USD #350 St. John-Hudson

Mathematics Curriculum

Draft May, 2014

USD #350 St. John/Hudson

Kindergarten

Focus: Students will analyze and compare geometric shapes. They will represent and relate whole numbers and apply number sense to solve mathematical problems.

M.K.1	**Outcome: Students will count and compare numbers from 0-20.**	
	Students will…	
	M.K.1.1	count numerals from 0-20. (K.CC.1)
	M.K.1.2	read numerals from 0-20.
	M.K.1.3	write numerals from 0-20. (K.CC.3)
	M.K.1.4	match objects 1:1 with the corresponding number. (K.CC.4)
	M.K.1.5	order numbers smallest to largest 0-20.
	M.K.1.6	compare groups of objects to find the larger or smaller group, through counting or estimation. (K.CC.6)
	M.K.1.7	identify numbers in relation to greater than, less than and equal to. (K.CC.6)
	M.K.1.8	identify an object's place in line using cardinality first, second, third and last. (K.CC.4)
	M.K.1.9	count to answer how many. (K.CC.5)
	M.K.1.10	start from a random number and count to 20. (K.CC.2)
	M.K.1.11	locate the missing number in a sequence from 0-20. (K.OA.4)

M.K.2	**Outcome: Students will count and compare numbers from 0-100**	
	Students will…	
	M.K.2.1	count numerals by ones and tens from 0-100. (K.CC.1) (KP)
	M.K.2.2	read numerals from 0-100.
	M.K.2.3	write numerals from 0-100. (K.CC.3)
	M.K.2.4	order numbers smallest to largest 0-100 .
	M.K.2.5	compare groups of objects to find the larger or smaller group, through counting or estimation of numbers to 100. (K.CC.6)
	M.K.2.6	compare numbers in relation to smaller, larger and equal to up to 100. (K.CC.7)
	M.K.2.7	count to answer “how many?” using objects or tally marks. (K.CC.5) (K15)
	M.K.2.8	start from a random number and count to 100. (K.CC.2)
	M.K.2.9	identify odd and even numerals to 40. (K15)

M.K.3	**Outcome: Students will use, objects, drawings or equations to represent numbers from 11-100 in terms of place value.**	
	Students will…	
	M.K.3.1	compose numbers from 11-100 using a ten frame. (K.NBT.1)
	M.K.3.2	complete a corresponding equation using a ten frame or drawing. (K.NBT.1)
	M.K.3.3	decompose numbers from 11-100 into ones, tens and hundreds using objects. (K.NBT.1)

M.K.4	**Outcome: Students will analyze to compare two-dimensional geometric shapes.**	
	Students will…	
	M.K.4.1	identify flat or two-dimensional (2D) shapes which include circle, square, rectangle, triangle and hexagon. (K.G.3)
	M.K.4.2	name and count sides of flat shapes with different orientations. (K.G.2)
	M.K.4.3	describe objects in the environment using relative positions of above, below and beside. (K.G.1)
	M.K.4.4	model flat shapes using a variety of methods (geo board, sticks, draw, etc.) (K.G.5).
	M.K.4.5	compose simple shapes to form larger shapes. (K.G.6).

M.K.5	**Outcome: Students will analyze to compare two and three-dimensional geometric shapes.**	
	Students will…	
	M.K.5.1	identify solid or three-dimensional (3D) shapes which include cone, cube, cylinder, sphere. (K.G.3)
	M.K.5.2	analyze flat and solid shapes to describe similarities, differences, parts and attributes. (K.G.4)
	M.K.5.3	model solid shapes using a variety of methods (clay, play dough…). (K.G.5)
	M.K.5.4	compose simple shapes to form larger shapes. (K.G.6)
	M.K.5.5	classify shapes as 2D or 3D. (K.G.3)

M.K.6	**Outcome: Students will demonstrate addition as adding to a number.**	
	Students will…	
	M.K.6.1	represent addition from a number with objects, drawings, or equations. (K.OA.1)
	M.K.6.2	solve addition story problems using objects, drawings, or equations to represent a problem. (K.OA.2-3)
	M.K.6.3	decompose numbers less than or equal to ten using a ten frame or equation. (K.OA.3)
	M.K.6.4	add numbers fluently within 10. (K.OA.5)
	M.K.6.5	solve addition problems with sums within 10, using equations in more than one way. (K.OA.2)
	M.K.6.6	find the number that makes 10 when added to a different number using objects or drawings. (K.OA.4)

M.K.7	**Outcome: Students will demonstrate subtraction as taking away from a number.**	
	Students will…	
	M.K.7.1	represent subtraction from a number with objects, drawings, or equations. (K.OA.1)
	M.K.7.2	solve subtraction story problems using objects, drawings, or equations to represent a problem. (K.OA.2-3)
	M.K.7.3	subtract numbers fluently within 10. (K.OA.5)
	K.K.7.4	solve subtraction problems with differences within 10, using equations in more than one way. (K.OA.2)

M.K.8	**Outcome: Students will analyze measurable attributes to compare objects.**	
	Students will…	
	M.K.8.1	describe measurable attributes of objects, such as height and weight, using standard measurement in inches and pounds. (K.MD.1)
	M.K.8.2	describe measurable attributes of objects using nonstandard measurement. (K.MD.1)
	M.K.8.3	compare measurable attributes of objects. (K.MD.2)
	M.K.8.4	classify objects into given categories. (K.MD.3)
	M.K.8.5	create and interpret a bar graph to show mode (most often). (K15)
	M.K.8.6	identify and segment an object into two equal parts to show symmetry.
	M.K.8.7	estimate length and weight using objects or a group of objects.

M.K.9	**Outcome: Students will analyze a pattern for its missing link and create an original pattern.**	
	Students will…	
	M.K.9.1	identify and extend a pattern (AB, ABC, AABB, AAB, ABB). (K15)
	M.K.9.2	identify the missing number from 0-100 by 1s, 2s, 5s, 10s.
	M.K.9.3	identify the missing number using a given rule (function machines). (K15)
	M.K.9.4	create a manipulative or number pattern. (K15)

M.K.10	**Outcome: Students will tell time to the nearest hour and half hour, and make value comparisons between coins.**	
	Students will…	
	M.K.10.1	identify a penny, nickel, dime, and quarter. (K15)
	M.K.10.2	state the values and make comparisons between a penny, nickel, dime, and a quarter. (K15)
	M.K.10.3	show equal values of mixed money using different sets of coins. (K15)
	M.K.10.4	tell time to the hour and half hour, using analog and digital clocks. (K15)
	M.K.10.5	identify the features on an analog and digital clock.

USD #350 St. John/Hudson
1st Grade

Focus: Students will demonstrate various addition and subtraction strategies for learning basic math facts. They will use whole number and place value relationships to solve problems.

M.1.1	**Outcome: Students will use place value to add and subtract using a number grid within 120.**	
	Students will...	
	M.1.1.1	count, order and write numbers within 120. (1.NBT.1)
	M.1.1.2	read and write missing whole numbers starting at a random number within 120, and represent a given number of objects with a written numeral. (1.NBT.1)
	M.1.1.3	use a number grid to solve ten more or ten less problems starting from multiples of ten. (1.NBT.5)
	M.1.1.4	use manipulatives such as straws or cubes to bundle groups of ten ones to represent one ten. (1.NBT.2a)
	M.1.1.5	compose numbers 11-19 with drawings or manipulatives and show understanding of one ten + (one, two, three, etc.) ones. (1.NBT.2b)
	M.1.1.6	mentally solve problems to find ten-more or ten-less within 120 and explain the reasoning used. (1.NBT.5)
	M.1.1.7	compose and decompose whole numbers using tens and ones manipulatives. Example: 42 is made up of 4 tens and 2 ones, or 4 tens and 2 ones makes the number 42. (1.NBT.2)
	M.1.1.8	color a growing number pattern on a number grid to show counts of 2, 5, & 10. (K15)
	M.1.1.9	add or subtract multiples of ten from a random two digit number, and write a number model and explain the reasoning. (1.NBT.4, 6)

M.1.2	**Outcome: The students will solve and create number models for addition and subtraction facts using multiple strategies.**	
	Students will...	
	M.1.2.1	add, subtract, and write corresponding number sentences by counting on a number line to. (1.OA.5)
	M.1.2.2	add and subtract numbers from 0-100 by using a number line or hundreds grid. (1.NBT.4)
	M.1.2.3	Demonstrate fluency of all sums within 10. (1.OA.6)
	M.1.2.4	Solve an equation and explain answers with an unknown whole number. For example, 8+?=11. (1.OA.8)
	M.1.2.5	Use addition to solve subtraction number models. For example, 10-8=? is the same as 8+?= 10. (1.OA.4)
	M.1.2.6	solve and explain addition problems with three whole numbers (in number and story form) using pictures, manipulatives, and symbols to show an unknown number within 20. (1.OA.2, 1.NBT.4)

M.1.3	**Outcome: Outcome: The students will apply strategies of addition and subtraction to increase fluency of sums and differences within 20.**	
	Students will…	
	M.1.3.1	solve number sentences with plus one or minus one. (1.OA.6)
	M.1.3.2	solve number sentences involving doubles up to 10. (1.OA.6)
	M.1.3.3	solve number sentences involving doubles plus one or doubles minus one. (1.OA.6)
	M.1.3.4	use addition to help solve subtraction facts. (1.OA.4, 6)
	M.1.3.5	use fact families to help with addition and subtraction facts. (1.OA.4, 6)

M.1.4	**Outcome: Students will organize objects into categories, create visual displays of information and interpret data.**	
	Students will...	
	M.1.4.1	sort objects (shapes, colors, money, etc.) into like categories of three or more. (1.MD.4)
	M.1.4.2	identify median (middle), mode (most often), and range (spread) for a set of data. (1.MD.4)
	M.1.4.3	collect and record data using tally marks, graphs, or line plots. (K15, 1.MD.4)
	M.1.4.4	ask and answer questions such as "which has more? how much more?" in regard to data. (1.MD.4)
	M.1.4.5	use daily weather or temperature routines for collecting data and graphing information. (1.MD.4, K15)

M.1.5	**Outcome: The students will solve word problems or number sentences within 100 using manipulatives, charts, and pictures.**	
	Students will...	
	M.1.5.1	solve and explain answers of story problems with unknown addends and write addition and subtraction number models to match. (1.OA.1 - 1.OA.4 - 1.NBT.4)
	M.1.5.2	use objects or drawings to solve story problems within 20, and create number models to show unknown numbers in an equation. (1.OA.1, 8)
	M.1.5.3	use charts or number lines to show a number pattern rule. Example: function machines or frames and arrows could show a pattern of +5. (K15)
	M.1.5.4	use objects or drawings to solve and create number models to show addition of three whole numbers up to 20 . (1.OA.2)
	M.1.5.5	apply commutative property (3+7=10, 7+3=10) and associative property (6+4=3+3+4) as strategies to add and subtract. (1.OA.3)
	M.1.5.6	show the relationship between adding and subtracting. Example: If 3+7=10 then 10-7=3 (1.OA.3)

M.1.6	**Outcome: The students will compare measurements and numbers up to 120 using comparison symbols >, <, and =.**	
	Students will...	
	M.1.6.1	locate numbers that are greater than or less than a given number.
	M.1.6.2	show equivalent numbers for a given number and recognize if something is not equal. (1.OA.7)
	M.1.6.3	compare two and three digit numbers up to 120 using symbols >, <, and =. (NBT. 3)
	M.1.6.4	examine number sentences with comparison symbols to decide if the solution is true or false. (1.OA.7)
	M.1.6.5	order three or more objects from longest to shortest. (1.MD.1)
	M.1.6.6	measure line segments and objects using standard and non-standard measurements end to end with no gaps or overlaps. (1.MD.2)
	M.1.6.7	estimate and compare objects that are greater than, less than, almost the same, or equal to (>, <, =) a given standard or non-standard measurement. (NBT.3 & K15)
	M.1.6.8	draw line segments and objects that measure a given length in inches and centimeters. (K15)

M.1.7	**Outcome: The students will utilize clocks and other manipulatives to show fractions of 1/2 and 1/4, and to show equal parts.**	
	Students will...	
	M.1.7.1	use manipulatives and drawings to identify halves, quarters and equal parts of a circle or rectangle. (1.G.3)
	M.1.7.2	divide a clock to show half hour and quarter hour measurements. (1.MD.3)
	M.1.7.3	tell and write time in hours and half hours using digital and analog clocks. (1.MD.3)
	M.1.7.4	tell and write time on an analog clock to show quarter till or quarter past an hour. (1.G.3)
	M.1.7.5	use groups of objects (such as pennies or blocks) to show equal shares.
	M.1.7.6	partition circles and rectangles into two and four equal parts and describe those shares using the words halves, fourths, and quarters or half of, fourth of, and quarter of. (1.G.3)
	M.1.7.7	show how decomposing a shape into more equal shares creates smaller shares. (1.G.3)

M.1.8	**Outcome: The students will create, compare, and distinguish between different shapes, solids, and their attributes.**	
	Students will...	
	M.1.8.1	identify and draw two-dimensional shapes including triangles, squares, rectangles, trapezoids, half-circles, and quarter-circles. (1.G.2)
	M.1.8.2	identify and create three-dimensional shapes including cubes, rectangular prisms, cones, and cylinders. (1.G.2)
	M.1.8.3	create composite shapes and new shapes from those composite shapes. (1.G.2)
	M.1.8.4	distinguish between defining attributes (triangles are closed and have three sides) versus non-defining attributes (color, orientation, size, etc.). (1.G.1)
	M.1.8.5	identify shapes with a line of symmetry and complete symmetrical drawings.
	M.1.8.6	build and draw shapes that possess defining attributes. (1.G.1)

M.1.9	**Outcome: The students will add, subtract, and make exchanges with groups of coins.**	
	Students will...	
	M.1.9.1	add, subtract and make exchanges between coins including pennies, nickels, dimes, quarters, and dollars.
	M.1.9.2	count money and show the same amount in two different ways.
	M.1.9.3	respond to questions about money such as "Who has more?" and “How much more?"

M.1.10	**Outcome: The students will create visual and numerical patterns.**	
	Students will...	
	M.1.10.1	differentiate between a repeating pattern and a growing pattern. (15-P)
	M.1.10.2	finish and create repeating patterns with missing shapes or numbers. (15-P)
	M.1.10.3	finish and create growing patterns with missing shapes or numbers. (15-P)

USD #350 St. John/Hudson
2nd Grade

Focus: Students will apply number sense to compute and solve addition and subtraction problems.

M.2.1	**Outcome: Students will make comparisons about place value using numbers in the base ten system within 1,000.**	
	Students will…	
	M.2.1.1	identify place value in three digit numbers. (2.NBT.1)
	M.2.1.2	use manipulatives such as base ten blocks, cubes of towers, etc. to show that 100 can be thought of as a bundle of tens called a hundred. (2NBT.1a)
	M.2.1.3	decompose numbers with multiples of 100 up to 900 with drawings or manipulatives using groups of 10. (2NBT.1a)
	M.2.1.4	count by 2s, 5s, 10s, and 100s within 1,000. (2NBT.2)
	M.2.1.5	use base ten numerals to read and write numbers to 1,000. (2NBT.3)
	M.2.1 6	write numbers in expanded and written form to 1,000. (2.NBT.3)
	M.2.1.7	compare three-digit numbers using <, =, and > based on place value to 1,000. (2NBT.4)
	M.2.1.8	apply mental math strategies to add and subtract multiples of 10 or 100 to any number between 100 and 900. (2.NBT.8)

M.2.2	**Outcome: Students will add and subtract with sums and differences within 20 using a variety of ways in order to develop fluency and solve problems.**	
	Students will…	
	M.2.2.1	demonstrate fluency of addition and subtraction facts within 20 using mental strategies. (2.OA.2)
	M.2.2.2	identify numbers as even or odd by counting objects by twos. (2.OA.3)
	M.2.2.3	write an equation to express an even number as a sum of two equal addends (doubles). (2.OA.3)
	M.2.2.4	write and solve number sentences with missing addends.
	M.2.2.5	show that addition facts to 20 are computed from memory. (2.OA.2)
	M.2.2.6	solve function machine problems (What's My Rule?). (K15)
	M.2.2.7	find, identify, and use patterns when adding and subtracting. (K15)

M.2.3	**Outcome: Students will solve problems involving addition and subtraction within 1,000.**	
	Students will…	
	M.2.3.1	add and subtract problems within 1,000 using concrete models or drawings. (2.NBT.7)
	M.2.3.2	solve one-and two-step addition and subtraction problems using drawings, objects, and equations with a symbol for the unknown number within 100. (2.OA.1)
	M.2.3.3	use repeated addition (equal addends) to find the total number of objects in rectangular arrays and write an equation to express the total number as a sum of equal addends. (2.OA.4)
	M.2.3.4	add up to four two-digit numbers based on place value and properties of operations. (2.NBT.6)
	M.2.3.5	explain why addition and subtraction strategies work, using place value and the properties of operations. (2.NBT.9)
	M.2.3.6	use the concept of place value when adding or subtracting three-digit numbers including regrouping (composing or decomposing tens or hundreds). (2.NBT.7)
	M.2.3.7	create number lines with evenly spaced points corresponding to numbers within 100 to solve addition and subtraction problems. (2.MD.6)
	M.2.3.8	apply the concept of length to solve addition and subtraction word problems within 100 using the same units. (2.MB.5)

M.2.4	**Outcome: Students will estimate, make comparisons, and solve problems using units of measure.**	
	Students will…	
	M.2.4.1	measure the length of an object selecting and using tools such as rulers, yardsticks, meter sticks, and measuring tapes. (2.MD.1)
	M.2.4.2	choose the appropriate unit of measure for a given task. (K15)
	M.2.4.3	estimate lengths using inches, feet, centimeters, and meters. (2.MD.3)
	M.2.4.4	measure an object using two units of different lengths and describe the relationship to the size of the unit chosen. (2.MD.2)
	M.2.4.5	measure and compare the length of two different objects, determine how much longer or shorter one object is, and express the difference in terms of a standard length unit. (2.MD.4)
	M.2.4.6	apply the concept of length (using the same unit) to solve addition and subtraction word problems with numbers within 100. (2.MD.5)
	M.2.4.7	represent the length of several objects by making a line plot (rounding their lengths to the nearest whole unit). (2.MD.9)

M.2.5	**Outcome: Students will collect, interpret, and represent data in a display with up to four categories.**	
	Students will…	
	M.2.5.1	create a picture graph and a bar graph to represent data including a title, categories, category label, key, and data. (2.MD.10)
	M.2.5.2	represent the length of several objects (rounded to the nearest whole unit) by making a line plot. (2.MD.9)
	M.2.5.3	solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2.MD.10)
	M.2.5.4	record data in a table or chart. (K15)
	M.2.5.5	read tables, graphs, and charts. (K15)
	M.2.5.6	make predictions about data. (K15)
	M.2.5.7	examine data in order to find the minimum, maximum, range (spread), median (middle), and mode (most often). (K15)

M.2.6	**Outcome: Outcome: Students will solve word problems using money and tell time to the nearest five minutes.**	
	Students will…	
	M.2.6.1	tell time from analog and digital clocks to the nearest five minutes using a.m. and p.m. (2.MD.7)
	M.2.6.2	name and number the months of the year and days in a week.
	M.2.6.3	write the time after reading analog and digital clocks to the nearest five minutes.
	M.2.6.4	solve addition and subtraction word problems involving dollar bills, quarters, dimes, nickels, and pennies using dollar and cent symbols appropriately. (2.MD.8)
	M.2.6.5	solve word problems using only dollars or only cents. (2.MD.8)

M.2.7	**Outcome: Students will create polygons and make fractional comparisons using the attributes of shapes.**	
	Students will…	
	M.2.7.1	identify and draw shapes based on a given set of attributes including triangles, quadrilaterals (squares, rectangles, and trapezoids), pentagons, hexagons, and cubes. (2.G.1)
	M.2.7.2	identify multiple lines of symmetry.
	M.2.7.3	draw, identify, measure, and name lines, points, rays, and segments.
	M.2.7.4	identify, draw, classify, compare, and construct polygons.
	M.2.7.5	divide a rectangle into same-size squares (rows and columns) and then determine the total number of squares. (2.G.2)
	M.2.7.6	find the area of a rectangle divided into square units.
	M.2.7.7	identify fractional parts (of a region of a set).
	M.2.7.8	divide circles and rectangles into two, three, or four equal shares (regions). (2.G.3)
	M.2.7.9	use vocabulary terms such as halves, thirds, half of, third of, fourth (or quarter) of when describing parts of a whole. (2.G.3)
	M.2.7.10	show a “whole” is composed of two halves, three thirds, or four fourths. (2.G.3)

M.2.8	**Outcome: Students will demonstrate repeated addition, use of manipulatives and drawings, and write equations in order to gain foundations for multiplication.**	
	Students will…	
	M.2.8.1	use repeated addition (equal addends) to find the total number of objects in rectangular arrays and write an equation to express the total number as a sum of equal addends. (2.OA.4)
	M.2.8.2	use manipulatives, drawings, arrays, number sentences, repeated addition, and story problems to explain and demonstrate the meaning of multiplication. (K15)
	M.2.8.3	write equations representing sums of two equal addends (doubles) to develop a foundation for multiplication.

USD #350 St. John/Hudson
3rd Grade

Focus: Students will apply number sense to compute and solve multiplication and division problems. Students will use fractions to represent parts of a whole.

M.3.1	**Outcome: Students will use patterns in the four operations of arithmetic to solve problems.**	
	Students will…	
	M.3.1.1	identify and use patterns in the four operations. (3.OA.9, K15)
	M.3.1.2	create addition/subtraction and multiplication/division fact families.
	M.3.1.3	examine the relationships and the patterns between operations in order to solve problems. (K15)

M.3.2	**Outcome: Students will use place value and properties of operations to perform multi-digit arithmetic.**	
	Students will...	
	M.3.2.1	round whole numbers to the nearest 10 or 100. (3.NBT.1)
	M.3.2.2	apply concepts of place value to add and subtract whole numbers within 1,000.
	M.3.2.3	compare and order whole numbers to the ten thousands place.
	M.3.2.4	identify place value through hundredths.
	M.3.2.5	solve real world problems with money using dollars and cents notation.
	M.3.2.6	compute multiplication of one-digit whole numbers by multiples of 10 in the 10-90 range. (3.NBT.3)
	M.3.2.7	identify even and odd numbers to 1,000.

M.3.3	**Outcome: Students will use the four operations for a variety of problem solving strategies.**	
	Students will...	
	M.3.3.1	multiply and divide fluently within 100. (3.OA.7)
	M.3.3.2	solve function machine (t-table) problems with one or two rules (What's My Rule?). (K15)
	M.3.3.3	demonstrate division by finding the number that makes the product when multiplied by a factor. (3.OA.6)
	M.3.3.4	solve two-step problems involving the four operations. (3.OA.8)
	M.3.3.5	solve problems using equations with a letter standing for the unknown quantity. (3.OA.8)
	M.3.3.6	apply commutative, associative, and distributive properties of operations as strategies to multiply and divide. (3.OA.5)

M.3.4	**Outcome: Students will interpret and solve problems involving whole numbers while using multiplication and division.**	
	Students will...	
	M.3.4.1	interpret whole number products by expressing the total number of objects in each group. (3.OA.1)
	M.3.4.2	interpret whole number quotients by expressing the number of objects shared equally in each share. (3.OA.2)
	M.3.4.3	use multiplication and division within 100 to solve word problems using drawings and equations with a symbol for the unknown number to represent the problem. (3.OA.3)
	M.3.4.4	determine the unknown whole number in multiplication and division that makes the equation true. (3.OA.4)

M.3.5	**Outcome: Students will interpret data, create visual displays of information, and make predictions about the likelihood of events.**	
	Students will...	
	M.3.5.1	collect and record data using tables, tally charts, bar graphs, pictographs, Venn diagrams, or line plots. (3.MD.3) & (K15)
	M.3.5.2	predict outcomes of events. (K15)
	M.3.5.3	calculate minimum, maximum, range (spread), median (middle), and mode (most often) from a set of data. (K15)
	M.3.5.4	categorize measurement data by using rulers marked to halves and fourths of an inch. (3.MD.4)
	M.3.5.5	represent data by making a line plot marked off in whole numbers, halves, or quarters. (3.MD.4)
	M.3.5.6	identify tools used to measure weight.
	M.3.5.7	distinguish between possible and impossible, likely and unlikely events. (K15)

M.3.6	**Outcome: Students will solve word problems involving measurement and estimation.**	
	Students will...	
	M.3.6.1	examine in order to use a thermometer to state the temperature in Fahrenheit and Celsius.
	M.3.6.2	tell time to the nearest minute. (3.MD.1)
	M.3.6.3	solve word problems involving addition and subtraction in minutes. (3.MD.2)
	M.3.6.4	measure and estimate liquid volumes and masses of objects. (3.MD.2)
	M.3.6.5	compute one-step word problems involving masses or volumes using addition, subtraction, multiplication, and division. (3.MD.2)

M.3.7	**Outcome: Students will demonstrate finding area through counting unit squares or by using a formula.**	
	Students will...	
	M.3.7.1	compute the area of regular shapes. (3.MD.5)
	M.3.7.2	solve real world problems by finding the perimeter of regular and irregular shapes. (3.MD.8)
	M.3.7.3	examine in order to measure areas by counting unit squares. (3.MD.6)
	M.3.7.4	determine the areas by counting unit squares. (3.MD.5a)
	M.3.7.5	identify tools used to measure area.
	M.3.7.6	find the area by adding and/or multiplying. (3.MD.7)

M.3.8	**Outcome: Students will represent fractions as numbers and make comparisons between fractions.**	
	Students will...	
	M.3.8.1	identify the numerator as the part of a whole. (3.NF.1)
	M.3.8.2	identify the denominator as the quantity of the whole. (3.NF.1)
	M.3.8.3	diagram fractions on a number line. (3.NF.2)
	M.3.8.4	identify equivalent fractions on a number line. (3.NF.3a
	M.3.8.5	make simple equivalent fractions. (3.NF.3b)
	M.3.8.6	write whole numbers as fractions. (3.NF.3c)
	M.3.8.7	compare fractions with the same numerator or the same denominator. (3.NF.3d)
	M.3.8.8	record comparisons of fractions with >, +, < and justify by using a visual fraction model. (3.NF.3d)

M.3.9	**Outcome: Students will classify shapes by examining the properties of the geometric figures.**	
	Students will...	
	M.3.9.1	categorize shapes by their attributes. (3.G.1)
	M.3.9.2	classify shapes by shared attributes and draw shapes that fit specific categories.
	M.3.9.3	divide shapes into parts with equal areas and identify the area of each part as a fraction. (3.G.2)

USD #350 St. John/Hudson
4th Grade

Focus: Students will apply the four basic operations to fluently solve real world problems using multi-digit numbers including decimals. Students will compare, contrast, and convert decimals and fractions. They will analyze two-dimensional shapes in order to describe, draw, and classify properties of lines and angles.

M.4.1	**Outcome: Students will use place value concepts to compare, round, and evaluate numbers.**	
	Students will...	
	M.4.1.1	read and write whole numbers (using base 10 numerals) to the hundred millions, and decimals to the hundredths using number names and expanded form. (4.NT.2)
	M.4.1.2	compare and order whole numbers to the millions place and decimals to the hundredths place. (4.NBT.2)
	M.4.1.3	estimate sum, difference, product, and quotient of base 10 numerals. (4.OA.3)
	M.4.1.4	describe that in a multi-digit whole number, a digit in the ones place represents ten times the place to its right. For example, recognize that 700/70=10 by applying place value and division. (4.NBT.1)
	M.4.1.5	round whole numbers to any place value and decimals to the hundredths place. (4.NTB.3)
	M.4.1.6	all factor pairs for a whole number in the range of 1-100 by demonstrating that a whole number is a multiple of each of its factors. (4.OA.4)
	M.4.1.7	evaluate whole numbers to determine if they are divisible by 2, 5, and 10 through the use of divisibility rules. (4.OA.4)

M.4.2	**Outcome: Students will add and subtract multi-digit numbers in order to solve problems with a variety of strategies.**	
	Students will...	
	M.4.2.1	add and subtract multi-digit numbers frequently to the 100,000's place. (4.NBT.4)
	M.4.2.2	add and subtract multi-digit numbers using whole numbers and decimals.
	M.4.2.3	operate a calculator adding and subtracting multi-digit whole numbers and decimals.
	M.4.2.4	solve a number story problem using multi-digit whole and decimal numbers. (4.MD.2)

M.4.3	**Outcome: Students will use properties of multiplication and division to solve real-world problems.**	
	Students will...	
	M.4.3.1	identify factor pairs for whole numbers 1-100. (4.OA.4)
	M.4.3.2	determine whether a given whole numbers, in the range 1-100, is prime or composite. (4.OA.4)
	M.4.3.3	explain that a whole number is a multiple of each of its factors. (4.OA.4)
	M.4.3.4	show the problem as a multiplicative vs. addition problem (Example: Multiplication problem vs. addition problem). (4.OA.2)
	M.4.3.5	model problems with arrays. (4.OA.1)
	M.4.3.6	interpret remainders as whole numbers, fractions, and decimals. (4.OA.3)
	M.4.3.7	use estimation strategies to create similar problems to be solved with mental math and find approximate or "ballpark" answers. (4.OA.3)
	M.4.3.8	solve two-digit by two digit multiplication problems (using lattice or partial products), and four digit dividend by a one digit divisor (using partial quotients and traditional methods). (4.NBT.5-6)
	M.4.3.9	apply multiplication and division strategies to create drawings, equations, and word problems. (4.OA.2)

M.4.4	**Outcome: Students will apply equivalent names for numbers in order to organize and display data in graphs, charts, and diagrams.**	
	Students will...	
	M.4.4.1	create a pattern demonstrating knowledge of odd and even numbers. (4.OA.5)
	M.4.4.2	use of tally marks, standard notation, expanded notation, and exponential notation, to illustrate equivalent names for numbers.
	M.4.4.3	collect data using counting, maps, and surveys and also organize data using tally charts and Venn diagrams. (4.MD.4)
	M.4.4.4	display data using graphs and circle graphs using percent circles. (4.MD.4)
	M.4.4.5	use a data set to figure and identify numbers as minimum, maximum, mean, median, mode, and range.
	M.4.4.6	create a data set using minimum, maximum ,mean, median, mode, and range. (4.MD.4)

M.4.5	**Outcome: Students will add, subtract and compare fractions, mixed numbers and decimals to determine their equivalency when solving real world problems.**	
	Students will...	
	M.4.5.1	represent fractions using pictures, models, and pattern block representations. (4.NF.3a)
	M.4.5.2	add and subtract fractions with like denominators.
	M.4.5.3	determine equivalent fractions with unlike denominators. (4.NF.2)
	M.4.5.4	convert fractions to decimals. (4.MD.6)
	M.4.5.5	multiply a fraction by a whole number and convert the improper fraction to a mixed number. (4.MD.4b)
	M.4.5.6	solve word problems involving multiplication of a fraction by a whole number. (4.MD.4c)
	M.4.5.7	express a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100, and use this technique to add two fractions with denominators of 10 and 100. (4.NF.5)
	M.4.5.8	use fractions to show probability and categorize events or results in terms of equally likely outcomes.

M.4.6	**Outcome: Students will estimate, measure, and compare metric units of weight and length.**	
	Students will...	
	M.4.6.1	generate measurement data by measuring lengths using rules. (4.MD.4)
	M.4.6.2	record data creating a line plot. (4.MD.4)
	M.4.6.3	measure to the nearest quarter inch, mm, and cm. (4.MD.1)
	M.4.6.4	estimate the length of an object to estimate the length of a greater distance.
	M.4.6.5	convert units of measurements of length (ex: m to cm, cm to mm). (4.MD.1)
	M.4.6.6	record equivalent measures (ex: km, m, cm, kg, g, lb, oz).
	M.4.6.7	generate measurement data by measuring units of weight using a balance.
	M.4.6.8	estimate the weight of an object to estimate the weight of a larger object.
	M.4.6.9	convert units of weight (ex: g to mg, mg to kg).

M.4.7	**Outcome: Students will use lines of symmetry and polygon characteristics for classification.**	
	Students will...	
	M.4.7.1	identify properties and characteristics of regular and irregular polygons.
	M.4.7.2	classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or right angles. (4.G.2)
	M.4.7.3	find and draw lines of reflection and lines of symmetry. (4.G.3)
	M.4.7.4	relate the lines of symmetry to the number of sides on a regular polygon.

M.4.8	**Outcome: Students will apply area and perimeter formulas to regular and irregular shapes.**	
	Students will...	
	M.4.8.1	find area and perimeter for rectangles and squares. (4.MD.3)
	M.4.8.2	find area and perimeter for irregular shapes, by counting units.
	M.4.8.3	count unit squares and fractions of squares to find estimated areas.

M.4.9	**Outcome: Students will apply properties of lines and angles to create polygons and solve real-world problems.**	
	Students will...	
	M.4.9.1	draw, identify, and name points, line segments, lines, and rays. (4.G.1)
	M.4.9.2	draw and contrast perpendicular and parallel lines. (4.G.1)
	M.4.9.3	draw and identify types of angles, quadrangles, triangles, and parallelograms.
	M.4.9.4	use a compass and straight edge, to create different triangles and circles for graphing.
	M.4.9.5	use a protractor to measure angles within 2 degrees and to draw angles of various measure. (4.MD.6)
	M.4.9.6	describe angle measure as additive and solve addition and subtraction problems to find unknown angles on a diagram in real-world problems.

USD #350 St. John/Hudson
5th Grade

Focus: Students will use the four mathematical operations when working with fractions of like and unlike denominators and convert between fractions, decimals, and percentages. Students will estimate and apply formulas to calculate area for plane figures and volume for solids

M.5.1	**Outcome: Students will use the four operations (addition, subtraction, multiplication, division) for a variety of problem-solving applications.**	
	Students will...	
	M.5.1.1	use addition and subtraction with decimals, money, time, positive and negative numbers, and to estimate sums and differences. (5.NBT.7)
	M.5.1.2	memorize and apply the order of operation (PEMDAS) to solve equations.
	M.5.1.3	memorize multiplication facts up to 12 x 12. (5.NBT.5,7)
	M.5.1.4	solve three digit by three digit multiplication problems using Lattice and Partial Product methods. (5.NBT.5)
	M.5.1.5	use multiplication concepts to identify fact families, construct arrays, and identify square numbers. (5.NBT.7)
	M.5.1.6	use divisibility rules to create factor strings of numbers to 100, show prime factorization, and identify prime and composite numbers. (5.NF.5a-b)
	M.5.1.7	solve real-world problems to find discount and sale prices. (5.NF.4a)
	M.5.1.8	extend multiplication concepts to include use of exponents, exponential notation, square root, and scientific notation with and without a calculator.
	M.5.1.9	identify correct use of the commutative and distributive properties and how they relate to multiplication and division. (5.NBT.2)
	M.5.1.10	solve division problems with a two-digit divisor, up to hundredths, and display the remainder as a fraction or decimal.
	M.5.1.11	Explain multiplication patterns in numbers of zeroes using powers of 10. (5.NBT.2)

M.5.2	**Outcome: Students will perform the four basic operations to solve fraction problems, convert and order fractions, decimals, and percentage, with and without a calculator, and calculate probability.**	
	Students will...	
	M.5.2.1	compare and order decimals to the ten-thousandths place. (5.NBT.3b)
	M.5.2.2	convert fractions to decimals and percentage with and without a calculator, and find equivalent fractions and decimals. (5.NF.3,6,7)
	M.5.2.3	use the four basic operations to solve fraction problems with like and unlike denominators. Students will use those strategies to find equivalent fractions, compare and order fractions, convert mixed numbers and improper fractions, and to identify mixed numbers with pattern blocks. (5.NF.2-7)
	M.5.2.4	calculate probability using fractions and percentage.

M.5.3	**Outcome: Students will utilize rounding, place value, and number concepts to demonstrate number sense.**	
	Students will...	
	M.5.3.1	read and write numbers to the trillions and thousandths place.
	M.5.3.2	compare numbers, decimals, and fractions using <, >, and = symbols.
	M.5.3.3	illustrate place value concepts by writing in expanded form, using number names, and using base ten numerals. (5.NBT.3a)
	M.5.3.4	round whole numbers to the nearest ones to millions place, decimals to any place value, and fractions to whole numbers. (5.NBT.4)
	M.5.3.5	label numbers as even/odd, prime/composite, and represent numbers with base ten blocks.
	M.5.3.6	identify number line patterns, including negative integers (numbers), square roots, sum, difference, product, and quotient. (5.NBT.1)
	M.5.3.7	create and solve number expressions using parentheses and brackets.

M.5.4	**Outcome: Students will calculate volume with and without formulas for regular and irregular shapes.**	
	Students will...	
	M.5.4.1	describe how volume is a characteristic of a solid 3D figure. (5.MD.3)
	M.5.4.2	explain volume as additive, and find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of non-overlapping parts, applying this technique to solve real-world problems. (5.MD.5)
	M.5.4.3	measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units. (5.MD.4)
	M.5.4.4	calculate the volume of irregular 3D figures by using volume displacement of an object. (5.MD.5)
	M.5.4.5	calculate the volume of regular 3D figures by using formulas.

M.5.5	**Outcome: Students will classify polygons based on their properties and use measurement of different two-dimensional (2D) objects to apply formulas for area and perimeter.**	
	Students will...	
	M.5.5.1	classify, compare, and contrast 2D polygons based on properties. (5.G.4)
	M.5.5.2	use a protractor to find angle measures of polygons and name triangles according to angle measures. (5.G.4)
	M.5.5.3	measure various objects in inches (nearest 1/8), feet, m, mm, cm, and identify units of weight and volume.
	M.5.5.4	use conversion factors to convert different units of measure in both the Customary (English) and metric systems. (5.MD.1)
	M.5.5.5	create 2-dimensional shapes to identify area and perimeter and be able to apply formulas to solve for both. (5.NF.4b)
	M.5.5.6	show the relationship between categories and sub-categories of polygons. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

M.5.6	**Outcome: Students will create data displays using data landmarks and real-world numbers.**	
	Students will...	
	M.5.6.1	create line plots and/or stem and leaf plots using data landmarks. (5.MD.2)
	M.5.6.2	produce various graphs (circle, line, and bar) using positive and negative numbers. (5.OA.3)
	M.5.6.3	represent real-world and mathematical problems by graphing Quadrant I of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5.G.2)
	M.5.6.4	display organized data in computer-created graphs, line plots, or pictographs.

M.5.7	**Outcome: Students will evaluate numerical expressions and solve for an unknown variable.**	
	Students will...	
	M.5.7.1	create simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. Example: Express “add 8 and 7, then multiply by 2” as 2 x (8+7). (5.OA.2)
	M.5.7.2	create and identify number sentences and the problems they solve.
	M.5.7.3	solve equations for an unknown variable.

M.5.8	**Outcome: Students will measure, construct, name and label angles, and evaluate angle relationships.**	
	Students will...	
	M.5.8.1	draw, measure, and label different angles using both half-circle and full-circle protractors. (5.G.3)
	M.5.8.2	identify types of angles (perpendicular, acute, obtuse, right, reflex, straight, opposite, and adjacent) based on angle measures and location. (5.G.3)
	M.5.8.3	evaluate angle relationships and relate the number of sides of a 2D object in relation to its interior angle sums. Example: Triangle = 180 degrees, Square (Quadrilateral) = 360 degrees. Students will use this relationship to find interior angle measures without using a protractor. (5.G.3)
	M.5.8.4	identify angle measures of the hands of a clock and translate this measurement into fractional parts of an hour.

USD #350 St. John/Hudson
6th Grade

Focus: Students will apply rate and ratio to rational numbers and apply properties of operations to generate and solve equivalent expressions. Students will solve balanced equations. They will analyze and model probability incorporating various data displays.

M.6.1	**Outcome: Students will apply the four functions (addition, subtraction, multiplication, and division) to fractions and percent when solving real-world problems.**	
	Students will...	
	M.6.1.1	add, subtract, multiply, and divide mixed numbers and improper fractions. (6.NS.1)
	M.6.1.2	convert fractions to decimals and decimals to percent, with and without a calculator.
	M.6.1.3	reduce fractions to simplest form and create equivalent fractions.
	M.6.1.4	determine sales tax, discount, sale price, and the better buy in real-world problems. (6.RP.3b)

M.6.2	**Outcome: Students will calculate area, perimeter, and volume of shapes using formulas.**	
	Students will...	
	M.6.2.1	use formulas to determine area of triangles and quadrilaterals. (6.G.1)
	M.6.2.2	use formulas to determine area and circumference of a circle. (6.G.2)
	M.6.2.3	identify area and perimeter of regular and irregular shapes.
	M.6.2.4	calculate volume of 3D objects on paper only.
	M.6.2.5	estimate area and perimeter of shapes.
	M.6.2.6	represent 3D figures as 2D nets, with and without formulas. (6.G.4)

M.6.3	**Outcome: Outcome: Students will use data collected from questions, observations, and experiments to analyze patterns and relationships in the data.**	
	Students will...	
	M.6.3.1	analyze data from a question to determine whether or not it is a statistical question based on the variability of its answer. (6.SP.1)
	M.6.3.2	analyze data collected from a statistical question to describe its center, spread, and overall shape. (6.SP.2)
	M.6.3.3	conduct experiments and record outcomes to determine the likelihood of events, and random or biased results. (6.EE.9)
	M.6.3.4	summarize numerical data sets in relation to their context, by reporting the number of observations and describing the attribute under investigation, including how it was measured and units of measurement. (6.SP.5 a-b)
	M.6.3.5	analyze any overall patterns in data including, median, mean, interquartile range, and absolute deviation, and describing any other patterns in the data. (6.SP.5c)
	M.6.3.6	relate the overall shape of the data in the context in which it was gathered. (6.SP.5d)
	M.6.3.7	describe the difference between a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. (6.SP.3)

M.6.4	**Outcome: Outcome: Students will classify figures, both two and three dimensional, by comparing their characteristics and measuring their sides and angles.**	
	Students will...	
	M.6.4.1	use geometry tools to create six types of triangles(Acute, Obtuse, Right, Isosceles, Equilateral, Scalene), and be able to identify them according to their length of sides and measure of angles.
	M.6.4.2	draw, measure, and duplicate angles and triangles to scale using a protractor, compass, and straight edge.
	M.6.4.3	produce transformations of two dimensional objects to scale on a coordinate plane. (6.G.3)
	M.6.4.4	calculate area of a polygon by decomposing the polygon into rectangles and triangles. (6.G.1)
	M.6.4.5	compare and contrast various geometric solids(3D) by identifying corners, edges, faces, vertices, and congruent figures. (6.G.4)
	M.6.4.6	calculate the interior angle sum of a polygon by decomposing it into triangles.

M.6.5	**Outcome: Outcome: Students will find exact measurements of the length and weight of objects and make conversions between like systems of measurement.**	
	Students will...	
	M.6.5.1	perform measurements on different objects to the nearest 1/16 of an inch and nearest mm.
	M.6.5.2	weigh objects using a balance scale.
	M.6.5.3	compare distances/weights in different units of measure and perform conversions between different units.

M.6.6	**Outcome: Students will create data sets from real world problems and display the data in various numerical plots and graphs.**	
	Students will...	
	M.6.6.1	collect data in order to create data sets from which to identify landmarks.
	M.6.6.2	display collected numerical data in plots on a number line including dot plots(line plots), histograms, and box plots(box and whiskers). (6.SP.4)
	M.6.6.3	graph data sets on double line graphs and step graphs, and identify possible outliers and their effect on the overall data. (6.NS.6b)

M.6.7	**Outcome: Students will use any of the four operations to solve expressions involving the commutative and distributive properties.**	
	Students will...	
	M.6.7.1	read, write, and compare numbers in standard and expanded form, scientific notation, numbers to trillions in whole numbers, and ten-thousandths in decimals. (6.EE.1)
	M.6.7.2	use any of the four operations to fluently solve problems using multi-digit numbers, decimals, fractions, and mixed numbers. (6.NS.2)
	M.6.7.3	use the commutative and distributive property to write and solve equations.
	M.6.7.4	factor an expression using the distributive property and the greatest common factor. (6.NS.4)
	M.6.7.5	identify number line sequences using positive and negative numbers. (6.NS.6a)
	M.6.7.6	perform the order of operations(PEMDAS) to solve any expression. (6.EE.2c)

M.6.8	**Outcome: Students will use the commutative and distributive properties to solve equations.**	
	Students will...	
	M.6.8.1	identify a simple pattern using a function table.
	M.6.8.2	solve real-world and mathematical problems by writing and solving equations in the form x + p = q and px=q for cases in which p,q, and x are all nonnegative rational numbers. (6.EE.7)
	M.6.8.3	graph a solution set of an inequality of the form x>c or x<c on a number line. (6.EE.8)
	M.6.8.4	use variables to represent two quantities in a real world problem that change in relation to one another, and write an equation to represent two variables. (6.EE.9)
	M.6.8.5	apply the distributive property to represent expressions in an equivalent manner, for example, 3(2+x) is equivalent to 6+3x and 6(4x+3y) is equivalent to 24x+18y. (6.EE.3)
	M.6.8.6	balance and equation with up to three terms and two variables using the four operations and both positive and negative numbers(sometimes using a pan-balance).

M.6.9	**Outcome: Students will perform the four basic operations using rational numbers, and interpret absolute value.**	
	Students will...	
	M.6.9.1	add, subtract, multiply, and divide rational numbers using a number line and formulas. (6.NS.5)
	M.6.9.2	identify a rational number as a point on a number line, and position it correctly on a coordinate plane or line diagram. (6.NS.6c)
	M.6.9.3	identify the absolute value of a rational number as its distance from 0 on the number line for a positive or negative quantity in a real world situation. (6.NS.7c)
	M.6.9.4	distinguish comparisons of absolute value from statements about order. (6.NS.7d)

M.6.10	**Outcome: Students will apply rates, ratios, and properties to solve real-world problems.**	
	Students will...	
	M.6.10.1	use rates and ratios to write proportions for unit rates, equivalent ratios, and solve ratio proportions. (6.RP.1-3)
	M.6.10.2	solve rate proportion problems by using the cross-products method. (6.RP.3)
	M.6.10.3	use maps to produce scale drawings of real world situations and measure and estimate mileage and degrees of latitude and longitude.

USD #350 St. John/Hudson
7th Grade

Focus: Students will apply basic algebraic and geometric concepts to proportional relationships, use operations with rational numbers, and work with expressions and linear equations. Students will solve problems involving informal geometric constructions and utilize two and three-dimensional shapes to solve problems involving area, surface area and volume.

M.7.1	**Outcome: Students will gather, create, and analyze data displays.**	
	Students will...	
	M.7.1.1	describe data sets using measures of central tendency. (7.SP.1-3)
	M.7.1.2	display a data line/double line graph, bar/double bar graph, histogram, stem-and-leaf plot, box-and-whisker plot (box plot), and a scatter plot. (7.SP.3- 4)
	M.7.1.3	construct a data table, frequency table, and cumulative frequency table. (7.SP.3)
	M.7.1.4	utilize tables and graphs to solve real-world problems from data gathered. (7.SP.3-4)

M.7.2	**Outcome: Students will use number theory and algebraic reasoning to solve one-step equations.**	
	Students will...	
	M.7.2.1	evaluate expressions with exponents. (7.NS.1-3)
	M.7.2.2	compute expressions using scientific notation. (7.NS.1-3)
	M.7.2.3	apply order of operations to solve expressions using rational numbers. (7.NS.3)
	M.7.2.4	utilize a factor tree to find Lowest Common Multiple (LCM) and Greatest Common Factor (GCF) and apply LCM and GCF to real situations. (7.NS.2-3)
	M.7.2.5	translate words to mathematical expressions to model real world situations.(7.EE.4)
	M.7.2.6	evaluate expressions combining like terms. (7.EE.3,4)
	M.7.2.7	solve one-step equations and apply to real situations. (7.EE.3-4)

M.7.3	**Outcome: Students will add, subtract, multiply and divide integers and rational numbers.**	
	Students will...	
	M.7.3.1	compare and order integers using absolute value and number line with wholes, fractions, and decimals and apply to real situations; temperature, sports, etc. (7.NS.1-3)
	M.7.3.2	evaluate expressions with integers and decimals.(7.NS.1-3, 7.EE.3-4)
	M.7.3.3	plot and identify ordered pairs with integers on a coordinate plane and apply to coordinate geometry and navigation.
	M.7.3.4	use real-world problems to solve mental math using commutative, associative, distributive properties and divisibility rules using integers and apply integer operations to business models. (7.NS.1-3)
	M.7.3.5	compare and order fractions. (7.NS.1-3)
	M.7.3.6	solve equations with fractions and model real situations using equations involving finance, science, geometry, etc. (7.EE.4)
	M.7.3.7	solve real-world problems involving interest, discount, tips, taxes, etc. (7.NS.1-3, 7.EE.2-3)

M.7.4	**Outcome: Students will convert measurements and solve for indirect measurements using proportional reasoning.**	
	Students will...	
	M.7.4.1	create, write, and solve proportions, rates, and ratios. (7.RP.1-3, 7.G.1-3)
	M.7.4.2	use proportions, ratios, and rates with and without technology to compare similar figures, scale drawings, maps, and perimeter and area as it applies to architecture. (7.SP.5-7)
	M.7.4.3	use proportions to find indirect measurements in similar figures. (7.EE.3-4)
	M.7.4.4	use proportions to model real situations such as using an object's shadow to find its height.
	M.7.4.5	apply dimensional analysis to conversions and apply to measurement and physics.

M.7.5	**Outcome: Students will construct, and analyze two-dimensional (2D) and three-dimensional (3D) figures using plane geometry.**	
	Students will...	
	M.7.5.1	identify and name points, lines, planes, rays, and line segments and connect concepts to real-world objects.
	M.7.5.2	classify, measure, and explain the relationship between supplementary and complimentary angles. (7.G.5)
	M.7.5.3	classify lines using parallel, perpendicular, skew, and transversal and apply to real-world problems involving house construction and roads.
	M.7.5.4	name the parts of the circle. (7.G.4, 6)
	M.7.5.5	classify triangles based on properties, apply algebra to science and architecture to find angle measurements. (7.G.2)
	M.7.5.6	transform figures on a coordinate plane.
	M.7.5.7	apply symmetry and congruence to art and life sciences.

M.7.6	**Outcome: Students will apply formulas for perimeter, area, and circumference to solve real-world problems.**	
	Students will...	
	M.7.6.1	convert measurements within customary and metric measurement and apply to science, agriculture, and sports. (7.EE.3-4)
	M.7.6.2	calculate perimeter and apply to geography, sports, and architecture. (7.G.4)
	M.7.6.3	estimate and solve area for 2D objects and from graphed points applying to geography, surveying, and agriculture. (7.G.4, 6)

M.7.7	**Outcome: Students will use two and three-dimensional figures and their characteristics in order to solve real-world problems.**	
	Students will...	
	M.7.7.1	calculate the volume and surface area of regular 3D solids. (7.G.4,6)
	M.7.7.2	create 2D figures from slicing regular 3D solids. (7.G.3)
	M.7.7.3	apply the formulas for volume and surface area in order to solve real-world problems about house construction and agriculture.

M.7.8	**Outcome: Students will calculate the probability of events and use probability to predict outcomes.**	
	Students will...	
	M.7.8.1	apply probability to sample space. (7.SP.5-8)
	M.7.8.2	use a simulation to find probability. (7.SP.5-8)
	M.7.8.3	calculate the probability of a compound event. (7.SP.5-8)
	M.7.8.4	apply probability to games and real life situations to predict future events.

M.7.9	**Outcome: Students will solve, create, and apply multi-step equations and inequalities to solve real world problems.**	
	Students will...	
	M.7.9.1	evaluate two-step equations using properties. (7.EE.4)
	M.7.9.2	evaluate and graph one-step inequalities. (7.EE.4)
	M.7.9.3	apply two-step equations and inequalities to business, consumer math, and earth science.

M.7.10	**Outcome: Students will write, evaluate, and graph functions to solve real world problems.**	
	Students will...	
	M.7.10.1	determine a pattern using an equation in a function table. (K15)
	M.7.10.2	determine a function using variables and expressions. (7.EE.3-4)
	M.7.10.3	apply functions to real world situations including physical science, consumer math, sports, and nutrition.

USD #350 St. John/Hudson
Basic Algebra / 8th Grade

Focus: Students will apply algebraic principles to operations with real numbers in proportions, linear equations, and geometric relationships.

M.BA.1	**Outcome:**	
	Students will...	
	M.BA.1.1	define and identify variables, expressions, and equations. (8.FI.5)
	M.BA.1.2	combine like terms in expressions, equations, and inequalities. (8.EE.7)
	M.BA.1.3	solve one-step equations and inequalities by adding, subtraction, multiplying or dividing. (8.EE.7)
	M.BA.1.4	solve two-step equations. (8.EE.7)
	M.BA.1.5	graph points on a coordinate plane. (8.EE.6)

M.BA.2	**Outcome: Students will add, subtract, multiply, and divide integers and exponents.**	
	Students will...	
	M.BA.2.1	graph integers on a number line.
	M.BA.2.2	solve equations containing integers by multiplying, dividing, adding, and/or subtracting.
	M.BA.2.3	apply properties of exponents (positive, negative, and roots) to solve problems. (8.EE.1-4)
	M.BA.2.4	simplify and solve problems with positive and negative exponents. (8.EE.1-2)
	M.BA.2.5	convert numbers into and out of scientific notation. (8.EE.3-4)
	M.BA.2.5	express metric measurements using scientific notation .

M.BA.3	**Outcome: Collect, display, and analyze data.**	
	Students will...	
	M.BA.3.1	create and analyze scatter plots, line graphs, histograms, bar graphs, box and whisker plots. (S-ID 1, N-Q 1, F-IF 4)
	M.BA.3.2	calculate and interoperate measures of central tendency and identify outliers. (8.SP.1-4)
	M.BA.3.3	make predictions based on data displays and measures of central tendency. (S-ID 2-4)
	M.BA.3.4	identify population and sample. (8.SP.1-4)
	M.BA.3.5	compare slope of line graph to rate of change. (8.SP.1-4)

M.BA.4	**Outcome: Students will identify, construct, and analyze two dimensional figures using plane geometry.**	
	Students will...	
	M.BA.4.1	construct, measure, and compare points, lines, angles, and planes.
	M.BA.4.2	construct parallel and perpendicular lines (using coordinate plane and slope). (8.EE.6, 8.G.1-5)
	M.BA.4.3	classify polygons using angles and properties. (8.G.2-3)
	M.BA.4.4	verify properties of rotation, translation, and reflection of polygons on the coordinate plane. (8.G.1-5)
	M.BA.4.5	construct figures using line and rotational symmetry .
	M.BA.4.6	write congruency statements. (8.G.2)
	M.BA.4.7	construct and/or classify similar figures using proportions. (8.G.3-4)

M.BA.5	**Outcome: Students will analyze and describe two and three dimensional figures.**	
	Students will...	
	M.BA.5.1	solve for perimeter or circumference of plane figures. (8.NS.1-2, 8.G.6-8)
	M.BA.5.2	solve for the area of plane figures (sometimes by graphing). (8.G.6-8)
	M.BA.5.3	solve for the surface area of solid figures (sometimes by graphing).
	M.BA.5.4	solve for the volume of solid figures. (8.G.9)
	M.BA.5.5	construct two and three dimensional figures using scale (ratio). (8.EE.5-6)
	M.BA.5.6	apply the Pythagorean Theorem to solve problems and compare triangles. (8.NS.1-2, 8.G.6-8, 8.EE.1-2)

M.BA.6	**Outcome: Students will relate and solve problems with decimals, fractions, percentages, and probabilities.**	
	Students will...	
	M.BA.6.1	solve equations containing decimals and fractions. (8.EE.7)
	M.BA.6.2	convert between decimals, fractions, and percentages.
	M.BA.6.3	estimate, calculate, and compare percentages. (8.NS.1-2)
	M.BA.6.4	convert odds into probabilities.
	M.BA.6.5	solve for permutations and combinations.
	M.BA.6.6	solve for and compare experimental and theoretical probabilities.

M.BA.7	**Outcome: Students will solve and graph functions.**	
	Students will...	
	M.BA.7.1	solve multistep functions. (8.EE.7)
	M.BA.7.2	solve and graph linear functions. (8.EE.7)
	M.BA.7.3	analyze functions using arithmetic and geometric sequences. (8.F.1-5)
	M.BA.7.4	solve linear systems graphically. (8.EE.8)

USD #350 St. John/Hudson
Algebra I / Transitional Algebra

Focus: Students will apply linear, quadratic, and exponential functions to a broad spectrum of real-world applications. Students will analyze and make predictions using functions and develop functions to model real-world situations.

M.A.1	**Outcome: Students will examine and interpret relationships between quantities and reason with equations.**	
	Students will...	
	M.A.1.1	use units as a way to understand problems and to guide the solution of multi-step problems including choosing an appropriate level of accuracy when reporting quantities. (N.Q.1, N.Q.3)
	M.A.1.2	define appropriate quantities for descriptive modeling. (N.Q.2)
	M.A.1.3	Interpret expressions that represent a quantity in terms of its context (terms, factors, and coefficients). (A.SSE.1)
	M.A.1.4	create equations (linear, quadratic, simple rational and exponential) and inequalities in over variable and use them to solve problems. (A.CED.1)
	M.A.1.5	create equations in two or more variables to represent relationships between quantities; graph equation on coordinate exes with labels and scales. (A.CED.3)
	M.A.1.6	represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions. (A.CED.3)
	M.A.1.7	rearrange formulas to highlight a quantity of interest. (A.CED.4)
	M.A.1.8	explain each step in solving a simple equations and construct a viable argument to justify a solution method. (A.REI.1)
	M.A.1.9	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (A.REI.3)

M.A.2	**Outcome: Students will solve, interpret, and graph equations with rational exponents by extending the properties of exponents to rational exponents.**	
	Students will...	
	M.A.2.1	rewrite expressions involving radicals and rational exponents using the properties of exponents. (N.RN.2)
	M.A.2.2	explain how the meaning of rational exponents follows from extending the properties of integer exponents to those values. (N.RN.1)
	M.A.2.3	graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (F.IF.7)
	M.A.2.4	model with exponential functions (exponential growth or decay). (F.LE.1)
	M.A.2.5	prove exponential growth exceeds linear growth over time. (F.LE.3)
	M.A.2.6	construct an exponential function given a graph, a description of the relationship, or two input-output pairs. (F.LE.3)
	M.A.2.7	interpret the parameters in an exponential function in terms of a context. (F.LE.3)

M.A.3	**Outcome: Students will solve systems of equations and/or inequalities algebraically and graphically.**	
	Students will...	
	M.A.3.1	solve systems of linear equations exactly and approximately (graph), focusing on pairs of linear equations in two variables. (A.REI.6)
	M.A.3.2	solve systems of linear equations in two variables by substitution and/or elimination. (A.REI.5)
	M.A.3.3	solve for the solutions of an equation in two variables by using the graph (on a coordinate plane) of the equation. (A.REI.10)
	M.A.3.4	explain why the coordinates of the intersection (graphed on a coordinate plane) of two linear equations is the solution to the system of equations. (A.REI.11)
	M.A.3.5	graph the solutions to a linear inequality in two variables and the solution of a systems of linear inequalities. (A.REI.12)

M.A.4	**Outcome: Students will interpret functions that arise in application in terms of context and analyze functions using different representations.**	
	Students will...	
	M.A.4.1	create the domain and range sets for a given function and understand that for each element of the domain has exactly one element of the range. (F.IF.1)
	M.A.4.2	evaluate functions for inputs in their domains and interpret statements that use function notation in terms of context. (F.IF.2)
	M.A.4.3	write functions from sequences (understanding that the domain is a subset of the integers). (F.IF.3)
	M.A.4.4	relate the domain of a functions to its graph and, where applicable, to the quantitative relationship it describes. (F.IF.5)
	M.A.4.5	calculate and interpret the average rate of change of a function over a specified interval (presented symbolically or as a table). (F.IF.6)
	M.A.4.6	graph functions (show maxima, minima, and intercepts) expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (F.IF.7)
	M.A.4.7	identify and predict the effects of translations, dilations, compressions, and transformations on f(x) through graphing and analyzing functions. (F.BF.3)
	M.A.4.8	interpret the parameters of a linear function in terms of context. (F.LE.5)
	M.A.4.9	construct linear functions given a graph, a description of a relationship, or two input-output pairs. (F.LE.2)

M.A.5	**Outcome: Students will model relationships with functions.**	
	Students will...	
	M.A.5.1	interpret key features of graphs and tables modeling a function (intercepts, increasing and/or decreasing intervals, symmetries, end behavior, maximums, minimums, and periodicity). (F.IF.4)
	M.A.5.2	compare properties of two functions each represented in a different ways (algebraically, graphically, numerically, in tables, or by verbal descriptions). (F.IF.9)
	M.A.5.3	write a function that describes a relationship between two quantities. (F.BF.1)
	M.A.5.4	write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situation, and translate between the two forms. (F.BF.2)

M.A.6	**Outcome: Students will describe linear relationships between quantities using regression techniques and make judgments about the appropriateness of linear models.**	
	Students will...	
	M.A.6.1	represent data with plots on the real number line (dot plots, histograms, and box plots). (S.ID.1)
	M.A.6.2	use statistics to approximate to the shape of the data distribution to compare center and spread of two of more different data sets. (S.ID.2)
	M.A.6.3	interpret differences in center, spread, and shape in the context of data sets, accounting for possible effects of extreme data points. (S.ID.3)
	M.A.6.4	summarize categorical data for two categories in two-way frequency tables, interpret relative frequencies in the context of the data and describe trends in data. (S.ID.5)
	M.A.6.5	represent data on two quantitative variables on a scatter plot, describe how the variables are related, and fit a function to the data. (S.ID.6)
	M.A.6.6	interpret the slope and intercept of a linear model in the context of data. (S.ID.7)
	M.A.6.7	compute (using technology) and interpret the correlation coefficient of a linear fit. (S.ID.8)
	M.A.6.8	distinguish between correlation and causation. (S.ID.9)

M.A.7	**Outcome: Students will identify structure within and create quadratic and exponential expressions.**	
	Students will...	
	M.A.7.1	interpret expression that represent a quantity in terms of its context (interpret parts such as terms, factors, and coefficients). (A.SSE.1)
	M.A.7.2	rewrite an expression using the structure of the expression. (A.SSE.2)
	M.A.7.3	choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represent by the expression (factor a quadratic expression, complete the square in a quadratic expression, transform exponential expressions (A.SSE.3)
	M.A.7.4	add, subtract, multiply, and divide polynomials under the closed system analogous to operations with integers. (A.APR.1)

M.A.8	**Outcome: Students will create and solve equations, inequalities, and systems of equations involving quadratic expressions.**	
	Students will...	
	M.A.8.1	create equations and inequalities in one variable and use them to solve problems. (A.CED.1)
	M.A.8.2	create equations in two or more variables to represent relationships between quantities; graph equations on coordinate exes with labels and scales. (A.CED.2)
	M.A.8.3	rearrange formulas to highlights a quantity of interest. (A.CED.4)
		solve quadratic equations in one variable by completing the square, taking square roots, or using the quadratic formula. (A.REI.4)
	M.A.8.4	solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (A.REI.7)

M.A.9	**Outcome: Students will model with functions.**	
	Students will...	
	M.A.9.1	prove the sum or product of two rational numbers is rational; that the sum or a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. (N.RN.3)
	M.A.9.2	relate the domain of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes. (F.IF.5)
	M.A.9.3	graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (F.IF.7b)
	M.A.9.4	use factoring and completing the square in a quadratic function to show zeroes, extreme values, and symmetry of the graph, and interpret those values in terms of context. (F.IF.8a)
	M.A.9.5	solve a simple function and write its inverse. (F.BF.4)

USD #350 St. John/Hudson
Geometry

Focus: Students will apply algebraic and geometric principles to plane and spatial relationships to mathematically describe the physical world.

M.G.1	**Outcome: Students will experiment with transformations in the plane and create a definition of congruence in terms of ridged motion.**	
	Students will...	
	M.G.1.1	precisely define angle, circle, perpendicular line, parallel line, and line segment based on the undefined notion of point, line, and distance along a line and arc. (G.CO.1)
	M.G.1.2	represent transformations in the plane, describe transformations as functions, and compare transformations that preserve distance and angle and those that do not. (G.CO.2)
	M.G.1.3	develop definitions of rotation, reflection, and translation in terms of angles, circles, perpendicular lines, parallel lines, and line segments. (G.CO.4)
	M.G.1.4	describe the rotations and reflections that carry a given rectangle, parallelogram trapezoid, or regular polygon onto itself. (G.CO.3)
	M.G.1.5	transform figures and predict the effect of a given rigid motion on a given figure; determine if two given figures are congruent by the definition of congruence in terms of rigid motions. (G.CO.6)
	M.G.1.6	show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent using the definition of congruence in terms of rigid motions. (G.CO.7)
	M.G.1.7	explain how the criteria of triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. (G.CO.8)

M.G.2	**Outcome: Students will apply reasoning to complete geometric constructions.**	
	Students will...	
	M.G.2.1	given a geometric figure and a rotation, reflection, or translation, draw the transformed figure and specify a sequence of transformations that will carry a given figure onto another. (G.CO.5)
	M.G.2.2	make formal geometric constructions with a variety of tools and methods. (G.CO.12)
	M.G.2.3	construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. (G.CO.13)

M.G.3	**Outcome: Students will prove theorems about line segment, angle, triangle, and parallelogram congruence.**	
	Students will...	
	M.G.3.1	prove theorems about congruency of lines and angles. (G.CO.9)
	M.G.3.2	prove theorems about triangle congruency and components. (G.CO.10)
	M.G.3.3	prove theorems about parallelogram congruency and components. (G.CO.11)

M.G.4	**Outcome: Students will prove theorems involving similarity and determine if figures are similar using the definition of similarity and/or transformations.**	
	Students will...	
	M.G.4.1	verify experimentally the properties of dilations given by a center and scale factor. (G.SRT.1)
	M.G.4.2	determine if two given figures are similar using the definition of similarity in terms of similar transformations. (G.SRT.2)
	M.G.4.3	establish the AA criterion for two triangles to be similar using properties of similarity. (G.SRT.3)
	M.G.4.4	prove theorems about triangle similarity. (G.SRT.4)
	M.G.4.5	solve problems and prove relationships in geometric figures using congruence and similarity criteria for triangles. (G.SRT.5)

M.G.5	**Outcome: Students will solve problems involving right triangles, formally define trigonometric ratios, and apply trigonometry to general triangles.**	
	Students will...	
	M.G.5.1	formally define trigonometric ratios for acute angles using similarity of side ratios in right triangles. (G.SRT.6)
	M.G.5.2	explain and apply the relationship between the sine and cosine of complementary angles to problems. (G.SRT.7)
	M.G.5.3	solve right triangles in applied problems using trigonometric ratios and the Pythagorean Theorem. (G.SRT.8)
	M.G.5.4	derive the formula A=1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. (G.SRT.9*)
	M.G.5.5	prove the Laws of Sines and Cosines and use them to solve problems. (G.SRT.9*)
	M.G.5.6	apply the Laws of Sines and Cosines to find unknown measurements in right and non-right triangles. (G.SRT.11*)

M.G.6	**Outcome: Students will apply geometric concepts in modeling situations.**	
	Students will...	
	M.G.6.1	describe objects using geometric shapes, their measures, and their properties. (G.MG.1)
	M.G.6.2	apply concepts of density based on area and volume in modeling situations to solve problems. (G.MG.2)
	M.G.6.3	apply geometric methods to solve design problems. (G.MG.3)

M.G.7	**Outcome: Students will apply their knowledge of two-dimensional shapes to define the shapes of cross-sections of three-dimensional objects and the result of rotating a two-dimensional object about a line.**	
	Students will...	
	M.G.7.1	create an informal argument for the formulas for the circumference of a circle, area of a circles, volume of a cylinder, pyramid, and cone. (G.GMD.1)
	M.G.7.2	solve problems involving the formulas for the volume of cylinders, pyramids, cones, and spheres. (G.GMD.3)
	M.G.7.3	describe the shapes of two-dimensional cross-sections of three-dimensional objects and identify three-dimensional objects generated by rotations of two-dimensional objects. (G.GMD.4)

M.G.8	**Outcome: Students will connect algebra and geometry through the use of coordinates.**	
	Students will...	
	M.G.8.1	prove simple geometric theorems using coordinates. (G.GPE.4)
	M.G.8.2	prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. (G.GPE.5)
	M.G.8.3	find the point of a directed line segment between two given points that partitions the segment in a given ratio. (G.GPE.6)
	M.G.8.4	compute perimeters of polygons and areas of triangles and rectangles. (G.GPE.7)
	M.G.8.5	derive the equation of a parabola give an focus and directrix. (G.GPE.2)
	M.G.8.6	use coordinates to prove simple geometric theorems algebraically. (G.GPE.4)

M.G.9	**Outcome: Students will prove basic theorems about circles, graph circles from equations, and derive the equation for a circle from the distance formula.**	
	Students will...	
	M.G.9.1	prove all circles are similar. (G.C.1)
	M.G.9.2	describe relationships among inscribed angles, radii, and chords. (G.C.2)
	M.G.9.3	construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. (G.C.3)
	M.G.9.4	derive using similarity the fact that the lengths of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionally; derive the formula of the area of a sector. (G.C.5)
	M.G.9.5	derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. (G.GPE.1)

USD #350 St. John/Hudson
Algebra II

Focus: Students will apply linear, quadratic, exponential, logarithmic, rational, and trigonometric functions to a broad spectrum of real-world applications. Students will analyze and make predictions using these functions to model realistic situations.

M.A2.1	**Outcome: Students will solve problems with complex numbers.**	
	Students will...	
	M.A2.1.1	apply knowledge of complex numbers (i^2=-1 and a + bi) to solve problems. (N.CN.1)
	M.A2.1.2	apply the relation i^2=-1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. (N.CN.2)
	M.A2.1.3	solve quadratic equations with real coefficients that have complex solutions. (N.CN.7)
	M.A2.1.4	extend polynomial identities to complex numbers. (N.CN.8*
	M.A2.1.5	know the Fundamental Theorem of Algebra; demonstrate that it is true for quadratic polynomials. (N.CN.9*)

M.A2.2	**Outcome: Students will solve problems with rational and radical polynomial expressions.**	
	Students will...	
	M.A2.2.1	derive the formula for the sum of a finite geometric series, and use the formula to solve problems. (A.SSE.4)
	M.A2.2.2	apply the Remainder Theorem to solve problems. (A.APR.1)
	M.A2.2.3	graph a function defined by polynomials after identifying the zeroes of the polynomial. (A.APR.3)
	M.A2.2.4	prove polynomial identities and use them to describe numerical relationships. (A.APR.4)
	M.A2.2.5	apply the Binomial Theorem for the expansion of $(x + y)^n$. (A.APR.5*)
	M.A2.2.6	solve rational and radical equations in one variable and give examples showing how extraneous solutions my arise. (A.REI.2)
	M.A2.2.7	rewrite rational expression in different forms using inspection, long division, or synthetic division. (A.APR.5)
	M.A2.2.8	graph polynomial functions, identifying zeroes when suitable factorizations are available, and showing end behavior. (F.IF.7c)

M.A2.3	**Outcome: Students will model periodic phenomena using trigonometry and the coordinate plane.**	
	Students will...	
	M.A2.3.1	apply the understanding of radian measure of an angles as the length of the arc on the unit circle subtended by the angle to solve problems. (F.TF.1)
	M.A2.3.2	explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. (F.TF.2)
	M.A2.3.3	model periodic phenomena with specified amplitude, frequency, and midline with trigonometric functions. (F.TF.5)
	M.A2.3.4	prove the Pythagorean identity $\sin^2(g) + \cos^2(g) = 1$ and use it to find sin, cos, or tan, given sin, cos, or tan and the quadrant of the angle. (F.TF.8)

M.A2.4	**Outcome: Students will create equations to describe numbers or relationships using linear, quadratic, exponential, and root functions.**	
	Students will...	
	M.A2.4.1	create equations and inequalities in one variable and sue them to solve problems (including use of rational and exponential functions). (A.CED.1)
	M.A2.4.2	create equations in two or more variables to represent relationships between quantities; graph equations on coordinate exes with labels and scales. (A.CED.2)
	M.A2.4.3	represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. (A.CED.3)
	M.A2.4.4	write a function that describes a relationship between two quantities, combining standard function types using arithmetic operations. (F.BF.1)
	M.A2.4.5	use transformations of functions to find appropriate models in terms of context considering more complex situations. (F.BF.3)
	M.A2.4.6	solve for inverse functions and write the inverse function. (F.BF.4a)

M.A2.5	**Outcome: Students will interpret and analyze functions that arise in applications in terms of a context.**	
	Students will...	
	M.A2.5.1	interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship between two quantities described by a function. (F.IF.4)
	M.A2.5.2	relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (F.IF.5)
	M.A2.5.3	calculate and interpret the average rate of change of a function over a specified interval and estimate the rate of change from a graph. (F.IF.6)
	M.A2.5.4	graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (F.IF.7e)
	M.A2.5.5	write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (F.IF.8)
	M.A2.5.6	compare properties of two functions (including exponential and logarithmic functions) represented in a different way. (F.IF.9)
	M.A2.5.7	for exponential models, express as a logarithm the solution to $ab^{ct}=d$ where a, c, and d are numbers and the base b is 2, 10, or e. (F.LE.4)

M.A2.6	**Outcome: Students will make inferences about and draw conclusions from data collected from surveys, experiments, and simulations.**	
	Students will...	
	M.A2.6.1	use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. (S.ID.4)
	M.A2.6.2	make inferences about population parameters based on a random sample from that population. (S.IC.1)
	M.A2.6.3	determine if a specified model is consistent with results from a given data-generating process. (S.IC.2)
	M.A2.6.4	explain how randomization applies to sample surveys, experiments, and observational studies. (S.IC.3)
	M.A2.6.5	use data from sample surveys to estimate a population mean or proportion and develop a margin of error through the use of simulation models for random sampling. (S.IC.4)
	M.A2.6.6	use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. (S.IC.5)
	M.A2.6.7	evaluate reports based on data. (S.IC.6)
	M.A2.6.8	use probabilities to make fair decisions. (S.MD.6*)
	M.A2.6.9	analyze decisions and strategies using probability concepts. (S.MD.7)

M.A2.7	**Outcome: Students will compute interpret theoretical and experimental probabilities for compound events, attending to mutually exclusive events, independent events, and conditional probability.**	
	Students will...	
	M.A2.7.1	describe events as subsets of a sample space using characteristic of the outcomes, or as unions, intersections, or complements of their events. (S.CP.1)
	M.A2.7.2	determine if two events (A and B) are independent based on the product of their probabilities. (S.CP.2)
	M.A2.7.3	apply the definition of conditional probability to interpret independence of events. (S.CP.3)
	M.A2.7.4	construct and interpret two-way frequency tables of data; use the two-way table to decide if events are independent and to approximate conditional probabilities. (S.CP.4)
	M.A2.7.5	explain the concepts of conditional probability and independence in everyday language and everyday situations. (S.CP.5)
	M.A2.7.6	calculate the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. (S.CP.6)
	M.A2.7.7	apply the Addition Rule and interpret the answer in terms of the model. (S.CP.7)