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

PACING Guide SY 2021- 2022

Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
First Quarter				
Holt McDougal pg. 92-94/96-100	**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.	➢ 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.	Square Roots Cube Roots Cube

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Holt McDougal Resource pg. 66-73	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?	❖ I will be able to compare two properties of functions even those represented in different ways	Input Output
□ Holt McDougal Resource pg. 231-235	• 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]	➢ 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,	❖ 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

	• AZ-8.G.A.1c Parallel lines are taken to parallel lines. [From cluster: Understand congruence and similarity using physical models, transparencies, or geometry software]	alternate interior angles, alternate exterior angles and corresponding angles		
	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?	❖ 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.	Real Numbers Rational Numbers Irrational Numbers
□ Holt McDougal Resource pg. 338-349	• 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	➢ Why do we use domain/range instead of input/output?	❖ 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

	example, the function A = s^2 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 many ways can you represent a function? ➢ 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.	
□ 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	➢ What is a transformation?	❖ 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.	Transformation

	physical models, transparencies, or geometry software] AZ-8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.			
Second Quarter				
☐ Holt McDougal Resource pg. 345-349	• 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	➢ How do you graph a line using the unit of rate (rise/run)?	❖ I am able to graph proportional relationships and interpret the unit rate of a slope of a graph.	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

	a line intercepting the vertical axis at b.			
□ Holt McDougal Resource pg. 300-314	• 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?	❖ I am able to give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.	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
	❖ 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	➢ *Why do we use domain/range instead of input/output?*	❖ I am able to describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the functions is	Function Linear Equations/Function Function Table Equations Slope Y-intercept

	or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.		increasing or decreasing, linear or nonlinear).	X-intercept Vertical Line test Types of Slope Coordinates Point-Slope form Slope-intercept form
□ Holt McDougal Resource pg. 231-243	• 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?	❖ I am able to describe the effects of dilations, translations, rotations, and reflections using a two-dimensional figure.	Transformation Image Translation Reflections Rotation Center of rotations Coordinate Plane Coordinates X-axis Y-axis Origin Figure Degree Similarity Sequences Congruence Combination
Third Quarter				
	• 8. NS.A.3: Understand that given any two distinct rational numbers, a<b there exist a rational number c, and an	➢ What is a scientific notation and standard notation?	❖ I will be able to express large and small numbers in scientific notations.	Function Powers Scientific Notations Standard Notations

Holt McDougal Resource pg. 100-108	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 c and an irrational number d such that a < c< b and a < d < b. • 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:	Laws of exponents

	Work with radicals and integer exponents]			
Holt McDougal Resource pg. 202-205	• 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?	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

☐ Holt McDougal Resource pg. 202-205	• 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?	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				
☐ 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	➢ What are systems of equations?	❖ I am able to analyze and solve pairs of simultaneous linear equations.	Systems of Equations No Solution (Undefined) One Solution

	satisfy both equations simultaneously. ➢ AZ-8.EE.C.8b Solve systems of 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.			Infinite Numbers of Solutions (Many Solutions) Substitution Intersecting lines Parallel Lines Same lines Combining Like Terms Variables
□ Holt McDougal Resource pg. 267-271/282-285	• 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	➢ What is a Cylinder, Cone, & Sphere?	❖ I am able to demonstrate my understanding of formulas for cones, cylinders, and spheres by applying them to real-life situations.	Volume Circumference Base Radius Diameter Area Formula Cylinder Cone

		investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.			Sphere Hemisphere Great circle
☐	Holt McDougal Resource pg. 386-393/396	• 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.	What is important to explore the effects of changing dimension?	❖ 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	**Scatter Plots Vocabulary Words:** Scatter plot Correlations Line of best fit Weak Correlation Strong correlations Negative Correlation Positive correlations No correlations Clustering Patterns Outliers
☐	Holt McDougal Resource pg. 386-393/396	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	➢ What is a scatter plot?		Scatter plot Correlations Line of best fit Weak Correlation Strong correlations Negative Correlation Positive correlations No correlations Clustering Patterns

	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.		Outliers