Course Resources:

8th Grade Math Chapter Outcomes.docx

Unit	State Standards	Outcomes	Essential Questions	Essential Skills	Assessments	Faith Integration
Entire Year						
Chapter 1-Equations *(updated 6/7/19)*	8.EE.C.7(I) 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.		1.1 How can you use inductive reasoning to discover rules in mathematics? How can you test a rule? 1.2 How can you solve a multi-step equation? How can you check the reasonableness of your solution? 1.3 How can you solve an equation that has variables on both sides? 1.4 How can you use a formula for one measurement to write a formula for a different measurement?	Solve equations using addition or subtraction. Solve equations using multiplication or division. Identify the solution of an equation. Solve a two-step equation. Combine like terms to solve an equation. Solve a two-step equation. Use the distributive property to solve an equation. Solve an equation with variables on both sides. Use the distributive property to solve an equation. Solve equations with no solution Solve equations with infinitely many solutions. Write and solve an equation. Rewrite an equation. Rewrite a formula. Rewrite the temperature formula.	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16
Chapter 2-Transformations *(updated 6/7/19)*	8.G.A.1(A) 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.G.A.2(A) 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		2.1 How can you identify congruent triangles? 2.2 How can you arrange tiles to make a tessellation? 2.3 How can you use reflections to classify a frieze pattern? 2.4 What are three basic ways to move an object in a plane?	Name corresponding parts. Identify congruent figures. Use congruent figures. Identify a translation. Translate a figure in the	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with

	two congruent figures, describe a sequence that exhibits the congruence between them. 8.G.A.3(A) Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. 8.G.A.4(A) 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.			coordinate plane. Translate a figure using coordinates. Identify a reflection. Reflect a figure in the x-axil. Reflect a figure in the y-axis. Identify a rotation. Rotate a figure. Rotate a figure. Use more than one transformation. Describe a sequence of transformation.		his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16
Chapter 3-Angles and Triangles *(updated 6/7/19)*	8.G.A.5(A) 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.		3.1 How can you describe angles formed by parallel lines and transversals? 3.2 How can you describe the relationships among the angles of a triangle? 3.3 How can you find the sum of the interior angle measures and the sum of the exterior angle measures of a polygon? 3.4 How can you use angles to whether triangles are similar?	Find angle measures. Use corresponding angles Identifying alternate interior and alternate exterior angles. Explore the interior angles of a triangle. Explore the interior angles of a triangle. Explore the exterior angle of a triangle. Measure the exterior angles of a triangle. Use interior angle measures. Find exterior angle measures. Explore the interior angles of a polygon. Explore the exterior angles of a polygon. Find the sum of interior angle measures. Find an interior angle measure of a polygon. Find exterior measures. Construct similar	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16

				triangles Use technology to explore triangles. Make indirect measurements. identify similar triangles. use indirect measurements.		
Chapter 4- Graphing and Writing Linear Equations *(updated 6/7/19)*	8.EE.B.5(A) 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.EE.B.6(A) 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.F.B.4(I) 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.		4.1 How can you recognize a linear equation? How can you draw its graph? 4.2 How can you use the slope of a line to describe the lines? 4.3 How can you describe the graph of teh equation $y = mx$? 4.4 How can you describe the graph of the equation $y = mx + b$? 4.5 How can you describe the graph of the equation $ax + by = c$? 4.6 How can you write an equation of a line when you are given the slope and the y-intercept of the line? 4.7 How can you write an equation of a line when you are given the slope and a point on the line?	Graph a linear equation. Graph a horizontal line and a vertical line. Find the slope of a line. Use similar triangles. Draw lines with given slopes. Find the slope of a line. Find the slope of a horizontal line. Find the slope of vertical line. Find the slope from a table Identify parallel lines. Identify perpendicular lines. Identify proportional relationships. Analyze proportional relationships. Graph a proportional relationship. Write and used a direct variation equation. Compare proportional relationships. Identify slopes an y-intercepts. Graph a linear equation in slope-intercept form. Use a table to plot points. Rewrite an equation. Graph a linear	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16

				equation in standard form. Write equations of lines. Describe a parallelogram. Interpret the slope of the y-intercept. Write equations in slope-intercept form. Write an equation. Derive and equation. Write an equation using a slope and a point. Write an equation using two points.		
Chapter 5- Systems of Linear Equations *(updated 6/7/19)*	8.EE.C.7(A) 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. 8.EE.C.8(A) 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.		5.1 How can you solve a system of linear equations? 5.2 How can you use substitution to solve a system of linear equations? 5.3 How can you use elimination to solve a system of linear equations? 5.4 Can a system of linear equations have no solution? Can a system of linear equations have many solutions?	Write a system of linear equations. Use a table to solve a system. Use a graph to solve a system. Solve a system of linear equation by graphing. Use substitution to solve a system. Write and solve a system of equations. Solve a secret code. Solve a system of linear equations by substitution. Use elimination to solve a system. Solve a system of linear equations by elimination. Write a system of linear equations. Use a graph to solve a puzzle. Solve a system: no solution. Solve a system: infinitely many solutions. Solve an equation using a	Informal observations Target questions Exit tickets Quizzes Chapter test	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16

				graph.		
Chapter 6-Functions *(updated 6/7/19)*	8.F.A.1(A) 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. 8.F.A.2(A) 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.F.A.3(A) 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.F.B.4(A) 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.F.B.5(A) 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.		6.1 How can you use a mapping diagram to show the relationship between two data sets? 6.2 How can you represent a function in different ways? 6.3 How can you use a function to describe a linear pattern? 6.4 How can you recognize when a pattern in real life is linear or nonlinear? 6.5 How can you use a graph to represent a relationship between quantities without using numbers?	Construct mapping diagrams. Listing ordered pairs of a relation. Determine whether relations are functions. Describe a mapping diagram. Write function rules. Evaluate a function. Graph a function. Find linear patterns. Write a linear function using a graph. Write a linear function using a table. Comparing linear functions. Finding patterns for similar figures. Compare linear and nonlinear functions. Identify functions from tables. Identify functions from graphs. Identify a nonlinear function Analyzing Graphs. Sketching graphs.	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16
Chapter 7-Real Numbers and the Pythagorean Theorem *(updated 6/7/19)*	8.NS.A.1(A) 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. 8.NS.A.2(A) 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., pi2). For example, by truncating the decimal expansion of sqrt2, show that sqrt2 is between 1 and 2, then between 1.4		7.1 How can you find the dimensions of a square or a circle when you are given its area? 7.2 How is the cube root of a number different from the square root of a number? 7.3 How are the lengths of the sides of a right triangle related? 7.4 How can you find	Find square roots of a perfect square. Finding square roots. Evaluate expressions involving square roots. Using prime factorizations to find cube roots. Find cube roots. Evaluate expressions	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16

	and 1.5, and explain how to continue on to get better approximations. 8.EE.A.2(A) 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 is irrational. 8.G.B.6(A) Explain a proof of the Pythagorean Theorem and its converse. 8.G.B.7(A) 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.B.8(A) Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.		7.4 How can you find decimal approximations of a square roots that are not rations? 7.5 In what other ways can you use the Pythagorean Theorem?	expressions involving cube roots. Evaluating an algebraic expression. Find the length of a hypotenuse. Find the length of a leg. Classifying real numbers. Approximating a square root. Comparing real numbers. Approximating the value of an expression. Identifying a right triangle. Finding the distance between two points.		Revelation 21:16
Chapter 8- Volume and Similar Solids *(updated 6/7/19)*	8.G.C.9(A) Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.		8.1 How can you find the volume of a cylinder? 8.2 How can you find the volume of a cone? 8.3 How can you find the volume of a sphere? 8.4 When the dimensions of a solid increase by a factor of *k*, how does the surface area change? How does the volume change?	Finding the volume of a cylinder. Finding the height of a cylinder. Finding the volume of a cone. Finding the height of a cone. Finding the volume of a sphere. Finding the radius of a sphere. Finding the volume of a composite solid. Identify similar solids. Finding missing measures in similar solids.	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16
Chapter 9-Data Analysis and Displays *(updated 6/7/19)*	8.SP.A.1(A) 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.A.2(A) 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		9.1 How can you construct and interpret a scatter plot? 9.2 How can you use data to predict an event? 9.3 How can you read and make a two-way table? 9.4 How can yoy	Construct a scatter plot. Interpret a scatter plot. Identify relationships. Finding a line of fit. Finding a line of best fit using technology.	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its

	Informally assess the model fit by judging the closeness of the data points to the line. 8.SP.A.3(A) 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.SP.A.4(A) 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?		display in a way that helps you make decisions?	Reading a two-way table. Finding marginal frequencies. Make a two-way table. Find a relationship in a two-way table. Choose an appropriate data display. Identify an appropriate data display. Identify a misleading data display. Analyze a misleading data display.		width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16
Chapter 10-Exponents and Scientific Notation *(updated 6/7/19)*	8.EE.A.1(A) 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.A.3(A) 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. 8.EE.A.4(A) 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.		10.1 How can you use exponents to write numbers? 10.2 How can you use inductive reasoning to observe patterns and write general rules involving properties of exponents? 10.3 How can you divide two powers that have the same base? 10.4 How can you evaluate a nonzero number with an exponent of zero? How can you evaluate a nonzero number with a negative integer exponent? 10.5 How can you read numbers that are written in scientific notation? 10.6 How can you write a number in scientific notation? 10.7 How can you perform operations with numbers written in scientific notation?	Writing expressions using exponents. Evaluating expressions. Using order of operations. Multiplying powers with the same base. Finding a power of a power. Finding a power of a product. Dividing powers with the same base. Simplifying an expression. Evaluating expressions. Simplifying expressions. Identifying numbers written in scientific notation. Adding and subtracting numbers in scientific notation. Multiplying numbers in scientific notation. Dividing numbers in scientific	Informal observations Target questions Exit tickets Quizzes Chapter tests	And I lifted my eyes and saw, and behold, a man with measuring line in his hand! Then I said, "Where are you going? And he said to me, "To measure Jerusalem, to see what is its width and what is its length." Zechariah 2:1-2 Whoever multiplies his wealth by interest and profit gathers it for him who is generous to the poor. Proverbs 28:8 The city lies four square, its length the same as its width. And he measured the city with his rod, 12,000 stadia. Its length and width and height are equal. Revelation 21:16

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