

Wyoming Department of Education Required Virtual Education Course Syllabus

Niobrara County School District # 1

Program Name	Wyoming Virtual Academy	Content Area	MA
Course ID	D-MTH-112BV1-K	Grade Level	9-12
Course Name	Pre-Algebra - Semester 2	# of Credits	0.5
SCED Code	02051G0.5022	Curriculum Type	K12 Inc

COURSE DESCRIPTION

Generally offered second semester. In this course, students learn computational and problem-solving skills and the language of algebra. Students translate word phrases and sentences into mathematical expressions; analyze geometric figures; solve problems involving percentages, ratios, and proportions; graph different kinds of equations and inequalities; calculate statistical measures and probabilities; apply the Pythagorean theorem; and explain strategies for solving real-world problems. The textbook provides students with a ready reference and explanations that supplement the online material. Online lessons provide demonstrations of concepts, as well as interactive problems with contextual feedback.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
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 $y = f(x)$.
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.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.*
G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*
G.SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
G.SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
N.Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*
N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $[5^{1/3}]^3 = 5^{[(1/3) \times 3]}$ to hold, so $[5^{1/3}]^3$ must equal 5.
S.CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.*
S.IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*

S.IC.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*
S.IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.*
S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).*
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.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
Unit 1: Ratio, Proportion, and Percent Lesson 1: Semester Introduction		
Unit 1: Ratio, Proportion, and Percent Lesson 2: Ratio, Part 1		Write a ratio as a fraction in lowest terms. Write a simplified ratio for a word problem. Write a ratio for a word problem.
Unit 1: Ratio, Proportion, and Percent Lesson 3: Ratio, Part 2		Write a ratio as a rate. Write a ratio as a unit rate.
Unit 1: Ratio, Proportion, and Percent Lesson 4: Proportion, Part 1		Find equivalent ratios for a given ratio. Determine whether two ratios are proportional.
Unit 1: Ratio, Proportion, and Percent Lesson 5: Proportion, Part 2		Solve a proportion. Solve a word problem involving proportions.
Unit 1: Ratio, Proportion, and Percent Lesson 6: Discuss: Ratio and Proportion		Write a ratio as a unit rate. Solve a proportion. Solve a word problem involving proportions.
Unit 1: Ratio, Proportion, and Percent Lesson 7: Your Choice		
Unit 1: Ratio, Proportion, and Percent Lesson 8: Percents, Fractions, and Decimals, Part 1		Express a fraction as a decimal. Express a decimal as a fraction or a mixed number. Express a fraction as a decimal, and a decimal as a fraction or a mixed number. Convert a decimal to a percent. Convert a percent to a decimal. Convert a decimal to a percent, and a percent to a decimal.

Unit 1: Ratio, Proportion, and Percent Lesson 9: Percents, Fractions, and Decimals, Part 2		Convert a fraction to a percent. Convert a percent to a fraction. Convert a fraction to a percent, and a percent to a fraction. Solve word problems involving percents.
Unit 1: Ratio, Proportion, and Percent Lesson 10: Similarity and Scale		Write a ratio as a fraction in lowest terms. Find equivalent ratios for a given ratio. Determine whether two ratios are proportional. Solve a proportion. Express a fraction as a decimal. Convert a decimal to a percent. Determine whether two figures are similar and find a missing length in a pair of similar figures.
Unit 1: Ratio, Proportion, and Percent Lesson 11: Your Choice		
Unit 1: Ratio, Proportion, and Percent Lesson 12: Working with Percent		Solve a percent of a whole problem. Solve word problems involving percent of a whole. Solve a word problem involving percent of a whole, percent increase or decrease, and simple interest.
Unit 1: Ratio, Proportion, and Percent Lesson 13: Percent of Increase and Decrease		Find a percent of increase or decrease. Solve a word problem involving percent of increase or decrease. Solve a word problem involving percent of a whole, percent increase or decrease, and simple interest.
Unit 1: Ratio, Proportion, and Percent Lesson 14: Simple Interest		Solve a word problem that involves simple interest. Solve a word problem involving percent of a whole, percent increase or decrease, and simple interest.
Unit 1: Ratio, Proportion, and Percent Lesson 15: Unit Review		
Unit 1: Ratio, Proportion, and Percent Lesson 16: Unit Test	G-SRT.2	
Unit 2: Analytic Geometry Lesson 1: Points on the Plane		Find coordinates for a point in a plane. Graph an ordered pair in a coordinate plane. Graph an ordered pair on a coordinate plane. Determine the axis or quadrant for a given point.

Unit 2: Analytic Geometry Lesson 2: Two-Variable Equations, Part 1		Determine whether an ordered pair is a solution of a linear equation in two variables.
Unit 2: Analytic Geometry Lesson 3: Two-Variable Equations, Part 2		Identify the dependent and independent variables for a problem situation.
Unit 2: Analytic Geometry Lesson 4: Linear Equations and Intercepts, Part 1		Find intercepts of a given linear graph. Find intercepts for a linear equation.
Unit 2: Analytic Geometry Lesson 5: Your Choice		
Unit 2: Analytic Geometry Lesson 6: Linear Equations and Intercepts, Part 2		Use intercepts to graph a linear equation. Use intercepts to write an equation for a given linear graph.
Unit 2: Analytic Geometry Lesson 7: Slope, Part 1		Find the slope of a line when given two points on the line. Find the slope of a line when given two points on the line or when given the equation of the line.
Unit 2: Analytic Geometry Lesson 8: Slope, Part 2		Determine whether an ordered pair is a solution of a linear equation in two variables. Identify the dependent and independent variables for a problem situation. Use intercepts to graph a linear equation. Use intercepts to write an equation for a given linear graph. Find the slope of a line when given two points on the line. Graph an ordered pair on a coordinate plane. Find the slope of a line when given an equation. Find intercepts of a given linear graph or linear equation. Find the slope of a line when given two points on the line or when given the equation of the line.
Unit 2: Analytic Geometry Lesson 9: Your Choice		
Unit 2: Analytic Geometry Lesson 10: Problem Solving		Use interpolation to make inferences about linear data. Solve a word problem involving slope. Use interpolation and extrapolation to make inferences about linear data.

		Use extrapolation to make inferences about linear data.
Unit 2: Analytic Geometry Lesson 11: Functions, Part 1		Determine the domain and range for a function presented as a table or a set of ordered pairs. Determine whether a relation is a function when given a graph or set of ordered pairs. Determine whether a relation is a function when given a graph or a set of ordered pairs.
Unit 2: Analytic Geometry Lesson 12: Functions, Part 2		Evaluate a function for a given value.
Unit 2: Analytic Geometry Lesson 13: Unit Review		Review the concepts and skills learned in the unit.
Unit 2: Analytic Geometry Lesson 14: Unit Test	A-REI.10, F-IF.1, F-IF.2, F.IF.7a	
Unit 3: Perimeter and Area Lesson 1: Types of Polygons		Classify a polygon as equilateral, equiangular, both, or neither. Plot and connect points on a coordinate plane and classify the resulting polygon. Name a polygon by its number of sides.
Unit 3: Perimeter and Area Lesson 2: Perimeter		Write a formula to find the perimeter of a polygon. Find the perimeter of a polygon. Find the perimeter of a figure made up of rectangles or triangles or both.
Unit 3: Perimeter and Area Lesson 3: Areas of Rectangles and Triangles		Find the area of a rectangle. Find the area of a triangle. Use area to find a missing length. Use area to find a missing side length of a triangle or quadrilateral.
Unit 3: Perimeter and Area Lesson 4: Discuss: Measurement		Find the area of a rectangle. Find the perimeter of a rectangle.
Unit 3: Perimeter and Area Lesson 5: Your Choice		
Unit 3: Perimeter and Area Lesson 6: Special Quadrilaterals		Identify properties of a quadrilateral. Classify a figure as a special type of quadrilateral. Plot given vertices and identify the type of quadrilateral they form.
Unit 3: Perimeter and Area Lesson 7: Areas of Special Quadrilaterals		Classify a polygon as equilateral, equiangular, both, or neither. Plot and connect points on a coordinate plane and classify the resulting polygon. Find the perimeter of a polygon. Find the area of a rectangle.

		<p>Find the area of a triangle.</p> <p>Classify a figure as a special type of quadrilateral.</p> <p>Find the area of a parallelogram.</p> <p>Find the area of a trapezoid.</p> <p>Use area to find a missing side length of a quadrilateral.</p>
Unit 3: Perimeter and Area Lesson 8: Your Choice		
Unit 3: Perimeter and Area Lesson 9: Circumference, Part 1		<p>Find the exact circumference of a circle with a given radius or diameter.</p> <p>Use an approximation for pi to estimate the circumference of a circle.</p> <p>Find the circumference or area of a circle using pi or an approximation for pi.</p>
Unit 3: Perimeter and Area Lesson 10: Circumference, Part 2		<p>Find the perimeter of a figure that has part of a circle or parts of both circles and polygons.</p> <p>Solve a word problem involving the circumference of a circle.</p> <p>Solve a word problem involving the circumference or area of a circle.</p> <p>Find the perimeter or area of a figure that has part of a circle or both parts of a circles and polygons.</p>
Unit 3: Perimeter and Area Lesson 11: Areas of Circles, Part 1		<p>Find the exact area of a circle with a given radius or diameter.</p> <p>Use an approximation for pi to estimate the area of a circle.</p>
Unit 3: Perimeter and Area Lesson 12: Areas of Circles, Part 2		<p>Find the area of a figure that has part of a circle or parts of both circles and polygons.</p> <p>Solve a word problem involving the area of a circle.</p> <p>Solve a word problem involving the circumference or area of a circle.</p> <p>Find the perimeter or area of a figure that has part of a circle or both parts of a circles and polygons.</p>
Unit 3: Perimeter and Area Lesson 13: Unit Review		Review the concepts and skills learned in the unit.
Unit 3: Perimeter and Area Lesson 14: Unit Test	N-Q.3	
Unit 4: Square Roots and Right Triangles Lesson 1: Rational Square Roots		<p>Find square roots of a perfect square.</p> <p>Solve a simple equation with squares.</p>

<p>Unit 4: Square Roots and Right Triangles Lesson 2: Irrational Square Roots, Part 1</p>		<p>Determine whether a square root is rational or irrational. Find consecutive integers between which a square root lies. Approximate a square root to the nearest tenth. Find consecutive integers between which a square root lies, and approximate its value to the nearest tenth.</p>
<p>Unit 4: Square Roots and Right Triangles Lesson 3: Irrational Square Roots, Part 2</p>		<p>Write the square root of a positive whole number in simplified radical form. Solve a word problem involving square roots.</p>
<p>Unit 4: Square Roots and Right Triangles Lesson 4: The Pythagorean Theorem, Part 1</p>		<p>Find square roots of a perfect square. Determine whether a square root is rational or irrational. Find consecutive integers between which a square root lies. Approximate a square root to the nearest tenth. Write the square root of a positive whole number in simplified radical form. Solve a word problem involving square roots. Identify the hypotenuse and legs of a right triangle. Use the Pythagorean theorem to find the length of a leg of a right triangle. Solve a simple equation with squares. Use the Pythagorean theorem to find the length of the hypotenuse of a right triangle.</p>
<p>Unit 4: Square Roots and Right Triangles Lesson 5: Your Choice</p>		
<p>Unit 4: Square Roots and Right Triangles Lesson 6: The Pythagorean Theorem, Part 2</p>		<p>Identify Pythagorean triples. Solve a word problem involving right triangles. Use the Pythagorean Theorem to find an unknown length of a side of a right triangle and solve word problems.</p>
<p>Unit 4: Square Roots and Right Triangles Lesson 7: The Distance Formula</p>		<p>Find the distance between two points on a coordinate grid. Find the distance between two points on a coordinate plane.</p>

		Find the perimeter of a figure on a coordinate plane.
Unit 4: Square Roots and Right Triangles Lesson 8: Special Types of Triangles, Part 1		Use properties of isosceles and equilateral triangles to find missing measures. Use properties of 30-60-90 triangles to find missing values. Use properties of 45-45-90 triangles to find missing values.
Unit 4: Square Roots and Right Triangles Lesson 9: Special Types of Triangles, Part 2		Solve a word problem involving a special right triangle. Use properties of special right triangles to find lengths of unknown sides and solve word problems.
Unit 4: Square Roots and Right Triangles Lesson 10: Unit Review		Review the concepts and skills learned in the unit.
Unit 4: Square Roots and Right Triangles Lesson 11: Unit Test	G-SRT.8, G-GPE.7, 8.EE.A.1	
Unit 5: Solid Figures Lesson 1: Volume and Capacity, Part 1		Find the volume of a cube. Interpret units in the context of the problem.
Unit 5: Solid Figures Lesson 2: Volume and Capacity, Part 2		Convert measures of volume in cubic centimeters to measures of capacity in mL or L. Find the capacity of a cube in mL or L.
Unit 5: Solid Figures Lesson 3: Volumes of Prisms and Cylinders, Part 1		Find the volume of a right prism.
Unit 5: Solid Figures Lesson 4: Volumes of Prisms and Cylinders, Part 2		Find the volume of a right prism. Find the exact volume of a cylinder. Use an approximation for pi to estimate the volume of a cylinder.
Unit 5: Solid Figures Lesson 5: Discuss: Volume		Find the volume of a cube. Find the volume of a right prism. Find the exact volume of a cylinder.
Unit 5: Solid Figures Lesson 6: Your Choice		
Unit 5: Solid Figures Lesson 7: Volume of Pyramids and Cones, Part 1		Find the volume of a right pyramid.
Unit 5: Solid Figures Lesson 8: Volume of Pyramids and Cones, Part 2		Find the volume of a cube. Convert measures of volume in cubic centimeters to measures of capacity in mL or L.

		<p>Find the capacity of a cube in mL or L.</p> <p>Find the volume of a right pyramid.</p> <p>Find the volume of a cylinder using pi or an approximation for pi.</p> <p>Find the volume of a prism.</p> <p>Find the volume of a cone using pi or an approximation for pi.</p> <p>Use an approximation for pi to estimate the volume of a cone.</p> <p>Find the exact volume of a cone.</p>
Unit 5: Solid Figures Lesson 9: Your Choice		
Unit 5: Solid Figures Lesson 10: Surface Area		<p>Find the surface area of figures made up of rectangular prisms.</p> <p>Find the lateral area of a rectangular prism.</p> <p>Find the lateral area and total surface area of a rectangular prism.</p> <p>Find the total surface area of a rectangular prism.</p> <p>Find the surface area of a cube.</p>
Unit 5: Solid Figures Lesson 11: Surface Areas of Prisms and Cylinders		<p>Find the surface area of a prism.</p> <p>Find the exact surface area of a cylinder.</p> <p>Use an approximation for pi to estimate the surface area of a cylinder.</p> <p>Find the surface area of a cylinder using pi or an approximation for pi.</p>
Unit 5: Solid Figures Lesson 12: Unit Review		Review the concepts and skills learned in the unit.
Unit 5: Solid Figures Lesson 13: Unit Test	N-Q.3, G-GMD.3	
Unit 6: Counting and Probability Lesson 1: Counting Principles		<p>Use the sum rule to find the number of ways a task can be done.</p> <p>Determine whether a situation is best modeled with the sum or product rule.</p> <p>Solve a word problem involving the sum or product rule.</p> <p>Use the sum and product rules to find the number of ways a task can be done.</p> <p>Solve a word problem involving the sum or product rules.</p>

		Use the product rule to find the number of ways a task can be done.
Unit 6: Counting and Probability Lesson 2: Permutations		Evaluate a factorial expression. Evaluate a permutation expression. Solve word problems involving permutations. Solve word problems involving permutations or combinations. Evaluate a factorial, permutation, and combination expression.
Unit 6: Counting and Probability Lesson 3: Combinations		Use the sum and product rules to find the number of ways a task can be done. Solve word problems involving the sum or product rules. Solve word problems involving permutations or combinations. Evaluate a factorial, permutation, or combination expression. Evaluate a factorial, permutation, and combination expression. Solve word problems involving combinations. Determine whether a situation is best modeled with a permutation or a combination. Evaluate a combination expression.
Unit 6: Counting and Probability Lesson 4: Your Choice		
Unit 6: Counting and Probability Lesson 5: Probability		Find the sample space for an experiment. Find the probability of an event when the outcomes are equally likely. List the sample space for an experiment.
Unit 6: Counting and Probability Lesson 6: Mutually Exclusive Events		Identify a set of mutually exclusive events. Find the probability of a set of mutually exclusive events.
Unit 6: Counting and Probability Lesson 7: Samples and Prediction		Use random samples and repeated observations to estimate probability. Identify samples as biased or unbiased. Determine sources of bias in a sample procedure. Identify samples as biased or unbiased and determine sources of bias in a sample procedure.
Unit 6: Counting and Probability Lesson 8: Unit Review		Review the concepts and skills learned in the unit.

Unit 6: Counting and Probability Lesson 9: Unit Test	S-IC.1, S-IC.2, S.IC.3, S.CP.7	
Unit 7: Statistics Lesson 1: Graphs, Part 1		Interpret a bar graph. Construct or interpret a bar graph. Construct a bar or circle graph for given data. Interpret a circle graph. Construct or interpret a circle graph.
Unit 7: Statistics Lesson 2: Graphs, Part 2		Interpret a broken-line graph. Construct or interpret a broken-line graph. Construct a broken-line graph or scatter plot. Interpret a scatter plot. Construct or interpret a scatter plot.
Unit 7: Statistics Lesson 3: Measures of Center		Interpret a scatter plot. Interpret a bar graph. Interpret a broken-line graph. Interpret a circle graph. Solve problems using measures of central tendency. Compute the mean, median, and mode of a set of data.
Unit 7: Statistics Lesson 4: Your Choice		
Unit 7: Statistics Lesson 5: Stem-and-Leaf Plots		Compute the range, median, and quartiles for a given data set. Interpret a stem-and-leaf plot. Construct a stem-and-leaf plot from a set of data. Construct or interpret a stem-and-leaf plot. Compute the quartiles, range, and interquartile range for a set of data.
Unit 7: Statistics Lesson 6: Frequency Tables and Histograms		Interpret a frequency table. Construct a frequency table for a set of data. Construct or interpret a frequency table for a set of data. Interpret a histogram. Construct or interpret a histogram. Construct a histogram for a set of data.
Unit 7: Statistics Lesson 7: Box-and-Whisker Plots		Calculate the interquartile range for a set of data. Compute the quartiles, range, and interquartile range for a set of data. Construct a box-and-whisker plot from a set of data.

		Interpret a box-and-whisker plot. Construct or interpret a box-and-whisker plot.
Unit 7: Statistics Lesson 8: Unit Review		Review the concepts and skills learned in the unit.
Unit 7: Statistics Lesson 9: Unit Test	S-ID.1, S-ID.3, S-ID.6a, S.IC.1	
Unit 8: Semester Review and Test Lesson 1: Semester Review		
Unit 8: Semester Review and Test Lesson 2: Your Choice		
Unit 8: Semester Review and Test Lesson 3: Your Choice		
Unit 8: Semester Review and Test Lesson 4: Semester Test		