Curriculum Maps
Mathematics

Grade 3	Grade 4	Grade 5
PSSA ASSESSMENT ANCHORS	*PSSA ASSESSMENT ANCHORS*	*PSSA ASSESSMENT ANCHORS*
M3.A Numbers and Operations	*M4.A Numbers and Operations*	*M5.A Numbers and Operations*
M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	*M4.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.*	*M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.*
M3.A.1.1. Apply place-value concepts and numeration to counting, ordering, grouping and equivalency.	*M4.A.1.1. Use models and/or words to represent quantities as decimals, fractions, or mixed numbers.*	*M5.A.1.1. Express numbers in equivalent forms.*
Eligible Content	*M4.A.1.2 Compare quantities and/or magnitudes of numbers.*	*Eligible Content*
M3.A.1.1.1 Match the word name with the appropriate whole number (up through 9,999.	*M4.A.1.3 Apply number theory concepts.*	*M5.A.1.1.1 Use expanded notation to represent whole numbers or decimals (whole numbers less than 10,00,000 and decimals to hundredths.*
M3.A. 1.1.2 Differentiate between an even and odd number.	*.M4.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.*	*M5.A.1.2 Demonstrate understanding of place value of whole numbers and decimals.*
M3.A.1.1.3 Compare two whole numbers using greater than (>), less than (<), or equal to (=) (up through 9,999).	*M4.A.2.1 Use operations to solve problems (may include word problems).*	*Eligible Content*
M3.A.1.1.4 Order a set of whole numbers from least to greatest or greatest to least (up through 9,999; limit sets to no more than 4 numbers).	*M4.A.3 Compute accurately and fluently and make reasonable estimates.*	*M5.A.1.2.1 Read and write decimal numbers through the thousandths.*
M3.A.1.1.5 Match a symbolic representation of numbers to appropriate whole numbers (e.g., place value blocks, 7 hundreds, 4 tens and 8 ones, etc.).	*M4.A.3.1 Apply rounding and/or estimation strategies to solve problems.*	*M5.A.1.2.2 Identify the number with its place value (from millions to thousandths).*
M3.A.1.2 Use fractions to represent quantities as part of a whole.	*M4.A.3.2 Compute, using fractions or decimals, written vertically or horizontally (straight computation only).*	*M5.A.1.3 Compare quantities or magnitudes of numbers.*
Eligible Content	*M4.B Measurement*	*Eligible Content*
M3.A.1.2.1 Match the fraction to the appropriate drawing or part of a set.	*M4.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.*	*M5.A.1.3.1 Compare whole numbers through 9 digits using the words: more, less, equal, least, most, greater than, less than, or the symbols <, >, =.*
M3.A.1.3 Count, compare and make changes using a collection of coins and one-dollar bills.	*M4.B.1.1 Determine time and/or calculate elapsed time.*	*M5.A.1.3.2 Compare and/or order decimals through the thousandths.*
	M4.B.1.2 Convert linear measurements within the same system.	*M5.A.1.3.3 Compare proper fractions to 16^{th} with like and unlike denominators.*
		M5.A.1.4 Use simple applications of negative numbers (number line, counting, temperature).

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Eligible Content *M3.A.1.3.1 Count a collection of bills and coins less than $5.00 (penny, nickel, dime, quarter, dollar).* *M3.A.1.3.2 Compare total values of combinations of coins less than $5.00 (penny, nickel, dime, quarter, dollar).* *M3.A.1.3.3 Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, dollar).* *M3.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.* *M3.A.2.1 Understand various meanings of operations and the relationship between them.* *Eligible Content* *M3.A.2.1.1 Understand the relationship between operations or arrays:* *Represent multiplication as repeated addition;* *Demonstrate the inverse relationship between addition and subtraction using fact families.* *M3.A.2.1.2 Choose the correct operation(s) to solve a word problem (no more than 2 operations using +, - and/or x).* *M3.A.3 Compute accurately and fluently and make reasonable estimates.* *M3.A.3.1 Solve problems using addition, subtraction and multiplication (straight computation and word problems).* *Eligible Content* *M3.A.3.1.1 Solve single- and double- digit addition and subtraction problems with regrouping in vertical and horizontal form.*	*M4.B.2 Apply appropriate techniques, tools and formulas to determine measurement.* *M4.B.2.1 Select and/or use appropriate tools and/or measurements.* *M4.B.2.2 Estimate measurements of figures. .* *M4.C Geometry* *M4.C.1 Analyze characteristics and properties of two and three dimensional geometric shapes and demonstrate understanding of geometric relationships.* *M4.C.1.1 Identify/describe the basic properties of two- or three- dimensional figures.* *M4.C.1.2 Represent and/or use properties of relationships of points, lines, line segments, rays and angles.* *M4.C.2 Identify and/or apply concepts of transformations or symmetry.* *M4.C.2.1 Apply the concepts of reflection and symmetry.* *M4.C.3 Locate points or describe relationships using the coordinate plane.* *M4.C.3.1 Locate points on a simple grid.* *M4.D Algebraic Concepts* *M4.D.1 Demonstrate an understanding of patterns, relations and functions.* *M4.D.1.1 Recognize, describe, extend, create and/or replicate a variety of patterns.* *M4.D.1.2 Apply simple function rules.* *M4.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.* *M4.D.2.1 Use numbers and symbols to model the concepts of expressions and/or equations.* *M4.D.2.2 Determine the missing number or symbol in a number sentence.*	*Eligible Content* *M5.A.1.4.1 Identify negative numbers on a number line (greater than or equal to -20).* *M5.A.1.4.2 Identify negative numbers on a thermometer (F or C).* *M5.A.1.5 Use or develop models to represent fractions and/or mixed numbers.* *Eligible Content* *M5.A.1.5.1 Use or develop regions and/or sets (e.g., circle graph, hundred-blocks) to model fractions and mixed numbers to hundredths (may include reducing the fractions).* *M5.A.1.6 Apply number theory concepts (i.e., primes, factors, multiples, composites).* *Eligible Content* *M5.A.1.6.1 Name/identify prime and composite numbers less than or equal to 100.* *M5.A.1.6.2 List/identify factors and/or multiples of a given number less than or equal to M50.* *M5.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.* *M5.A.2.1 Solve problems involving decimals, fractions, and/or whole numbers (straight computation or word problems).* *Eligible Content* *M5.A.2.1.1 Solve problems involving addition, subtraction, multiplication and division of whole numbers (multipliers up to 2 digits – divisors of one digit) and decimals (answers to hundredths – whole number divisors).* *M5.A.2.1.2 Solve problems involving addition and subtraction of fractions (to 16ths – like and unlike denominators – for unlike denominators, the LCD must be one of the given denominators).*

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M3.A.3.1.2 Solve problems involving multiplication through the 9 times tables through 9 x 5. *M3.A.3.2 Use estimation skills to arrive at conclusions.* *Eligible Content* *M3.A.3.2.1 Estimate sums and differences of quantities; round 2-digit numbers to the nearest 10, and 3-digit numbers to the nearest 100, before computing (limit to 2 numbers).* *M3.A.3.2.2 Round whole numbers to the nearest ten, hundred or thousand (no higher than 9,000).* *M3.B Measurement* *M3.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.* *M3.B.1.1 Determine or calculate time and elapsed time.* *Eligible Content* *M3.B.1.1.1 Tell time (analog) to the minute.* *M3.B.1.1.2 Find elapsed time to increments of 5 minutes (limited to 2 adjacent hours).* *M3.B.1.1.3 Identify times of the day and night as a.m. and p.m.* *M3.B.1.2 Use the attributes of length, area, volume and weight of objects.* *Eligible Content* *M3.B.1.2.1 Select an appropriate unit and/or tool for the attribute being measured.* *M3.B.1.2.2 Compare and/or order objects according to length, area, volume or weight.* *M3.B.2 Apply appropriate techniques, tools and formulas to determine measurement.* *M3.B.2.1 Determine the measurement of objects with non-standard and standard units.*	*M4.E Data Analysis and Probability* *M4.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.* *M4.E.1.1 Interpret data shown on tables, charts, line graphs, bar graphs or pictographs.* *M4.E.1.2 Organize or display data using tables, charts, bar graphs, line graphs or pictographs.* *M4.E.2. Select and/or use appropriate statistical methods to analyze data.* *M4.E.2.1 Describe data sets using mean, median or mode.* *M4.E.3 Understand and/or apply basic concepts of probability or outcomes.* *M4.E.3.1 Predict and/or measure the likelihood of events.* *M4.E.3.2 Find all possible combinations or arrangements involving two variables.*	*M5.A.2.1.3 Choose the correct operation(s) to solve a problem (no more than 2 operations).* *M5.A.3 Compute accurately and fluently and make reasonable estimates.* *M5.A.3.1 Apply estimation strategies to a variety of problems.* *Eligible Content* *M5.A.3.1.1 Round whole numbers through millions and decimals through hundredths.* *M5.A.3.1.2 Use estimation to solve problems involving whole numbers and/or decimals (up to 2 digit multipliers, single-digit divisors or multiples of 10; whole numbers to thousands and decimals to hundredths).* *M5.A.3.2 Compute accurately, without the use of a calculator, (straight computation or 1 operation word problems).* *Eligible Content* *M5.A.3.2.1 Use addition, subtraction, multiplication and division to compute accurately without a calculator (multipliers up to 2 digits, single-digit whole number divisors or multiples of 10 – whole numbers to thousands and decimals to hundredths).* *M5.B Measurement* *M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.* *M5.B.1.1 Select appropriate units (customary or metric) to measure specific attributes of objects.* *Eligible Content* *M5.B.1.1.1 Select the appropriate unit for measuring weight (mass), capacity, length, perimeter and area.*

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Eligible Content *M3.B.2.1.1 Use a ruler (provided) to measure to the nearest ½ inch or centimeter.* *M3.B.2.1.2 Find the perimeter of a figure drawn and labeled (with the same units throughout).* *M3.B.2.1.3 Find the area of a figure drawn on a grid (only full grid blocks inside the figure).* *M3.B.2.2 Estimate measurements of familiar objects.* *Eligible Content* *M3.B.2.2.1 Match the object with its approximate measurement (all measurements given must be of the same system, e.g., about how tall is a soda pop can? 5 inches, 5 feet, 5 yards, etc.).* *M3.C Geometry* *M3.C.1 Analyze characteristics and properties of two and three dimensional geometric shapes and demonstrate understanding of geometric relationships.* *M3.C.1.1 Identify and/or describe two and three dimensional objects.* *Eligible Content* *M3.C.1.1.1 Name/identify/describe geometric shapes in two dimensions (circle, square, rectangle, triangle, pentagon, hexagon, octagon).* *M3.C.1.1.2 Name/identify geometric shapes in three dimensions (sphere, cube, cylinder, cone, pyramid, rectangular prism).* *M3.C.1.2 Identify/draw right angles and right triangles.* *Eligible Content* *M3.C.1.2.1 Identify/draw right angles and right triangles formed by line segments, in geometric figures, on a geoboard, and/or in real world objects.*		*M5.B.1.2 Solve problems using simple conversions and/or add and subtract measurements.* *Eligible Content* *M5.B.1.2.1 Convert, using linear measurements, capacity, and weight (mass) within the same system to the unit immediately above or below the given unit (using only the units below).* *Metric using mm, cm, m, and km;* *Customary using cup, pint, quart, gallon; in, ft, yd; oz, lb.* *M5.B.1.2.2 Add or subtract linear measurements, (inches and feet) or units of time (hours and minutes), without having to regroup with subtraction (answer should be in simplest form).* *M5.B.1.3 Estimate and/or compare the perimeters or areas of 2 figures without computation.* *Eligible Content* *M5.B.1.3.1 Estimate which polygon (shown) has a greater perimeter or area (do not mix perimeter with area).* *M5.B.1.3.2 Estimate and/or compare the area of an irregular figure shown on a grid.* *M5.B.2 Apply appropriate techniques, tools and formulas to determine measurement.* *M5.B.2.1 Use appropriate tools to determine measurements.* *Eligible Content* *M5.B.2.1.1 Use a ruler to measure to the nearest 1/8 inch or millimeter.* *M5.B.2.2 Solve problems involving length, time, weight, mass, capacity, temperature, perimeter, area and/or money.*

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M3.C.2 Identify and/or apply concepts of transformations or symmetry. *M3.C.2.1 Apply the concepts of transformations and symmetry.* *Eligible Content* *M3.C.2.1.1 Recognize a translation (slide), reflection (flip), or rotation (turn) of s simple two dimensional figure.* *M3.C.2.1.2 Identify/draw a line of symmetry in a two-dimensional figure.* *M3.C.2.1.3 Identify symmetrical two-dimensional shapes.* *M3.D Algebraic Concepts* *M3.D.1 Demonstrate an understanding of patterns, relations and functions.* *M3.D.1.1 Recognize, describe, or extend a variety of patterns.* *Eligible Content* *M3.D.1.1.1 Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).* *M3.D.1.1.2 Identify/describe the rule for a pattern shown (pattern must show 3 repetitions – if multiples are used, limit to 2, 3, or 5).* *M3.D.1.2 Demonstrate simple function rules.* *Eligible Content* *M3.D.1.2.1 Determine the missing element in a function table (functions may use +, -, or x; allowable multiples are 2, 3 or 5. Tables must have 3 INs and 3 OUTs listed).* *M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.*		*Eligible Content* *M5.B.2.2.1 Find the perimeter or area of a square or rectangle (same system of measurement – whole numbers only).* *M5.B.2.2.2 Solve problems involving weight, time, temperature, length, capacity, mass (limited to 3 digits) or money.* *M5.C Geometry* *M5.C.1 Analyze characteristics and properties of two and three dimensional geometric shapes and demonstrate understanding of geometric relationships.* *M5.C.1.1 Define and/or use basic properties of quadrilaterals (parallelograms, squares, rectangles, trapezoids, rhombi), triangles, circles, pyramids, cubes, and/or prisms.* *Eligible Content* *M5.C.1.1.1 Identify/classify/compare cubes, rectangular prisms and pyramids using faces, vertices and edges.* *M5.C.1.1.2 Identify/classify/compare triangles and quadrilaterals according to sides (length, parallel or perpendicular) and angles.* *M5.C.1.1.3 Identify and/or compare parts of right triangles, including right angles, acute angles, hypotenuse and legs.* *M5.C.1.1.4 Identify and/or determine the measure of the diameter and radii of a circle (when one or the other is given).* *M5.C.1.2 Represent and/or use properties of, lines, line segments, rays, points and planes.* *Eligible Content* *M5.C.1.2.1 Identify, draw and/or label points, lines, line segments, rays and planes.*

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M3.D.2.1 Create/model expressions, equations and inequalities to match a problem situation. *Eligible Content* *M3.D.2.1.1 Create or match a story to a given combination of symbols (+, -, x, <, >, =) and numbers.* *M3.D.2.1.2 Choose the number sentence that matches a given story (one operation, + or – only).* *M3.D.2.2 Determine the missing number or symbol in a number sentence.* *Eligible Content* *M3.D.2.2.1 Find a missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, -, or x through 9x5).* *M3.D.2.2.2 Identify the missing symbol (+, -, =, <, >) that makes a number sentence true.* *M3.E Data Analysis and Probability* *M3.E.1 Formulate or answer questions that can be addressed with data and/or organization.* *M3.E.1.1 Answer questions based on data shown on tables, charts, bar graphs or pictographs.* *Eligible Content* *M3.E.1.1.1 Analyze data shown on tables, charts, bar graphs or pictographs using the concepts of largest, smallest, most often, least often and middle.* *M3.E.1.1.2 Describe, interpret and/or answer questions based on data shown in tables, charts, bar graphs and/or pictographs.* *M3.E.1.2 Organize or display data using tables, charts, bar graphs or pictographs.* *Eligible Content* *M3.E.1.2.1 Graph data or complete a graph given the data (bar graph or pictograph – grid is provided).*		*M5.C.2 Identify and/or apply concepts of transformations or symmetry.* *M5.C.2.1 Analyze transformations and/or use symmetry to analyze mathematical situations.* *Eligible Content* *M5.C.2.1.1 Draw or identify a translation (slide), reflection (flip) or rotation (turn) of a 2 dimensional shape.* *M5.C.2.1.2 Draw or identify a maximum of 2 lines of symmetry in a two-dimensional figure.* *M5.C.3 Locate points or describe relationships using the coordinate plane.* *M5.C.3.1 Identify, plot or match points given an ordered pair.* *Eligible Content* *M5.C.3.1.1 Locate, plot and/or identify points in quadrant 1 and on the x and y axes of a grid (intervals of 1 – up to 20 by 20 grid).* *M5.D Algebraic Concepts* *M5.D.1 Demonstrate an understanding of patterns, relations and functions.* *3.D.1.1 Create or extend patterns.* *Eligible Content* *M5.D.1.1.1 Extend or find a missing element in a numerical or simple geometric pattern (pattern must show 3 repetitions).* *M5.D.1.1.2 Create a numerical or geometric pattern showing 3 repetitions of that pattern.* *M5.D.1.2 Analyze patterns. .* *Eligible Content* *M5.D.1.2.1 Form a rule based on a given pattern, or illustrate a pattern based on a given rule (whole numbers up to 100- patterns must show 3 repetitions).*

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M3.E.1.2.2 Translate information from one type of display to another (e.g., convert tally chart to bar graph). Limit to tally charts, bar graphs, tables and pictographs. *M3.E.2. Select and/or use appropriate statistical methods to analyze data (not assessed at grade 3).* *M3.E.3 Understand and/or apply basic concepts of probability or outcomes.* *M3.E.3.1 Predict and/or measure the likelihood of events.* *Eligible Content* *M3.E.3.1.1 Make predictions based on data or chance.* *M3.E.3.1.2 Determine the likelihood of an event (more/most likely, less/least likely, equally likely or impossible).*		*M5.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.* *M5.D.2.1 Select and/or use appropriate strategies, including concrete materials, to solve number sentences.* *Eligible Content* *M5.D.2.1.1 Solve for a missing number (blank, question mark, variable) in an equation involving a single operation.* *M5.D.2.1.2 Choose the operation needed to solve for the variable in a one-step equation.* *M5.D.2.1.3 Match a realistic situation to an equation, expression, inequality (<,>, =), table or graph (variable must be isolated, e.g., 17 + 39 = n).* *M5.D.3 Analyze change in various contexts.* *M5.D.3.1 Describe the relationship between rate of change and another variable (e.g., time, temperature).* *Eligible Content* *M5.D.3.1.1 Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables).* *M5.E Data Analysis and Probability* *M5.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.* *M5.E.1.1 Organize, display and/or interpret data using pictographs, tallies, tables, charts, line, bar and circle graphs and Venn diagrams.*

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		<u>Eligible Content</u> *M5.E.1.1.1 Display and/or interpret data shown in tallies, tables, charts, pictographs, bar graphs, line graphs and circle graphs using a title, appropriate scale, and labels.* *Circle graphs for open-ended items must show a center point and tic marks (circle graph data must be based on 100 – percents are given).* *Venn diagram* ***– interpret*** *data with a maximum of 3 overlapping categories.* *Venn diagram –* ***display*** *data with a maximum of 10 elements and 2 overlapping categories (diagram of circles provided for open-ended items).* *A grid will be provided to display data on bar graphs or line graphs.* *M5.E.2. Select and/or use appropriate statistical methods to analyze data.* *M5.E.2.1 Describe data sets using mean, median, mode and/or range.* *<u>Eligible Content</u>* *M5.E.2.1.1 Determine the mean/average (answer is a whole number), median (answer is a whole number or average of 2 numbers) and range of data (up to 10 numbers).* *M5.E.2.1.2 Identify the mode in a set of data (up to 10 numbers).* *M5.E.3 Understand and/or apply basic concepts of probability or outcomes.* *M5.E.3.1 Predict or determine all possible combinations, outcomes and/or calculate the probability of a simple event.*

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2.1 Numbers, Number Systems and Number Relationships • Using whole numbers, count to 10,000 by 2s, M3s, 5s, 10s, 25s and 100s; • Use whole numbers and fractions to represent quantities; • Represent equivalent forms of the same number, through the use of concrete objects, drawings, word names and symbols; • Use drawings, diagrams, and models to show the concept of a fraction as part of a whole; • Apply number patterns (even and odd) and compare values of numbers on the hundred board; • Use concrete objects to count, order and group; • Demonstrate understanding of one-to-one correspondence; • Read, write and order six digit numbers represented by place value models; • Determine the number of objects that are in a dozen or some multiple of a dozen; • Interpret the multi use of numbers such as cardinals, ordinals and measurements; • Read, write and represent whole numbers using symbols, words and models; • Express whole numbers using expanded form; • Identify the place value of a digit in a whole number; • Compare, order and describe whole numbers with or without using relational symbols; • Read, write and represent fractions as part of a single region using symbols, words and models;	2.1 Numbers, Number Systems and Number Relationships • Round decimals to thousandths; • Read and write numbers up to 9 digits; • Represent simple fractions and mixed numbers on the calculator (i.e., changing fractions to decimals); • Use models to add and subtract fractions with like and unlike denominators; add mixed numbers with and without renaming. • Count by 10,000 for any 10 sequential numbers between 100,000and 1,000,000. • Identify multiples of a one-digit number, and at least 2 pairs of factors for composite numbers $\geq$ 50. • Find fractional parts of a number. • Use models to write whole or mixed numbers for fractions greater than one. • Read, write and order decimals through thousandths; including money. • Write equivalent fractions for halves, thirds, fourths, sixths, and eighths; discuss why a given set of fractions are or are not equivalent. • Identify a mixed number on a number line; order rationals on a number line. • Use the calculator to order fractions by converting them to decimals. • Use the calculator to do multiplication and division with decimals. • Calculate powers using repeated multiplication or a multiplication constant; • Read, write and represent whole numbers using symbols, words and models; • Express whole numbers in expanded form;	2.1 Numbers, Number Systems and Number Relationships • Use expanded notation to represent whole numbers or decimals; • Apply number theory concepts to rename a number quantity (six, 3x2, 10-4); • Demonstrate that mathematical operations can represent a variety of problem situations; • Use models to represent fractions and decimals; • Explain the concepts of prime and composite numbers; • Use simple concepts of negative numbers (on a number line, in counting, in temperature); • Develop and apply number theory concepts (primes, factors, multiples, composites) to represent numbers in various ways; • Round decimals to thousandths; • Read and write numbers up to 9 digits; • Represent simple fractions and mixed numbers on the calculator (i.e., changing fractions to decimals); • Use models to add and subtract fractions with like and unlike denominators; add mixed numbers with and without renaming. • Count by 10,000 for any 10 sequential numbers between 100,000and 1,000,000. • Identify multiples of a one-digit number, and at least 2 pairs of factors for composite numbers $\geq$ M50. • Find fractional parts of a number. • Use models to write whole or mixed numbers for fractions greater than one.

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• Read, write and represent fractions as part of a set using symbols, words and models; • Determine the value of a given set of mixed currency; • Compare the value of two sets of mixed currency; • Write a story that models an operation in a given number sentence using greater than, less than or equal; • Recognize and explain the use of associative and commutative properties for multiplication; • Determine the number of objects that are in a dozen or some multiple of a dozen; • Interpret the multi-use of numbers such as cardinals, ordinals and measurements.	• Identify the place value of a digit in a number; • Compare, order and describe whole numbers; • Read, write or represent fractions of a single region using symbols, words or models; • Read, write or represent proper fractions of a set which has the same number of items as the denominator using symbols, word or models; • Read, write or represent decimals using symbols, words or models; • Express decimals in expanded form; • Compare fractions or mixed numbers with or without using the symbols (<, >, or =); • Compare, order or describe decimals with or without using the symbols (<, >, or =); • Compare the value of sets of mixed currency; • Determine the change from $100; • Identify and use divisibility rules; • Identify factors; • Identify multiples; • Write number to 10,000, using expanded notation; • Read and write numbers to 1 million using whole numbers; • Apply place value to counting, comparing, ordering and grouping; • Use whole numbers, decimals and fractions to represent quantities; • Represent equivalent forms of the same number through the use of concrete objects, drawings, diagrams, symbols and models; • Count, compare and make change using money;	• Read, write and order decimals through thousandths; including money. • Write equivalent fractions for halves, thirds, fourths, sixths, and eighths; discuss why a given set of fractions are or are not equivalent. • Identify a mixed number on a number line; order rationals on a number line. • Use the calculator to order fractions by converting them to decimals. • Use the calculator to do multiplication and division with decimals. • Calculate powers using repeated multiplication or a multiplication constant; • Read, write and represent whole numbers using symbols, words and models; • Express whole numbers in expanded form; • Identify the place value of a digit in a number; • Compare, order and describe whole numbers; • Read, write or represent fractions of a single region using symbols, words or models; • Read, write or represent proper fractions of a set which has the same number of items as the denominator using symbols, word or models; • Read, write or represent decimals using symbols, words or models; • Express decimals in expanded form; • Compare fractions or mixed numbers with or without using the symbols (<, >, or =); • Compare, order or describe decimals with or without using the symbols (<, >, or =); • Compare the value of sets of mixed currency; • Determine the change from $100; • Identify and use divisibility rules; • Identify factors;

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	• Identify and compare fractions and decimals to the thousandths place using money and base ten models; • Develop and apply number theory concepts to represent numbers in various ways; • Estimate, approximate, round or use exact numbers as appropriate; • Describe the inverse relationship between multiplication and division; • Demonstrate knowledge of basic facts in the M4 basic operations.	• Identify multiples; • Write number to 10,000, using expanded notation; • Read and write numbers to 1 million using whole numbers; • Apply place value to counting, comparing, ordering and grouping; • Use whole numbers, decimals and fractions to represent quantities; • Represent equivalent forms of the same number through the use of concrete objects, drawings, diagrams, symbols and models; • Count, compare and make change using money; • Identify and compare fractions and decimals to the thousandths place using money and base ten models; • Develop and apply number theory concepts to represent numbers in various ways; • Estimate, approximate, round or use exact numbers as appropriate; • Describe the inverse relationship between multiplication and division; • Demonstrate knowledge of basic facts in the M5 basic operations; • Read, write or represent fractions or mixed numbers using symbols, models and words; • Read, write or represent decimals using symbols, words and models; • Identify or determine equivalent forms of proper fractions; • Compare or order fractions with or without using the symbols (<, >, =);

Grade 3	Grade 4	Grade 5
		• Compare, order or describe decimals with or without using the symbols (<, >, =); • Identify or describe numbers as prime or composite; • Identify and use rules of divisibility; • Identify the GCF; • Identify a common multiple and the LCM; • Read and write numbers up to 9 digits; • Model and identify prime and composite numbers; • Describe or model relationships between fractions and decimals; • Model the square and the cube of a number; • Name the factors or multiples of a given number; • Write the prime factorization of any number using a factor tree; • Write numbers using exponential notation given the numbers in standard form; • Write the standard form for numbers expressed in exponential notation; • Model the GCF and the LCM of two numbers; • Use models to find equal ratios and identify proportions; • Use models to write percents as fractions and decimals, and fractions and decimals as percents; • Determine if two rational numbers are equal; • Use the calculator to aid in exploration of number properties such as divisibility and primeness.

Grade 3	Grade 4	Grade 5
2.2 Computation and Estimation • Round three digit whole numbers to the nearest hundred and ten; • Round four digit whole numbers to the nearest thousand and hundred; • Estimate and describe strategies used to estimate sums, differences, products and quotients; • Determine reasonableness of answers and determine the effect of operations on numbers; • Round monetary values between $0.01 and $9.99 to the nearest dollar; • Add four digit addends with and without trading, using either mental mathematics or a calculator; • Subtract whole numbers with up to four digits with and without trading, using either mental mathematics or a calculator; • Model and recall multiplication facts through 9 x 5; • Model and multiply a three digit factor by a one digit factor; • Recall division facts related to product through 9 x 5; • Model and divide by numbers less than 10 to find two or three digit quotients and their remainder; • Use the calculator to multiply with more than 2 digits in the multiplier; • Use the calculator to divide and verify results; • Use models to find sums and differences of 2 place decimals; • Use models to write whole numbers and decimals to hundreds;	2.2 Computation and Estimation • Given a number with up to 8 digits, round the number to the nearest million; • Find products of a two digit whole number and multiples of 10, 100 and 1000. • Using at least 2 different algorithms, multiply factors with up to 3 digits, by two digit factors; • Using at least 2 different algorithms, divide by one and two-digit divisors to find up to 3 digit quotients. • Complete, create and discuss number patterns involving combinations of the M4 basic operations, describe and model relationships between and among arithmetic operations; • Determine products where one factor is 10, 100, 1000.; • Convert time dimensions (minutes, seconds, hours, days, weeks, months, years, decades, centuries, millennium); • Calculate powers using repeated multiplication or a multiplication constant. • Determine the value of coins and bills $\geq$ $20, given $20, make change for purchases $\leq$ $20. • Compute elapsed time. • Estimate and find sums and differences of decimals through hundredths and money values < $1000; describe estimation strategies; • Add, subtract, multiply and divide whole numbers; • Add and subtract proper fractions and mixed numbers; • Add 2 decimals; • Subtract decimals;	2.2 Computation and Estimation • Create and solve word problems involving addition, subtraction, multiplication and division of whole numbers; • Develop and apply algorithms to solve word problems that involve addition, subtraction, and/or multiplication with decimals, with and without regrouping; • Develop and apply algorithms to solve word problems that involve addition, subtraction, and/or multiplication with decimals with or without regrouping; • Develop and apply algorithms to solve word problems that involve addition, subtraction, and/or multiplication with fractions and mixed numbers that include like and unlike denominators; • Demonstrate the ability to round numbers; • Determine, through estimations, the reasonableness of answers to problems involving addition, subtraction, multiplication and division of whole numbers; • Demonstrate skills for using fraction calculators to verify conjectures, confirm computations and explore complex problem solving situations; • Apply estimation strategies to a variety of problems, including time and money; • Explain multiplication and division algorithms; • Select a method for computation and explain why it is appropriate; • Given a number with up to 8 digits, round the number to the nearest million;

Grade 3	Grade 4	Grade 5
• Discuss the relationship between fractions of a dollar; apply money concepts to real-life situations and construct problems which use fractions and decimals; • Write fractions for parts of regions or sets up to eighths; • Identify numerators, denominators, proper and improper fractions; • Use models to find equivalent and lowest term fractions; • Use models to order any two fractions with the same numerator; • Use models to illustrate mixed numbers; • Represent decimals to hundredths on the calculator; • Write a story that models an operation in a given number sentence using greater than, less than or equal; • Recognize and explain the use of associative and commutative properties for multiplication; • Add numbers using a variety of strategies; • Subtract numbers using a variety of strategies; • Solve addition or subtraction number word problems; • Add and subtract money amounts; • Identify and apply the concept to inverse operations to addition and subtraction; • Represent multiplication and division basic facts using number sentences, pictures, and drawings; • Identify and use properties of multiplication; • Multiply a one-digit factor by a two-digit factor using models, pictures and drawings;	• Determine the approximate sum and difference of 2 numbers; • Determine the approximate product or quotient of 2 numbers; • Solve word problems involving addition, subtraction, multiplication and division of whole numbers; • Solve addition and subtraction problems of numbers up to five digits with and without regrouping; • Develop and apply algorithms to solve word problems that involve addition, subtraction, multiplication and division with decimals with or without regrouping fractions and mixed numbers; • Demonstrate the ability to round numbers; • Determine, through estimation, the reasonableness of answers to problems involving addition, subtraction, multiplication and division of whole numbers; • Demonstrate the ability to solve multiplication and division problems with regrouping and remainders; • Apply estimation strategies to a variety of problems involving time and money; • Select a method for computation and explain why it is appropriate; • Explain multiplication and division algorithms.	• Find products of a two digit whole number and multiples of 10, 100 and 1000. • Using at least 2 different algorithms, multiply factors with up to 3 digits, by two digit factors; • Using at least 2 different algorithms, divide by one and two-digit divisors to find up to 3 digit quotients. • Complete, create and discuss number patterns involving combinations of the M5 basic operations, describe and model relationships between and among arithmetic operations; • Determine products where one factor is 10, 100, 1000. • Convert time dimensions (minutes, seconds, hours, days, weeks, months, years, decades, centuries, millennium); • Calculate powers using repeated multiplication or a multiplication constant. • Determine the value of coins and bills $\geq$ \$20, given \$20, make change for purchases $\leq$ \$20. • Compute elapsed time. • Estimate and find sums and differences of decimals through hundredths and money values < \$1000; describe estimation strategies; • Add, subtract, multiply and divide whole numbers; • Add and subtract proper fractions and mixed numbers; • Add 2 decimals; • Subtract decimals; • Determine the approximate sum and difference of 2 numbers; • Determine the approximate product or quotient of 2 numbers;

Grade 3	Grade 4	Grade 5
• Divide a two-digit dividend by a one-digit divisor using models, pictures and drawings; • Identify and apply the concept of inverse operations to multiplication and division; • Write a word problem based on multiplication or division number sentences; • Determine the reasonableness of sums and differences; • Identify the question in the problem; • Decide if enough information is present to solve the problem; • Make a plan to solve a problem; • Apply a strategy: draw a picture, guess and check, find a pattern, write an equation; • Select a strategy: draw a picture, guess and check, find a pattern, write an equation; • Identify alternative ways to solve a problem; • Show that a problem might have multiple solutions or no solution; • Extend the solution of a problem to a new problem situation; • Estimate, approximate, round or use exact numbers as appropriate; • Describe the inverse relationship between addition and subtraction; • Demonstrate knowledge of basic facts in four basic operations.		• Solve word problems involving addition, subtraction, multiplication and division of whole numbers; • Solve addition and subtraction problems of numbers up to five digits with and without regrouping; • Develop and apply algorithms to solve word problems that involve addition, subtraction, multiplication and division with decimals with or without regrouping fractions and mixed numbers; • Demonstrate the ability to round numbers; • Determine, through estimation, the reasonableness of answers to problems involving addition, subtraction, multiplication and division of whole numbers; • Demonstrate the ability to solve multiplication and division problems with regrouping and remainders; • Apply estimation strategies to a variety of problems involving time and money; • Select a method for computation and explain why it is appropriate; • Explain multiplication and division algorithms; • Multiply and divide whole numbers; • Interpret quotients and remainders mathematically and in the context of a problem; • Add and subtract proper fractions and mixed numbers with answers in simplest form; • Add and subtract decimals including money; • Multiply decimals; • Determine the approximate sum and difference of decimals;

Grade 3	Grade 4	Grade 5
		• Determine the approximate product and quotient of whole numbers; • Determine the approximate product of decimals; • Mentally apply divisibility rules for 2, 3, M5, 6, and 10; • Estimate before calculating; • Add and subtract whole numbers, fractions and decimals; • Multiply and divide whole numbers (quotient need not be a whole number, interpret remainder properly); • Round decimals to the nearest whole number, tenth or hundredth; • Compute the unit price and discuss other factors involved in determining better buys; • Use the memory function of the calculator; • Compute elapsed time.

Grade 3	Grade 4	Grade 5
2.3 Measurement and Estimation • Estimate to the nearest unit, describe estimation strategies and verify measurements for: Length (centimeter, decimeter, meter, kilometer, inch, foot, yard and mile); Capacity (liters, millimeters, cup, pint, quart and gallon); Weight (grams, kilograms, pounds, ounces); Temperature (F, C); • Identify and use appropriate tools and units of measure; • Find the perimeter of polygons; • Tell the resulting time for a given number of minutes or hours before or after a given time; • Determine the value of sets of coins and bills ≤ $10 and write the value using the dollar and cents sign; • Round monetary values between $0.01 and $9.99 to the nearest dollar; • Make change for any purchase ≥ $10; • Estimate and then find the sum and difference of amounts of money ≥$100; • Estimate then find the product of an amount of money < $10 by a one digit whole number; • Find area by counting squares and volume by counting cubes; • Estimate and determine length; • Tell time in days, hours minutes and seconds; • Estimate and read temperature; • Estimate and determine weight of objects; • Measure length of objects and pictures of objects using a ruler, a tape measure, a yardstick, or a meter stick;	2.3 Measurement and Estimation • Estimate and verify: Length (cm, dm, m, km, inch, foot, yard, mile); Capacity (liter, milliliter, cup, pint, quart, gallon); Weight (grams, kilograms); Temperature (F, C). • Using models, estimate and verify the area and perimeter of regular and irregular shapes; use appropriate units. • Measure lengths to the nearest ¼ inch or ½ cm; mass to the nearest ½ pound or ½ gram; • Given several alternatives, choose the best unit of measure, provide an explanation for the choice; • Estimate and determine length and height; • Estimate and determine weight and mass; • Estimate and determine capacity; • Select and use appropriate tools and units; • Determine perimeter; • Determine area; • Determine elapsed time and end time; • Determine equivalent units of length; • Determine equivalent units of time; • Determine equivalent units of capacity and weight within the same system; • Select and use appropriate instruments and units for measuring quantities, such as: perimeter, volume, area, weight, time and temperature; • Determine the measurement of objects with non standard and standard (US customary and metric) units; • Determine and compare elapsed time;	2.3 Measurement and Estimation • Select and use appropriate instruments and units for measuring quantities (perimeter, area, volume, weight, time temperature); • Select and use standard tools to measure the size of figures with specific accuracy, including length, width, perimeter and area; • Estimate, refine and verify specified measurements of objects; • Convert linear measurements within the same system; • Add and subtract measurements; • Estimate and verify: length (cm, dm, m, km, inch, foot, yard, mile); capacity (liter, milliliter, cup, pint, quart, gallon); weight (grams, kilograms); temperature (F, C). • Using models, estimate and verify the area and perimeter of regular and irregular shapes; use appropriate units. • Measure lengths to the nearest ¼ inch or ½ cm; mass to the nearest ½ pound or ½ gram; • Given several alternatives, choose the best unit of measure, provide an explanation for the choice; • Estimate and determine length and height; • Estimate and determine weight and mass; • Estimate and determine capacity; • Select and use appropriate tools and units; • Determine perimeter; • Determine area; • Determine elapsed time and end time; • Determine equivalent units of length; • Determine equivalent units of time;

Grade 3	Grade 4	Grade 5
• Measure capacity of containers to the nearest cup, pint, quart, gallon, milliliter, and liter using graduated containers; • Measure weight/mass of objects to the nearest ounce, pound, gram and kilogram; • Estimate and determine the perimeter of geometric figures and pictures on a grid; • Estimate and determine the area of geometric figures and pictures on a grid; • Estimate and determine the volume of rectangular prisms; • Determine equivalent units of length; • Use estimation skills to arrive at conclusions; • Determine the reasonableness of calculated answers; • Explain addition and subtraction algorithms with regrouping; • Compare measurable characteristics of different objects on the same dimensions (time, temperature, area, length, weight, capacity and perimeter); • Determine appropriate unit of measure; • Use concrete objects to determine area and perimeter; • Estimate and verify measurements; • Demonstrate that a single object has attributes that can be measured in different ways (e.g., length, mass/weight, time, area, temperature, capacity, perimeter).	• Estimate, refine, and verify measurement of objects; • Add and subtract measurement.	• Determine equivalent units of capacity and weight within the same system; • Select and use appropriate instruments and units for measuring quantities, such as: perimeter, volume, area, weight, time and temperature; • Determine the measurement of objects with non standard and standard (US customary and metric) units; • Determine and compare elapsed time; • Estimate, refine, and verify measurement of objects; • Convert linear measurements with the same system; • Add and subtract measurement; • Estimate a determine weight; • Estimate and determine capacity; • Select and use appropriate tools and units; • Use the nearest degree and acute, right or obtuse angles; • Determine perimeter; • Determine area; • Estimate and determine volume by counting; • Determine start, elapsed and end time; • Determine equivalent units of measurement; • Use models to describe the development of area, perimeter and volume formulas; • Describe the difference between area and perimeter and know which to use; • Estimate and verify the area and perimeter of a regular and irregular shape; • Apply measurements to interdisciplinary and real world problem solving situations, such as temperature changes;

Grade 3	Grade 4	Grade 5
		• Convert units of measurement.

Grade 3	Grade 4	Grade 5
2.4 Mathematical Reasoning and Connections • Use deductive or inductive reasoning; • Make or test generalizations; • Support or refute mathematical statements or solutions; • Use methods of proof: direct, indirect, paragraph, or contradiction; • Make, check and verify predictions about quantity, size and shape of objects and groups of objects; • Use measurements to determine the geography of the school building.	2.4 Mathematical Reasoning and Connections • Use inductive or deductive reasoning; • Make or test generalizations; • Support or refute mathematical statements or solutions; • Use methods of proof, i.e., direct, indirect, paragraph or contradiction; • Identify mathematical concepts in relationship to other mathematical concepts; • Identify mathematical concepts in relationship to other disciplines; • Identify mathematical concepts in relationship to life; • Use the relationship among mathematical concepts to learn other mathematical concepts; • Use models, number facts, properties and relationships to check and verify predictions and explain reasoning; • Distinguish between relevant and irrelevant information in a mathematical problem; • Interpret and use statistics to quantify issues in all subject areas.	2.4 Mathematical Reasoning and Connections • Compare quantities and magnitude of numbers; • Use models, number facts, properties and relationships to check and verify predictions and explain reasoning; • Draw inductive and deductive conclusions within mathematical contexts; • Distinguish between relevant and irrelevant information in a mathematical problem; • Interpret statements made with precise language of logic (all, or, every, none, some, many); • Use statistics to quantify issues (social studies in science); • Use inductive or deductive reasoning; • Make or test generalizations; • Support or refute mathematical statements or solutions; • Use methods of proof, i.e., direct, indirect, paragraph or contradiction; • Identify mathematical concepts in relationship to other mathematical concepts; • Identify mathematical concepts in relationship to other disciplines; • Identify mathematical concepts in relationship to life; • Use the relationship among mathematical concepts to learn other mathematical concepts; • Use models, number facts, properties and relationships to check and verify predictions and explain reasoning; • Distinguish between relevant and irrelevant information in a mathematical problem;

Grade 3	Grade 4	Grade 5
		• Interpret and use statistics to quantify issues in all subject areas.

Grade 3	Grade 4	Grade 5
2.5 Mathematical Problem Solving and Communication • Use multiple representations to express concepts or solutions; • Apply addition and subtraction situations using concrete objects; • Solve single and double digit addition and subtraction problems (with regrouping) in vertical form; • Demonstrate concept of multiplication as repeated addition and arrays; • Demonstrate concept of division as repeated subtraction and sharing; • Express mathematical ideas orally; • Explain mathematically, ideas in written form; • Express solutions using concrete materials; • Express solutions using pictorial, tabular, graphical, or algebraic methods; • Explain solutions in written form; • Ask questions about mathematical ideas or problems; • Give or use feedback to revise mathematical thinking; • Identify mathematical concepts in relationship to other mathematical concepts; • Identify mathematical concepts in relationship to other disciplines; • Identify mathematical concepts in relationship to life; • Use the relationship among mathematical concepts to learn other mathematical concepts; • Use appropriate problem solving strategies, such as guess and check and work backwards;	2.5 Mathematical Problem Solving and Communication • Identify the question in the problem; • Decide if enough information is present to solve the problem; • Make a plan to solve a problem; • Apply a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Select a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Identify alternative ways to solve a problem; • Show that a problem might have multiple solutions or no solution; • Extend the solution of a problem to a new problem situation; • Use multiple representations to express concepts or solutions; • Express mathematical ideas orally; • Explain mathematical ideas in written form; • Express solutions using concrete materials; • Express solutions using pictorial, tabular, graphical, or algebraic methods; • Explain solutions in written form; • Ask questions about mathematical ideas or problems; • Give or use feedback to revise mathematical thinking; • Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved;	2.5 Mathematical Problem Solving and Communication • Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense and explain how the problem was solved; • Use appropriate mathematical terms, vocabulary, language symbols and graphs to explain clear and logical solutions to problems; • Show ideas in a variety of ways, including words, numbers, symbols, diagrams and models; • Identify the question in the problem; • Decide if enough information is present to solve the problem; • Make a plan to solve a problem; • Apply a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Select a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Identify alternative ways to solve a problem; • Show that a problem might have multiple solutions or no solution; • Extend the solution of a problem to a new problem situation; • Use multiple representations to express concepts or solutions; • Express mathematical ideas orally; • Explain mathematical ideas in written form; • Express solutions using concrete materials; • Express solutions using pictorial, tabular, graphical, or algebraic methods; • Explain solutions in written form;

Grade 3	Grade 4	Grade 5
• Determine when sufficient information is present to solve a problem and explain; • Select and use an appropriate method, materials and strategies to solve problems, including mental math, paper and pencil, and concrete objects.	• Use appropriate mathematical terms, vocabulary, language, symbols and graphs to explain solutions to problems.	• Ask questions about mathematical ideas or problems; • Give or use feedback to revise mathematical thinking; • Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved; • Use appropriate mathematical terms, vocabulary, language, symbols and graphs to explain solutions to problems; • Identify the question in the problem; • Decide if enough information is present to solve the problem; • Make a plan to solve a problem; • Apply a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Select a strategy, i.e., draw a picture, guess and check, find a pattern, write an equation; • Identify alternative ways to solve a problem; • Show that a problem might have multiple solutions or no solution; • Extend the solution of a problem to a new problem situation; • Use inductive or deductive reasoning; • Make or test generalizations; • Support or refute mathematical statements or solutions; • Use methods of proof, i.e., direct, indirect, paragraph or contradiction; • Use multiple representations to express concepts or solutions; • Express mathematical ideas orally;

Grade 3	Grade 4	Grade 5
		• Explain mathematical ideas in written form; • Express solutions using concrete materials; • Express solutions using pictorial, tabular, graphical, or algebraic methods; • Explain solutions in written form; • Ask questions about mathematical ideas or problems; • Give or use feedback to revise mathematical thinking; • Identify mathematical concepts in relationship to other mathematical concepts; • Identify mathematical concepts in relationship to other disciplines; • Identify mathematical concepts in relationship to life; • Use the relationships among mathematical concepts to learn other mathematical concepts.

Grade 3	Grade 4	Grade 5
2.6 Statistics and Data Analysis • Collect, organize and display data, using: picture graphs, tally charts, bar graphs, coordinate graphs, glyphs and line graphs; • Given information displayed on a graph, describe patterns; • Collect data by conducting surveys; • Organize and display data to make tables using a variety of categories and sets of data; • Organize and display data to make pictographs using a variety of scales; • Organize and display data to make single bar graphs using a variety of categories and intervals; • Organize and display data to make line plots using a variety of intervals; • Interpret data contained in tables using a variety of categories and intervals; • Interpret data contained in pictographs using a variety of categories and intervals; • Interpret data contained in single bar graphs using a variety of categories and intervals; • Interpret data contained in single bar graphs using a variety of categories and intervals; • Interpret data contained in line plots using a variety of intervals; • Gather, organize and display data, using pictures, tallies, charts, bar graphs and pictographs; • Formulate and answer questions based on data shown on graphs; • Predict the likely number of times a condition will occur based on analyzed data;	2.6 Statistics and Data Analysis • Model and find the measure of central tendencies (mean, median, mode and range); • Collect, organize, display and interpret data using: scaled picture graphs; bar graphs; line graphs; tables; coordinate graphs; glyphs; stem and leaf plots; line plots. • Observe patterns in collected data and make predictions. • Write a descriptive paragraph that interprets data; • Collect data by conducting surveys to answer a question; • Organize and display data in line plots and frequency tables using a variety of categories and sets of data; • Interpret line plots; • Interpret line graphs; • Determine mean, median, mode and range; • Model the mean of a set of data; • Gather, organize and display data using pictures, tallies, charts and graphs; • Use the date to form and justify an opinion.	2.6 Statistics and Data Analysis • Connect, extend and generalize problems solutions to other concepts, problems and circumstances in mathematics; • Select, use and justify the methods, materials and strategies used to solve problems; • Use appropriate problem solving strategies (solving a simpler problem, drawing a picture or diagram); • Organize and display data using pictures, tallies, tables, charts, bar graphs and circle graphs; • Describe data sets using mean, median, mode and range; • Sort data using Venn diagrams; • Predict the likely number of times a condition will occur based on analyzed data; • Construct and defend simple conclusions based on data; • Select and use appropriate strategies; include concrete materials to solve number sentences and explain the method of solution; • Locate and identify points on a coordinate system; • Generate functions from tables of data and relate data to corresponding graphs and functions; • Model and find the measure of central tendencies (mean, median, mode and range); • Collect, organize, display and interpret data using: scaled picture graphs; bar graphs; line graphs; tables, coordinate graphs; glyphs; stem and leaf plots; line plots;

Grade 3	Grade 4	Grade 5
• Form and justify an opinion on whether a given statement is reasonable based on comparison data.		• Observe patterns in collected data and make predictions. • Write a descriptive paragraph that interprets data; • Collect data by conducting surveys to answer a question; • Organize and display data in line plots and frequency tables using a variety of categories and sets of data; • Interpret line plots; • Interpret line graphs; • Determine mean, median, mode and range; • Model the mean of a set of data; • Gather, organize and display data using pictures, tallies, charts and graphs; • Use the date to form and justify an opinion; • Collect data by conducting surveys to answer a question; • Organize and display data in stem leaf plots; in line plots; in double bar graphs; in line graphs; • Interpret and compare data in stem and leaf plots; in line plots; in double bar graphs; in line graphs; • Read circle graphs; • Determine the mean of a given data set or data display; • Apply the range and measures of central tendency to solve a problem or answer a question; • Model and find the measures of central tendencies: mean, mode, median and range; • Collect, organize, display and interpret data, using: scaled picture graphs; bar graphs; circle graphs; line graphs; tables; coordinate graphs; glyphs; stem and leaf plots; line plots;

Grade 3	Grade 4	Grade 5
		• Observe patterns in collected data and make predictions; Write a descriptive paragraph that interprets data.

Grade 3	Grade 4	Grade 5
2.7 Probability and Prediction • Through exploration and experimentation, define and apply basic probability concepts, such as: equally likely, less likely, likely, certain, possible and impossible; • Through exploration and experimentation, determine whether a game is fair or unfair; list possible outcomes; • Identify possible outcomes that make up the sample space for a given real life situation ; • Identify possible outcomes that make up the sample space for a given experiment, such as: flipping a coin, spinning a spinner, and rolling a number cube; • Describe the probability of an event using words; • Predict and measure the likelihood of events and recognize that the results of an experiment may not match predicted outcomes; • Design a fair and unfair spinner; • List and graph the possible results of an experiment; • Analyze data using the concepts of largest, smallest, most often, least often and middle.	2.7 Probability and Prediction • Through exploration and experimentation find the probability of a singe event listing possible outcomes: equal and unequal chances, more likely, less likely, certain and impossible. • Through exploration and experimentation, determine whether a game is fair or unfair; list possible outcomes; • List all possible outcomes using a tree diagram, table or an organized list. • Predict and measure the likelihood of events and recognize that the results of an experiment may not match the predicted outcomes; • Determine the fairness of the design of a spinner; • Express probabilities as fractions and decimals; • Calculate the probability of a simple event; • Predict and determine why some outcomes are certain, more likely, less likely or impossible.	2.7 Probability and Prediction • Perform simulations with concrete devices (dice, spinners) to predict the chance of an event occurring; • Determine the fairness of the design of the spinner; • Express probability as fractions and decimals; • Compare predictions based on theoretical probability and experimental results; • Calculate the probability of a single event; • Determine patterns generated as a result of an experiment; • Determine the probability of an event involving “and”, “or”, or “not”; • Predict and determine why some outcomes are certain, more likely, less likely, equally likely or impossible; • Find all possible combinations and arrangements involving a limited number of variables; • Develop a tree diagram and list elements; • Through exploration and experimentation find the probability of a singe event listing possible outcomes: equal and unequal chances, more likely, less likely, certain and impossible. • List all possible outcomes using a tree diagram, table or an organized list. • Predict and measure the likelihood of events and recognize that the results of an experiment may not match the predicted outcomes; • Determine the fairness of the design of a spinner; • Express probabilities as fractions and decimals; • Calculate the probability of a simple event;

Grade 3	Grade 4	Grade 5
		• Predict and determine why some outcomes are certain, more likely, less likely or impossible; • Find all possible combinations and arrangements involving a limited number of variables; • Determine possible outcomes of independent events; • Make predictions and express the probability as a fraction; • Write a descriptive paragraph to interpret data gathered through experimentation; • List all possible outcomes of an event (tree diagram); • Through exploration and experimentation, find the probability of a single event listing possible outcomes, such as certain, expected and impossible.

Grade 3	Grade 4	Grade 5
2.8 Algebra and Functions • Represent whole numbers on a number line; • Represent proper fractions on a number line; • Represent and analyze numeric patterns using skip counting; • Represent and analyze numeric patterns using skip counting backwards; • Complete a function table using a given addition or subtraction rule; • Represent and analyze growing patterns using symbols, shapes, designs or pictures; • Represent and analyze repeating patterns using symbols, shapes, designs or pictures; • Represent numeric quantities using operational symbols; • Represent relationships using appropriate relational symbols and operational symbols on either side; • Find the missing number (unknown) in a number sentence (equation) using operational symbols (+, -, x, /); • Find the missing numbers (unknown) on one or both sides of a number sentence (equation); • Create and explain a pattern; • Recognize, describe and extend patterns; • Use constant function on calculator; • Recognize, describe, extend, create, and replicate a variety of patterns including attribute, activity, number and geometric patterns; • Use concrete objects and trial and error to solve number sentences and check if solutions are sensible and accurate;	2.8 Algebra and Functions • Illustrate a problem with physical objects, representational drawings, models, etc. • Generalize the rule for a pattern; • Given a one-step equation or inequality, write a story and interpret the solution within the context of the story; use the concept of variable. • Evaluate expressions which include parentheses for grouping numbers. • Solve for missing number in a number sentence; • Represent or analyze numeric patterns using skip counting; • Create a one operation (+ or -) function table to solve a real world problem; • Complete a function table using a one operation (+, -, x, / with no remainders) rule; • Describe the relationship that generates a one operation rule; • Generate a rule for the next level of the growing pattern; • Generate a rule for a repeating pattern; • Create a non numeric growing or repeating pattern; • Represent numeric quantities using operational symbols (+, -, x, / with no remainders); • Determine equivalent expressions; • Represent relationships by using relational symbols (>, <, =) and operational symbols (+, -, x, /) on either side; • Find the unknown in an equation with one operation;	2.8 Algebra and Functions • Recognize, reproduce, extend, create, and describe patterns, sequences and relationships verbally, numerically, symbolically and graphically, using a variety of materials; • Connect patterns to geometric relations and basic number skills; • Form rules based on patterns (an equation that relates pairs in a sequence); • Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations; • Explain the use of combinations of symbols and numbers in expressions, equations and inequalities; • Describe realistic situations using information given in equations, inequalities, tables or graphs; • Illustrate a problem with physical objects, representational drawings, models, etc. • Generalize the rule for a pattern; • Given a one-step equation or inequality, write a story and interpret the solution within the context of the story; use the concept of variable. • Evaluate expressions which include parentheses for grouping numbers. • Solve for missing number in a number sentence; • Represent or analyze numeric patterns using skip counting; • Create a one operation (+ or -) function table to solve a real world problem;

Grade 3	Grade 4	Grade 5
• Substitute a missing addend in a number sentence; • Create a story to match a given combination of symbols and numbers; • Use concrete objects and symbols to model the concept of variables, expressions, equations and inequalities; • Explain the meaning of solutions and symbols; • Gather information and display it in the form of a table or chart; • Describe and interpret the data shown in tables and charts; • Demonstrate simple function rules; • Analyze simple functions and relationships and locate points on a simple grid.	• Represent mixed numbers and proper fractions on a number line; • Identify positions in a coordinate plane; • Represent decimals on a number line; • Identify properties of angles using manipulatives and pictures; • Identify and describe angles in relationship to another angle; • Identify parallel and intersecting line segments; • Compare and classify angles in geometric figures and pictures; • Identify cones, cylinders, prisms and pyramids; • Describe solid geometric figures by the number of edges, faces or vertices; • Compare a plane figure to surfaces of solid geometric figures; • Identify and describe the results of translations, reflections, and rotations; • Express the probability as a fraction; • Recognize, reproduce, extend, create and describe patterns, sequences and relationships verbally, numerically, symbolically, and graphically using a variety of materials; • Connect patterns to geometric relations and basic number skills; • Substitute missing addend or factor in a number sentence; • Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations; • Explain the use of combinations of symbols and expressions, equations and inequalities;	• Complete a function table using a one operation (+, -, x, / with no remainders) rule; • Describe the relationship that generates a one operation rule; • Generate a rule for the next level of the growing pattern; • Generate a rule for a repeating pattern; • Create a non numeric growing or repeating pattern; • Represent numeric quantities using operational symbols (+, -, x, / with no remainders); • Determine equivalent expressions; • Represent relationships by using relational symbols (>, <, =) and operational symbols (+, -, x, /) on either side; • Find the unknown in an equation with one operation; • Represent mixed numbers and proper fractions on a number line; • Identify positions in a coordinate plane; • Represent decimals on a number line; • Identify properties of angles using manipulatives and pictures; • Identify and describe angles in relationship to another angle; • Identify parallel and intersecting line segments; • Compare and classify angles in geometric figures and pictures; • Identify cones, cylinders, prisms and pyramids; • Describe solid geometric figures by the number of edges, faces or vertices; • Compare a plane figure to surfaces of solid geometric figures;

Grade 3	Grade 4	Grade 5
	• Describe realistic situations using information given in equations, inequalities, tables or graphs; • Gather information and display it in the form of a table or chart; • Locate and identify points on a coordinate system.	• Identify and describe the results of translations, reflections, and rotations; • Express the probability as a fraction; • Recognize, reproduce, extend, create and describe patterns, sequences and relationships verbally, numerically, symbolically, and graphically using a variety of materials; • Connect patterns to geometric relations and basic number skills; • Substitute missing addend or factor in a number sentence; • Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations; • Explain the use of combinations of symbols and expressions, equations and inequalities; • Describe realistic situations using information given in equations, inequalities, tables or graphs; • Use parentheses to evaluate a numeric expression; • Gather information and display it in the form of a table or chart; • Locate and identify points on a coordinate system; • Interpret and write a rule for a one operation (+, -, x, / with no remainders) table; • Determine approximate product and quotient of whole numbers; • Complete a one operation (+, -, x, / with no remainders) function table; • Apply a given two operation rule for a pattern; • problem-solving strategy used.

Grade 3	Grade 4	Grade 5
		• Represent unknown quantities with one unknown and one operation (+, -, x, / with no remainders); • Evaluate algebraic expressions with one unknown, one operation and whole numbers; • Represent relationships by using the appropriate relational symbols (<, >, =) and one operational symbol (+, -, x, / with no remainders) on either side; • Find the unknown in an equation with one operation (+, -, x, / with no remainders); • Represent decimals and mixed numbers on a number line; • Create a graph in a coordinate plane; • Compare numerical and non-numerical patterns, generalize the rule for the pattern using both a verbal description and mathematical symbols; • Given a functional relationship, describe how a change in one variable results in a change in the other variable; generalize the pattern; • Given a function table, write a rule using both a verbal description and mathematical symbols; • Given a story, write a two-step equation of inequality and solve it; interpret the solution within the context of the story; describe the problem solving strategy used.

Grade 3	Grade 4	Grade 5
2.9 Geometry • Describe and draw a picture of intersecting, perpendicular, parallel, diagonal, horizontal, and vertical lines; • Identify points, lines, line segments and rays; make geometric analogies; • Determine whether a given angle is less than, greater than, or equal to 90 degrees; • Identify, draw and describe triangles, quadrilaterals, pentagons and hexagons and determine the number of sides, angles and vertices; • Describe characteristics of two and three dimensional shapes and the effects of combining them; • Recognize similar characteristics seen in different settings; • Identify and draw lines of symmetry that exist for simple plane figures; • Distinguish between any similar and congruent plane figures; demonstrate slides, flips and turns; • Identify or describe points, lines, line segments, rays and angles; • Identify or describe polygons; • Identify or describe quadrilaterals; • Identify triangles, rectangles, or squares as part of a composite figure; • Identify and describe cubes, rectangular prisms, and triangular prisms; • Identify or describe geometric figures as congruent; • Identify and describe the results of a slide, flip and turn;	2.9 Geometry • Draw a polygon, given its name and dimensions; • Complete geometric analogies; • Identify and create tessellations and other geometric patterns; • Describe the characteristics of a rectangular prism, pyramid, cube, sphere, cylinder, and cone. • Plot points on a grid and connect to determine if resultant figures are congruent, similar, or symmetric (angles and polygons). • Describe the relationship between points, lines, line segments, rays, intersecting lines, parallel lines, perpendicular lines, and diagonal lines. • Distinguish among angles: acute, obtuse, and right. • Distinguish among triangles: isosceles, right, scalene, and equilateral. • Distinguish among equilaterals. • Identify a radius and diameter of a circle, and find the length of one given the other. • Construct a circle, given its radius; • Identify and draw lines of symmetry in geometric figures; • Identify and distinguish between 1, 2 and 3 dimensional figures and their properties; • Name and label triangles and quadrilaterals according to sides or angles; • Construct 2 and 3 dimensional shapes and figures using manipulatives, geo-boards, and computer software; • Identify and measure circles, their diameters and radii;	2.9 Geometry • Classify and compare triangles and quadrilaterals according to size or angles; • Identify and measure circles, their diameters and their radii; • Describe in words how geometric shapes are constructed; • Construct two and three dimensional shapes and figures using manipulatives, geoboards and computer software; • Find familiar solids in the environment and describe them; • Create an original tessellation; • Describe the relationship between the perimeter and the area of triangles, quadrilaterals and circles; • Represent and use concepts of line, point and plane; • Define the basic properties of squares, pyramids, parallelograms, trapezoids, polygons, rectangles, rhombi, circles, triangles, cubes, prisms, spheres and cylinders; • Analyze simple transformations of geometric figures and rotations of line segments; • Identify properties of geometric figures (parallel, perpendicular, similar, congruent and symmetrical); • Draw a polygon, given its name and dimensions; • Complete geometric analogies; • Identify and create tessellations and other geometric patterns;

Grade 3	Grade 4	Grade 5
• Name and label geometric shapes in two and three dimensions (circle/sphere, square/cube, triangle/pyramid, rectangle/prism); • Build geometric shapes using concrete objects (manipulatives); • Draw two and three dimensional geometric shapes and construct rectangles, squares and triangles on the geoboard and on graph paper satisfying specific criteria; • Find and describe geometric figures in real life; • Identify and draw lines of symmetry in geometric figures; • Identify symmetry in nature; • Fold paper to demonstrate the reflections about a line; • Show relationships between and among figures using reflections; • Predict how combining them or dividing them can change shapes.	• Identify familiar geometric figures in the environment; • Create an original tessellation; • Identify and draw lines of symmetry in geometric figures; • Describe the relationship between the perimeter and area of triangles, quadrilaterals, and circles; • Define the basic properties of squares, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, triangles, cubes, prisms, spheres, and cylinders; • Identify properties of angles using manipulatives and pictures; • Identify and describe angles in relationship to another angle; • Identify parallel and intersecting line segments; • Compare and classify angles in geometric figures and pictures; • Identify cones, cylinders, prisms and pyramids; • Describe solid geometric figures by the number of edges, faces, or vertices; • Compare a plane figure to surfaces of solid geometric figure; • Identify and describe the results of translations, reflections and rotations.	• Describe the characteristics of a rectangular prism, pyramid, cube, sphere, cylinder, and cone. • Plot points on a grid and connect to determine if resultant figures are congruent, similar, or symmetric (angles and polygons). • Describe the relationship between points, lines, line segments, rays, intersecting lines, parallel lines, perpendicular lines, and diagonal lines. • Distinguish among angles: acute, obtuse, and right. • Distinguish among triangles: isosceles, right, scalene, and equilateral. • Distinguish among equilaterals. • Identify a radius and diameter of a circle, and find the length of one given the other. • Construct a circle, given its radius; • Identify and draw lines of symmetry in geometric figures; • Identify and distinguish between 1, 2 and 3 dimensional figures and their properties; • Name and label triangles and quadrilaterals according to sides or angles; • Construct 2 and 3 dimensional shapes and figures using manipulatives, geo-boards, and computer software; • Identify and measure circles, their diameters and radii; • Identify familiar geometric figures in the environment; • Create an original tessellation; • Identify and draw lines of symmetry in geometric figures;

Grade 3	Grade 4	Grade 5
		• Describe the relationship between the perimeter and area of triangles, quadrilaterals, and circles; • Define the basic properties of squares, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, triangles, cubes, prisms, spheres, and cylinders; • Identify and describe relationships of lines and line segments in geometric figures or pictures; • Identify and describe the radius and diameter of a circle; • Identify polygons within a composite figure; • Compare or classify quadrilaterals by length of sides and measures of angles (include the angle symbol <ABC) • Compare triangles by sides; • Identify and classify pyramids and prisms by the number of edges, faces or vertices; • Identify and classify pyramids and prisms by the base; • Compare a plane figure to surfaces of a solid geometric figure; • Identify, describe, and draw angles, parallel line segments, and perpendicular line segments; • Identify or describe geometric figures as similar; • Analyze translations, reflections, and rotations of geometric figures; • Perform transformations on a plane figure (rotations, translations, reflections, expansions/contractions using a coordinate system);

Grade 3	Grade 4	Grade 5
		• Discuss congruency and symmetry as they apply to angles and polygons; • Define, measure to the nearest degree, and classify right angles, obtuse angles, straight angles and acute angles; • Construct a circle, given its radius or diameter; • Identify and describe characteristics of solid and plane figures; • Distinguish among kinds of angles, triangles and quadrilaterals.

Grade 3	Grade 4	Grade 5
2.10 Trigonometry • Identify right angles in the environment; • Model right angles and right triangles using concrete objects.	2.10 Trigonometry • Identify right angles in the environment; • Create right triangles on a geoboard.	2.10 Trigonometry • Identify right angles in the environment; • Create right triangles on a geoboard; • Identify and compare parts of right triangles, including right angles, acute angles, hypotenuses and legs.

Grade 3	Grade 4	Grade 5
2.11 Concepts of Calculus • Identify whole number quantities and measurements from least to most and greatest value; • Identify least and greatest values represented in bar graphs and pictographs; • Categorize rates of change as faster and slower; • Continue a pattern of numbers or objects that could be extended to infinity.	2.11 Concepts of Calculus • Make comparisons of numbers, such as more, less, same as, least, most, greater than, and less than; • Identify least and greatest values represented in bar and circle graphs; • Identify maximum and minimum; • Continue pattern of numbers or objects that could be extended infinitely.	2.11 Concepts of Calculus • Make comparisons of numbers, such as more, less, same as, least, most, greater than, and less than; • Identify least and greatest values represented in bar and circle graphs; • Identify maximum and minimum; • Continue pattern of numbers or objects that could be extended infinitely; • Describe the relationship between rates of change and time; • Estimate areas and volumes as the sums of areas of tiles and volumes of cubes; • Describe the relationship between the size of the unit of measurement and the estimate of the areas and volumes.