4th Grade New Mexico Mathematics Standards

Strand 1: NUMBER AND OPERATIONS **Standard:** Students will understand numerical concepts and mathematical operations					
Mathematics Benchmarks and Performance Standards	**Expectations for Students in Mathematics**				
	Mathematics Skills		**Problem Solving**		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 1: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Exhibit an understanding of the place-value structure of the base-ten number system by reading, modeling, writing, and interpreting whole numbers up to 100,000; compare and order the numbers:					
a. Recognize equivalent representations for the same number and generate them by decomposing and combining numbers (e.g., 853 = 8 x 100 + 5 x 10 + 3; 853 = 85 x 10 + 3; 853 = 900 – 50 + 3)					
b. Identify the numbers less than 0 by extending the number line and using negative numbers through familiar applications (e.g., temperature, money)					
2. Identify fractions as parts of unit wholes, as parts of groups, and as locations on number lines:					
a. Use visual models and other strategies to compare and order commonly used fractions					
b. Use models to show how whole numbers and decimals (to the hundredths place) relate to simple fractions (e.g., ½, 5/10, 0.5)					

Strand 1: NUMBER AND OPERATIONS
Standard: Students will understand numerical concepts and mathematical operations

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
c. Identify different interpretations of fractions: ▪ division of whole numbers by whole numbers ▪ ratio ▪ equivalence ▪ ordering of fractions ▪ parts of a whole or parts of a set					
3. Add and subtract fractions with common and uncommon denominators using a variety of strategies (e.g., manipulatives, numbers, pictures):					
a. Recognize and generate equivalent decimal forms of commonly used fractions (e.g., halves, quarters, tenths, fifths)					
b. Identify the numbers less than 0 by extending the number line and using negative numbers through familiar applications (e.g., temperature, money)					
4. Recognize classes of numbers (e.g., odd, even, factors, multiples, square numbers) and apply these concepts in problem-solving situations.					
K-4 Benchmark 2: Understands the meaning of operations and how they relate to one another.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Demonstrate an understanding of and the ability to use:					
a. Standard algorithms for the addition and subtraction of multi-digit numbers					
b. Standard algorithms for multiplying a multi-digit number by a two-digit number and for dividing a multi-digit number by a one-digit number					

Strand 1: NUMBER AND OPERATIONS
Standard: Students will understand numerical concepts and mathematical operations

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
2. Select and use appropriate operations (addition, subtraction, multiplication, and division) to solve problems.					
3. Extend the uses of whole numbers to the addition and subtraction of simple decimals (positive numbers to two places).					
4. Demonstrate commutative, associative, identity, and zero properties of operations on whole numbers (e.g., 37 x 46 = 46 x 37 and (6 x 2) x 5 = 6 x (2 x 5)).					
5. Demonstrate the concept of distributivity of multiplication over addition and subtraction (e.g., 7 x 28 is equivalent to (7 x 20) + (7 x 8) or (7 x 30) - (7 x 2)).					
K-4 Benchmark 3: Compute fluently and make reasonable estimates.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Demonstrate multiplication combinations through 12 x 12 and related division facts, and use them to solve problems mentally and compute related problems (e.g., 4 x 5 is related to 40 x 50, 400 x 5, and 40 x 500).					
2. Add, subtract, and multiply up to two double-digits accurately and efficiently.					
3. Use a variety of strategies (e.g., rounding and regrouping) to estimate the results of whole number computations and judge the reasonableness of the answers.					
4. Use strategies to estimate computations involving fractions and decimals					

4th Grade New Mexico Mathematics Standards

Strand 2: ALGEBRA
Standard: Students will understand algebraic concepts and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 1: Understand patterns, relations, and functions	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Represent and analyze patterns and simple functions using words, tables, and graphs.					
2. Create and describe numeric and geometric patterns including multiplication and division patterns.					
3. Express mathematical relationships using equations.					
4. Use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences:					
a. Use letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate an understanding of the concept of a variable)					
b. Interpret and evaluate mathematical expressions using parentheses					
c. Use and interpret formulas (e.g., Area = Length x Width or A = L x W) to answer questions about quantities and their relationships					
K-4 Benchmark 2: Represent and analyze mathematical situations and structures using algebraic symbols.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Identify symbols and letters that represent the concept of a variable as an unknown quantity.					
2. Explore the uses of properties (commutative, distributive, associative) in the computation of whole numbers.					

Strand 2: ALGEBRA
Standard: Students will understand algebraic concepts and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
3. Express mathematical relationships using equations.					
4. Determine the value of variables in simple equations (e.g., 80 x 15 = 40 x).					
5. Develop simple formulas in exploring quantities and their relationships (e.g., A = L x W).					
K-4 Benchmark 3: Use mathematical models to represent and understand quantitative relationships.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Solve problems involving proportional relationships (including unit pricing and map interpretations; e.g., one inch = five miles; therefore, five inches = 1 miles).					
2. Model problem situations and use graphs, tables, pictures, and equations to draw conclusions (e.g., different patterns of change).					
3. Use and interpret formulas (e.g., Area = Length x Width or A = L x W) to answer questions about quantities and their relationships.)					
K-4 Benchmark 4: Analyze changes in various contexts.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Identify and describe situations with constant or varying rates of change and compare them.					
2. Determine how a change in one variable relates to a change in a second variable (e.g., data tables, input- output machines).					
3. Find and analyze patterns using data tables (e.g., T tables).					
4. Demonstrate and describe varying rates of change in relation to real-world situations (e.g., plant growth, students' heights).					

4th Grade New Mexico Mathematics Standards

Strand 3: GEOMETRY
Standard: Students will understand geometric concepts and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 1: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes:					
a. Build, draw, create, and describe geometric objects					
b. Identify lines that are parallel or perpendicular					
c. Identify and compare congruent and similar figures					
2. Classify two- and three-dimensional shapes according to their properties and develop definitions of classes like triangles and pyramids:					
a. Visualize, describe, and make models of geometric solids in terms of the number of faces, edges, and vertices					
b. Interpret two-dimensional representations of three-dimensional objects					
3. Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.					
K-4 Benchmark 2: Specify locations and describe spatial relationships using coordinate geometry and other representational systems	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Describe location and movement using common language and geometric vocabulary.					

Strand 3: GEOMETRY
Standard: Students will understand geometric concepts and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
2. Use ordered pairs to graph, locate, identify points, and describe paths in the first quadrant of the coordinate plane.					
3. Use a variety of methods for measuring distances between locations on a grid.					
K-4 Benchmark 3: Apply transformations and use symmetry to analyze mathematical situations.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Create and describe rotational designs using language of transformational symmetry.					
2. Describe a motion or set of motions that will show that two shapes are congruent.					
K-4 Benchmark 4: Use visualization, spatial reasoning, and geometric modeling to solve problems.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Develop and use mental images of geometric shapes to solve problems (e.g., represent three-dimensional shapes in two dimensions).					
2. Use geometric models such as number lines, arrays, and computer simulations to investigate number relationships (e.g., patterns).					
3. Explore relationships involving perimeter and area:					
a. Measure area of rectangular shapes and use appropriate units					
b. Recognize that area can have the same perimeter but different areas and vice versa					
c. Use models and formulas to solve problems involving perimeter and area of rectangles and squares (e.g., arrays)					

4th Grade New Mexico Mathematics Standards

Strand 4: MEASUREMENT
Standard: Students will understand measurement systems and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 1: Understand measurable attributes of objects and the units, systems, and process of measurement.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Select the appropriate type of unit for measuring perimeter and size of an angle.					
2. Understand the need for measuring with standard units and become familiar with the standard units in customary and metric system.					
3. Identify the inverse relationship between the size of the units and the number of units.					
4. Develop formulas to determine the surface areas of rectangular solids.					
5. Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.					
6. Carry out simple conversions within a system of measurement (e.g., hours to minutes, meters to centimeters).					
K-4 Benchmark 2: Apply appropriate techniques, tools, and formulas to determine measurements.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Estimate perimeters, areas of rectangles, triangles, and irregular shapes.					
2. Find the area of rectangles, related triangles, and parallelograms.					
3. Estimate, measure, and solve problems involving length, area, mass, time, and temperature using appropriate standard units and tools.					

Strand 4: MEASUREMENT
Standard: Students will understand measurement systems and applications.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 2: Apply appropriate techniques, tools, and formulas to determine measurements.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards (continued)					
4. Identify common measurements of turns (e.g., 360 degrees in one turn, 90 degrees in a quarter-turn).					
5. Compute elapsed time and make and interpret schedules.					
6. Use tools to measure angles (e.g., protractor, compass).					

4th Grade New Mexico Mathematics Standards

Strand 5: DATA ANALYSIS AND PROBABILITY
Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

Mathematics Benchmarks and Performance Standards	Expectations for Students in Mathematics				
	Mathematics Skills		Problem Solving		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 1: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Organize, represent, and interpret numerical and categorical data and clearly communicate findings:					
a. Choose and construct representations that are appropriate for the data set					
b. Recognize the differences in representing categorical and numerical data					
2. Design investigations and represent data using tables and graphs (e.g., line plots, bar graphs, line graphs).					
K-4 Benchmark 2: Select and use appropriate statistical methods to analyze data.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Compare and describe related data sets.					
2. Use the concepts of median, mode, maximum, minimum, and range and draw conclusions about a data set.					
3. Use data analysis to make reasonable inferences/predictions and to develop convincing arguments from data described in a variety of formats (e.g. bar graphs, Venn diagrams, charts, tables, line graphs, and pictographs).					

Strand 5: DATA ANALYSIS AND PROBABILITY
Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

Mathematics Benchmarks and Performance Standards	**Expectations for Students in Mathematics**				
	Mathematics Skills		**Problem Solving**		
	Recall Information	Apply Procedural Knowledge	Communicate & Represent Understanding	Analyze, Reason, & Prove	Make Connections & Evaluate
K-4 Benchmark 3: Develop and evaluate inferences and predictions that are based on data.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Propose and justify conclusions and predictions based on data.					
2. Develop convincing arguments from data displayed in a variety of formats.					
K-4 Benchmark 4: Understand and apply basic concepts of probability.	**Time Spent in Each Performance Standard** Indicate **N** (never), **S** (sometimes), or **U** (usually) for each expectation				
Performance Standards					
1. Describe events as "likely," "unlikely," or "impossible" and quantify simple probability situations:					
a. Represent all possible outcomes for a simple probability situation in an organized way (e.g., tables, grids, tree diagrams)					
b. Express outcomes of experimental probability situations verbally and numerically (e.g., three out of four, ¾)					
2. List all the possible combinations of objects from three sets (e.g., spinners, number of outfits from three different shirts, two skirts, and two hats).					