Wyoming Department of Education Required Virtual Education Course Syllabus

LincolnCounty School District # 2

Program Name	Star Valley Virtual School	Content Area	Mathematics
Course ID	MAALG1035	Grade Level	9th - 12th
Course Name	Algebra I OL	# of Credits	1
SCED Code	02052G1.0011	Curriculum Type	District Developed

COURSE DESCRIPTION

This is a one semester course studying simplifying of expressions, order of operations, real number properites, solving equations, graphing and solving sytems of equations and inequalities, applying rules for exponents, factoring polynomials and simplyfing sqaure roots.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
N.Q.1-3	Reason quantitatively and use units to solve problems.
A.SSE.1 A.SSE.1a A.SSE.1b A.SSE.2 A.SSE.3 A.SSE.3a A.SSE.3b A.SSE.3c A.SSE.4	Interpret expressions that represent a quantity in terms of its context.* Interpret parts of an expression, such as terms, factors, and coefficients.* Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)^n as the product of P and a factor not depending on P.* Use the structure of an expression to identify ways to rewrite it. For example, see x^4 – y^4 as (x^2)^2 – (y^2)^2, thus recognizing it as a difference of squares that can be factored as (x^2 – y^2)(x^2 + y^2). Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.* Factor a quadratic expression to reveal the zeros of the function it defines.* Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.* Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as [1.15^(1/12)]^(12t) ≈ 1.012^(12t) to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.* Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.*
F.IF.1-6 F.IF.7a-d F.IF.8a-b F.IF.9	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). Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1 (n is greater than or equal to 1). 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. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.* Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.* Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.* Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.* (+)Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.* Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.* Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in
G.MG.1 G.MG.2 G.MG.3	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).* Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).* Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*
G.GMD.1 G.GMD.2 G.GMD.3 G.GMD.4	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. (+)Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

S.MD.1 S.MD.2 S.MD.3 S.MD.4 S.MD.5 S.MD.5a S.MD.5b S.MD.6 S.MD.7	(+)Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.* (+)Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.* (+)Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.* (+)Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
Foundations for Algebra	A.SSE.1 A.SSE.1a A.SSE.1b	Students will understand and be able to use appropriate skills necessary to solve problems using Variables and expressions, order of operations, Real Numbers.
Solving Equations	A.REI.1, A.REI.2, A.REI.4, A.REI.5, A.REI.7	necessary to solve equations. Students will be able to Solve one-step, two-step & multi-step equations. Students will also be able to solve proportions with similar figures.
Solving Inequalities	A.CED.3,A.REI.6A.REI.12, A.CED.1	necessary to solve inequalities. Students will solve multi-step inequalities using multiplication division, subraction, and addition. Students will work with Sets and compound inequalities.
Introduction to Functions	F.IF.1-6 F.IF.7a-d F.IF.8a-b F.IF.9	Students will understand and be able to use appropriate skills necessary with functions. Students will: use graphs to relate two quantities; use patterns for linear and non linear functions; formalize relations and functions.
Linear Functions	F.IF.1-6 F.IF.7a-d F.IF.8a-b F.IF.9	Students will understand and be able to use appropriate skills necessary to solve linear functions. Students will use functions to describe: rate of change and slope; direct variation, parallel and perpendicular lines; and absolute value.
Systems of Equations & Inequalities	A.CED.1, A.REI.1 A.REI.2 A.REI.3 A.REI.4 A.REI.4a A.REI.4 A.REI.4a A.REI.4b	Students will understand and be able to use appropriate skills necessary to solve systems of Equations and Inequalities
Exponents and Exponential Functions	A.SSE.3c, A.CED.1, F.IF.8b, F.BF.5	Students will understand and be able to use appropriate skills necessary to solve problems using Variables and expressions, order of operations, Scientific Notation and exponential growth and decay. Students will be able to use exponential Functions and properties of exponents.
Polynomials and Factoring	A.REI.5 A.SSE.3 A.REI.7 A.REI.8 A.REI.9	Students will understand and be able to use appropriate skills necessary for polynomials: factoring; adding and subtracting; multiplying and dividing.
Quadratic Functions and Equations	F.IF.7a F.IF.7b F.IF.7c F.IF.7d F.IF.7e F.IF.8 F.IF.8a F.IF.8b F.IF.9	Students will understand and be able to use appropriate skills necessary to solve quadratic functions and equations including: completing the square; the quadtratic formula; the Discriminant; and systmes of Linear and Quadratic Equations.

Radical Expressions and Equations	A.REI.2, F.BF.1-5, S.MD.2 S.MD.3 S.MD.4 S.MD.5 S.MD.5a	Students will understand and be able to use appropriate skills necessary to solve radical expressions and equations including: the Pythagorean theorem, Distance and Mid-point Formula; Trigonometric Ratios (Right Traingle ratios); and opertations with Radical Expressions.