Cambria Heights School District Curriculum

Course Name	Math
Grade Level	Second Grade
Mathematical Practices	The following mathematical practices are included as a foundational component of the National and State Common Core Standards for Mathematics at all grade levels. The list identifies practices that should be explicitly modeled as well as embedded within instruction, work habits and daily math routines in the classroom. The Mathematical Practices are essential in building effective math habits of mind and maintaining high expectations for all learners. • **Make sense of problems and persevere in solving them.** • **Reason abstractly and quantitatively.** • **Construct viable arguments and critique the reasoning of others.** • **Model with mathematics.** • **Use appropriate tools strategically.** • **Attend to precision.** • **Look for and make use of structure.** • **Look for and make sense of regularity in repeated reasoning.**

Unit 1	Number and Operations – Base Ten			
Mathematical Practices	**• Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. • Look for and make sense of regularity in repeated reasoning.**			
Key Concepts	**Essential Questions**	**PA Core Standard (Descriptor)**	**Eligible Content (Grades 3-5)**	**Terminology**
A 3 digit number can be represented using base ten models (hundreds, tens, ones) For any 3-digit numbers the one with more hundreds has the greater value. If the numbers have equal hundreds then the tens are compared. If the values of the tens are also equal, the values of the ones are compared.	How can I identify the value of a digit in a 3-digit number using place value? How do I use base ten blocks to represent a 3-digit number? How can I compare 3-digit numbers using place value? How can I use the symbols (< , > , =) to express the relationship between two 3-digit numbers?	CC.2.1.2.B.1 Use place value concepts to represent amounts of tens and ones and to compare three digit numbers.	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.	compare symbols < (less than) > (greater than) = (equal) place value hundreds tens ones
1 hundred is equivalent to 10 tens or 100 ones. one hundred (100) can also be represented as groups of tens and ones whose sum equal 100. (i.e. 5 groups of 20, 4 groups of 25, …)	How can I represent the value of one hundred in different ways?		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).	
Counting involves increasing the ones digit by one. This rule applies regardless of where the counting begins or ends. When skip counting by 5s beginning at zero, numbers in the pattern will always have the digits 0 or 5 in the	How can I count within 1000? How can I extend skip-counting patterns (5, 10, 100) to help me count within 1000?	CC.2.1.2.B.2 Use place value concepts to read, write and skip count to 1000.	Count within 1000; skip-count by 5s, 10s, and 100s.	equivalent hundreds tens ones

ones place.				
Numbers can be expressed using words, in expanded form (notation), standard form, and using base ten models.	How can read and write 2-digit and 3-digit numerals using place value? How can I express numbers through 1000 in different ways?		Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	
Addition and subtraction are inverse (opposite) operations. The commutative property, associative property, additive identity property, and inverse relationship of addition and subtraction can be used to add and subtract within 1000.	What is the relationship between addition and subtraction? How can knowing the relationship between addition and subtraction help me add/subtract within 100? How can knowing place value help me add and subtract numbers within 100? How can I compose/decompose numbers to add and subtract fluently within 100?	CC.2.1.2.B.3 Use place value understanding and properties of operations to add and subtract within 1000.	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	addends sum difference compose decompose inverse 3 + 1 = 4 4 - 1 = 3 associative property (1 + 2) + 3 = 6 1 + (2 + 3) = 6 commutative property (2 + 3 = 5) (3 + 2 = 5) *additive identity property (5 + 0 = 5) *doubles *doubles plus one *make a ten *give one-take one to make a double “number strings”
Associative Property - when three or more numbers are added, the sum is the same regardless of the grouping of addends. (3+4) + 2 = 9 or 3+(4+2) = 9 Commutative Property - when two numbers are added, the sum is the same regardless of the order of addends. 3+5=8 5+3=8 Numbers can be decomposed and composed to make familiar sums (making even tens, doubles), as long as place value is maintained and all numbers are used.	What strategies can I use to add up to four two-digit addends in a row?		Add up to four two-digit numbers using strategies based on place value and properties of operations.	

The commutative property, associative property, additive identity property, and inverse relationship of addition and subtraction can be used to add and subtract within 1000.	How can I add three-digit numbers using models or drawings? How can I subtract three-digit numbers using models or drawings? What strategies can I use to add three-digit numbers? What strategies can I use to subtract three-digit numbers? How do I know when to compose or decompose ones, tens or hundreds to find the sum of two three-digit numbers? How do I know when to compose or decompose ones, tens or hundreds to find the difference of two three-digit numbers? How can I show my addition in written form? How can I show my subtraction in written form?		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.	
When adding 10 to any given number the digit in the tens place will increase by 1 ten. When adding 100 to any given number, the digit in the hundreds place will increase by 1 hundred.	How can I use mental math to add 10 or 100 to any given number? How can I use mental math to subtract 10 or 100 to any given number?		Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.	
Commutative Property - when two numbers are added, the sum is the same regardless of the order of addends. 3+5=8 5+3=8 Associative Property - when three or more numbers are added, the sum is the same regardless of the grouping of addends. (3+4) + 2 = 9 or 3+(4+2) = 9	What are the properties of addition? What are the properties of subtraction? How can I prove an addition strategy works? How can I prove a subtraction strategy works?		Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)	

Additive Identity Property - the sum of any number and zero is the original number. 5+0=5 Words, pictures or objects can be used to show how addition and subtraction strategies work.				

Unit 3	Operations and Algebraic Thinking-			
Mathematical Practices	**• Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. • Look for and make sense of regularity in repeated reasoning.**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Solve word problems by first understanding the context of the problem (read the problem, draw, and/or use key words) Then by making a plan to find the unknown within the problem. Word problems have parts and a whole. (part + part = whole) (whole - part = part) If the unknown value is a part, subtraction can be used to find the unknown (whole - known part = unknown part) If the unknown is the whole, addition can be used to find the unknown value. (known part + known part = unknown whole)	How do I know when to use addition to solve a word problem? How do I know when to use subtraction to solve a word problem? How can I identify the unknown value in a word problem? How can I solve a word problem with an unknown whole? How can I solve a word problem with an unknown part? How can I draw a picture to help me understand and solve a word problem? How can I write an equation to help me understand and solve a word problem? How can I use symbols to represent the unknown in an equation?	CC.2.2.2.A.1 Represent and solve problems involving addition and subtraction within 100.	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. (also aligns to PA Standard 2.8.2.E)	Understand - part - whole Plan Solve - equation - symbol Check Key Words - in all - altogether - total - sum - difference - comparisons “more/greater than” or “less/fewer than”

A variety of strategies can be used to achieve fluency in addition and subtraction within 20. Fluency implies automaticity in determining sums. Although mental math strategies may be used, paper/pencil, number charts and/or counters are not needed.	What strategies can I use to add within 20 (mental math)? What does it mean to add fluently? What strategies can I use to subtract within 20? What does it mean to subtract fluently?	CC.2.2.2.A.2 Use mental strategies to add and subtract within 20.	Add and subtract within 20. Fluently add and subtract with 20 using mental strategies. By the end of Grade 2 know from memory all sums of two one-digit numbers.	Adding Strategies (not limited to) - counting on - sums of 10 - making 9 a 10 - doubles - doubles plus 1 Subtraction Strategies (not limited to) - counting up - counting back - doubles
The sum of two equal addends is an even number. 3+ 3=6, 4+4=8.An even number is any number that can be divided into two equal halves; an odd number cannot. Even numbers can also be identified as having the digit 0, 2, 4, 6, or 8 in the ones place. Odd numbers can also be identified as having the digit 1, 3, 5, 7 or 9 in the ones place. The sum of an even number plus an even number will always be even. The sum of two odd numbers will always be even. The sum of an odd number plus an even number will always be odd.	How can I identify a number as even or odd? How can I write an equation to express an even number? How can I use repeated addition to help me understand multiplication? How can skip counting help me understand multiplication? How can adding equal groups help me understand multiplication?	CC.2.2.2.A.3 Work with equal groups of objects to gain foundations for multiplication.	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.	array even odd equation (number sentence) row column addends
An array is a systematic arrangement of objects, usually in rows and columns.	How can addition help me count a group of objects arranged in rows and columns?		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.	

Unit 4	**Measurement and Data- Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects.**			
Mathematical Practices	**• Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. • Look for and make sense of regularity in repeated reasoning.**			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
A reasonable measurement tool is selected by considering the purpose for measuring and a unit of measure.	How do I choose a tool to measure the length of an object? How can I use a tool to estimate the length of an object?	CC.2.4.2.A.1 Measure and estimate lengths in standard units using appropriate tools.	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	metric/customary systems length inch foot yard centimeter decimeter meter tools:foot ruler, yardstick, decimeter, meter stick, tape measure feet vs. inches estimate length
An object's measurement can be expressed in different units based on the tool used to measure. When using a larger unit of measurement (feet vs. inches), the object will use less units.	How can I compare measurements expressed in different units?		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.	
An object's length can be estimated by rounding to the nearest whole unit (inch, centimeter, etc...)	How do I estimate an object's length?		Estimate lengths using units of inches, feet, centimeters, and meters.	
Comparing lengths is similar to comparing two- or three-digit numbers to determine the greater length. Then subtracting to find the difference in length between the lengths. This may or may not include measuring to determine the lengths first.	How do I compare the difference in lengths?		Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	

Time is displayed as hour:minute on a digital clock. Time on an analog clock is displayed with the position of the hour hand identifying the hour and the position of the minute hand identifying the minutes.	How can I read the time on an analog or digital clock? How can I write time to the nearest 5 minutes?	CC.2.4.2.A.2 Tell and write time to the nearest five minutes using both analog and digital clocks.	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	analog clock hour hand minute hand digital clock AM PM
When adding money, one strategy is to begin adding with the highest value coin/bill continuing to the lowest value coin/bill. ¢100 = $1.00 Skip-Counting Patterns Nickels (by 5s) Dimes (by 10s) Quarters (by 25s) Half-Dollar (by 50s) When recording money totals in terms of only cents the cents (¢) sign is used but no decimal point is required. (ex: ¢85) When recording amounts in term of dollars and cents the dollar signed and decimal point are required. ($1.85)	How can I solve problems involving money? Why is it important for me to know the value of each coin or bill? What strategies can I use when counting coins and bills? How can I use skip-counting patterns to count money? How can I record amounts of money using a cent sign or a dollar sign and decimal point?	CC.2.4.2.A.3 Solve problems using coins and paper currency with appropriate symbols	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?	Penny Nickel Dime Quarter Dollar Bill $ (dollars) ¢ (cents) decimal point
Data can be represented in various ways (line plots, pictographs, bar graphs) A line plot is a visual display of data on a number line, using an X to mark each value. A picture graph (pictograph)	How can I represent data? How do I read and understand (interpret) data in a line plot? How do I read and understand (interpret) data in a picture graph? How do I read and understand (interpret) data on a bar graph?	CC.2.4.2.A.4 Represent and interpret data using line plots, picture graphs, and bar graphs.	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.	data line plot picture graph bar graph

is a visual display of data on a chart with a row or column for each category. The values are represented using pictures/ symbols. The picture/symbol used has a set value (displayed in a key). A bar graph is a visual representation of data displayed by the length/height of horizontal/vertical bars for each value.				
Problems involving measurement can be solved using an effective problem solving method (ex: understand, plan, solve, check) to find the unknown value. These problems can be solved similar to addition/subtraction problems, but the answer should be written with an appropriate label in units of measurement.	How can I solve problems involving measurement (length)?	CC.2.4.2.A.6 Extend the concepts of addition and subtraction to problems involving length.	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.	metric/customary systems length inch foot yard centimeter decimeter meter tools: foot ruler, yardstick, meter stick, tape measure
Any number can be represented as a length on the number line if numbers are equally spaced on the line.	How can I represent numbers as lengths on a number line?		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.	number line

Unit 5	Geometry- Reason with Shapes and their attributes
Mathematical Practices	**• Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. • Look for and make sense of regularity**

	in repeated reasoning.			
Key Concepts	**Essential Questions**	**PA Core Content Standard**	**Eligible Content**	**Terminology**
Geometric shapes make up our world. The attributes of a 2D shape include its sides and angle. A 2D (plane) shape can be identified by its number of sides and angles. A 2D shape can be drawn, created on a geo-board or constructed with other materials. A 3D (solid) shape can be identified by the number of its faces, edges and vertices. A 3D shape can be constructed using various every objects. The face of 3D shapes may include one or more 2D shapes. A 2D shape has length width. A 3D shape has length, width and height.	How can I describe the attributes of a 2D shape? How can I identify 2D shapes using their attributes? How can I construct 2D shapes? How can I recognize equivalent 2D shapes? How can I describe the attributes of a 3D shape? How can I identify 3D shapes using their attributes? How can I construct 3D shapes? How are 2D and 3D shapes alike? How are they different?	CC.2.3.2.A.1 Analyze and draw two- and three-dimensional shapes having specified attributes	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.)	attribute, side angle face edge vertex (vertices) two-dimensional, plane shape, circle, quadrilateral (square, rectangle, trapezoid, parallelogram), triangle, pentagon, hexagon,, right angle, three -dimensional, solid shape, sphere, cube, rectangular prism, cylinder, cone, pyramid, face, edge, vertex, equivalent figures/shapes row, column, area, square units
A rectangle can be divided into rows and columns to create a grid of equal squares. The area of a rectangle can be found by counting the total number of equal squares within a rectangle.	How can I divide a rectangle into equal squares?		Partition a rectangle into rows and columns of same -size squares and count to find the total number of them.	
Objects can be divided into equal parts and represented by fractions. A fraction is represented numerically as the number of parts/total parts in a whole. Equal shares of an identical whole have	How can an object be divided equally? How can I divide a shape into the same number of equal parts in different ways? How can shares of a shape look	CC.2.3.2.A.2 Use the understanding of fractions to partition shapes into halves, quarters, and thirds.	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.	action, equal parts, half, third, fourth (quarter)

the same value but may not have the same shape.	different but still be equal?			