Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Math
Course ID	CAEL77962	Grade Level	3
Course Name	Math 3 A	# of Credits	0.5
SCED Code	NoCourseSCED	Curriculum Type	Connections Academy

COURSE DESCRIPTION

In Math 3 A, the student will learn mathematical concepts related to multiplication and division, patterns, rounding, and mental math. 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.
3.OA.1	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = __÷ 3, 6 × 6 = ?.
3.OA.5	Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15 then 15 × 2 = 30, or by 5 × 2 = 10 then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.) (Students need not use formal terms for these properties.)
3.OA.6	Understand division as an unknown-factor problem. For example, divide 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of one-digit numbers.
3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).)
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (A range of algorithms may be used.)

3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and
3.NF.1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.2a	Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.2b	Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.3a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.3b	Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3), Explain why the fractions are equivalent, e.g., by using a visual fraction model. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.3c	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.NF.3d	Compare two fractions with the same numerator or the same denominator, by reasoning about their size, Recognize that valid comparisons rely on the two fractions referring to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems (problems involving notions of "times as much.")
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
3.MD.7	Relate area to the operations of multiplication and addition.
3.MD.7a	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
3.MD.7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
3.MD.7c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.
3.MD.7d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different area or with the same area and different perimeter.
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part is 1/4 of the area of the shape.

SCOPE AND SEQUENCE		
UNIT OUTLINE	STANDARD#	OUTCOMES

Unit 1: Welcome to Math 3 This unit will introduce your student to the Math 3 course. In this unit, he will meet Clara, an animated character who will guide him through the course. Clara will pose math 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 also contains important information for the Learning Coach, which will be useful throughout the course.		• Introduce your student to the avatar companion, who will serve as an instructional helper throughout the course • Provide information about the types of lesson slides your student will encounter and what to expect to find on each • Introduce your student to the different types of assessments that appear throughout the course • Familiarize your student with the various icons used throughout the course and what types of assets they precede
Unit 2: Whole Number Multiplication and Division In this unit, your student will revisit the concepts of equal groups and skip counting as she relates multiplication to repeated addition. Before your student practices the basic multiplication facts for mastery, it is important that she master the strategies for knowing how to multiply. Thus, your student will make arrays and use counting objects to model how multiplication works. Your student will also explore two interpretations of division: division as sharing and division as repeated subtraction. Your student will make arrays, use counting objects, and draw pictures to model division. This unit will focus on the mathematical practice standard of "use appropriate tools."	MP-1., MP-4., MP-7., OA.3.1., OA.3.2., OA.3.3., OA.3.5., OA.3.7., OA.3.8., MD.3.7(b)	• Use repeated addition to show the relationship between multiplication and addition • Use number lines and arrays to understand multiplication • Understand and use the commutative property of multiplication • Use sharing to separate equal groups and to think about division and repeated subtraction to show the relationship between division and subtraction • Think strategically about available tools that can be used to solve problems
Unit 3: Multiplication Facts: Use Patterns In this unit, the student will learn some of the basic multiplication facts. Specifically, he will use patterns and apply the properties of multiplication to multiply with the numbers 0, 1, 2, 5, 9, and 10. This unit will focus on the mathematical practice standard of "model with math."	MP-1., MP-3., MP-4., MP-5., MP-7., MP-8., OA.3.3., OA.3.5., OA.3.7., OA.3.8., NBT.3.2., MD.3.7(b)	• Gain fluency in multiplication when using 2, 5, and 9 as factors • Gain fluency in multiplication when multiplying by 0, 1, or 10 • Use number relationships and patterns to develop reasoning strategies to support recall of the basic multiplication facts
Unt 4: Apply Properties of Multiplication This unit provides your student with multiple strategies to learn basic multiplication facts. The Distributive Property is introduced to teach simplifying multiplication problems. Your student will learn to use the "break apart" and "known facts" strategies for multiplication facts in which the numbers 3, 4, 6, 7, or 8 are factors. Your student will be introduced to the Associative Property of Multiplication and will use the property to multiply numbers with three factors. By the end of this unit, your student will know the basic multiplication facts up to 10. Your student should continue to practice these basic multiplication facts throughout the year to ensure mastery of them. This unit will focus on the mathematical practice standard of "repeated reasoning."	MP-1., MP-4., MP-5., MP-7., MP-8., OA.3.3., OA.3.5., OA.3.7., OA.3.8., MD.3.7(b), MD.3.7c.	• Use the Distributive Property to solve problems involving multiplication within 100 • Use appropriate tools and the Distributive Property to break apart unknown facts with 3 as a factor • Use the Distributive Property to break apart unknown facts with 4, 6, 7, or 8 as a factor • Use strategies such as bar diagrams and arrays with known facts to solve multiplication problems • Use the Associative Property of Multiplication to group 3 factors and multiply

Unit 5: Division Facts: Use Multiplication In this unit, your student will relate multiplication to division by using multiplication facts to divide. Your student will use these multiplication facts to find the related division facts. He will then use even and odd number patterns to identify multiplication patterns. This unit will focus on the mathematical practice standard of "make sense and persevere."	MP-1., MP-4., MP-5., MP-7., MP-8., OA.3.2., OA.3.3., OA.3.6., OA.3.7., OA.3.8., NF.3.1., NF.3.2(a), NF.3.2(b), NF.3.3c., MD.3.7(b), G.3.2.	• Use multiplication facts to divide and to find related division facts • Use knowledge of even and odd numbers to identify multiplication patterns • Use properties to understand division involving 0 and 1 • Use patterns and known facts to find unknown multiplication facts • Use multiplication and division facts to find unknown values in equations
Unit 6: Fluently Multiply and Divide Within 100 In this unit, your student will learn that patterns between pairs of numbers exist when they are related by multiplication or division. Your student will encounter such related numbers in a multiplication table. Given the value of one of the numbers, your student will learn to find the value of the other number by writing a rule for the relationship and thereby extending the table. In addition, your student will use her knowledge of numbers and operation symbols to translate words from a given mathematical scenario into a numerical expression. She will also learn to write personal multiplication and division stories. This unit will focus on the mathematical practice standard of "look for and use structure."	MP-1., MP-4., MP-5., MP-7., MP-8., OA.3.2., OA.3.3., OA.3.4., OA.3.5., OA.3.6., OA.3.7., OA.3.8., MD.3.5(a), MD.3.7(c)., MD.3.5(b), MD.3.6., MD.3.7(a), MD.3.7(b), MD.3.7 (c)., MD.3.7(d)	• Use the multiplication table to find patterns in factors and products and to find the missing factor in a division problem • Use number sense and reasoning while practicing multiplication and division basic facts • Solve multiplication and division problems that involve different strategies and representations • Use multiplication and division to write and solve real-world problems involving equal groups • Use the structures of multiplication and division to compare expressions
Unit 7: Multiply by Multiples of 10 In this unit, your student will first use a number line to find products when one factor is a multiple of 10. Your student will then learn that basic multiplication facts and properties of multiplication can be used to find products when one factor is a multiple of 10. Your student will also discover the different strategies that can be used to find products when one factor is a multiple of 10. This unit will focus on the mathematical practice standard of "look for and use structure."	MP-1., MP-4., MP-5., MP-7., MP-8., OA.3.3., OA.3.5., OA.3.6., OA.3.7., OA.3.8., MD.3.5(a), MD.3.5(b), MD.3.6., MD.3.7(a), MD.3.7(b), MD.3.7 (c)., MD.3.7 (d)	• Use an open number line to find products when one factor is a multiple of 10 • Use properties of multiplication to find products when one factor is a multiple of 10 • Use different strategies to find products when one factor is a multiple of 10 • Use the structure of multiplication and place value to find products when one factor is a multiple of 10
Unit 8: Strategies to Add and Subtract In this unit, your student will learn that some real-world problems that involve joining, separating part-whole, or comparing can be solved using addition. She will learn to make generalizations about addition and investigate patterns and reasoning about mathematical relationships Your student will understand that there is more than one way to do mental math; she will investigate techniques such as changing the numbers or the expressions so that calculations are easy to do mentally, rounding, and using compatible numbers. Finally, she will explore the inverse relationship between addition and subtraction. This unit will focus on the mathematical practice standard of "model with math."	MP-1., MP-3., MP-4., MP-5., MP-6., MP-7., MP-8., OA.3.3., OA.3.5., OA.3.7., OA.3.8., NBT.3.1., NBT.3.2., MD.3.7(b)	• Solve real-world problems using properties of addition • Identify patterns in the addition table and explain them using algebraic thinking • Use mental math to add or subtract • Use rounding or compatible numbers to estimate a sum or difference • Solve one-step and multi-step problems using strategies based on the relationship between addition and subtraction by modeling with math

Unit 9: Fluently Add and Subtract within 1,000 In this unit, your student will use his knowledge and skills of basic addition and subtraction facts to add and subtract whole numbers of greater value. As your student learns to estimate and compute sums and differences of numbers within 1,000, he will use his background knowledge of place value to model the process of regrouping in the ones and tens place values. This unit will provide your student with meaningful computational practice through word problems that are presented in authentic contexts. This unit will focus on the mathematical practice standard of "construct arguments."	MP-1., MP-3., MP-4., MP-6., MP-7., OA.3.8., NBT.3.2., NF.3.1., NF.3.2(a), NF.3.2(b), NF.3.3(a), NF.3.3(b), NF.3.3(c), NF.3.3(d), G.3.2.	• Add two three-digit numbers by breaking apart problems into simpler problems or by using the standard algorithm • Add three or more numbers using the standard algorithm • Subtract multi-digit numbers using the expanded algorithm • Subtract a three-digit number from another three-digit number with one or more zeros by using the standard algorithm • Use addition and subtraction to justify a conjecture