Grades 4-8	Math Outcomes Map				
Topics	4 th Grade	5 th Grade	6 th Grade	7 th Grade	8th Grade
	 Read and write numbers up to 1,000,000,000 Read and write decimals through thousandths 	 Read and write whole numbers to the 100,000,000,000 place and decimals to the thousandths place. 	 Understand the representations, uses, and meanings of Positive and negative rational numbers 	 Understand the representations, uses, and meanings of Ratios Proportions Percentages 	 Understand the representations, uses, and meanings of Rational numbers and Irrational numbers
	 Translate between whole numbers and decimals in words and numerals 	 round whole numbers and decimals use expanded notation to represent whole numbers and 	number word, and number using a variety of representation, including a number line o Compare and order o Fractions and percentages	 Understand equivalent names for numbers (i.e. large and small numbers) Understand numerical relations 	 Understand equivalent names for numbers (i.e. large and small numbers/scientific notation)
	fractions	decimals	 Connect the model, number word, and number using a variety of representation 	(properties i.e. associative, commutative, identify, etc.)	
Numbers & Numeration	 Solve problems involving fractions of a collection 	 identify prime and composite numbers 	~Understand equivalent names for numbers (i.e. large and small		
	 Find Multiples of whole numbers less than 10 	 factor numbers find prime factorization 	numbers) using		
	 Find whole number factors of numbers 	 use numerical expressions involving one or more of the 	 Scientific notation Standard notation 		
	• Use numerical expressions involving the four arithmetic operations and grouping symbols to give equivalent names for whole numbers	basic four arithmetic operations, grouping symbols and exponents to give equivalent names for whole numbers	 Understand numerical relations Using factors Multiples Exponential notation 		
	 Use numerical expressions to find and represent equivalent names 	 convert between fractions, decimals, and percentages convert fractions to 	o Prime factorization		
	for fractions and decimals Use a multiplication rule to find equivalent fractions 	simplest forms convert between mixed numbers and improper fractions 			
	 Rename fourths, fifths, tenths, and hundredths as decimals and percents 	 compare and order fractions and mixed numbers 			
	• Compare and order whole numbers up to 1,000,000,000 and decimals through thousandths				

	 Compare and order integers between -100 and 0 Use area models, benchmark fractions, and numerators and denominators to compare and order fractions 				
Operations & Computation	 Demonstrate automaticity with basic addition and subtraction facts Use manipulatives, mental arithmetic, and algorithms to solve problems involving the addition and subtraction of whole numbers and decimals Demonstrate automaticity with multiplication facts through 10 * 10 and proficiency with related division facts Use basic facts to compute extensions such as 30 * 60 Use mental arithmetic, paper and pencil algorithms to solve problems involving the multiplication of multi digit whole numbers by 3-digit whole numbers by 3-digit whole numbers by 1-digit whole numbers and divide multi digit whole numbers by 1-digit whole numbers Use manipulatives and mental arithmetic to solve problems involving the addition and subtraction of fractions with like and unlike denominators Make reasonable estimates for whole number and division and subtraction and subtraction and division problems 	 solve problems involving addition and subtraction of whole numbers and decimals round whole numbers and decimals demonstrate automaticity with multiplication facts and proficiency with division facts solve problems involving the multiplication of whole numbers and decimals solve problems involving division of multi digit whole numbers and decimals by whole numbers solve division with remainders in solution solve division with decimals in solution solve problems involving addition and subtraction of fractions and mixed numbers find common denominators multiply fractions 	 Compute accurately with non- negative rational numbers Addition Subtraction Multiplication Division Make reasonable estimates When computing non-negative and negative rational numbers When computing fractions and percentages When estimating the results of computations Understand meanings of operations by being able to: Judge the reasonableness of a solution in computations Describe the effect and operations on size 	 Compute accurately with all rational numbers Addition Subtraction Multiplication Division Make reasonable estimates Computations of rational numbers Analyzing the reasonableness of a solution Analyzing computational strategies Understand meanings of operations by being able to Describe the effect of an operation on an outcome Develop flexibility in solving problems by selecting strategies and using mental computation and estimation PEMDAS- understand and be able to apply correct order of operations 	 Compute accurately with all rational and irrational numbers Addition Subtraction Multiplication Division Make reasonable estimates In irrational numbers in appropriate situations Students will understand meanings of operations PEMDAS- understand and be able to apply correct order of operations

	 Use repeated addition, skip counting, arrays, area, and scaling to model multiplication and division 				
Data & Chance	 Collect and organize data or use given data to create charts, tables, bar graphs, line plots, and line graphs Use the maximum, minimum, range, median, mode, and graphs to ask and answer questions, draw conclusions, and make predictions Describe events using certain, very likely, likely, unlikely, impossible, and other basic probability terms Use more likely, equally likely, same chance, 50-50, less likely, and other basic probability terms to compare events Predict the outcomes of experiments and test the predictions using manipulative Summarize the results and use them to predict future events Express the probability of an event as a fraction 	 collect and organize data to create bar, line, and circle graphs find maximum, minimum, range, median, mode, and mean in a data set describe events as certain, very likely, likely, unlikely, very unlikely, impossible, and other basic probability terms express probability in percentages, fractions, or decimals 	 Select and create appropriate graphical representations of collected or given data Tree diagrams Pie graphs Stem-leaf graph Bar graphs Line graphs Analyze and interpret data Tree diagrams Pie graphs Analyze and interpret data Tree diagrams Pie graphs Stem-leaf graph Bar / Line graphs Stem-leaf graph Bar / Line graphs Cunderstand and apply basic concepts of probability by Using a sample space to identify probability Conduct experiments involving simple and compound events, then determine and compare the experimental and theoretical probabilities Conduct experiments involving independent and dependent events, then determine and compare the experimental and theoretical probabilities 	 Select and create appropriate graphical representations of collected or given data to Analyze data in histograms to solve problems Analyze data in box plots to solve problems Analyze, interpret, calculate, describe and identify data Including the mean, median, mode, and range Including outliers and the effect the outlier has on the data (mean, median, mode, range) Solving problems involving two or more sets of data using appropriate statistical measures Understand and apply basic concepts of probability 	 Select and create appropriate graphical representations of collected or given data to Scatter plots Matrices Analyze, interpret, calculate, describe and identify data Finding the best fit line for a given scatter plot Explaining the meaning of the line as it relates to the problem In matrices Understand basic concepts of probability Make predictions based on the best fit line Identify misuses of statistical and numerical data
Measure- ment & Reference Frames	 Estimate length with and without tools Measure length to the nearest ¼ inch and ½ centimeter Estimate the size of angles without tools Describe and use 	 estimate length in US customary and metric units measure length to the nearest 1/8 inch and millimeter estimate angles measure angles 	 Understand the systems and processes of measurement; use appropriate techniques, tools, units, and formulas in making measurements of Length Perimeter Area Angles Weight Mass 	 Understand the systems and processes of measurement; use appropriate techniques, tools, units, and formulas by Drawing objects to scale Using scale drawings to solve problems Use both the Metric system and English system 	 Understand the systems and processes of measurement; use appropriate techniques, tools, units, and formulas Determine the effect on perimeter, area and volume when one or more dimensions of A two-dimensional figures are changed A three-dimensional figures are changed

	strategies to measure the		~Practice using both the metric		 Apply and use concepts of
	perimeter and area of	 find the perimeter of 	system and English system		indirect measurement
	polygons	polygons			
	 Estimate the area of 		~Convert from Metric to English		
	irregular shapes	 find the areas of 	and vice versa		
	inogulai onapoo	rectangles, parallelograms,			
	 Find the volume of 	triangles and circles			
	rectangular prisms				
	ů i	 find the volume of a prism 			
	 Describe relationships 	prom			
	among U.S. customary units	 define ni as the ratio of a 			
	of length and among metric	circle's circumference to its			
	units of length	diameter			
	- Lies ordered pairs of				
	numbers to name, locate, and	 describe relationships 			
	plot points in the first quadrant	between US customary units			
	of a coordinate grid	oriengin			
		 describe relationships 			
		between metric units of			
		length			
		 use ordered pairs to 			
		locate points on a coordinate			
		gna			
	 Identify, draw, and 	o identify describe	~Investigate characteristics and	 Investigate characteristics and 	 Investigate characteristics and
	describe points, intersecting	compare, name and draw	properties of two-and three-	properties of two-dimensional	properties of three-dimensional
	and parallel line segments and	right, acute, obtuse, straight,	dimensional geometric shapes by	geometric shapes by being able to	geometric shapes by being able to
	lines, rays, and right, acute,	and reflex angles	 Measuring and estimating the 	 Identify, describe and draw from various views (top) 	 Properly use the Pythagorean Theorem
	and obtuse angles		length, perimeter, area, angles,	side, front, corner)	 Apply knowledge of
	 Describe compare and 	 describe, compare, and classify plane and solid figures 	weight and mass of two-and three	Build from various views	specific shapes, i.e.
	classify plane and solid	by their geometric properties	dimensional shapes	 Identify and describe similar and congruent 	squares, rectangles,
	figures, including polygons,		perimeter/circumference and area	polygons	 Identify measurements
	circles, spheres, cylinders,		of plane figures	• Angle measure	of angles and side
Geometry	cubes, and pyramids		 Identify and describe the 	 Length of sides Broportionality of 	lengths
aconicity			Intersection of figures in a plane	sides	 Apply proportions to similar shapes to
	• Use appropriate geometric		relationship between the radius,	 Apply transformations and 	identify the
	terms such as vertex, base,		diameter, chord, center, and	symmetry in geometric situations by	measurements of
	tace, edge, and congruent		circumference of a circle	 Use scaling and 	angles and side lengths
			geometric figures in a coordinate	proportional reasoning to	 Apply dilations in geometric
	 Identify, describe, and sketch examples of reflections 		plane	solve problems related to	situations by being able to
	energin examples of reflections			similar and congruent	 Identify, describe and
	 Identify and describe 		~Apply transformations and	polygons.	predict dilations
	examples of translations and		symmetry in geometric situations	 Understand and write 	
	•		by being able to		

	rotations	 Transform figures in a 	 If-then statements 	
		coordinate plane	 Converse of if-then 	
		 Describe the transformation of 	statements	
		a figure in a coordinate plane		
			Identify and evolute checkute	
			value equations	
	 Extend, describe, and 	~Patterns and functions	 Understand patterns and 	 Understand patterns and
	create numeric patterns	o Identity	functions	functions
		 Commutative 	 In linear relations and sequences 	 Translate tabular,
	 Describe rules for patterns 	 Associative 	 In functions using graphs, tables, 	verbal, graphic and
	and use them to solve	 Distributive 	diagrams, and written descriptions	algebraic
	problems	 Order of operations 	 Use and evaluate algebraic 	representations of
	probleme	·	equations	functions
		Evaluating algebraic equations	 Using linear equalities and 	 Identify functions as
	 Use words and symbols to 	- Solve simple (one and two	inequalities to solve problems	Inteal of hon-inteal
	describe and write rules for	stop) algobraic equations	 Solve algebraic two-step 	 Identity slope of linear functions
	functions that involve the four	 Selve simple (one and two 	equations	 Identify intercents of a
	and use the rules to solve	step) algebraic inequalities	 Use algebraic notation to 	linear function
	problems	step) algebraic mequantes	represent and analyze situations and	 Interpret and compare
	problems		structures by being able to	properties of a linear
		~Use algebraic notation to		function
	 Use conventional notation 	represent and analyze situations	formulas to solve problems	
	to write expressions and	and structures by being able to	 Onderstand and be able to graph Deinte in a coordinate glaph 	 Solvo algobraio oguations
	number sentences using the	• Use graphs, tables and	 Points in a coordinate plane Desis linear equations in a 	Using inverse operations of
		symbols to model and solve	o Basic illear equations in a	Addition and subtraction
	operations	changes and ratios	\sim Inequalities on a number line	Multiplication and
Functions,		changes and ratios		division
Patterns &	 Determine whether number 			 Squares and square
Algebra	sentences are true or false			roots
-				 Cubes and cube roots
	 Solve open sentences and 			
	explain the solutions			 Write algebraic equations
				 Given two points
	 Write expressions and 			 Given the slope and
	number sentences to model			one point of a line
	number stories			 Given the slope and y-
				intercept of a line
	E colorado acomo esta			
	• Evaluate numeric			 Use algebraic notation to
	arouping symbols			represent and analyze situations
	grouping symbols			and structures by being able to
				solve algebraic problems and
	 Insert grouping symbols to 			justify answers both graphically
	make number sentences true			and symbolically
				 Using linear equations
	 Apply the Distributive 			Using Linear
	Property of Multiplication over			inequalities
	Addition to the partial-products			
	multiplication algorithm			