Wyoming Department of Education Required Virtual Education Course Syllabus

2201001 - Washakie County School District No. 1

Program Name	Washakie #1 Online	Content Area	MA
Course ID	WOL-6MATH-B	Grade Level	6
Course Name	WOL-Fundamentals of Algebra & Geometry B-6	# of Credits	NA
SCED Code	NA	Curriculum Type	K-12 Fuel Education

COURSE DESCRIPTION

MTH06: MATH 6

In the second semester of this course, students will learn how to create and interpret statistical graphs, how to calculate and interpret measures of center and variation, and how sampling can influence decision-making. Students will use variables and two-dimensional plots/coordinate planes to see patterns and make predictions. Students will calculate and use rates to solve problems and see how rates affect graphs of relationships. Throughout the course, students will deepen their understanding of positive and negative numbers including decimals, and will strengthen multiplication and division of fractions, with an additional focus on increasing efficiency and fluency. Students will gain a solid foundation in the concepts   of ratio and rate as an extension of their work with whole number multiplication and division, and in preparation for work with proportional   relationships in Math 7. Students also make connections among area, volume, and surface area, and continue to lay the groundwork for deep   algebraic understanding by interpreting and using expressions and equations.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK_ (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
6.RP.2	Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0 (b not equal to zero), and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." (Expectations for unit rates in this grade are limited to non-complex fractions.)
6.RP.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
6.RP.3a	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
6.RP.3b	Solve unit rate problems including those involving unit pricing and constant speed. For example, If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
6.RP.3c	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole given a part and the percent.
6.RP.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
6.NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?
6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.

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6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
6.NS.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).
6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
6.NS.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
6.NS.6a	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.
6.NS.6b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
6.NS.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
6.NS.7	Understand ordering and absolute value of rational numbers.
6.NS.7a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.
6.NS.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3°C > -7°C$ to express the fact that $-3°C$ is warmer than $-7°C$.
6.NS.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $|-30| = 30$ to describe the size of the debt in dollars.
6.NS.7d	Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.
6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
6.EE.1	Write and evaluate numerical expressions involving whole-number exponents.
6.EE.2	Write, read, and evaluate expressions in which letters stand for numbers.
6.EE.2a	Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$.
6.EE.2b	Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.
6.EE.2c	Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.
6.EE.3	Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6 (4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.
6.EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.
6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

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6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.
6.G.1	Find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
6.G.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\,w\,h$ and $V = b\,h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
6.G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
6.G.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
6.SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
6.SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
6.SP.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
6.SP.5	Summarize numerical data sets in relation to their context, such as by: **a.** Reporting the number of observations. **b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. **c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered. **d.** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/ STUDENT CENTERED GOALS
Statistics	6.SP.1 6.SP.2 6.SP.3 6.SP.4 6.SP.5.a 6.SP.5.b 6.SP.5.c 6.SP.5.d	**Unit 8: Statistics** • Interpret data represented in a histogram. • Demonstrate understanding that mean, median, and mode are all measures of where the center of a data set lies. • Evaluate the validity of a statistical claim on the basis of graphics or data. • Demonstrate understanding that the collection methods and display of data can influence conclusions about the data. • Determine the best measure of finding the center of a data set for a particular situation. • Draw a histogram for a given data set. • Create or interpret box-and-whisker plots. • Identify outliers in a data set. • Demonstrate understanding of and calculate the interquartile range for a data set. • Determine the effect outliers have on the measures of central tendency for a data set. • Use measures of variation to compare distributions within and across data sets.
The Second Dimension	6.NS.6.b 6.NS.6.c 6.NS.7.a 6.NS.7.b 6.NS.7.c 6.NS.7.d 6.EE.8 6.EE.9 6.G.3	**Unit 9: The Second Dimension** • Determine the location of and plot points to form geometric figures with a given description on a coordinate plane. • Draw a polygon on a coordinate grid when given coordinates of vertices. • Identify coordinates of given points on a coordinate plane. • Plot points on a coordinate plane. • Find distance between points on a coordinate grid with same first coordinate or same second coordinate. • Identify independent and dependent variables from a given mathematical relationship or practical situation. • Substitute values into a linear equation in two variables to graph the linear equation. • Demonstrate understanding that solving an equation means finding all possible values of the variables within the allowed domain that make the equation true. • Create a scatter plot from statistical data. Interpret a scatter plot. • Make or interpret conjectures on the basis of mathematical data. • Solve word problems involving graphs of points on a coordinate plane.
Rates	6.RP.2 6.RP.3.a 6.RP.3.b 6.RP.3.c	**Unit 10: Rates** • Recognize and use symbolic representations to represent and compare rates. Demonstrate understanding of the meaning of unit rate and solve unit-rate problems. • Solve rate, average speed, distance, and time problems. • Find a unit rate for a given situation. Use a rate to solve a practical problem.
Working with Positives and Negatives	6.NS.7.a 6.NS.7.b 6.NS.7.d 6.EE.1 6.EE.5	**Unit 11: Working with Positives and Negatives** • Use the order of operations to simplify an expression with signed numbers. • Use exponents to represent a pattern involving multiplication.

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/ STUDENT CENTERED GOALS
	6.EE.8	• Solve calculation problems and problems arising from practical situations that involve positive and negative numbers and one or more operations. • Graph an inequality of the form x > c or x < c on a number line. • Write an inequality of the form x > c or x < c for a problem. • Use the order of operations to simplify expressions with mixed operations.
Probability		**Unit 12: Probability** • Calculate and use theoretical probability to solve problems. Use experimental probability to predict future events. • Determine the probability of independent events. Solve problems by using the results of simple probability experiments. • Demonstrate understanding that for two mutually exclusive events, the probability of one or the other event occurring is the sum of the probabilities of each event. • Use a Venn diagram, tree diagram, or other visual organizer to find the number of ways a process can be done. • Determine whether events in a set are independent or dependent. • Demonstrate understanding that the sum of the probabilities for complementary events is 1, and calculate the probability of complementary events. • Demonstrate understanding of the difference between theoretical and experimental probability.
Making and Moving Figures	6.EE.8 6.SP.5.c	**Unit 13: Making and Moving Figures** • Describe results of transformations of plane figures. • Translate figures on a coordinate plane. • Use a variety of tools to construct figures. • Reflect figures on a coordinate plane.
Semester 2 Review and Checkpoint		**Unit 14: Semester 2 Review and Checkpoint** • Create or interpret box-and-whisker plots. • Locate and plot points on a coordinate plane. • Demonstrate understanding of the difference between theoretical and experimental probability. • Substitute values into a linear equation in two variables to graph the linear equation. • Identify outliers in a data set. • Calculate the range, mean, median, and mode for a data set. • Determine the effect outliers have on the measures of central tendency for a data set. • Solve word problems involving graphs of points on a coordinate plane. • Demonstrate understanding of and calculate the interquartile range for a data set. • Plot points on a coordinate plane.