

Eighth Grade Mathematics Standards: *Expressions and Equations*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Analyze and solve linear equations and pairs of simultaneous linear equations		**AA Student Will:**
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). ▪ Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	and subtraction.	**EE8.EE.7.** Solve algebraic expressions using simple addition and subtraction. Ex. Mark had 10 dollars and needs 15. How many more dollars does he need? Ex. Given a set of basketballs, some in a bag and five outside of the bag, solve for find the total number of basketballs in the set when the bag contains two basketballs. Ex. Find the difference when given the total and the solution (e.g., A student has 10 chocolate chips and a bag of chocolate chips. Solve for the amount the bag contains when the total is 25.) **EE8.EE.7.** Solve simple addition and subtraction problems. Ex. Playing a game, roll two dice and add up the dots (dice with dots or dice with numerals). Ex. Using a pictorial representation of numbers, solve the addition and subtraction problems (i.e. three balloons minus one balloon). **EE8.EE.7.** Distinguish between a letter and a number. Ex. When asked to write their home address, identify between the letters and numbers in the address. Ex. When a book is read to them, identify the page number. Ex. When looking in a telephone book identify the telephone number vs. the name.
8.EE.8. Analyze and solve pairs of simultaneous linear equations. ▪ 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. ▪ Solve systems of two linear equations in two	**EE8.EE.8.** N/A (See EE.8.EE.5-6)	

Eighth Grade Mathematics Standards: *Expressions and Equations*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Analyze and solve linear equations and pairs of simultaneous linear equations		**AA Student Will:**
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.* ▪ 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.*		

Eighth Grade Mathematics Standards: *Functions*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Define, evaluate, and compare functions		**AA Student Will:**
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.[21] **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*	**EE8.F.1-3.** Given a function table, identify the missing number.	**EE8.F.1-3.** Given a function table, identify the rule and express the rule for the missing variable (e.g., n times 2). Ex. Given a function table, identify the rule to find the missing number. | **1**	**2**	**3**	**4**	**n** | |---|---|---|---|---| | 2 | 4 | 6 | 8 | X | Ex. Given a function table, identify the rule to find the missing number. | **1** | **2** | **3** | **4** | **n** | |---|---|---|---|---| | 5 | 10 | 15 | 20 | X |

The Range of Complexity Examples cell contains the following tables:

Ex. Given a function table, identify the rule to find the missing number.

1	2	3	4	n
2	4	6	8	X

Ex. Given a function table, identify the rule to find the missing number.

1	2	3	4	n
5	10	15	20	X

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[21] Function notation is not required in Grade 8.

Eighth Grade Mathematics Standards: *Functions*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Define, evaluate, and compare functions		**AA Student Will:**
represented by an algebraic expression, determine which function has the greater rate of change. **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.*		**EE8.F.1-3.** Given a function table, identify the missing number. Ex. <table><tr><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td></tr><tr><td>2</td><td>4</td><td>X</td><td>8</td></tr></table> **EE8.F.1-3.** Identify the relationship between two numbers. Ex. Given choices, tell the relationship between two numbers (e.g., How much more is five than three? Five is two more than three.). Ex. Identify the relationship between two given numbers (e.g., If you double four, you have eight). **EE8.F.1-3.** Given a sequence, match the element of a sequence. Ex. Given the sequence 1, 2, 1, 2 and a 1, match to number 1. Ex. Given a sequence of triangle, circle, triangle, circle and a circle, match the circle.

Eighth Grade Mathematics Standards: *Functions*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Use functions to model relationships between quantities		**AA Student Will:**
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.	**EE8.F.4.** Determine the values or rule of a function using a graph or a table.	**EE8.F.4.** Given the input values and a rule, complete the output. Ex. Complete the table by adding three to each input value. <table><tr><td>**x**</td><td>**y**</td></tr><tr><td>1</td><td></td></tr><tr><td>2</td><td></td></tr><tr><td>3</td><td></td></tr><tr><td>4</td><td></td></tr></table>

Eighth Grade Mathematics Standards: *Functions*

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Use functions to model relationships between quantities		**AA Student Will:**
		EE8.F.4. Determine the values or rule of a function using a graph or a table.

Ex. Given a table, determine rule applied.

x		y
1	1 + _ =	4
2	2 + _ =	5
3	3 + _ =	6

Ex. Given a table, determine increase or decrease.

x	y
1	4
2	5
3	6

EE8.FEE8.F.4. Navigate, read, use, or apply a graph or table.
Ex. Given a set of coordinates, locate on a graph.
Ex. Given a location, identify coordinates.
Ex. Using a basic map of town, identify two streets over.

EE8.F.4. Identify the different parts of a graph or a table.
Ex. Recognize more or less.   Ex. Recognize a graph.   Ex. Recognize a table.   Ex. Identify rows/columns.

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
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.	**EE8.F.5.** Describe how a graph represents a relationship between two quantities.	**EE8.F.5.** Describe how a graph represents a relationship between two quantities and use the graph to answer questions using that relationship. Ex. Given a chart showing the numbers of each colored disk in a bag, show how the graph relates color to number (e.g., Point to the axis that tells you the number and to the axis that tells you the color and point to the bar that shows the color with the highest number.). Ex. Given a line graph showing days of consecutive snowfall and inches of accumulated snow, show how the graph relates number of days to amount of accumulated snow (e.g., Say the name of the axis that shows inches of snow and the axis that show consecutive days of snowfall and then tell which point on the graph shows the most snow and most

Eighth Grade Mathematics Standards: *Functions*

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Use functions to model relationships between quantities		**AA Student Will:**
		consecutive days of snowfall.).
		EE8.F.5. Describe how a graph represents a relationship between two quantities. Ex. Given a chart showing the numbers of each colored disk in a bag, show how the graph relates color to number (e.g., Point to the axis that tells you the number and to the axis that tells you the color.). Ex. Given a line graph showing days of consecutive snowfall and inches of accumulated snow, show how the graph relates number of days to amount of accumulated snow (e.g., say the name of the axis that shows inches of snow and the axis that shows consecutive days of snowfall).
		EE8.F.5. Answer questions about data from a graph. Ex. Given a chart of colors in an M&M bag, answer a question about the information on the graph (e.g., Which is the most common color?). Ex. Given a bar graph representing numbers of colored disks found in a bag, answer a question about the information (e.g., A bag of colored discs contains 15 red, 12 blue, eight green, and five yellow. Which bar shows how many red discs are in the bag?). Ex. Given a picture graph showing a five-day forecast showing snow showers for all days, identify which point shows how much snow is expected to fall on the fifth day.
		EE8.F.5. Place data in a graph. Ex. Place stickers of the same type (e.g., color, animal) on the same bar in a graph? Ex. Group data into categories and place on a graph (e.g., types of music, types of food).

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Understand congruence and similarity using physical models, transparencies, or geometry software		**AA Student Will:**
8.G.1. Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments	**EE8.G.1-3.** Identify similarity and congruence (same)	**EE8.G.1-3.** N/A **EE8.G.1-3.** Identify similarity and congruence (same) in objects and shapes containing angles without translations.

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Understand congruence and similarity using physical models, transparencies, or geometry software		**AA Student Will:**
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.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.G.3.** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	in objects and shapes containing angles without translations.	Ex. Match an angle in one shape with the same angle in another shape with manipulatives or pictures. Ex. Given different size shapes, find the two shapes that are similar and tell why. Ex. Given a picture of a shape, match that picture to the congruent object on the table. Ex. Using a picture of a door at a 45 or 90-degree angle adjust the classroom door to the same angle. **EE8.G.1-3.** Match similar shapes. Ex. Match a square to a square. Ex. Match a large square with a large square. Ex. Given shapes, find the two shapes that are similar and tell why. **EE8.G.1-3.** Match shapes using a three-dimensional object. Ex. Overlay the outline of a shape with a three-dimensional object using angles in the outline as guides (e.g., building with blocks). Ex. Tell, which socks match in color, shape, and size. Ex. If a sock is upside down and another sock is right side up, can you make them match?
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.	**EE8.G.4.** Identify similar shapes with and without rotation.	**EE8.G.4**. Determine if geometric shapes are similar with rotations or reflections. Ex. Sort shapes into groups of similar shapes with rotation and similar shapes with reflections. Ex. Matches combinations of similar shapes to each other (e.g., match similar shapes with rotations to each other and match similar shapes with reflections to each other). **EE8.G.4.** Identify similar shapes with and without rotation. Ex. Given a shape find its similar rotation. Ex. Compare shapes in the environment to find a similar shape that is rotated. Ex. When given a group of triangles, select two that are similar when one is rotated. Ex. Select the shape that is not similar from a group of three shapes.

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Understand congruence and similarity using physical models, transparencies, or geometry software		**AA Student Will:**
		EE8.G.4. Identify similar geometric shapes. Ex. Sort regular polygons into groups of similar shapes. Ex. When given a shape, select a similar shape. Ex. Match the shape of one small square to the shape of a large square. **EE8.G.4.** Recognize geometric shapes. Ex. Same thing comparer – compare to shapes to see if they are the same. Ex. Select the named shape. Ex. When shown a shape, name the shape. Ex. Point to a triangle when shown a circle and a triangle. Ex. Trace around a geometric shape.
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 sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	**EE8.G.5.** Compare measures of angles to a right angle (greater than, less than, or equal to).	**EE8.G.5.** Compare measures of angles formed by intersecting lines. Ex. Given intersecting lines, identify linear pair angles. Ex. Given a pair of parallel lines intersected by a third line, identify angles that are the same measure. **EE8.G.5.** Compare measures of angles to a right angle (greater than, less than, or equal to). Ex. Locate an angle with a measure greater than the measure of a right angle. Ex. Use a right-angle tool (square corner - corner of a note card), to find right angles. **EE8.G.5.** Recognize a right angle. Ex. Identify a right angle in the school environment. Ex. Which of these is a right angle? Ex. Teacher creates on a geoboard. Is this a right angle? **EE8.G.5.** Recognize an angle. Ex. Find angles in given shapes. Ex. Find a corner in the classroom (e.g., corner of the room or a table).

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Understand and apply the Pythagorean Theorem		**AA Student Will:**
8.G.6. Explain a proof of the Pythagorean Theorem and its converse. **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.G.8.** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**EE8.G.6-8.** N/A	

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres		**AA Student Will:**
8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**EE8.G.9.** Identify volume of common measures (cups, pints, quarts, gallons, etc.).	**EE8.G.9.** Apply knowledge of volume. Ex. Use simple units to fill a container with accurate counting. Ex. Uses cubes to fill a small container and estimate the number of cubes it took by mathematical reasoning (addition or multiplication of row/column). Ex. Select appropriate tool to fill a pitcher (e.g., tsp., cup, bucket). Ex. Select appropriate tool to measure flour for a cake – cup or bucket. Ex. Convert – how many cups in a pint? **EE8.G.9.** Identify volume of common measures (cups, pints, gallons, etc.). Ex. Tell which holds more when using cubes to fill two boxes (e.g., count the cubes that fit in one box as compared to another). Ex. Identify which is a cup when given a cup, teaspoon, and a gallon container. Ex. Show which is a gallon when given a teaspoon, ball, and a gallon container. Ex. Given a gallon, tell if it will take longer to fill the gallon with cups or with pints? **EE8.G.9**. Identify which is more or less? Ex. Compares two containers using a third for transitive reasoning – pours one container into two others to see which holds more because one may overflow and one may not become full. Ex. Which container has more marbles in it? Ex. Which container has less marbles in it?

Eighth Grade Mathematics Standards: *Geometry*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres		**AA Student Will:**
		EE8.G.9. Experience volume. Ex. Compare two containers – which holds more? Ex. Point to the empty cup. Ex. Point to the full container.

Eighth Grade Mathematics Standards: *Statistics and Probability*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Investigate patterns of association in bivariate data		**AA Student Will:**
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.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.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.*	**EE8.SP.1-3.** N/A	
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-	**EE8.SP.4.** Construct a graph or table from	**EE8.SP.4.** Conduct an experiment, collect data, and construct a graph or table. Ex. Conduct an experiment to find if plants grow faster in the

Eighth Grade Mathematics Standards: *Statistics and Probability*

CCSS Grade-Level Clusters	Common Core Essential Elements	Range of Complexity Examples
Investigate patterns of association in bivariate data		**AA Student Will:**
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?*	given categorical data and compare data categorized in the graph or table.	sun or in the shade. Graph plant height over time and make a conclusion. Ex. Ask 10 people how many hours of TV they watch a day. Put the findings into a table. **EE8.SP.4.** Construct a graph or table from given categorical data and compare data categorized in the graph or table. Ex. Given data about boys' and girls' favorite games, create a bar graph and compare the preferences of boys and girls. Ex. Given two graphs (hours of TV watched by boys and hours of TV watched by girls), answer questions to compare the habits of each. **EE8.SP.4.** Collect and organize data. Ex. Organize objects into groups (teddy bears, balls, crayons). Ex. Examine a basic bus route schedule in table form and highlight which buses run at 5:00 p.m. Ex. Given five students, organize them shortest to tallest. **EE8.SP.4.** Organize data into groups. Ex. Survey five people and ask if they like hamburgers or pizza better. Keep track of the findings. Ex. Organize disks by color and count how many of each. Which is most and which is least? Ex. Organize clothing by type (e.g., shirt, pants, socks) and count how many of each. Which is most and which is least?