Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Mathematics
Course ID	CAMA79195	Grade Level	9, 10, 11, 12
Course Name	Pre-Algebra B	# of Credits	0.5
SCED Code	02051G0.5022	Curriculum Type	Connections Academy

COURSE DESCRIPTION

This is the second of two courses that comprise Pre-Algebra. In this course, the student will explore basic algebraic principles. The student will examine and evaluate two-step and multi-step equations and inequalities and then explore and use graphs to solve linear relations and functions. Next, the student will be introduced to basic concepts of geometry including angle relationships, parallel lines, polygons, circles, and transformations. Next, the student will apply their knowledge of geometry and algebra to solve area and volume problems. Then, the student will explore nOAar functions and polynomials. Finally, the students will examine properties of right triangles, data analysis, and probability.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
A.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition,
A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
F.IF.1	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 = f(x).
F.IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.3	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).
F.IF.4	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.*
F.IF.6	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.*
F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*
F.BF.1	Write a function that describes a relationship between two quantities.*
F.BF.1a	Determine an explicit expression, a recursive process, or steps for calculation from a context.
F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
G.CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
G.CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
G.CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
G.CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
G.CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
G.GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).*
S.ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.*
S.ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).*
S.ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*
S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or compliments of other events ("or," "and," "not").

S.CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.*
S.CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*
S.CP.9	(+)Use permutations and combinations to compute probabilities of compound events and solve problems.*
S.MD.7	(+)Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).*

SCOPE AND SEQUENCE		
UNIT OUTLINE	STANDARD#	OUTCOMES
Unit 1: Geometry In this unit, you will learn to classify polygons based upon their sides and angles, and perform computations using related angles and parallel lines. In addition, you will find the area of common figures and the circumference of circles. Finally, you will use basic geometry tools to construct angles and parallel lines.	G.CO.1; G.CO.2; G.CO.3; G.CO.4; G.CO.12; G.GMD.3	•Classify a polygon based upon its sides and angles •Identify and use congruent figures •Calculate the area of figures and circumference of circles
Unit 2: Measurement This unit focuses on the skills of calculating surface area and volume. By the end of the unit, you will be able to calculate the exact surface area and volumes of specific 3-D figures that are based upon rectangles and circles, including spheres. You will display your knowledge at the end in a portfolio project by finding, measuring, and calculating the surface area and volume of two items you probably already have at home.	G.GMD.3; G.GMD.4	•Identify solids and their parts •Calculate the surface area and volume of cylinders, prisms, cones, pyramids, and spheres •Determine how a change in one dimension affects changes in surface area and volume
Unit 3: Using Graphs to Analyze Data In this unit of the course, you will examine, analyze, and construct scatter plots and tables. With these skills, you will be able to roughly predict the strength and direction of a pattern of association between two things. You will also find measures of central tendency and determine which graph and measure of central tendency best represents a data set.	S.ID.1; S.ID.2; S.ID.3; S.ID.6	•Calculate the mean, median, and mode of a data set and explain the best use of each •Determine the best type of graph to display a data set •Identify patterns of association—indicating strength and direction—of two factors and make predictions based upon a scatter plot
Unit 4: Probability In this unit of the course, you will find probabilities and odds of events.	S.CP.1; S.CP.2; S.CP.5; S.CP.9; S.MD..7	•Calculate odds and probabilities of dependent and independent events, and make predictions using those calculations •Calculate permutations and combinations of sets of objects
Unit 5: Functions This unit focuses on the concept of functions. By the end, you will be able to identify a function as an equation having one output for every input, and you will be able to graph linear and non-linear functions on a coordinate plane.	F.IF.1; F.IF.2; F.IF.3; F.IF.4; F.IF.6; F.IF.7; F.BF.1; F.BF.1a; F.BF.2; A.REI.6	•Describe a sequence •Identify and graph functions and determine slope and y-intercept •Determine the solution of two functions by graphing
Unit 6: Polynomials and Properties of Exponents In this final unit, you will be working with expressions called polynomials. By the end, you will be able to add, subtract, and multiply these expressions. You will also simplify powers and use negative and zero exponents.	A.APR.1	•Add, subtract, and multiply polynomials •Multiply and divide powers with the same base, including numbers in scientific notation