

## Lower School Mathematics Standards & Benchmarks

**1. Students will apply a wide variety of mathematical concepts, processes, and skills to solve a broad range of problems in various content areas and everyday situations**

Pre-school	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
	Use trial and error and the process of elimination to solve problems	Use trial and error and the process of elimination to solve problems.	Use trial and error and the process of elimination to solve problems.	Use trial and error and the process of elimination to solve problems.	Use trial and error and the process of elimination to solve problems.	Use trial and error and the process of elimination to solve problems. (Now called guess & check).	Use trial and error and the process of elimination to solve problems. (Now called guess & check).
			Understand that there is no one right way to solve mathematical problems but that different methods have different advantages and disadvantages.	Understand that there is no one right way to solve mathematical problems but that different methods have different advantages and disadvantages.	Understand that there is no one right way to solve mathematical problems but that different methods have different advantages and disadvantages.	Understand that there is no one right way to solve mathematical problems but that different methods have different advantages and disadvantages.	Understand that there is no one right way to solve mathematical problems but that different methods have different advantages and disadvantages.
		Verify the correctness and reasonableness of simple mathematical results	Verify the correctness and reasonableness of simple mathematical results.	Verify the correctness and reasonableness of simple mathematical results.	Verify the correctness and reasonableness of simple mathematical results.	Interpret results in the context of the problem being solved (for example, when determining the number of buses necessary to transport students, the remainder must be rounded up).	Interpret results in the context of the problem being solved (for example, when determining the number of buses necessary to transport students, the remainder must be rounded up).
		Transfer strategies from a prior problem to a new situation	Transfer strategies from a prior problem to a new situation.	Transfer strategies from a prior problem to a new situation.	Transfer strategies from a prior problem to a new situation.	Develop and apply a variety of problem solving strategies.	Develop and apply a variety of problem solving strategies and justify the choice of strategies.
			Demonstrate that there may be multiple ways to solve a problem and explain why this is so.	Demonstrate that there may be multiple ways to solve a problem and explain why this is so.	Demonstrate that there may be multiple ways to solve a problem and explain why this is so.	Demonstrate and justify a variety of problem-solving strategies.	Demonstrate and justify a variety of problem-solving strategies.
					Understand how to break a complex problem into simpler parts.	Understand how to break a complex problem into simpler parts.	Understand how to break a complex problem into simpler parts.
					Know how to select and use mathematical tools and methods (such as manipulatives, mental math, calculator, computer, and paper-and-pencil techniques) as a part of the problem-solving process.	Know how to select and use mathematical tools and methods (such as manipulatives, mental math, calculator, computer, and paper-and-pencil techniques) as a part of the problem-solving process.	Know how to select and use mathematical tools and methods (such as manipulatives, mental math, calculator, computer, and paper-and-pencil techniques) as a part of the problem-solving process.
					Formulate a problem, determine information required to solve the problem, choose methods for obtaining this information, and set limits for acceptable solutions.	Formulate a problem, determine information required to solve the problem, choose methods for obtaining this information, and set limits for acceptable solutions.	Formulate a problem, determine information required to solve the problem, choose methods for obtaining this information, and set limits for acceptable solutions.

**2. Students will apply mathematical reasoning skills to make sense of, investigate, evaluate, justify, and connect approaches and solutions to situations in mathematics and in other disciplines.**

Pre-school	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
		Make and check predictions about the quantity, size, and shape of objects and groups of objects.	Make and check predictions about the quantity, size, and shape of objects and groups of objects.	Make, check, and verify predictions about the quantity, size, and shape of objects and groups of objects.	Make, check, and verify predictions about the quantity, size, and shape of objects and groups of objects.	Make, check and explain predictions and estimations.	Make, check and explain predictions and estimations.
		Discuss why a prediction, estimation, or solution is reasonable	Explain why a prediction, estimation, or solution is reasonable.	Explain why a prediction, estimation, or solution is reasonable.	Explain why a prediction, estimation, or solution is reasonable.	Review, verify and explain solutions to prove their accuracy and reasonableness.	Review, verify and explain solutions to prove their accuracy and reasonableness
		Find examples that support or refute mathematical statements.	Find examples that support or refute mathematical statements	Find examples that support or refute mathematical statements	Find examples that support or refute mathematical statements	Support or refute mathematical statements and justify reasoning.	Support or refute mathematical statements and justify reasoning.
			Demonstrate an understanding between the abstract and concrete.	Demonstrate an understanding between the abstract and concrete.	Demonstrate an understanding between the abstract and concrete.	Demonstrate an understanding between the abstract and concrete.	Demonstrate an understanding between the abstract and concrete.
						Draw logical conclusions about mathematical situations using informal inductive and deductive reasoning (e.g., observing that the angles of several triangles add up to 180 degrees and concluding that the angles of all triangles add up to 180 degrees; concluding that since all rectangles have 4 90-degree corners, a square must be a rectangle).	Draw logical conclusions about mathematical situations using informal inductive and deductive reasoning (e.g., observing that the angles of several triangles add up to 180 degrees and concluding that the angles of all triangles add up to 180 degrees; concluding that since all rectangles have 4 90-degree corners, a square must be a rectangle).
						Interpret statements that include words such as all, every, none, some.	Interpret statements that include words such as all, every, none, some.
						Independently apply mathematical concepts to other content areas such as science, geography, and music.	Independently apply mathematical concepts to other content areas such as science, geography, and music.
							Use models, spreadsheets, number facts, properties, and relationships to check and verify predictions and explain reasoning.

**3. Students will understand mathematical information presented and obtained in a variety of ways and will accurately and clearly present and justify mathematical ideas in diverse formats.**

Pre-school	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Show understanding of mathematical ideas (e.g. sorting and ordering) using concrete and pictorial representations.	Show understanding of mathematical ideas (e.g. sorting and ordering) using concrete and pictorial representations.	Show understanding of mathematical ideas (e.g. sorting and ordering) using concrete and pictorial representations.	Communicate mathematical ideas using concrete, pictorial and symbolic representations.	Communicate mathematical ideas using concrete, pictorial and symbolic representations.	Communicate mathematical ideas using concrete, pictorial and symbolic representations.	Identify, communicate, and model key mathematical concepts and situations using oral, written, concrete, pictorial, and graphic methods, making certain that the situation is represented clearly and accurately.	Identify, communicate, and model key mathematical concepts and situations using oral, written, concrete, pictorial, and graphic methods, making certain that the situation is represented clearly and accurately.
			Listen to and read about mathematical strategies and solutions, and communicate them to others using everyday language and correct mathematical terms (e.g., sum, difference) and symbols (e.g., +, =, >).	Listen to and read about mathematical strategies and solutions, and communicate them to others using everyday language and correct mathematical terms (e.g., sum, difference) and symbols (e.g., +, =, >).	Listen to and read about mathematical strategies and solutions, and communicate them to others using everyday language and correct mathematical terms (e.g., quotient, product) and symbols (e.g., +, =, >).		
						Explain and justify mathematical ideas, strategies, and solutions to others, using the correct mathematical vocabulary.	Explain and justify mathematical ideas, strategies, and solutions to others, using the correct mathematical vocabulary.
		Understand and demonstrate that some ways of representing a problem are more helpful than others.	Understand and demonstrate that some ways of representing a problem are more helpful than others.	Understand and demonstrate that some ways of representing a problem are more helpful than others.	Understand and demonstrate that some ways of representing a problem are more helpful than others.		
						Demonstrate an ability to understand others' strategies or explanations	Demonstrate an ability to understand others' strategies or explanations
			Recognize that certain words give clues to specific operations (e.g., sum means addition, difference means subtraction).	Recognize that certain words give clues to specific operations (e.g., sum means addition, difference means subtraction).	Recognize that certain words give clues to specific operations (e.g., sum means addition, difference means subtraction, product means multiplication).	Recognize that certain words give clues to specific operations (e.g. product, quotient).	Recognize that certain words give clues to specific operations (e.g. of means multiplication of fractions, per to mean division).

**4. Students will select and use a wide variety of tools and technology to support and validate mathematical results, when appropriate.**

<b>Pre-school</b>	<b>K1</b>	<b>K2</b>	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>
Represent and examine mathematical situations using concrete materials (sorting, non-standard, one to one).	Represent and examine mathematical situations using concrete materials.	Represent and examine mathematical situations using concrete materials.	Represent and examine mathematical situations using concrete materials and computers.	Represent and examine mathematical situations using concrete materials and computers.	Represent and examine mathematical situations using concrete materials and computers.	Represent and examine mathematical situations using computers.	Represent and examine mathematical situations using computers.
			Use a calculator to confirm computations and to explore patterns.	Use a calculator to confirm computations and to explore patterns	Use a calculator to confirm computations and to explore patterns	Use calculators or software to verify estimations and in problem-solving situations.	Use calculators or software to verify estimations and in problem-solving situations.
	Use a variety of non-standard tools to measure.	Use a variety of non-standard tools to measure.					
			Use a variety of standard tools (e.g., rulers, clocks, measuring tapes, thermometers) and non-standard objects (e.g., counters, sticks), to measure.	Use a variety of standard tools (e.g., rulers, clocks, measuring tapes, thermometers) and non-standard objects (e.g., counters, sticks), to measure.	Use a variety of standard tools (e.g., rulers, clocks, measuring tapes, thermometers) and non-standard objects (e.g., counters, sticks), to measure.	Use a variety of standard tools (e.g., rulers, clocks, measuring tapes, thermometers) and non-standard objects (e.g., counters, sticks), to measure.	Use a variety of standard tools (e.g., rulers, clocks, measuring tapes, thermometers) and non-standard objects (e.g., counters, sticks), to measure.

### 5. Students will understand and apply numbers, ways of representing numbers, relationships among numbers, and number systems.

Pre-school	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Connect physical, verbal, and symbolic representations of whole numbers.	Connect physical, verbal, and symbolic representations of whole numbers.	Connect physical, verbal, and symbolic representations of whole numbers.	Connect physical, verbal, and symbolic representations of whole numbers, fractions and mixed numbers.	Connect physical, verbal, and symbolic representations of whole numbers, fractions and mixed numbers.	Connect physical, verbal, and symbolic representations of whole numbers, fractions and mixed numbers.	Model and connect physical, verbal, and symbolic representations of fractions, decimals and mixed numbers.	Model and connect physical, verbal, and symbolic representations of fractions, decimals, percentages and mixed numbers.
Demonstrate how numbers are used in various ways, e.g. counting, ordering.	Demonstrate how numbers are used in various ways, including counting, ordering, representing quantities, measuring and labeling.	Demonstrate how numbers are used in various ways, including counting, ordering, representing quantities, measuring and labelling.	Demonstrate how numbers are used in various ways, including counting, ordering, representing quantities, measuring, labeling, and indicating location.	Explain how numbers are used in various ways, including counting, ordering, representing quantities, measuring, labeling, and indicating location.	Explain how numbers are used in various ways, including counting, ordering, representing quantities, measuring, labeling, and indicating location.		
						Explain how fractions and decimals are used in various ways.	Explain how fractions, decimals and percentages are used in various ways.
			Apply place-value concepts and numeration to describe, compare, count, order, and group numbers.	Apply place-value concepts and numeration to describe, compare, count, order, and group numbers.	Apply place-value concepts and numeration to describe, compare, count, order, and group numbers.	Apply place value concepts when performing the 4 basic operations.	Apply place value concepts when performing the 4 basic operations.
						Use, model, and identify place value from hundredths to millions and describe its relationship to magnitude.	Use, model, and identify place value, from the thousandths to trillions and describe its relationship to magnitude.
			Identify and extend patterns in number sequences.	Identify and extend patterns in number sequences.	Recognize a wide variety of patterns and the rules that explain them.	Recognize a wide variety of patterns and the rules that explain them.	Recognize a wide variety of patterns and the rules that explain them.
						Understand that the same pattern can be represented in different ways; (e.g. geometrically or numerically; the pattern of numbers 7, 14, 21, 28...is equivalent to the mathematical relationship $7 \times n$ )	Understand that the same pattern can be represented in different ways; (e.g. geometrically or numerically; the pattern of numbers 7, 14, 21, 28...is equivalent to the mathematical relationship $7 \times n$ )
	Read, write and order numbers 1 to 10.	Read, write and order numbers 1 to 20.	Read, write and order numbers to 100.	Read, write, and order numbers to 1000.	Read, write, and order numbers to 10,000.	Read, write, and order numbers from hundredths to a million.	Read, write, and order numbers from thousandths to a trillion.
			Explain the connections between the operations of addition and subtraction.	Explain the connections between the operations of addition and subtraction.	Explain the connections between operations of multiplication and division.		

						Demonstrate that mathematical operations can represent a variety of problem situations (for example, multiplication can represent repeated addition and a model for finding area).	Demonstrate that mathematical operations can represent a variety of problem situations (for example, multiplication can represent repeated addition and a model for finding area).
			Use drawings, diagrams, and models to show the concept of halves and quarters as part of a whole and part of a set.	Use drawings, diagrams, and models to show the concept of fractions as part of a whole and part of a set.	Use drawings, diagrams, and models to show the concept of fractions as part of a whole and part of a set.	Recognize the relationship between fractions and decimals.	Recognize the relationship among fractions, decimals, and percentages.
						Identify and describe different representations for the same number (for example, 2,343 is the same as $2,000 + 300 + 40 + 3$ ; and 1 equals $16/16$ ).	Identify and describe different uses for the same numerical representation (for example, $1/4$ can represent a fraction, a division problem, or a ratio).
				Represent, identify and order halves, thirds, quarters and fifths.	Identify equivalence between simple fractions and decimals.	Identify, represent, order and connect equivalence between fractions and decimals, including mixed numbers, improper fractions and decimals to 100ths.	Identify, represent and connect equivalence between fractions, mixed numbers, improper fractions and decimals to 1000ths.
					Apply place value in order to describe, order and compare decimals to 10ths.	Apply place value in order to describe, order and compare decimals to 100ths.	Apply place value in order to describe, order and compare decimals to 1000ths.
				Connect simple equivalent fractions.	Demonstrate understanding of the relationship between fractions and division.		
						Connect decimals to metric and money units.	
							Use concepts of negative numbers in concrete situations (such as on a number line, with temperature).
							Explain and apply number theory concepts (such as primes, multiples, and composites).

**6. Students will estimate, compute, and assess reasonableness of solutions.**

Pre-school	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
	Apply addition and subtraction in a variety of situations.	Apply addition and subtraction in a variety of situations.	Apply addition and subtraction in a variety of situations.	Apply addition and subtraction in a variety of situations.	Apply addition and subtraction in a variety of situations (such as computing perimeter, extending functions).	Apply multiplication and division in a variety of situations.	Apply multiplication and division in a variety of situations.
	Understand and appropriately use the vocabulary of estimation (more than, less than).	Understand and appropriately use the vocabulary of estimation (more than, less than).	Understand and appropriately use the vocabulary of estimation (about, near, between, less than, more than).	Understand and appropriately use the vocabulary of estimation (about, near, between, greater than, less than).	Understand and appropriately use the vocabulary of estimation such as rounding.	Apply, explain, and assess the appropriateness of a variety of estimation strategies (such as rounding to compatible numbers).	Apply, explain, and assess the appropriateness of a variety of estimation strategies (such as rounding to compatible numbers).
			Demonstrate proficiency with and memorize addition and subtraction facts through 10 .	Demonstrate proficiency with and memorize addition and subtraction facts through 20 and multiplication facts: 2, 5 and 10 times tables.	Demonstrate proficiency with and memorize multiplication facts through 10.	Demonstrate proficiency with and memorize multiplication facts through 12.	Demonstrate proficiency with and memorize division facts through 12.
			Add and subtract single- and two-digit whole numbers without regrouping.	Add and subtract single- and two-digit whole numbers with regrouping.	Add and subtract single- and multi-digit whole numbers with regrouping.	Add and subtract decimals.	Add and subtract decimals.
			Demonstrate understanding of the value of Euros.	Demonstrate understanding of the value of Euros.	Read, write, add and subtract with decimal notation in situations involving money.	Read, write, add and subtract with decimal notation in situations involving money.	Read, write, add and subtract with decimal notation in situations involving money.
				Demonstrate the concept of multiplication as repeated addition and division as sharing into equal groups.	Demonstrate the concept of multiplication as repeated addition and arrays; demonstrate the concept of division as repeated subtraction and as sharing.		
			Create and solve practical problems involving addition and subtraction.	Create and solve practical problems involving addition and subtraction.	Create and solve practical problems involving addition, subtraction and multiplication.	Create and solve practical problems involving addition, subtraction, multiplication, and division of whole numbers.	Create and solve practical problems involving addition, subtraction, multiplication, and division of whole numbers, fractions and decimals.
					Use various forms of estimation, including rounding, to determine the reasonableness of calculated answers; determine if an estimate is too high or too low.	Use various forms of estimation, including rounding, to determine the reasonableness of calculated answers; determine if an estimate is too high or too low.	Use various forms of estimation, including rounding, to determine the reasonableness of calculated answers; determine if an estimate is too high or too low.

						Select and use the most efficient computational methods, choosing among concrete materials, paper and pencil, estimation, mental computation, and calculators.	Select and use the most efficient computational methods, choosing among concrete materials, paper and pencil, estimation, mental computation, and calculators.
						Analyze and compare a variety of algorithms	Analyze and compare a variety of algorithms
				Use a variety of mental computational methods, strategies, and estimation skills to find solutions and to determine the reasonableness of calculated answers.	Use a variety of mental computational methods, strategies, and estimation skills to find solutions and to determine the reasonableness of calculated answers.	Use a variety of mental computational methods, strategies, and estimation skills to find solutions and to determine the reasonableness of calculated answers.	Use a variety of mental computational methods, strategies, and estimation skills to find solutions and to determine the reasonableness of calculated answers.
					Multiply two digit whole numbers by single-digit numbers.	Multiply 3 and 4 digit numbers by single digit numbers.	
						Multiply 2 digit numbers by 2 digit numbers.	Multiply a 3 or 4 digit number by a 3 digit number.
						Multiply using multiples of 10, 100, 1000.	Multiply decimals using multiples of 10, 100, 1000.
							Apply beginning number theory including identifying and using multiples, factors, divisibility, properties of identity (zero and one), and prime and composite numbers.
					Divide two-digit whole numbers by single-digit numbers without remainders.	Divide a 2 or 3 digit number by a 1 digit number (with and w/o remainders).	Divide a 4 or 5 digit number by a 2 digit number and understand that a remainder can be expressed as a fraction or a decimal.
							Know and convert among fractions, decimals, and percents for $\frac{1}{10}$ , $\frac{1}{5}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , and $\frac{3}{4}$ .
				Apply addition to ones and halves.	Add and subtract simple fractions.	Add and subtract fractions with like denominators.	Apply addition, subtraction and multiplication of simple fractions.

**7. Students will estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools, and technologies.**

Pre-School	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
		Estimate before measuring to determine the reasonableness of a solution.	Estimate before measuring to determine the reasonableness of a solution.	Estimate before measuring to determine the reasonableness of a solution.	Use specific strategies to estimate quantities & measurements (e.g. estimating the whole by estimating the parts).	Use specific strategies to estimate quantities & measurements (e.g. estimating the whole by estimating the parts).	Use specific strategies to estimate quantities & measurements (e.g. estimating the whole by estimating the parts).
	Recognize the need for units of measure.	Recognize the need for units of measure.	Recognize the need for a uniform unit of measure.	Recognize the need for accuracy when using a uniform unit of measure.	Recognize the need for accuracy when using a uniform unit of measure.		
						Identify the approximate size of basic standard units (e.g. centimeters, grams) and the relationship between them (e.g. between centimeters and meters).	Identify the approximate size of basic standard units (e.g. centimeters, grams) and the relationship between them (e.g. between centimeters and meters).
			Estimate and measure length, time, and weight to the nearest unit using metric and nonstandard measurement.	Estimate and measure length, time, temperature, weight, and area to the nearest unit using metric and nonstandard measurement.	Estimate and measure length, time, temperature, weight, and area to the nearest unit using metric and nonstandard measurement.		
						Select and use appropriate tools for given measurement situations (e.g. rulers for length, measuring cups for capacity, protractors for angle).	Select and use appropriate tools for given measurement situations (e.g. rulers for length, measuring cups for capacity, protractors for angle).
			Compare and order measurable characteristics (time, temperature, length, weight).	Compare and order measurable characteristics (time, temperature, length, weight, area, perimeter).	Compare and order measurable characteristics (time, temperature, length, weight, capacity, area, perimeter).	Compare and order measurable characteristics (time, temperature, length, weight, capacity, area, perimeter).	Compare and order measurable characteristics (time, temperature, length, weight, capacity, area, perimeter).
			Tell time to the hour or half hour using analog and digital clocks.	Tell time to the hour, half hour, and quarter hour using analog and digital clocks.	Tell time to the minute using analog and digital clocks.		
						Solve calendar problems involving days, weeks, months, and years.	Solve calendar problems involving days, weeks, months, and years.
				Determine elapsed time to the hour using AM and PM.	Determine elapsed time to the hour using AM and PM.	Determine elapsed time to the hour and half hour using AM and PM.	Determine and compare elapsed time using AM and PM and a 24-hour clock.

**8. Students will use algebraic methods to represent, analyze, and solve abstract and practical mathematical situations involving patterns and functional relationships.**

Pre-School	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Recognize and reproduce simple patterns using a variety of methods.	Recognize, reproduce, extend, create, and describe repeating patterns using a variety of materials.	Recognize, reproduce, extend, create, and describe repeating patterns using a variety of materials.	Recognize, reproduce, extend, create, and describe repeating and increasing patterns using a variety of materials.	Recognize, reproduce, extend, create, and describe repeating, increasing, and decreasing patterns using a variety of materials.	Recognize, extend, create, and describe repeating, increasing, and decreasing patterns using a variety of materials.	Recognize a wide variety of patterns and identify the rules that explain them.	Recognize a wide variety of patterns and identify the rules that explain them.
				Use tables, graphs, diagrams and verbal rules to describe patterns.	Create and use tables, graphs, and rules to represent and describe mathematical relationships.	Create and use tables, graphs, and rules to represent and describe mathematical relationships.	Create and use tables, graphs, and rules to represent and describe mathematical relationships.
			Generate, write and solve number sentences containing one unknown using informal methods	Generate, write, and solve open sentences.	Generate, write, and solve open sentences.		
						Use variables and open sentences to express algebraic relationships ( $x + 17 = 23$ ).	Use variables and open sentences to express algebraic relationships ( $x + 17 = 23$ )
				Use concrete objects and symbols to model the concepts of variables, equations, and inequalities (for example, find the missing number, symbol, or operation sign).	Use concrete objects and symbols to model the concepts of variables, equations, and inequalities (for example, find the missing number, symbol, or operation sign).	Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations.	Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations.

**9. Students will use spatial reasoning and apply the properties and relationships of geometric figures to represent, investigate, analyze, and solve problems.**

Pre-School	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Use comparative, directional, and positional words.	Use comparative, directional, and positional words.	Use comparative, directional, and positional words.	Use comparative, directional, and positional words (such as above, inside, left, middle).	Use comparative, directional, and positional words (such as above, inside, left, middle, horizontal); and identity and locate coordinate points.	Use comparative, directional, and positional words (such as above, inside, left, middle, horizontal); and identity and locate coordinate points.		
						Locate and describe objects in terms of their position with and without compass directions; identify coordinates for a given point or locate points of given coordinates on a single quadrant grid.	Locate and describe objects in terms of their position with and without compass directions; identify coordinates for a given point or locate points of given coordinates on a four quadrant grid.
Name two-dimensional geometric shapes (such as circle, square, triangle and rectangle).	Name and construct geometric two-dimensional shapes (such as circle, square, triangle and rectangle).	Describe, name, and label related two-dimensional geometric shapes.	Describe, name, and label related two and three-dimensional geometric shapes (such as circle and sphere, square and cube, triangle and pyramid, rectangle and prism).	Describe, name, and label related two and three-dimensional geometric shapes (such as circle and sphere, square and cube, triangle and pyramid, rectangle and prism).	Describe, name, and label related two and three-dimensional geometric shapes (such as circle and sphere, square and cube, triangle and pyramid, rectangle and prism).	Compare, contrast, and describe plane and solid figures and shapes using their attributes (such as number of sides, parallel or perpendicular sides, number of vertices, classification of right angles).	Compare, contrast, and describe plane and solid figures and shapes using their attributes (such as number of sides, parallel or perpendicular sides, number of vertices, classification of right angles).
	Construct and draw simple two-dimensional geometric shapes.	Construct and draw two-dimensional geometric shapes.	Construct and draw two-dimensional geometric shapes.	Construct and draw two-dimensional and three-dimensional geometric shapes.	Construct and draw two and three-dimensional models using a variety of materials and tools.	Construct and draw two and three-dimensional models using a variety of materials and tools	Construct and draw two and three-dimensional models using a variety of materials and tools
Identify geometric figures in the environment.	Identify and describe geometric figures in the environment.	Identify and describe geometric figures in the environment.	Identify and describe geometric figures in the environment.	Identify and describe geometric figures in the environment.	Identify and describe geometric figures in the environment.		
						Identify and model geometric figures that are congruent, similar, or symmetrical or some combination of these properties.	Identify and model geometric figures that are congruent, similar, or symmetrical or some combination of these properties.
Sort and classify two-dimensional geometric shapes.	Sort and classify two-dimensional geometric shapes.	Sort and classify two-dimensional geometric shapes.	Sort, classify, and describe two and three-dimensional geometric shapes.	Sort, classify, and describe two and three-dimensional geometric shapes.	Sort, classify, and describe two and three-dimensional geometric shapes.		

			Identify and create examples of line symmetry.	Identify and create examples of line symmetry.	Identify and create examples of line symmetry.		
				Estimate and determine the perimeter and area of geometric figures using manipulatives.	Estimate and determine the perimeter, area, and volume of geometric figures	Estimate and determine the perimeter, area, and volume of geometric figures	Estimate and determine the perimeter, area, and volume of geometric figures.
				Describe, identify, and model slides, flips and turns with geometric figures.	Describe, identify, and model slides, flips and turns with geometric figures.	Describe, identify, and model slides, flips and turns with geometric figures.	Describe, identify, and model slides, flips and turns with geometric figures.
				Identify right angles.	Identify right angles.		
						Identify and draw line segments, midpoints, intersections, and parallel and perpendicular lines.	
							Identify and draw right, obtuse, and acute angles and their parts, including rays, points, and vertices.
							Identify the diameter, radius, chord, and circumference of a circle.

**10. Students will pose a question, collect, organize, analyze, and represent data in order to make decisions and predictions.**

Pre-School	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
	Read and interpret simple graphs.	Collect, graph, and interpret data.					
			Pose a question, collect, graph, and interpret data.	Pose a question, collect, graph, and interpret data.	Pose a question, collect, graph, and interpret data.		
						Collect, organize, and analyze data to formulate and solve problems.	Collect, organize, and analyze data to formulate and solve problems.
					Identify the maximum, minimum, and range.		
						Interpret data using the maximum, minimum, range, mean, median, and mode.	Interpret data using the maximum, minimum, range, mean, median, and mode.

**11. Students will understand and apply basic concepts of probability.**

Pre-School	K1	K2	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
			Predict and measure the outcome of events and record the results.	Predict and measure the outcome of events and record the results.			
					Predict, measure, and record the outcome of events, and explain why the results of an experiment may not match predicted outcomes.	Predict, measure, and record the outcome of events, and explain why the results of an experiment may not match predicted outcomes.	Predict, measure, and record the outcome of events, and explain why the results of an experiment may not match predicted outcomes.
			Use concepts of fairness to discuss the probability of actual events.	Use concepts of fairness to discuss the probability of actual events.	Use concepts of certainty, fairness, and chance to discuss the probability of actual events.	Use concepts of certainty, fairness, and chance to discuss the probability of actual events.	Use concepts of certainty, fairness, and chance to discuss the probability of actual events.
			Conduct simple probability experiments.	Conduct simple probability experiments.	Conduct simple probability experiments.		
						Design and conduct simple probability experiments using concrete materials and represent the results using ratios and fractions.	Design and conduct simple probability experiments, using concrete materials, and represent the results using ratios, fractions, decimals, and percentages.