Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Math
Course ID	CAEL77941	Grade Level	2
Course Name	Math 2 B	# of Credits	0.5
SCED Code	NoCourseSCED	Curriculum Type	Connections Academy

COURSE DESCRIPTION

In Math 2 B, the student will learn mathematical concepts related to measuring length, graphs and data, shapes and their attributes, and place value using models. Concepts are developed using mathematical processes of problem-solving, reasoning, communicating, representing, and making connections. Building both conceptual knowledge and procedural fluency supports the student's development of mathematical thinking and reasoning in solving various problems of authentic contexts.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
MP1	Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.
MP2	Mathematically proficient students make sense of the quantities and their relationships in problem situations. Students bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
MP3	Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.
MP4	Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

MP5	Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.
MP6	Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.
MP7	Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression x^2 + 9x + 14, older students can see the 14 as 2 × 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see 5 – 3(x – y)^2 as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.
MP8	Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation (y – 2)/(x –1) = 3. Noticing the regularity in the way terms cancel when expanding (x – 1)(x + 1), (x – 1)(x^2 + x + 1), and (x – 1)(x^3 + x^2 + x + 1) might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.
2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.OA.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.7	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.NBT.8	Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)

2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
2.MD.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, … , and represent whole-number sums and differences within 100 on a number line diagram.
2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ (dollars) and ¢ (cents) symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
2.MD.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
2.MD.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. (Sizes are compared directly or visually, not compared by measuring.)
2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES
Unit 1: Welcome to Math 2 This unit will introduce your student to the Math 2 course. In this unit, he will meet Ladybug, an animated learning buddy, who will guide him through the course. Ladybug will pose problems, work with your student to solve the problems, and provide tips and tricks. Your student will also become familiar with the instructional routines presented throughout the course, so that he is ready to begin learning with the first lesson. This unit contains a Learning Coach Resource Guide, which will be useful throughout the course.		•Introduce the student to the learning buddy who serves as a facilitator for the course •Provide a sample of the types of lesson slides and describe their purpose •Describe the types of activities the student will do in every lesson •Provide important information for the Learning Coach
Unit 2: Numbers to 1,000 In this unit, your student will focus on numbers and patterns through 1,000. This unit serves as a foundation for adding and subtracting within 1,000. Your student will represent numbers in a multitude of ways including word form, standard form, and expanded form. Your student will practice identifying patterns as well as comparing and ordering numbers by distinguishing the place value of ones, tens, and hundreds. Identification of counting sequences will help your student conceptualize the relative amount and order of certain numbers. This unit will focus on the mathematical practice standard of "look for and use structure."	MP-1, MP-4, MP-5, MP-7, OA.2.1, NBT.2.1(a), NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9, MD.2.6, MD.2.9	•Use place-value models to represent numbers to 1,000 •Identify and record 3-digit numbers in expanded form, standard form, and word form •Identify patterns of numbers increasing by ones, fives, tens, and hundreds using number charts and number lines •Compare and order 3-digit numbers using place value and number lines •Use structure to identify patterns and solve problems involving comparing and ordering numbers

Unit 3: Add using Models and Strategies In this unit, your student will build on their understanding of place value with three-digit numbers to add within 1,000. This unit will focus on using a variety of strategies, including visual models, number lines, mental math strategies, and partial sums to add 3-digit numbers, and explaining why these strategies work. Your student will develop a deeper conceptual understanding of the Commutative and Associative Properties of Addition by using these strategies. The strategies used in this unit will also help serve as a foundation for the standard addition algorithm. This unit will focus on the mathematical practice standard of "repeated reasoning."	MP-1, MP-4, MP-5, MP-7, OA.2.1, NBT.2.1(a), NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9, MD.2.6, MD.2.9	•Add three-digit numbers using place value and mental math strategies •Use visual models such as place-value blocks and number lines to add 3-digit numbers •Add three-digit numbers using partial sums •Compare and explain the strategies used to add within 1,000 •Use repeated reasoning to solve problems involving addition with and without regrouping
Unit 4: Subtract using Models and Strategies In this unit, your student will continue to work with hundreds, tens, and ones while subtracting within 1,000. Your student will use models, strategies, and the relationship between addition and subtraction to subtract 3-digit numbers. This unit encourages your student to experiment with different approaches to a problem and explain why it works. The strategies used in this unit will help serve as a foundation for the standard subtraction algorithm. This unit will focus on the mathematical practice standard of "make sense and persevere."	MP-2, MP-3, MP-4, MP-5, MP--6, MP-7, MP-8, OA.2.1, OA.2.2, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9, MD.2.6	•Subtract three-digit numbers using place value and mental math strategies •Use visual models including place-value blocks and number lines to subtract three-digit numbers •Compare and explain the strategies used to subtract within 1,000 •Use perseverance to solve multi-step problems
Unit 5: Measuring Length In this unit, your student will use customary and metric units to measure and estimate length. Your student will learn how to use different tools such as rulers, meter sticks, and measuring tape to measure lengths and heights of objects to the nearest unit, and he will also gain an understanding for how the measurements relate to the different sizes of units. Your student will also use addition and subtraction to compare the lengths of objects. This unit will focus on the mathematical practice standard of "use precision."	2.MD.3, MP5, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9, MD.2.6, MD.2.9	•Estimate the length of an object by relating the length of the object to a known measurement •Estimate measures and use a ruler to measure length and height to the nearest inch, foot, and yard •Estimate measures and use a ruler, meter stick, or tape measure to measure length and height to the nearest centimeter or meter •Measure the length and height of objects using different metric units •Tell how much longer one object is than another
Unit 6: More Addition, Subtraction, and Length This unit will focus on solving word problems involving length measurements, by using addition and subtraction. Your student will represent these word problems with drawings and equations that have symbols representing the unknown measurements. Your student will also use number lines to solve addition and subtraction problems within 100, by representing whole numbers as lengths on a number line. This unit will focus on the mathematical practice standard of “using appropriate tools.”	MP-1, MP-4, MP-6, OA.2.1, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9	•Solve addition and subtraction word problems involving length measurements •Use drawings and equations to represent word problems involving measurements and use symbols to represent the unknown value •Use number lines to solve addition and subtraction problems within 100 •Choose and use the appropriate tool to measure lengths and solve problems

Unit 7: Graphs and Data Graphs are a useful way to organize and display information in order to solve problems. This unit presents line plots, picture graphs, and bar graphs as ways to represent sets of data. Your student will be guided through the interpretive process, and will learn that providing a key and a title for each graph is a crucial part of communicating the graph's meaning to others. Your student will gather measurement data by measuring objects to the nearest unit and then present this data on a line plot. Your student will also draw conclusions and solve addition and subtraction problems using the information presented in a bar graph or picture graph. This unit will focus on the mathematical practice standard of "reasoning."	2.MD.3, MP5, MP-1, MP-4, MP-6, OA.2.1, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9	•Measure the length of a variety of objects and organize the data in a line plot •Draw and use bar graphs and picture graphs to represent data and solve problems •Analyze and interpret the information in a bar graph or picture graph and use it to draw conclusions and solve "put together," "take apart," or "compare" problems •Reason about data in bar graphs and picture graphs to write and solve problems
Unit 8: Shapes and Their Attributes In this unit, your student will explore the attributes of shapes such as triangles, quadrilaterals, pentagons, hexagons, and cubes. Your student will also use these attributes to identify, describe, and draw these shapes. In this unit, your student will partition rectangles, squares, and circles into equal shares and describe them as halves, thirds, or fourths. Some of the work in this unit will help serve as a foundation for area and fraction concepts. This unit will focus on the mathematical practice standard of "repeated reasoning."	MP5, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9, MD.2.6, MD.2.9	•Identify attributes of plane shapes and solid figures •Describe and draw polygons and cubes using their attributes •Divide rectangles into equal shares, and use repeated addition to count the shares •Partition shapes into 2, 3, or 4 equal shares, and describe the shares using fractional terminology •Use repeated reasoning to divide rectangles of the same size into equal shares in different ways
Unit 9: Looking Ahead to Grade 3 In this unit, your student will prepare to study math in grade 3. Your student will explore the relationship between multiplication and division, use arrays to model and solve multiplication problems, and explore division as sharing and repeated subtraction. In addition, your student will use various strategies to add and subtract numbers including partial sums and differences as well as models and drawings. Lastly, your student will further explore how to divide regions into equal parts and name an individual part as a unit fraction.	MP-1, MP-4, MP-6, OA.2.1, NBT.2.5, NBT.2.6, NBT.2.7, NBT.2.9	•Show the relationship between multiplication and division using repeated addition •Use arrays to solve multiplication problems •Explore the concept of division as sharing and as repeated subtraction •Use various strategies to add and subtract numbers •Divide regions into equal parts and name one part using a unit fraction