

## Wyoming Department of Education Required Virtual Education Course Syllabus

### Sheridan County School District # 1

Program Name	Sheridan County School District #1 Virtual School	Content Area	Math
Course ID	AC02034-4	Grade Level	4
Course Name	Grade 4 Math-CCSS	# of Credits	1
SCED Code	02034	Curriculum Type	Acellus

#### COURSE DESCRIPTION

This Grade 4 Math course emphasizes multi-digit multiplication and division, fractions, and analysis and classification of geometric figures. Concepts include: Place Value, Basic Addition and Subtraction, Rounding, Estimating Sums and Differences, Multiplication and Division Basic Facts, Mathematical Properties, Regrouping with Estimating Products, Regrouping with Multiplication, Fractions, Multiplying Equivalent Fractions, Comparing Fractions and Mixed Numbers, Data and Graphs, Digits by 2-Digits with Division, Estimating Quotients More Regrouping with Division, Decimals, Money, Geometry Customary Metric Units, Capacity Weight and Mass, Perimeter and Area, Divisibility, Factors, and Time and Number Patterns.

#### WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
4.OA.4	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.
4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$ , $=$ , and $<$ symbols to record the results of comparisons. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000. A range of algorithms may be used.)
4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000. A range of algorithms may be used.)
4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000. A range of algorithms may be used.)
4.NF.1	Explain why a fraction $a/b$ is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.NF.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$ . Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , or $<$ , and justify the conclusions, e.g., by using a visual fraction model. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)

4.NF.3	Understand a fraction $a/b$ with $a > 1$ as a sum of fractions $1/b$ . (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.NF.3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.3b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$ ; $3/8 = 1/8 + 2/8$ ; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$ .
4.NF.3c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
4.NF.3d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.NF.4a	Understand a fraction $a/b$ as a multiple of $1/b$ . For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$ , recording the conclusion by the equation $5/4 = 5 \times (1/4)$ .
4.NF.4b	Understand a multiple of $a/b$ as a multiple of $1/b$ , and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$ , recognizing this product as $6/5$ . (In general, $n \times (a/b) = (n \times a)/b$ .)
4.NF.4c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $3/10$ as $30/100$ and add $3/10 + 4/100 = 34/100$ . (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.) (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $62/100$ ; describe a length as 0.62 meters; locate 0.62 on a number line diagram. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when two decimals refer to the same whole. Record the results of comparisons with the symbols $>$ , $=$ , or $<$ , and justify the conclusions, e.g., by using a visual model. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example: Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ....
4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $1/360$ of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

**SCOPE AND SEQUENCE**

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
Unit 1 – Place Value	4.NBT.1; 4.NBT.2	In this unit students learn place value, including the thousands period, 3-Digits, and 4-Digits, all in both their expanded and word forms. They also learn to Use the word form of numbers.
Unit 2 – More Place Value and Basic Addition and Subtraction	4.NBT.2	In this unit students learn comparing and ordering numbers and more about the thousands and millions periods. They also learn addition and subtraction and fact families.
Unit 3 – Addition	4.NBT.4	In this unit students learn to use parentheses with addition, the commutative, identity, and associative properties of addition, and using addition properties. They also learn three- and four-digit addition with regrouping, addition with different place values, and adding larger numbers.
Unit 4 – Subtraction	4.NBT.4	In this unit students learn three-and four-digit subtraction with regrouping, four-digit subtraction with zeros, finding differences across zeros, and subtraction with different place values. They also learn addition and subtraction story problems, choosing whether to use addition or subtraction, and subtracting larger numbers.
Unit 5 – Rounding	4.OA.3; 4.NBT.3	In this unit students learn rounding to the nearest ten, to the nearest hundred, to the nearest thousand, and to a given place value. They also learn estimating, rounding in the thousands period, and doing rounding story problems.
Unit 6 – Estimating Sums and Differences	4.OA.3	In this unit students learn to do mental math to find sums and differences of tens, hundreds, and thousands. They also learn to estimate sums and differences, including rounding, thousands, and different place values.
Unit 7 – More Estimating Sums and Differences	4.OA.3	In this unit students learn over- and underestimating, adding and subtracting compatible numbers. They also learn estimating sums and differences with compatible numbers, and choosing whether to work out an exact answer or to estimate.
Unit 8 – Multiplication and Division Basic Facts	4.OA.1; 4.OA.2	In this unit students study multiplication and division. They come to understand these operations, and learn fact families, multiplying and dividing by the numbers 0 through 11, and verbal multiplication.

Unit 9 – Mathematical Properties	4.OA.2; 4.OA.2	In this unit students learn multiplying and dividing by the number 12, multiplication and division story problems, the commutative, identity, associative, and zero properties of multiplication, and using multiplication properties. They also learn expressions and equations, equations with variables, and multiplication mysteries.
Unit 10 – Regrouping with Multiplication	4.NBT.5	In this unit students learn regrouping and story problems when multiplying two- and three-digit numbers. They practice with examples of story problems.
Unit 11 – Estimating Products	4.OA.3	In this unit students study mental multiplication. They learn how to multiply mentally, estimating multiplication including rounding and compatible numbers, and choosing a method.
Unit 12 – More Regrouping with Multiplication	4.OA.1; 4.OA.2; 4.NBT.5	In this unit students study multiplication. They learn multiplying without regrouping, multiplying two-, three-, and four-digit numbers by one-digit numbers, multiplication arrays and models, the distributive property, choosing the operation, and multiplicative comparisons.
Unit 13 – Unit Fractions	4.NF.3; 4.NF.3a; 4.NF.3b; 4.NF.3d	In this unit students study fractions. They learn unit fractions, understanding fractions, fractions in a group, fractions on a number line, adding unit and like fractions, subtracting like fractions, breaking apart fraction amounts, and fraction story problems.
Unit 14 – Multiplying and Equivalent Fractions	4.NF.1; 4.NF.4; 4.NF.4a; 4.NF.4b; 4.NF.4c	In this unit students study multiplying and equivalent fractions. They learn multiplying unit fractions, multiplying whole numbers by fractions, and multiplying with a number line, as well as story problems about multiplying with fractions. They also learn equivalent fractions, including models, fraction strips, number lines, smaller pieces, and larger pieces.
Unit 15 – Comparing Fractions and Mixed Numbers	4.NF.2; 4.NF.3c; 4.NF.3d	In this unit students learn comparison, including comparing fractions with like denominators or with like numerators, comparing fractions with number lines, and comparing a fraction to the benchmark $\frac{1}{2}$ . Also covered are common denominators, mixed number models, understanding, adding, and subtracting mixed numbers, and adding and subtracting fractions.
Unit 16 – Data and Graphs	4.MD.4	In this unit students learn data and frequency tables, line plots, line plots with fractions, and making line plots. They also learn reading and making bar graphs, double-bar graphs, and pictographs.
Unit 17 – 2-Digits by 2-Digits Multiplication	4.NBT.5	In this unit students learn multiplying with zeros and multiplying by tens. They also learn multiplying 2-digits by 2-digits, and multiplication modes, arrays, and story problems.
Unit 18 – Regrouping with Division	4.NBT.6	In this unit students learn dividing with remainders, dividing 2-digits with regrouping, and models for dividing. They also learn sharing evenly, and story problems for dividing 2-digits and for tricky remainders.
Unit 19 – Estimating Quotients	4.OA.3; 4.NBT.1	In this unit students study estimating quotients. They learn finding quotients mentally, dividing multiples of 10, 100, and 1,000, doing story problems with mental quotients, estimating quotients and compatible numbers, choosing a method for division, doing larger mental quotients and estimating larger quotients.
Unit 20 – More Regrouping with Division	4.OA.2; 4.NBT.6	In this unit students learn division modes and dividing two- and three-digits by one-digit. They also learn division story problems, and division comparisons.

Unit 21 – Decimals	4.NF.6; 4.NF.7	In this unit students study decimals. They learn tenths, hundredths, number lines, how decimals and fractions are related, adding and subtracting decimals, and comparing decimals.
Unit 22 – Money	4.NF.5 4.MD.2	In this unit students study money. They learn how to count money, adding tenths and hundredths mentally as fractions and as decimals, adding, subtracting, multiplying and dividing money, and money story problems.
Unit 23 – More Complex Regrouping with Division	4.OA.3; 4.NBT.6; 4.MD.2	In this unit students study more complex regrouping with division. They learn placing the first digit, dividing 3- and 4-digits by 1-digit, division trouble spots, understanding remainders, dividing with zeros, and checking division with multiplication.
Unit 24 – Geometry	4.MD.5; 4.MD.6; 4.MD.7; 4.G.1	In this unit students study geometry. They learn points, lines, and rays; lines and angles; labeling points, lines, and rays; labeling, describing, understanding, measuring, classifying, using, and finding unknown angles.
Unit 25 – More Geometry	4.G.1; 4.G.2; 4.G.3	In this unit students continue to study geometry. They learn parallel lines, describing lines, polygons, including classifying and identifying angles and lines in polygons, classifying triangles by angles, classifying quadrilaterals, finding lines of symmetry, and right triangles.
Unit 26 – Length: Customary Units	4.MD.1	In this unit students study length in customary units. They learn measuring and estimating length, including inches, feet, yards, miles, and the nearest half inch. They also learn the relationships between feet and inches, and between feet and yards.
Unit 27 – Length: Metric Units	4.MD.1; 4.MD.2	In this unit students study length in metric units. They learn metric linear units, the relationship between centimeters and meters, kilometers, decimeters, and millimeters, measuring to the nearest half centimeter, estimating length with metric units, and adding and subtracting meters with decimals.
Unit 28 – Capacity	4.MD.1; 4.MD.2	In this unit students study capacity. They learn about cups, quarts, pints, and gallons, cooking with capacity, metric capacity units, milliliters and liters, and multiplying and dividing metric capacities.
Unit 29 – Weight and Mass	4.MD.2	In this unit students study weight and mass. They learn customary weight units, including ounces and pounds, adding and subtracting weights. They also learn metric mass units, including changing metric mass units, and multiplying and dividing with mass. They practice with measurement story problems.
Unit 30 – Perimeter and Area	4.MD.3	In this unit students learn what perimeter and area are. They also learn the perimeter and area of squares and rectangles, and using area to find length or width. They practice these concepts in story problems.
Unit 31 – Divisibility, Factors, and Multiples	4.OA.4	In this unit students learn divisibility rules for 2, 3, 5, and 10, factors, multiples, prime numbers, composite numbers. They practice with story problems.
Unit 32 – Time and Number Patterns	4.OA.3; 4.OA.5; 4.MD.1; 4.MD.2	In this unit students study time and number patterns. They learn units of time, telling time, hours, minutes, and seconds, telling time to the nearest minute, adding, subtracting, multiplying and dividing with time, patterns with shapes, number patterns, and multi-step story problems.