



# Rio Rancho Public Schools

## Math Standards

Revised 2007

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# PROCESS STANDARDS

## PROBLEM SOLVING

- Build new mathematical knowledge through problem solving
- Solve problems that arise in mathematics and in other contexts
- Apply and adapt a variety of appropriate strategies to solve problems
- Monitor and reflect on the process of mathematical problem solving.

## REASONING AND PROOF

- Recognize reasoning and proof as fundamental aspects of mathematics
- Make and investigate mathematical conjectures
- Develop and evaluate mathematical arguments and proofs
- Select and use various types of reasoning and methods of proof

## COMMUNICATION

- Organize and consolidate their mathematical thinking through communication.
- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- Analyze and evaluate the mathematical thinking and strategies of others.
- Use the language of mathematics to express mathematical ideas precisely.

## CONNECTIONS

- Recognize and use connections among mathematical ideas
- Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- Recognize and apply mathematics in contexts outside of mathematics

## REPRESENTATION

- Create and use representations to organize, record, and communicate mathematical ideas.
- Select, apply, and translate among mathematical representations to solve problems
- Use representations to model and interpret physical, social, and mathematical phenomena.

**RRPS District Standards: MATHEMATICS**

**Grade 1**

**STRAND I: NUMBERS AND OPERATIONS**

***NM State Content Standard I: Students will understand numerical concepts and mathematical operations.***

**NM State Benchmarks Grades K-4**

**RRPS Grade 1 Power Standards**

*While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed.*

**NM State Benchmark I-A: Grades K-4**

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

**Power Standard 1** Count, understand, relate, and represent whole numbers and place value to 1000.

**NM Grade 1 Performance Standards**

1. Demonstrate an understanding of the place-value structure of the base-ten number system:
  - read, write, model, and sequence whole numbers up to 100 (including filling in missing numbers in a sequence)
  - count with understanding and recognize “how many” in sets of objects up to 50
  - count orally by 2s to 20 and by 5s and 10s to 100
  - count orally backward from 100
  - compare and order numbers up to 100
  - decompose and recombine numbers using manipulatives (e.g., by breaking numbers apart and recombining) to create and construct equivalent representations for the same number (e.g.,  $10 = 3 + 7$  or  $1 + 2 + 7$  or  $3 + 2 + 5$ )
  - group objects by 10s and 1s to explore place value (e.g., 24 equals two tens and four ones)
  - use ordinal numbers (e.g., what position?) and cardinal numbers (e.g., how many?)
  - appropriately connect number words and numbers to the quantities they represent

**Performance Indicators**

- a. Count by 5's and 10s to 100.
- b. Count by 2's to 40.
- c. Count up and back by 1s, starting with any number up to an including 1000.
- d. Count 50 or more objects.
- e. Read and write numbers 1 – 1000.
- f. Compare and order numbers to 50.
- g. Group objects by 100's, 10s and 1s to explore place value to 1000(24 equals 2 tens and 4 ones)
- h. Connect number words and numbers to the quantities they represent.
- i. Explain answers using pictures, numbers, and words.

## STRAND I: NUMBERS AND OPERATIONS

*NM State Content Standard I: Students will understand numerical concepts and mathematical operations.*

### **NM State Benchmark I-B: Grades K-4**

Understand the meaning of operations and how they relate to one another.

#### **NM Grade 1 Performance Standards**

1. Use a variety of models to demonstrate an understanding of addition and subtraction of whole numbers.
2. Solve addition and subtraction problems with one- and two-digit numbers (e.g.,  $5 + 58 = \underline{\quad}$ )
3. Find the sum of three one-digit numbers to the sum of 15.
4. Understand and use the inverse relationship between addition and subtraction to solve problems and check solutions (e.g.,  $8 + 6 = 14$  is related to  $14 - 6 = 8$ ).
5. Use concrete materials to investigate situations that relate to multiplication and division (e.g., equal groupings of objects, sharing equally).
6. Given simple story problems, explain verbally how to select and use appropriate operations.

### **NM State Benchmark I-C: Grades K-4**

Compute fluently and make reasonable estimates.

#### **NM Grade 1 Performance Standards**

1. Use strategies for whole-number computation, with a focus on addition and subtraction (e.g., counting on or counting back, doubles, sums that make 10, direct modeling with pictures or objects, numerical reasoning based on number combinations and relationships).
2. Demonstrate a variety of methods to compute (e.g., objects, mental computation, paper and pencil, and estimation).
3. Perform addition and subtraction with whole number combinations.
4. Use and explain estimation strategies to determine the reasonableness of answers involving addition and subtraction.

### **Power Standard 2**

Use a variety of strategies to compute addition and subtraction problems.

#### **Performance Indicators**

- a. Select appropriate operations for addition and subtraction number stories.
- b. Solve addition and subtraction facts.
- c. Solve addition and subtraction with one- and two-digit numbers ( $5 + 58 = \underline{\quad}$ ) using a variety of strategies (numberline, number grid, mental computation, doubles, etc.)
- d. Solve open number sentences to 10 ( $7 + \underline{\quad} = 10$ )
- e. Complete fact families (fact triangles)
- f. Find equivalent names for numbers (name collection boxes).
- g. Explain answers using pictures, numbers, and words.

**STRAND II: ALGEBRA*****NM State Content Standard II: Students will understand algebraic concepts and applications.*****NM State Benchmarks Grades K-4****RRPS Grade 1 Power Standards***While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed.***NM State Benchmark II-A: Grades K-4**

Understand patterns, relations, and functions.

**Power Standard 3**

Recognize, describe, extend, and create patterns including counting patterns with and without a calculator.

**NM Grade 1 Performance Standards**

1. Recognize, reproduce, describe, extend, and create repeating patterns (e.g., color, shape, size, sound, movement, simple numbers) and translate from one representation to another (e.g., red, red, blue, blue to step, step, clap, clap).
2. Skip-count on a hundreds chart (e.g., by 2s up to 20 and 5s and 10s up to 100) to identify, describe, and predict number patterns.
3. Identify number patterns on the hundreds chart.

**Performance Indicators**

- a. Count up and back by 1s on the number grid.
- b. Identify, complete and extend patterns (color, shape, numbers, tallies, etc.)
- c. Solve addition and subtraction problems by skip counting on the number line and the number grid
- d. Identify and complete patterns on the number grid.
- e. Explain answers using pictures, numbers, and words.

**NM State Benchmark II-B: Grades K-4**

Represent and analyze mathematical situations and structures using algebraic symbols.

**NM Grade 1 Performance Standards**

1. Write number sentences that use concrete objects, pictorial, and verbal representations to express mathematical situations using invented and conventional symbols (e.g., +, -, =).
2. Demonstrate and describe the concept of equal (e.g., using objects, balance scales).
3. Solve open number sentences that have variables representing numbers up to 10 (e.g.,  $10 = \square + 2$ ).

**NM State Benchmark II-C: Grades K-4**

Use mathematical models to represent and understand quantitative relationships.

**NM Grade 1 Performance Standards**

1. Represent equivalent forms of the same number through the use of physical models, diagrams, and number expressions to 20 (e.g.,  $3 + 5 = 8$ ,  $2 + 6 = 8$ ).
2. Describe situations that involve addition and subtraction of whole numbers including objects, pictures, and symbols (e.g., Robert has four apples, Maria has five more).

**NM State Benchmark II-D: Grades K-4**

Analyze changes in various contexts.

**NM Grade 1 Performance Standards**

1. Describe qualitative change (e.g., a student growing taller, trees getting bigger, ice melting).

**STRAND III: GEOMETRY**

***NM State Content Standard III: Students will understand geometric concepts and applications.***

**NM State Benchmarks Grades K-4**

**RRPS Grade 1 Power Standards**

*While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed.*

**NM State Benchmark III-A: Grades K-4**

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

**NM Grade 1 Performance Standards**

1. Identify common geometric figures and classify them by common attributes:
  - recognize, name, build, and draw both polygonal (up to six sides) and curved shapes
  - sort two- and three-dimensional shapes into categories based on common attributes
  - use the attributes of shapes to analyze and identify examples and non-examples of geometric shapes
  - participate in discussions comparing, identifying, and analyzing attributes to develop the vocabulary needed to describe two- and three-dimensional geometric shapes and their attributes (e.g., sides, corners, edges, faces)

**NM State Benchmark III-B: Grade K-4**

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

**NM Grade 1 Performance Standards**

1. Participate in group and individual activities based on the concepts of space and location:
  - describe direction, location, space, and shape (e.g., left, right, over, under, near, far, between)
  - visualize, describe, and record directions for navigating from one location to another to develop the vocabulary needed to describe direction, distance, location, and representation
  - use materials to create representations of the surrounding environment (e.g., three-dimensional models, maps of the classroom)
  - develop estimates and measure distances using nonstandard measurements

**NM State Benchmark III-C: Grades K-4**

Apply transformations and use symmetry to analyze mathematical situations.

**NM Grade 1 Performance Standards**

1. Predict the results of changing a shape's position or orientation by using rotation (i.e., turns), reflection (i.e., flips), and translations (i.e., slides) .
2. Create simple symmetrical shapes and pictures.
3. Recognize and describe the symmetric characteristics of designs (e.g., geometric designs made with pattern blocks).

**NM State Benchmark III-D: Grades K-4**

Use visualization, spatial reasoning, and geometric modeling to solve problems.

**NM Grade 1 Performance Standards**

1. Use combinations of shapes to make a new shape to demonstrate relationships between shapes (e.g., a hexagon can be made from six triangles).
2. Create three-dimensional shapes based on two-dimensional representations.
3. Participate in activities to develop mental visualization and spatial memory (e.g., "quick image" activities that require students to recall or reproduce a configuration of dots on a card or to determine the number of dots without counting).
4. Describe how to get from one location to another by visualizing the landmarks along the route.
5. Identify structures from different views or match views of the same structure portrayed from different perspectives.

**STRAND IV: MEASUREMENT**

***NM State Content Standard IV: Students will understand measurement systems and applications.***

Use

**NM State Benchmarks Grades K-4**

**RRPS Grade 1 Power Standards**  
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**NM State Benchmark IV-A: Grades K-4**  
 Understand measurable attributes of objects and the units, systems, and process of measurement.

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**NM Grade 1 Performance Standards**

1. Develop an understanding of measurable properties (e.g., length, volume, weight, area, and time) using appropriate concepts and vocabulary:
  - length by measuring and estimating (e.g., longer, shorter, meter, centimeter, inch, yard)
  - weight by measuring, estimating, and weighing (e.g., heavy [-ier], light [-er])
  - volume by measuring, estimating, and weighing (e.g., full, empty)
  - area by measuring and estimating (e.g., perimeter, rectangles, squares)
  - time by estimating (e.g., minutes, hours, days, weeks)
2. Use digital and analog (face) clocks to tell time to the half hour.

**Power Standard 4**  
 Develop and understand measurable concepts of money and time

**Performance Indicators**

- a. Tell time using analog and digital clocks to the hour and half-hour.
- b. Calculate the values of pennies, nickels, dimes and quarters.
- c. Explain answers using pictures, numbers, and words.

**NM State Benchmark IV-B: Grades K-4**  
 Apply appropriate techniques, tools, and formulas to determine measurements.

**NM Grade 1 Performance Standards**

1. Measure with multiple copies of units the same size (e.g., paper clips).
2. Use repetition of a single unit to measure something larger than the unit (e.g., a yardstick/meterstick to measure a room).

## STRAND V: DATA ANALYSIS AND PROBABILITY

**NM State Content Standard V: Students will understand how to formulate questions, analyze data, and determine probabilities.**

**NM State Benchmarks Grades K-4**

**RRPS Grade 1 Power Standards**

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**NM State Benchmark V-A: Grades K-4**

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

**NM Grade 1 Performance Standards**

1. Collect, organize, represent, and compare data by category on graphs and charts to answer simple questions:
  - answer questions about “how” data can be gathered
  - gather data by interviewing, surveying, and making observations
  - organize data into appropriate categories by sorting based on shared properties
  - participate in discussions about selecting an appropriate way to display the data
  - represent data using objects, pictures, tables, and simple bar graphs

**NM State Benchmark V-B: Grades K-4**

Select and use appropriate statistical methods to analyze data.

**NM Grade 1 Performance Standards**

1. Analyze simple data:
  - interpret what the graph or other representation shows
  - determine whether or not the data gathered helps answer the specific question that was posed
  - compare parts of the data (e.g., “how many students have lost none, one, two, or three teeth?”) to make statements about the data as a whole (e.g., “Most students in the class have lost only two teeth.”)

**Power Standard 5**

Analyze data represented on simple graphs.

**Performance Indicators**

- a. Count tallies and explain the results of data collected.
- b. Analyze, summarize and write about data presented in a simple bar graph.
- c. Explain answers using pictures, numbers, and words.

**NM State Benchmark V-C: Grades K-4**

Develop and evaluate inferences and predictions that are based on data.

**NM Grade 1 Performance Standards**

1. Make conclusions based on data (e.g., whether or not other groups would reach similar conclusions based on the same data).

**NM State Benchmark V-D: Grades K-4**

Understand and apply basic concepts of probability.

**NM Grade 1 Performance Standards**

Discuss the likelihood of events (based on student experiences or from books) using terminology such as “more likely”, “less likely”, “possible”, or “certain”. Observe, explore, and discuss whether some events occur more often than others (e.g., tossing two die and recording the sum after each toss to explore whether or not certain sums occur more frequently than others).