

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

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

Big Ideas:

- EQUIVALENCE
- PROPERTIES
- FUNCTION
- MODELING

ESSENTIAL QUESTIONS:

01. Can two algebraic expressions that appear to be different be equivalent?
02. How are the properties of real numbers related to polynomials?
03. How are larger expressions called polynomials formed?
04. What are the characteristics of quadratic functions?
05. How can you use functions to model real-world situations?

ESSENTIAL UNDERSTANDING

01. Monomials can be used to form larger expressions called polynomials. Polynomials can be added and subtracted.
02. You can use the Distributive Property to multiply a monomial by a polynomial.
03. The properties of real numbers can be used to multiply a monomial by a polynomial or simplify the product of binomials.
04. There are several ways to find the product of two binomials, including models, algebra and tables.
05. Some trinomials of the form $ax^2 + bx + c$ and some polynomials of a degree greater than 2 can be factored to equivalent forms which are the product of two binomials
06. You can factor some trinomials by “reversing” the rules for multiplying special case binomials.
07. A quadratic function is a type of nonlinear function that models certain situations where the rate of change is not constant. The graph of a quadratic function is a symmetric curve with a highest or lowest point corresponding to a maximum or minimum value.
08. In a quadratic function $y = ax^2 + bx + c$, the value of b affects the position of the axis of symmetry.
09. You can solve some quadratic equations, including equations where b is not equal to zero, by using the Zero-Product Property.

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
Arithmetic with Polynomials and Rational Expressions A1.A-APR.A. Perform arithmetic operations on polynomials A1.A-APR.A. 1.	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. ----- KEY CONCEPTS - Adding and Subtracting Polynomials - Finding the degree of a Monomial - Classifying Polynomials by degree and number of terms. - Adding & subtracting polynomials vertically and horizontally - Multiplying Polynomials - Factoring Polynomials - Multiplying Binomials - Multiplying Special Cases	Distinguish between polynomials and non-polynomials. Understand that a polynomial is the sum or difference of monomials. Understand that polynomials are closed under the operations of addition, subtraction, and multiplication. Write polynomials in standard form Classify polynomials by degree and number of terms Add and subtract polynomials vertically and horizontally. Multiply a monomial by a polynomial Multiply a binomial by a binomial using the FOIL	NWEA Winter Test Practice and Problem Solving Exercises - Error Analysis - Standard Prep Test - Problem Solving Selected Response Assessment - Multiple Choice - True or False - Matching Lesson Quiz - Error Analysis - Reasoning - Problem Solving Personal Communication Assessment - Oral Presentation - Think Aloud - Discussions STAR Math - Diagnostic Assessment	Prentice Hall Algebra 1 SMART Board STAR Math IXL.com Cumulative Review Materials Enrichment or Extension Activity Sheets Algebra 1 Consumables www.pearsonrealize.com www.khanacademy.org www.apexvs.com VIRTUAL NERD https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA Kutasoftware.com	Monomial Degree of a Monomial Binomial Trinomial Polynomial Standard Form of a Polynomial Leading Coefficient Degree of a Polynomial

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
		method. Use special rules to find the square of a binomial and the sum and difference of two squares			
Seeing Structure in Expressions A1.A-SSE.A. Interpret the structure of expressions. A1.A-SSE.A.1a ALSO - A1.A-SSE.A.1b - A1.A-SSE.A.2	Interpret expressions that represent a quantity in terms of its context. - Interpret parts of an expression, such as terms, factors, and coefficients. - Interpret expressions by viewing one or more of their parts as a single entity. ----- KEY CONCEPTS: - Factoring $x^2 + bx + c$ - Factoring $ax^2 + bx + c$ - Factoring Special Cases	Factor trinomials of the form $x^2 + bx + c$ Factor trinomials of the form $ax^2 + bx + c$. Factor perfect-square trinomials and difference of two squares. Factor higher-degree polynomials by grouping	Monitoring Progress Activities Practice and Problem Solving Exercises - Reasoning - Standard Test Prep - STEM Problems Mixed/Cumulative Review Activities Selected Response Assessment - Multiple Choice - True or False Lesson Quiz - Error Analysis - Reasoning	Prentice Hall Algebra 1 STAR Math IXL.com Cumulative Review Materials Enrichment or Extension Activity Sheets Algebra 1 Consumables Algebra 1 Puzzles Kutasoftware.com www.pearsonrealize.com www.khanacademy.org www.apexvs.com	Terms Factors Constant Special Cases Perfect Square Trinomial Difference of Two Squares Factoring by Grouping Greatest Common Factor (GCF)

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
				VIRTUAL NERD https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA	
A1.A-APR.B. Understand the relationship between zeros and factors of polynomials. A1.A-APR.B.3.	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. <i>Focus on quadratic and cubic polynomials in which linear and quadratic factors are available.</i> ----- KEY CONCEPT: - Standard Form of a Quadratic Equation - Solving Quadratic Equations by Graphing - Solving Quadratic Equations Using Square Roots	Use factorization to identify the zeros of a polynomial function. Solve quadratic equations using graphing and finding the square roots. Use a graphing calculator to identify the roots of an equation or zeros of the function. Identify the zeros of a function from a graph. Identify the factors of a polynomial expression from a graph. Factor a polynomial expression to reveal the zeros of the related	Practice and Problem Solving Exercises - Factoring - Reasoning - Standard Prep Test - STEM Problems Mixed/Cumulative Review Activities Personal Communication Assessment - Oral Presentation - Think Aloud - Discussions Lesson Quiz - Error Analysis - Reasoning - Problem Solving	Prentice Hall Algebra 1 SMART Board GRAPHING Calculators Enrichment or Extension Activity Sheets Kutasoftware.com www.pearsonrealize.com www.khanacademy.org www.apexvs.com VIRTUAL NERD https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA	Quadratic Equation Standard Form of a Quadratic Equation Roots of an Equation Zeros of an Equation x-intercepts

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
	- Choosing a Reasonable Solution	function. Find and interpret the zeros of a polynomial function in terms of a context.	Summative Test AZM2 Practice Test	Algebra 1 Consumables Algebra 1 Puzzles	
A1.REI.B. Solve equations and inequalities in one variable. A1.REI.B.4 ALSO - A1.A-REI.A.1 - A1.A-REI.B.4b	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-k)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. ----- KEY CONCEPTS: - Completing the Square - The Quadratic Formula - Using the Discriminant -----	Solve quadratic equations in one variable by completing the square. Solve quadratic equations using the quadratic formula Find the number of solutions of a quadratic equation. Complete the square to find the maximum or minimum of a quadratic function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph,	Practice and Problem Solving Exercises - Factoring - Reasoning - Standard Prep Test Mixed/Cumulative Review Activities Personal Communication Assessment - Oral Presentation - Think Aloud - Discussions Lesson Quiz - Error Analysis - Reasoning - Problem Solving AZM2 Practice Test	Prentice Hall Algebra 1 Enrichment or Extension Activity Sheets Algebra 1 Puzzles Algebra 1 Consumables www.pearsonrealize.com www.khanacademy.org www.apexvs.com www.mathworksheetsgo.com VIRTUAL NERD - https://www.youtube.com/channel/UCe73Uxna_d_VYqYhQzLLD2IA	Zero-Product Property Standard Form of a Quadratic Equation Completing the Square Quadratic Formula Discriminant

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
	b. Solve quadratic equations by inspections (e.g. $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. <i>Focus on solutions for quadratic equations that have real roots. Include cases that recognize when a quadratic equation has no real solutions.</i> ----- Factoring to Solve Quadratic Equations KEY CONCEPT: • Zero-Product Property - Using the Zero-Product Property - Solving by Factoring	and interpret these in terms of a context. Use the Zero-Product Property to solve quadratic equations, including equations <i>where $b \neq 0$.</i> Distinguish quadratic equations from nonquadratic equations. Solve quadratic equations by taking the square root. Apply the zero-product rule to factored equations. Solve quadratic equations by factoring. Rewrite quadratic equations into standard form, and then factor and solve. Factor quadratic equations to solve real-world problems.		Kutasoftware.com WorksheetWorks.com Lesson/Video Tutorials Graphic Organizers SMART Board Calculators	

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
	- Writing in Standard Form - Using Factoring to Solve Real-World Problems				
Interpreting Functions A1.F-IF.C. Analyze functions using different representations • A1.F-IF.C.7 ALSO • A1-CED.A.2 • A1.F-IF.B.4 • A1.F-IF.B.5 • A1.F-IF.C.8 • A1.F-IF.C.9 • A1-BF.B.3	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. <i>Focus on linear, quadratic, exponential and piecewise-defined functions (limited to absolute value and step).</i> ----- KEY CONCEPTS: • Quadratic Graphs and their Properties - Standard Form of a Quadratic Function • Quadratic Functions - Graph of a Quadratic Function	Find the vertex and intercepts of the graph of a quadratic function from an equation. Use the quadratic formula to find the vertex of a given function. Identify the vertex of a graph from vertex form. Sketch the graph of a quadratic equation. Write a quadratic equation from its graph. Compare properties of two quadratic functions, one represented algebraically, and one represented graphically.	PBL - Performance Task: Pricing for Profit Practice and Problem Solving Exercises - Reasoning - Standard Test Prep - STEM Problems Personal Communication Assessment - Oral Presentation - Think Aloud - Discussions Selected Response Assessment - Multiple Choice - True or False Calculator Test	Prentice Hall Algebra 1 SMART Board Graphing Calculator www.pearsonrealize.com www.khanacademy.org www.apexvs.com www.mathworksheetsgo.com VIRTUAL NERD - https://www.youtube.com/channel/UCe73Uxna_d_VYqYhQzLLD2IA	Parabola Vertex of a Parabola y-intercept x-intercept Roots of a Function Zeros of a Function Quadratic Formula

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
<i>Interpreting Function</i> A1.F-IF.B Interpret functions that arise in applications in terms of the context A1.F-IF.B.4 ALSO - A1-F-IF.C.7 - A1.F-IF.B.5 - A1.F-IF.C.9 - A1-F-LE.A.2	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Include problem-solving opportunities utilizing real-world context. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums. <i>Focus on linear, quadratic, exponential and piecewise-defined functions (limited to absolute value and step).</i> ----- KEY CONCEPTS Linear Functions	Identify key features of linear, quadratic, and exponential functions. Recognize when a function or situation has a constant rate of change. Calculate the average rate of change of a function (represented with a table) over a specified interval. Use a graph to find the average rate of change of a function over a specified interval. Based on the pattern shown in a table, predict the average rate of change of a function for any unit interval of the function.	Practice and Problem Solving Exercises - Reasoning - Standard Test Prep - STEM Problems Personal Communication Assessment - Oral Presentation - Think Aloud - Discussions Selected Response Assessment - Multiple Choice - True or False - Matching Constructed Response - Extended - Brief Summative Test	Prentice Hall Algebra 1 SMART Board Graphing Calculator www.pearsonrealize.com www.khanacademy.org www.apexvs.com www.mathworksheetsgo.com VIRTUAL NERD https://www.youtube.com/channel/UCe73Uxnad_VYqYhQzLLD2IA AZM2 Practice Materials	Functions Standard Form Slope-Intercept Form Point-Slope Form Rate of Change Quadratic Equation Vertex Form Parabolas Average Rate of Change Exponential Function Variable Exponent

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

SUBJECT: Algebra 1

GRADE: 9

TIMELINE: Semester 2 - 3rd Quarter

STANDARD	CONTENT	OBJECTIVES <i>At the end of the lesson, I will be able to:</i>	ASSESSMENTS	RESOURCES	VOCABULARY
	- Equation Forms - Graph Characteristics - Rate of Change • Quadratic Functions - Equation Forms - Average Rate of Change for specified Intervals • Exponential Functions - Equations and Graphs - Average Rate of Change				