

Window Rock Unified School District #8
CURRICULUM GUIDE
SY 2021-2022

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 1 - 2nd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
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BIG IDEAS:

- FUNCTIONS
- MODELING
- PROPORTIONALITY
- SOLVING EQUATIONS AND INEQUALITIES

ESSENTIAL QUESTIONS:

01. How can you represent and describe functions?
02. Can functions describe real-world situations?
03. What does the slope of a line indicate about the line?
04. What information does the equation of a line give you?
05. How can you solve systems of equations or inequalities?
06. Can systems of equations and inequalities model real-world problems?

ESSENTIAL UNDERSTANDING

01. A function is a special type of relation in which each value in the domain is paired with exactly one value in the range.
02. The set of all solutions of an equation forms the equation's graph. A graph may include solutions that do not appear in a table.
03. A line on a graph can be represented by a linear equation. Forms of linear equations include the Slope-Intercept, Point-Slope, and Standard Forms.
04. The relationship between two lines can be determined by comparing their slopes and y-intercepts.
05. Absolute value equations can be graphed quickly by shifting the graph of $y = |x|$.
06. Systems of linear equations can be used to model problems. Systems of equations can be solved by graphing, substitution, or eliminating a variable.
07. Solutions to a linear inequality in two variables can be represented in the coordinate plane as the set of all points on one side of a boundary line. The solutions of a system of linear inequalities can be represented by the region where the graphs of the individual inequalities overlap.

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<p style="text-align: center;">Functions</p> <p>A1.F-IF.A Understand the concept of a function and use function notation.</p> <ul style="list-style-type: none"> A1.F-IF.A.1 <p>ALSO</p> <ul style="list-style-type: none"> A1.F-IF.A.2 	<p>Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">KEY CONCEPTS</p> <ul style="list-style-type: none"> Formalizing Relations and Functions <ul style="list-style-type: none"> - Domain and Range of a Relation - Mapping Diagram - Vertical Line test - Function Notation - Evaluating a Function - Input-Output Tables and Functions - Graphs of Relations and Functions 	<p>Find the domain and range of a given relation and describe their relationship</p> <p>Determine whether a relation is a function.</p> <p>Given a verbal description, write a relation in function notation.</p> <p>Evaluate functions for inputs in their domains and interpret the results.</p> <p>Determine whether a given mapping diagram represents a function.</p> <p>Define the domain and range of a given function and understand their relationship.</p> <p>Given a mapping diagram, identify the</p>	<p>Practice and Problem Solving Exercises</p> <ul style="list-style-type: none"> - Reasoning - Standard Test Prep - STEM Problems <p>Selected Response Assessment</p> <ul style="list-style-type: none"> - Multiple Choice - True or False - Matching <p>Lesson Quiz</p> <ul style="list-style-type: none"> - Error Analysis - Reasoning - Problem Solving <p>Personal Communication Assessment</p> <ul style="list-style-type: none"> - Oral Presentation - Think Aloud - Discussions <p>STAR Math</p> <ul style="list-style-type: none"> - Diagnostic Assessment 	<p>Prentice Hall Algebra 1</p> <p>STAR Math</p> <p>Cumulative Review Materials</p> <p>Algebra 1 Consumables</p> <p>www.pearsonrealize.com</p> <p>www.khanacademy.org</p> <p>www.apexvs.com</p> <p>VIRTUAL NERD</p> <ul style="list-style-type: none"> https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA <p>Kutasoftware.com</p>	<p>Relation</p> <p>Domain</p> <p>Range</p> <p>Function Notation</p> <p>Mapping Diagram</p> <p>Vertical Line Test</p> <p>Evaluate</p>

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		<p>domain and range of the function.</p> <p>Identify a function's domain and range values in an input-output table.</p> <p>Determine whether a relation is a function given a table of values.</p> <p>Use the Vertical Line Test to determine whether a graph is a function or not a function.</p>			
<p>Functions</p> <p>A1.F-IF.B Interpret functions that arise in applications in terms of the context.</p> <ul style="list-style-type: none"> A1.F-IF.B.5 <p>ALSO</p> <ul style="list-style-type: none"> A1.N-Q.A.1 A1.A-REI.D.10 	<p>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.</p> <p style="text-align: center;">-----</p> <p>Key Concepts</p> <ul style="list-style-type: none"> Graphs of Functions <ul style="list-style-type: none"> Graphing a Function Rule Continuous and 	<p>Graph equations that represent functions.</p> <p>Graphically define the domain and range of a function.</p> <p>Identify intervals in which a function is increasing, decreasing, or constant.</p> <p>Relate points on a graph to input/output values by</p>	<p>Monitoring Progress Activities</p> <p>Practice and Problem Solving Exercises</p> <ul style="list-style-type: none"> Reasoning Standard Test Prep <p>Mixed/Cumulative Review Activities</p> <p>Lesson Quiz</p> <ul style="list-style-type: none"> Error Analysis Reasoning 	<p>Prentice Hall Algebra 1</p> <p>www.pearsonrealize.com</p> <p>www.khanacademy.org</p> <p>www.apexvs.com</p> <p>VIRTUAL NERD</p> <ul style="list-style-type: none"> https://www.youtube.com/channel/UCe73Uxna d_VYqYhQzLLD2IA 	<p>Function Rule</p> <p>Continuous Graph</p> <p>Discrete graph</p> <p>Absolute Value</p> <p>Function</p> <p>Linear Function</p> <p>Domain</p>

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	Discrete Graphs - Graphs of Linear Function - Graphs of Absolute Value Functions - Finding Domain Using a Graph - Finding Range Using a Graph - Increasing, Decreasing and Constant Graphs - Identifying Change in Graphs	evaluating a function for inputs in its domain. Relate the domain of a function to its graph and the relationship it describes.	- Problem Solving Vocabulary Quiz - Creating Magic Squares	IXL.com Enrichment or Extension Activity Sheets Puzzles Algebra 1 Consumables AZM2 Practice Test www.mathworksheetsgo.com Kutasoftware.com	Range
<i>Building Functions</i> A1.F-LE.A Construct and compare linear, quadratic, and exponential models and solve problems. • A1.F-LE.A.1b ALSO • A1.F-IF.B.6	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. ----- KEY CONCEPTS • Linear Functions - Rate of Change and Slopes - The Slope Formula	Identify slope as a measure of the change in the y-variable with respect to the x-variable. Apply the slope formula to ordered pairs on a line. Calculate and interpret the rate of change of a function from a graph. Recognize relationships	Algebra Puzzles Mixed/Cumulative Review Activities AZM2 Practice Test Questions Practice and Problem Solving Exercises - Reasoning - Standard Test Prep - STEM Problems	Prentice Hall Algebra 1 www.pearsonrealize.com www.khanacademy.org www.mathworksheet4kids.com www.apexvs.com www.mathworksheetsgo.com	Rate of Change Rise Run Slope

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	<ul style="list-style-type: none"> Properties of Slopes Slopes of Lines 	in which one quantity changes at a constant rate relative to another.	Personal Communication Assessment <ul style="list-style-type: none"> Oral Presentation Think Aloud Discussions Summative Test	VIRTUAL NERD <ul style="list-style-type: none"> https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA 	
Interpreting Functions AF. F-IF.C. Analyze functions using different representations. <ul style="list-style-type: none"> AF. F-IF.C.7 ALSO <ul style="list-style-type: none"> A1.F-IF.B.4 A1.F-LE.A.2 A1.A-CED.A.2 	<p>Graph functions expressed symbolically and show key features of a graph, by hand in simple cases, and using technology for more complicated cases.</p> <p><i>Focus on linear, quadratic, exponential, and piecewise-defined functions (limited to absolute value and step).</i></p> <p style="text-align: center;">-----</p> <p style="text-align: center;">KEY CONCEPT</p> <ul style="list-style-type: none"> Slope-Intercept Form of a Linear Equation Identifying slope and 	<p>Write linear equations using slope-intercept form.</p> <p>Graph linear equations in slope-intercept form.</p> <p>Understand that the graph of a linear equation in the form $y = mx + b$ shows the set of all of its solutions plotted in the coordinate plane.</p> <p>Using function notation, evaluate a linear function for inputs in its domain.</p> <p>Graph an equation representing a real-world</p>	Practice and Problem Solving Exercises <ul style="list-style-type: none"> Reasoning Standard Test Prep STEM Problems Lesson Quiz <ul style="list-style-type: none"> Error Analysis Reasoning Problem Solving STAR Math <ul style="list-style-type: none"> Diagnostic Assessment 	<p>Prentice Hall Algebra 1</p> <p>Cumulative Review Materials</p> <p>Enrichment or Extension Activity Sheets</p> <p>Algebra 1 Consumables</p> <p>AZM2 Practice Test</p> <p>www.pearsonrealize.com</p> <p>www.khanacademy.org</p> <p>www.apexvs.com</p> <p>www.mathworksheetsgo.com</p>	<p>Parent Function</p> <p>Linear Parent Function</p> <p>Linear Equation</p> <p>Slope-intercept Form</p> <p>x-axis</p> <p>y-axis</p> <p>y-intercept</p>

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	y-intercept - Writing an Equation in Slope-Intercept form - Writing an Equation from a Graph - Writing an Equation From Two Points - Graphing a Linear Equation in Slope-Intercept Form - Evaluating a Linear Function - Modeling Real-World Linear Functions. - Interpreting the Slope and y-intercept	linear relationship, and identify the meaning of the slope and y-intercept. Compare the slopes and y-intercepts of linear functions represented in different ways.		VIRTUAL NERD <ul style="list-style-type: none"> https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA Kutasoftware WorksheetWorks.com Lesson Tutorials	
<i>Building Functions</i> A1.F-LE.A Construct and compare linear, quadratic, and exponential models and solve problems. <ul style="list-style-type: none"> A1.F-LE.A.2 ALSO <ul style="list-style-type: none"> A1.F-IF.C.7 A1.F-LE.B.5 	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or input/output pairs -----	Find the equation for a line given its slope and any point on the line. Find the point-slope equation given two points on the line. Convert an equation from point-slope form to slope-intercept form.	Monitoring Progress Activities Algebra Puzzles Mixed/Cumulative Review Activities Unit Cumulative Test Practice and Problem Solving Exercises	Prentice Hall Algebra 1 Algebra 1 Consumables www.pearsonrealize.com www.khanacademy.org www.apexvs.com www.mathworksheetsgo.com	Point-Slope Form

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<ul style="list-style-type: none"> A1.A-CED.A.2 	<p>KEY CONCEPT</p> <ul style="list-style-type: none"> Point-Slope Form of a Linear Equation <ul style="list-style-type: none"> - Writing an Equation in Point-Slope Form - Graphing Using Point-Slope Form - Using Two Points to Write an Equation - Using a Table to Write an Equation - Real-World Problem Solving 	<p>Solve a real-world problem by graphing and writing an equation that describes the relationship.</p>	<ul style="list-style-type: none"> - Skill-building activity - Open-Ended - Standard Test Prep - Challenge Questions <p>Lesson Quiz</p> <ul style="list-style-type: none"> - Error Analysis - Graphing - Real-World Problem Solving 	<p>com</p> <p>VIRTUAL NERD</p> <ul style="list-style-type: none"> https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA <p>Kutasoftware</p> <p>WorksheetWorks.com</p> <p>Lesson Tutorials</p>	
<p>Creating Equations</p> <p>A1.A-CED.A Create equations that describe numbers or relationships.</p> <ul style="list-style-type: none"> A1.A-CED.A.2 <p>ALSO</p> <ul style="list-style-type: none"> A1.F-IF.B.4 A1.F-IF.C.7 	<p>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p style="text-align: center;">-----</p> <p>KEY CONCEPTS</p> <ul style="list-style-type: none"> Standard Form of the Linear Equation 	<p>Find the x- and y-intercepts of a linear equation in standard form.</p> <p>Graph linear equations using the intercepts</p> <p>Transform an equation in slope-intercept form to standard form.</p> <p>Graph horizontal and vertical lines.</p>	<p>Algebra Puzzles</p> <p>Practice and Problem Solving Exercises</p> <ul style="list-style-type: none"> - Skill-building activity - Open-Ended - Standard Test Prep - Challenge Questions <p>Lesson Quiz</p> <ul style="list-style-type: none"> - Graphing using intercepts - Real-World Problem Solving 	<p>Prentice Hall Algebra 1</p> <p>Puzzles</p> <p>Algebra 1 Consumables</p> <p>www.pearsonrealize.com</p> <p>www.khanacademy.org</p> <p>www.apexvs.com</p> <p>www.mathworksheetsgo.com</p>	<p>Standard Form of a Linear Equation</p> <p>x-intercept</p> <p>y-intercept</p> <p>Horizontal Lines</p> <p>Vertical Lines</p>

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	<ul style="list-style-type: none"> - Finding x- and y-intercepts - Graphing a line using intercepts - Graphing horizontal and vertical lines 	Use an equation in standard form to model a real-world problem.		VIRTUAL NERD <ul style="list-style-type: none"> - https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA Kutasoftware.com Lesson/Video Tutorials	
<i>Reasoning with Equations and Inequalities</i> A1.A-REI.C Solve systems of equations. <ul style="list-style-type: none"> • A1.A-REI.C.6 ALSO <ul style="list-style-type: none"> • A1.A-REI.C.5 	Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables. Include problem solving opportunities utilizing real-world context <hr/> KEY CONCEPTS <ul style="list-style-type: none"> • Solving Systems of Equations <ul style="list-style-type: none"> - By Graphing - By Elimination 	Discover what it means when two lines have zero, one, or infinitely many points in common. Solve systems of equations using graphs. Solve real-world problems by writing and graphing systems of linear equations. Identify when to use elimination instead of graphing to solve systems of equations. Learn how to add or subtract the same value	Practice and Problem Solving Exercises <ul style="list-style-type: none"> - Graphing - Skill-building activity - Standardized Test Prep - Real-World Problem Solving Personal Communication Assessment <ul style="list-style-type: none"> - Oral Presentation - Discussions Lesson Quiz <ul style="list-style-type: none"> - Graphing - Reasoning - Problem Solving 	Prentice Hall Algebra 1 Algebra Puzzles Algebra 1 Consumables www.pearsonrealize.com www.khanacademy.org www.apexvs.com www.mathworksheetsgo.com VIRTUAL NERD <ul style="list-style-type: none"> - https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA 	System of Linear Equation Solution of a System of Linear Equations Consistent Independent Dependent Inconsistent Elimination Method

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		<p>on both sides of an equation to eliminate terms.</p> <p>Manipulate equations in standard form using multiplication to create equal or opposite coefficients.</p> <p>Solve systems of equations using the elimination method.</p>		<p>Kutasoftware.com</p> <p>Lesson/Video Tutorials</p>	
<p><i>Reasoning with Equations and Inequalities</i></p> <p>A1.A-REI.D Represent and solve equations and inequalities graphically</p> <ul style="list-style-type: none"> A1.A-REI.D.12 <p>ALSO</p> <ul style="list-style-type: none"> A1.A-CED.A.3 	<p>Graph the solutions to a linear inequality in two variables as a half-plane, excluding the boundary in the case of a strict inequality, and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">KEY CONCEPTS</p> <ul style="list-style-type: none"> Systems of Linear 	<p>Graph half planes to find common solutions to systems of inequalities.</p> <p>Identify graphs of half planes in which there are no common solutions.</p> <p>Create a system of inequalities to represent real-world constraints, and use this system to solve a problem.</p>	<p>Practice and Problem Solving Exercises</p> <ul style="list-style-type: none"> - Graphing - Skill-building activity - Standardized Test Prep - Real-World Problem Solving <p>Personal Communication Assessment</p> <ul style="list-style-type: none"> - Oral Presentation - Discussions <p>Lesson Quiz</p>	<p>Prentice Hall Algebra 1</p> <p>Puzzles</p> <p>Algebra 1 Consumables</p> <p>www.pearsonrealize.com</p> <p>www.khanacademy.org</p> <p>www.apexvs.com</p> <p>www.mathworksheetsgo.com</p>	<p>Inequality</p> <p>System of Linear Inequalities</p> <p>Solution of a System of Linear Inequalities</p> <p>Half Plane</p> <p>Boundary Line</p>

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	Inequalities - Graphing Systems of Inequalities - Writing a System of Inequalities from a graph.		- Graphing - Reasoning - Problem Solving	VIRTUAL NERD - https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA Lesson/Video Tutorials	