Ganado Unified School District #20
(Math/8th Grade)

PACING Guide SY 2018-2019

Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
First Quarter				
Purple Book: ✓ Lesson 1.2, 1.3, 1.4, and 1.5 ✓ Lesson 1.8, 1.9, 1.10, 5.5, 5.6, and 5.7 Holt McDougal pg. 92-94/96-100 Buckle Down pg. 32-34; 49-50 Algebra 1 pg. 435-456	**1.** AZ-8.EE.A.1 Understand and apply the properties of integer exponents to generate equivalent numerical expressions. **2.** AZ-8.EE.A.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. Know that square root of 2 is irrational **a.** Evaluate square roots of perfect square less than or equal to 225 **b.** Evaluate cube roots of perfect cubes less than or equal to 1000.	➢ Explain how to evaluate an expression with a negative or a zero exponent. ➢ Demonstrate how to raise a power to a power. ➢ Briefly explain how to simplify expressions using the order of operations.	❖ I am able to apply the properties of integer exponents to generate equivalent numerical expressions. ❖ I am able to explain how to apply the properties of integer exponents. ❖ I will be able to use square roots and cube roots to represent solutions. ❖ I will be able to demonstrate how to evaluate square roots and cube roots of perfect squares.	Power Radical Symbol Base Number Positive Exponents Negative Exponents Perfect Squares Square Roots Cube Roots Cube Multiplying Powers Dividing Powers Raising a Power to a Power

Purple Book; ○ Lesson 4.3, 4.4, and 4.7 ○ Lesson 3.3 and 4.5 Holt McDougal Resource pg. 66-73 Buckle Down pg. 112-125 Algebra 1 pg. 41-46/153-170	AZ-8.F.A.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.) AZ-8.F.A.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.	➢ What is a rule? ➢ What is a table? ➢ How do you create a table? ➢ What is an input/output value? ➢ Opposite ➢ Real-life situations worksheet ➢ Parabola ○ Linear ○ Non-linear Formula's	❖ I am able to define, evaluate, and compare functions by: ○ Clarifying why a function has exactly one output is assigned to each input. ❖ I will be able to compare two properties of functions even those represented in different ways	Input Output Range Domain Coordinates Linear Function Function Table Equations Slope-intercept form Linear Non-linear
□ Purple Book; ○ Lesson 6.1 and 7.2 □ Holt McDougal Resource pg. 231-235 □ Buckle Down pg. 178-182 □ Algebra 1 pg. SR12-SR13	• AZ-8.G.A.1a Lines are taken to lines, and line segments to line segments of the same length. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software] • AZ-8.G.A.1b Angles are taken to angles of the same measure. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software] • AZ-8.G.A.1c Parallel lines are	➢ Identify and verify right, obtuse, straight, complementary, supplementary, adjacent, vertical, and congruent angles. ➢ What is a transversal line? ➢ Identify and verify parallel lines, perpendicular lines, alternate interior	❖ I am able to verify experimentally properties of rotations, reflections, and translations. ❖ I am able to explain that a two-dimensional figure is congruent to another if one is obtained from the other by a sequence of rotations, reflections, and translation.	Right Angle Acute Angle Obtuse Angles Congruent Angles Congruent Segment Congruent Line Parallel Perpendicular Rotation Reflection Translation Dilation

	taken to parallel lines. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software]	angles, alternate exterior angles and corresponding angles		
Purple Book: Lesson 1.1 and 1.10 Lesson 1.9 and 1.10 Buckle Down pg. 10-22 Algebra 1 pg. 73-80	AZ-8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; know that number whose decimal expansion do not terminate in zeros or in a repeating sequence of fixed digits are called irrational numbers. AZ-8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate their values.	➢ Define and provide an example of a real numbers, irrational number, and rational numbers? ➢ Explain how do we organize numbers from least and greatest using a number line? ➢ How do identify whether a number is irrational or rational? ➢ How do you cite and develop a logical argument for irrational and rational numbers?	❖ I am able to classify numbers as rational or irrational, because for every number that does not terminate or repeat is referred to as an irrational number. ❖ Illustrate the decimal expansion of every number. ❖ I am able to compare the size of irrational numbers. ❖ I am able to locate irrational numbers on a number line utilizing a diagram to estimate their value.	Real Numbers Rational Numbers Irrational Numbers Natural numbers Whole Numbers Integers Radical Symbol Square Roots Square Cube Cube Roots Fractions
□ Purple Book: Lesson 3.4, 4.4, 4.7, and 4.8 Lesson 3.3, 3.4, 3.6, 4.1, 4.3, 4.4, 4.5, and 4.6	• AZ-8.F.A.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	➢ Why do we use domain/range instead of input/output? ➢ How many ways can you represent a function?	❖ I am able to interpret the equation y=mx + b, as a defined linear function. ❖ I am able to utilize the given information to fine	Slope Formula Slope Y-intercept X-intercept Positive Slope Negative Slope

☐ Holt McDougal Resource pg. 338-349 ☐ Buckle Down pg. 117-130 ☐ Algebra 1 pg. 173-206	giving the area of a square as a function of its side length is not linear. • AZ-8.F.B.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. Track how the values of the 2 quantities change together. 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.	➢ How can you identify a function? ➢ What is the vertical line test?	the slope of line (rate of change): rise/run. ❖ I am able to trace the value of given two quantities and interpret the rate of change (slope): rise/run.	Zero Slope Undefined Slope Vertical Line test Rise and Run Rate of change Slope-intercept form
☐ Purple Book: ○ Lesson 7.1 and 7.2 ○ Lesson 6.1, 6.2, 6.3, and 6.4 ☐ Holt McDougal Resource pg. 226 – 243	AZ-**8.G.A.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. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software]	➢ What is a transformation? ➢ Name and identify the types of transformations for Translation, Rotation, and Reflection	❖ I am able to explain that a two-dimensional figure is congruent to another if one is obtained from the other by a sequence of rotations, reflections, and translation. ❖ I am able to describe and demonstrate the sequence of transformation	Transformation Image Translation Reflections Rotation Center of rotations Coordinates Figure Similarity Sequences Congruence Combination

☐ Buckle Down pg. 178 – 186 ☐ Algebra 1 pg. SR12-SR13	AZ-8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.				
Second Quarter					
☐ Purple Book: ○ Lesson: _____ ☐ Holt McDougal Resource pg. 345-349 ☐ Buckle Down pg. 51-65 & 66-75 ☐ Algebra 1 pg. 223-229/232-239/242-249/258-263	• AZ-8.EE.B.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.* • AZ-8.EE.B.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.	➢ How do you graph a line using the unit of rate (rise/run)? ➢ How do you compare two graphed expressions using their unit of rate (rise/run)? ➢ How do you use similar triangles to explain the rise over the run?	❖ I am able to graph proportional relationships and interpret the unit rate of a slope of a graph. ❖ I am able to compare two different proportional relationships represented in different ways. ❖ I am able to utilize triangles to explain why the slope "m" is the same between any two distinct points on a non-vertical line. ❖ I am able to derive an equation using "y = mx + b."	Function Linear Equations/Function Function Table Equations Slope Y-intercept X-intercept Vertical Line test Types of Slope Coordinates Point-Slope form Slope-intercept form	

□ Purple Book: ○ Lesson: _____ □ Holt McDougal Resource pg. 300-314 □ Prentice Hall Resource Review of pg. □ Buckle Down pg. 41-48 □ Algebra 1 pg. 91-103	• AZ-8.EE.C.7a 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). • AZ-8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	➢ What is the distributive property? ➢ How do we use the Distributive Property? Provided an example. ➢ Explain how do we use real world situations when solving linear equations? ➢ How do we solve literal equations?	❖ I am able to give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. ❖ I am able to solve linear equations and inequalities with rational numbers coefficients: ○ Including solutions that require expanding expressions using the distributive property and collecting like terms.	Function Linear Equations/Function Function Table Equations Slope Y-intercept X-intercept Vertical Line test Types of Slope Coordinates Point-Slope form Slope-intercept form
□ Purple Book: Lesson: _____ □ Holt McDougal Resource pg. □ Buckle Down pg. □ Algebra 1 pg.	❖ AZ-8.F.B.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.	➢ *Why do we use domain/range instead of input/output?* ➢ *How many ways can you represent a function?* ➢ *How can you identify a function?* ➢ *What is the vertical line test?*	❖ I am able to describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the functions is increasing or decreasing, linear or nonlinear). ❖ I am able to sketch a graph that illustrates the qualitative features of a function.	Function Linear Equations/Function Function Table Equations Slope Y-intercept X-intercept Vertical Line test Types of Slope Coordinates Point-Slope form

				Slope-intercept form
□ Purple Book: Lesson: □ Holt McDougal Resource pg. 231-243 □ Buckle Down pg. 178 -190	• AZ-8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. • AZ-8.G.A.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.	➢ How can we identify similar figures? ➢ How can we prove to figures are congruent/similar? ➢ How can identify the type of transformation used from the original? ➢ Where is the original image?	❖ I am able to describe the effects of dilations, translations, rotations, and reflections using a two-dimensional figure. ❖ I am able to illustrate my understanding of two-dimensional figure that is similar "if and only if," one can be obtained from the other through a series of sequences.	Transformation Image Translation Reflections Rotation Center of rotations Coordinate Plane Coordinates X-axis Y-axis Origin Figure Degree Similarity Sequences Congruence Combination
Third Quarter				
□ Purple Book: Lesson: _____ □ Holt McDougal Resource pg. 100-108	• 8. NS.A.3: Understand that given any two distinct rational numbers, a<b there exist a rational number c, and an irrational number d such that a< c < b and a < d < b. Given any two distinct irrational number, a < b, there exist a rational number	➢ What is a scientific notation and standard notation? ➢ How do you convert scientific notation to standard notation and vice versa? ➢ Be able to recall rational and irrational numbers?	❖ I will be able to express large and small numbers in scientific notations. ❖ I will be able to use evidence to explain how to express large and small numbers in scientific notations.	Function Powers Scientific Notations Standard Notations Laws of exponents

☐ Prentice Hall Resource pg.		c and an irrational number d such that a < c< b and a < d < b.
☐ Buckle Down pg. 35-40	•	AZ-8.EE.A.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 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. [From cluster: Work with radicals and integer exponents]
	•	AZ-8.EE.A.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. [From cluster: Work with radicals and integer exponents]

Purple Book: ○ Lesson: _____ Holt McDougal Resource pg. 202-205 Buckle Down pg. 191-197	• AZ-8.G.A.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. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software] • AZ-8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse. [From cluster: Understand and apply the Pythagorean Theorem]	➢ What is the Pythagorean Theorem? ➢ For which triangle do you use the Pythagorean Theorem? ➢ What is a hypotenuse? ➢ How do you find the length of a hypotenuse using the Pythagorean Theorem? ➢ How do you find the length of a hypotenuse to the nearest hundredth?	I will be able to apply, demonstrate, and describe how to use the Pythagorean Theorem when solving real-life situations.	Pythagorean theorem Leg Hypotenuse Square root Radical Converse Distance formula Diagonal

☐ Purple Book: Lesson: _____ ☐ Holt McDougal Resource pg. 202-205 ☐ Buckle Down pg. 191-197	• AZ-8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse. [From cluster: Understand and apply the Pythagorean Theorem] • AZ-8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. [From cluster: Understand and apply the Pythagorean Theorem] • AZ-8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. [From cluster: Understand and apply the Pythagorean Theorem]	➢ How do you find the length of leg in a right triangle? ➢ How do you use the Pythagorean Theorem for measurement? ➢ What is the converse of the Pythagorean Theorem? ➢ What is the distance formula? ➢ How do you use the distance formula? ➢ Explain how to identify a right triangle.	I will be able to apply, demonstrate, and describe how to use the Pythagorean Theorem when solving real-life situations.	Pythagorean theorem Leg Hypotenuse Square root Radical Converse Distance formula Diagonal
Fourth Quarter				
☐ Purple Book (Same for Both): o Lesson 3.7 and 3.8 ☐ Holt McDougal Resource pg. 318-320/368-371 & 373	➢ AZ-8.EE.C.8a 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. ➢ AZ-8.EE.C.8b Solve systems of	➢ What are systems of equations? ➢ How do we solve systems of equations? ➢ How may we use graphing systems of linear equations to solve real life situations?	❖ I am able to analyze and solve pairs of simultaneous linear equations. ❖ I am able to explain that the solutions of system of equations correspond to points on a graph. ❖ I am able to solve linear equations and estimate the	Systems of Equations No Solution (Undefined) One Solution Infinite Numbers of Solutions (Many Solutions) Substitution Intersecting lines Parallel Lines

□ Buckle Down pg. 76-84/85-94/95-98 □ Algebra 1 pg. 369-375/377-383/386-392	two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. ➢ AZ-8.EE.C.8c Solve real-world and mathematical problems leading to two linear equations in two variables.	➢ How many solutions exist for systems of equations? ➢ How do we solve systems of equations by solving for a variable? ➢ Intersecting lines have how many solutions? ➢ Parallel lines have how many solutions? ➢ Same lines have how many solutions? ➢ How may we use graphing to solve systems of linear equations?	solutions by graphing the equations. ❖ I am able to solve mathematical problems in real-world context leading to linear equations in two variables.	Same lines Combining Like Terms Variables
□ Purple Book: Lesson: 8.1, 8.2, 8.3, and 8.6 □ Holt McDougal Resource pg. 267-271/282-285 □ Buckle Down pg. 163-167	• AZ-8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. • AZ-8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers,	➢ What is a Cylinder, Cone, & Sphere? ➢ How do you find the volume of Cylinder, Cone, & Sphere? ➢ How do you find the surface area of sphere? ➢ What is a hemisphere? ➢ How do you find the volume of a figure to the nearest tenth?	❖ I am able to demonstrate my understanding of formulas for cones, cylinders, and spheres by applying them to real-life situations. ❖ I am able to construct and interpret scatter plots for bivariate measurement data to investigate and describe their patterns.	Volume Circumference Base Radius Diameter Area Formula Cylinder Cone Sphere Hemisphere Great circle

☐ Algebra 1 pg. SR17-SR18 ☐ Purple Book: Lesson: 9.1 and 9.2 ☐ Holt McDougal Resource pg. 386-393/396 ☐ Buckle Down pg. 208-226 ☐ Algebra 1 pg. 264-270/275-281	positive or negative association, linear association, and nonlinear association. • AZ-8.SP.A.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.	➢ How are the formulas similar for a cone and cylinder? What is important to explore the effects of changing dimension?	❖ I am able to demonstrate my understanding of scatter plots by explaining the relationship of two variables by utilizing the line of best fit.	**Scatter Plots Vocabulary Words:** Scatter plot Correlations Line of best fit Weak Correlation Strong correlations Negative Correlation Positive correlations No correlations Clustering Patterns Outliers
☐ Purple Book: ○ Lesson: 9.2 and 9.3 ☐ Holt McDougal Resource pg. 386-393/396 ☐ Buckle Down pg. 208-226 ☐ Algebra 1 pg. 264-270/275-281	AZ-8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. AZ-8.SP.A.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	➢ What is a scatter plot? ➢ How do you use a scatter plot? ➢ What kind of information's are used for a scatter plot? ➢ What are correlations? ➢ How many correlations exist? ➢ What is a line of best fit?	❖ I am able to utilize an equation of a linear model to solve problems in the context of a bivariate measurement data. ○ Interpret the slope and intercept: y = mx + b ❖ I will be able to display data in two-way table and summarize the data and its relationship	Scatter plot Correlations Line of best fit Weak Correlation Strong correlations Negative Correlation Positive correlations No correlations Clustering Patterns Outliers

	columns to describe possible association between the two variables.	➢ How do you describe a correlation for a scatter plot? ➢ How do you use data to make predictions? ➢ What are clusters? ➢ How do you observe a pattern using a scatter plot? ➢ How do you assess the line of best fit? ➢ How do you apply scatter plots for real life situations?