Cambria Heights School District Curriculum

Course Name	Mathematics
Grade Level	Fourth grade

Unit 1	Number and Operations – Base Ten			
Time Frame	**4-5 Weeks**			
Key Concepts	___	**PA Core Standard** (Descriptor)	**Eligible Content** (Grades 3-5)	**Terminology**
Place value Forms Comparing and ordering Rounding	What is place value? How can it help you to understand the size of a number? How can you represent numbers in different ways? How can you compare and order multi-digit numbers through 1,000,000? How can you round numbers through 1,000,000 to a given place value?	**M04.A-T.1.1** Apply place- value and numeration concepts to compare, find equivalencies, and round.	**M04.A-T.1.1.1** Demonstrate an understanding that in a multi- digit whole number (through 1,000,000), a digit in one place represents ten times what it represents in the place to its right. **M04.A-T.1.1.2** Read and write whole numbers in expanded, standard and word form through 1,000,000. **M04.A-T.1.1.3** Compare two multi-digit numbers through 1,000,000 based on meanings of the digits in each place, using >, =, and < symbols. **M04.A-T.1.1.4** Round multi-digit whole numbers (through 1,000,000) to any place.	place value word form standard form expanded form compare order round
Addition Subtraction Multiplication Division	What strategies can you use to add and subtract whole numbers through 1,000,000? How can you apply strategies to add and subtract numbers through 1,000,000?	**M04.A-T.2.1** Use operations to solve problems.	**M04.A-T.2.1.1** Add and subtract multi-digit whole numbers (limit sums and subtrahends up to and including 1,000,000). **M04.A-T.2.1.2** Multiply a whole number of up to four digits by a one-digit whole number and multiply 2 two-digit numbers.	addend sum subtrahend minuend difference factor product dividend

Estimation	What strategies can you use to multiply one-digit numbers?		**M04.A-T.2.1.3** Divide up to four-digit dividends by one-digit divisors with answers written as whole-number quotients and remainders	divisor quotient remainder estimate inverse operations
	How can you apply strategies to multiply one-digit numbers?			
	What strategies can you use to multiply two-digit numbers?		**M04.A-T.2.1.4** Estimate the answer to addition, subtraction, and multiplication problems using whole numbers through six digits (for multiplication, no more than 2 digits °— 1 digit, excluding powers of 10).	
	How can you apply strategies to multiply two-digit numbers?			
	What strategies can you use to divide whole numbers, including situations with remainders?			
	How can you apply strategies to divide whole numbers up to four digits, including situations with remainders?			
	How can we estimate answers to problems involving addition and subtraction up to six digits?			
	How can we estimate answers to problems involving multiplication of two-digit by one-digit factors?			

Unit 2	Numbers and Operations – Fractions- Develop an understanding of fractions as numbers.			
Timeframe	**5-6 Weeks**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Equivalent fractions Comparing/ordering fractions	What are equivalent fractions? How can you recognize and make equivalent fractions? How can you compare and order fractions?	**M04.A-F.1.1** Find equivalencies and compare fractions.	**M04.A-F.1.1.1** Recognize and generate equivalent fractions. **M04.A-F.1.1.2** Compare two fractions with different numerators and different denominators (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100) using the symbols >, =, or <, and justify the conclusions.	fraction equivalent fractions numerator denominator
Adding and subtracting fractions (including mixed numbers) with common denominators Decomposing fractions and mixed numbers Solving word problems with adding and subtracting fractions Multiplying whole numbers and fractions	How can you add and subtract fractions with common denominators? How can you break a fraction or mixed number into parts? How can you add and subtract mixed numbers with common denominators? How can you apply problem solving strategies to solve addition and subtraction word problems with fractions? How can you multiply a fraction by a whole number?	**M04.A-F.2.1** Solve problems involving fractions and whole numbers (straight computation or word problems).	**M04.A-F.2.1.1** Add and subtract fractions with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; answers do not need to be reduced; no improper fractions as the final answer). **M04.A-F.2.1.2** Decompose a fraction or a mixed number into a sum of fractions with the same denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100), recording the decomposition by an equation. Justify decompositions (for example, by using a visual fraction model). **M04.A-F.2.1.3** Add and subtract mixed numbers with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; no regrouping with subtraction; fractions do not need to be reduced; no improper fractions as the final answers). **M04.A-F.2.1.4** Solve word problems involving addition and subtraction of fractions referring to the same whole or set and having like denominators (denominators limited to 2, 3, 4, 5, 6, 8,	fraction equivalent fractions numerator denominator common denominator mixed number

			10, 12, and 100).	
			M04.A-F.2.1.5 Multiply a whole number by a unit fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; final answers do not need to be reduced or written as a mixed number).	
			M04.A-F.2.1.6 Multiply a whole number by a non- unit fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; final answers do not need to be reduced or written as a mixed number).	
			M04.A-F.2.1.7 Solve word problems involving multiplication of a whole number by a fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100).	
Adding fractions (tenths and hundredths) Converting fractions to decimals Comparing decimals	How can you add fractions with denominators of 10 and 100? How can you express fractions with a denominator of 10 or 00 as a decimal? How can you compare and order decimals?	**M04.A-F.3.1** Use operations to solve problems involving decimals, including converting between fractions and decimals (may include word problems).	**M04.A-F.3.1.1** Add two fractions with respective denominators 10 and 100. **M04.A-F.3.1.2** Use decimal notation for fractions with denominators 10 or 100. **M04.A-F.3.1.3** Compare two decimals to hundredths using the symbols >, =, or <, and justify the conclusions.	fraction decimals tenths hundredths compare

Unit 3	Operations and Algebraic Thinking-			
Timeframe	**5-6 Weeks**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Multiplication of whole numbers Division of whole numbers Multistep word problems with whole numbers Multiplicative comparisons Additive comparisons	How can you use multiplication to compare? How can you solve word problems using multiplication to compare? How can you write and evaluate variable expressions using the four operations to solve multi-step word problems? How can you identify the missing symbol in a number sentence?	**M04.B-O.1.1** Use numbers and symbols to model the concepts of expressions and equations.	**M04.B-O.1.1.1** Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. **M04.B-O.1.1.2** Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison. **M04.B-O.1.1.3** Solve multi- step word problems posed with whole numbers using the four operations. Answers will be either whole numbers or have remainders that must be interpreted yielding a final answer that is a whole number. Represent these problems using equations with a symbol or letter standing for the unknown quantity. **M04.B- O.1.1.4** Identify the missing symbol (+, −, °—, ÷, =, <, >) that makes a number sentence true (single-digit divisor only).	expression equation factor product division divisor dividend quotient inverse operations variable fact family estimate
Factor whole numbers Multiples of whole numbers Prime vs. Composite Numbers	How can you find the factors of a whole number? How can you find the multiples of a whole number? How are factors and multiples related? How can you identify a prime number? How can you identify a composite	**M04.B-O.2.1** Develop and apply number theory concepts to represent numbers in various ways.	**M04.B-O.2.1.1** Find all factor pairs for a whole number in the interval 1 through 100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the interval 1 through 100 is a multiple of a given one-digit number. Determine whether a given whole number in the interval 1 through 100 is prime or composite.	factor multiple prime composite

	number?			
Find a pattern Find a rule for a function Complete a table using a rule	How can you make or extend a pattern to fit a rule? How can you find the missing number or shape in a pattern? How can you find a rule to fit a pattern?	**M04.B-O.3.1** Recognize, describe, extend, create, and replicate a variety of patterns.	**M04.B-O.3.1.1** 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.	pattern variable rule
			M04.B-O.3.1.2 Determine the missing elements in a function table (limit to +, – , or °— and to whole numbers or money).	
			M04.B-O.3.1.3 Determine the rule for a function given a table (limit to +, –, or °— and to whole numbers).	

Unit 4	**Measurement and Data-** Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects.			
Timeframe	**5-6 Weeks**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Standard units of length, mass, volume, time, area, and perimeter Metric units of length, mass, volume, time, area, and perimeter Elapsed time Word problems with area and perimeter Identify time in multiple ways	How can you change units of length, capacity, mass, weight, and time to equivalent units? How can you compare length, capacity, mass, weight, and time? How can you use the four operations to solve word problems involving measurement? How can you find the perimeter of a rectangle? How can you find the area of a rectangle?	**M04.D-M.1.1** Solve problems involving length, weight (mass), liquid volume, time, area, and perimeter.	**M04.D-M.1.1.1** Know relative sizes of measurement units within one system of units including standard units (in., ft, yd, mi; oz., lb; c, pt, qt, gal), metric units (cm, m, km; g, kg; mL, L), and time (sec, min, hr, day, wk, mo, yr). Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. **A table of equivalencies will be provided.**	standard units inches foot yard mile ounce pound cup pint quart gallon Fahrenheit metric units centimeter meter kilometer
			M04.D-M.1.1.2 Use the four operations to solve word problems involving distances, intervals of time (such as elapsed time), liquid volumes, masses of objects; money, including problems involving simple fractions or decimals;	

Conversions from larger unit to smaller unit	How can you use the formulas or area and perimeter to find the missing side of a rectangle? How can you identify time?		and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	gram kilogram milliliter liter second minute hour day week month year century millennium Celsius equivalent length capacity temperature weight elapsed time volume mass perimeter area liquid volume analog clock digital clock a.m. p.m.
			M04.D-M.1.1.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems (may include finding a missing side length). Whole numbers only. **The formulas will be provided.**	
			M04.D-M.1.1.4 Identify time (analog or digital) as the amount of minutes before or after the hour.	
Make a line plot Solve problems using line plots Translate data from one display to another	How can you make a line plot to display data in fractions of a unit? How can you use line plots to solve problems involving addition and subtraction of fractions? How can you translate data from one type of display to another?	**M04.D-M.2.1** Organize, display, and answer questions based on data.	**M04.D-M.2.1.1** Make a line plot to display a data set of measurements in fractions of a unit (e.g., intervals of 1/2, 1/4, or 1/8).	line plot interval scale data key outlier table chart trend
			M04.D-M.2.1.2 Solve problems involving addition and subtraction of fractions by using information presented in line plots (line plots must be labeled with common denominators, such as 1/4, 2/4, 3/4).	
			M04.D-M.2.1.3 Translate information from one type of display to another (table, chart, bar graph, or pictograph).	
Measure angles	How can you measure an angle using a protractor?	**M04.D-M.3.1** Use appropriate tools and units to sketch an angle and	**M04.D-M.3.1.1** Measure angles in whole-number degrees using a	angle protractor

Using a protractor Sketch specific angles Solve problems to find angle measurements	How can you use a protractor to sketch a specific angle? How can you use addition and subtraction to find unknown angles in real-world problems?	determine angle measurements.	protractor. With the aid of a protractor, sketch angles of specified measure. **M04.D-M.3.1.2** Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems. (Angles must be adjacent and non-overlapping.)	degree vertex side

Unit 5	Geometry- Reason with Shapes and their attributes			
Timeframe	**5-6 Weeks**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Properties of 2-D figures Classify 2-D figures by lines and angles Recognize lines of symmetry	How can you identify and draw important geometric terms relating to lines, parts of a line, and angles? What are some special angles and lines? How can you classify triangles based on specific lines and angles? How can you classify polygons based on specific lines and angles? How can you identify and make symmetrical figures? How can you draw a line or lines of symmetry?	**M04.C-G.1.1** List properties, classify, draw, and identify geometric figures in two dimensions.	**M04.C-G.1.1.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. **M04.C-G.1.1.2** 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. **M04.C-G.1.1.3** 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 mirroring parts. Identify line-symmetric figures and draw lines of symmetry (up to two lines of symmetry).	point line line segment ray sides vertices angle symmetry right angle acute angle obtuse angle perpendicular line parallel lines right triangle polygon rectangle square rhombus quadrilateral parallelogram trapezoid circle