

RRPS District Standards: MATHEMATICS

Grade 6

5/2007

STRAND I: NUMBERS AND OPERATIONS

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

NM State Benchmarks Grades 5-8

NM State Benchmark I-A: Grades 5-8

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

NM Grade 6 Performance Standards

1. Compare and order rational numbers.
2. Use equivalent representations for rational numbers (e.g., integers, decimals, fractions, percents, ratios, numbers with whole-number exponents).
3. Use appropriate representations of positive rational numbers in the context of real-life applications.
4. Identify greatest common factor and least common multiples for a set of whole numbers.
5. Identify and represent on a number line decimals, fractions, mixed numbers, and positive and negative integers.

NM State Benchmark I-B: Grades 5-8

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

NM Grade 6 Performance Standards

1. Calculate multiplication and division problems using contextual situations.
2. Factor a whole number into a product of its primes.
3. Demonstrate the relationship and equivalency among ratios and percents.
4. Use proportions to solve problems.
5. Explain and perform:
 - whole number division and express remainders as decimals or appropriately in the context of the problem
 - addition, subtraction, multiplication, and division with decimals
 - addition and subtraction with integers
 - addition, subtraction, and multiplication with fractions and mixed numerals
6. Determine the least common multiple and the greatest common divisor of whole numbers and use them to solve problems with fractions.

RRPS Power Standards

While all benchmarks are taught Power Standards are consistently emphasized and assessed

Power Standard 1 (Benchmark I-A)

Use equivalent representations for rational numbers (e.g., integers, decimals, fractions, percents, ratios, numbers with whole-number exponents).

Power Standard 2 (Benchmark I-A)

Identify greatest common factor and least common multiples for a set of whole numbers.

Power Standard 3 (Benchmark I-B)

Demonstrate the relationship and equivalency among ratios and percents.

Power Standard 4 (Benchmark I-B)

Explain and perform:

- whole number division and express remainders as decimals or appropriately in the context of the problem
- addition, subtraction, multiplication, and division with decimals
- addition and subtraction with integers
- addition, subtraction, and multiplication with fractions and mixed numerals

STRAND I: NUMBERS AND OPERATIONS

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

NM State Benchmark I-C: Grades 5-8

Compute fluently and make reasonable estimates.

RRPS Grade 6 Power Standards

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

NM Grade 6 Performance Standards

1. Design, analyze, and explain procedures use to *estimate quantities involving rational numbers, using various estimations.
2. Use estimates t check reasonableness of results and make predictions in situations involving rational numbers.
3. Determine if a problem situation calls for an exact or approximate answer and perform the appropriate computation.
4. Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.
5. Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.
6. Interpret and use ratios in different contexts.
7. Compute and perform multiplication and division of fractions and decimals and apply these procedures to solving problems.

Power Standard 5 (Benchmark I-C)

Use estimates to check reasonableness of results and make predictions in situations involving rational numbers.

STRAND II: ALGEBRA

NM State Content Standard II: Students will understand algebraic concepts and applications

NM State Benchmarks Grades 5-8	RRPS Grade 6 Power Standards <i>While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed</i>
NM State Benchmark II-A: Grades 5-8 Understand patterns, relations, and functions	<p>Power Standard 6 (Benchmark II-A) Graph ordered pairs in the coordinate plane.</p> <p>Power Standard 7 (Benchmark II-B) Solve problems involving proportional relationships.</p> <p>Power Standard 8 (Benchmark II-B) Demonstrate that a variable can represent a single quantity that changes.</p> <p>Power Standard 9 (Benchmark II-C) Create, explain, and use mathematical models such as:</p> <ul style="list-style-type: none"> • Venn diagrams to show the relationship between the characteristics of two or more sets • equations and inequalities to model numerical relationships • three-dimensional geometric models • graphs, tables, and charts to interpret and analyze data
NM Grade 6 Performance Standards 1. Solve problems involving proportional relationships. 2. Graph ordered pairs in the coordinate plane. 3. Explain and use symbols to represent unknown quantities and variable relationships. 4. Explain and use the relationships among ratios, proportions, and percents. 5. Make generalizations based on observed patterns and relationships.	
NM State Benchmark II-B: Grades 5-8 Represent and analyze mathematical situations and structures using algebraic symbols.	
NM Grade 6 Performance Standards 1. Solve problems involving proportional relationships. 2. Use letters to represent an unknown in an equation. 3. Solve one-step linear equations and inequalities in one variable with positive whole-number solutions. 4. Demonstrate that a variable can represent a single quantity that changes. 5. Demonstrate how changes in one variable affect other variables.	
NM State Benchmark II-C: Grades 5-8 Use mathematical models to represent and understand quantitative relationships	
NM Grade 6 Performance Standards 1. Develop and use mathematical models to represent and justify mathematical relationships found in a variety of situations. 2. Create, explain, and use mathematical models such as: <ul style="list-style-type: none"> • Venn diagrams to show the relationship between the characteristics of two or more sets • equations and inequalities to model numerical relationships • three-dimensional geometric models • graphs, tables, and charts to interpret and analyze data 	

STRAND II: ALGEBRA

NM State Content Standard II: Students will understand algebraic concepts and applications

NM State Benchmark II-D: Grades 5-8

Analyze changes in various contexts.

RRPS Grade 6 Power Standards

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

NM Grade 6 Performance Standards

1. Represent and explain changes using one step- equations with one variable.
2. Solve problems that involve change using proportional relationships.
3. Use ratios to predict changes in proportional situations.
4. Use tables and symbols to represent and describe proportional and other relationships involving, conversions, sequences, and perimeter.
5. Generate formulas to represent relationships involving changes in perimeter.

STRAND: GEOMETRY

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

<p>NM State Benchmarks Grades 5-8</p>	<p>RRPS Grade 6 Power Standard <i>While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed.</i></p>
<p>NM State Benchmark III-A: Grades 5-8 Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships</p>	<p>Power Standard 10 (Benchmark III-A) Identify, describe, and classify the properties of, and the relationships between plane and solid geometric figures:</p>
<p>NM Grade 6 Performance Standards 1. Identify, describe, and classify the properties of, and the relationships between plane and solid geometric figures:</p> <ul style="list-style-type: none"> • measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor ,drawing software such as Logo and Geometry Sketchpad). • understand that the sum of any triangle is 180 degrees and the sum of the angles of any quadrilateral is 360 degrees and use this information to solve problems • visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids <p>2. Classify angles as right, obtuse, or straight. 3. Describe the properties of geometric figures that include regular polygons, circles, ellipses, cylinders, cones, spheres, and cubes. 4. Classify polygons as regular or irregular. 5. Classify triangles as scalene, isosceles, or equilateral and by angles (e.g., right, acute, and obtuse). 6. Identify angle, line, segment, and ray and use the symbol for each 7. Describe the relationship between radius, diameter, and circumference of a circle.</p>	<ul style="list-style-type: none"> • measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor ,drawing software such as Logo and Geometry Sketchpad). • understand that the sum of any triangle is 180 degrees and the sum of the angles of any quadrilateral is 360 degrees and use this information to solve problems • visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids <p>Power Standard 11 (Benchmark III-A) Classify angles as right, obtuse, or straight.</p> <p>Power Standard 12 (Benchmark III-A) Describe the properties of geometric figures that include regular polygons, circles, ellipses, cylinders, cones, spheres, and cubes.</p>
<p>NM State Benchmark III-B: Grades 5-8 Specify locations and describe spatial relationships using coordinate geometry and other representational systems.</p>	<p>Power Standard 13 (Benchmark III-A) Classify triangles as scalene, isosceles, or equilateral and by angles (e.g., right, acute, and obtuse).</p>
<p>NM Grade 6 Performance Standards 1. Use co-ordinate geometry to describe location on a plane. 2. Recognize skewed lines in space.</p>	<p>Power Standard 14 (Benchmark III-A) Describe the relationship between radius, diameter, and circumference of a circle.</p>
<p>NM State Benchmark III-C: Grades 5-8 Apply transformations and use symmetry to analyze mathematical situations.</p>	
<p>NM Grade 6 Performance Standards 1. Identify line of symmetry with rotation and scaling.</p>	
<p>NM Benchmark III-D: Grades 5-8 Use visualization, spatial reasoning, and geometric modeling to solve problems</p>	
<p>NM Grade 6 Performance Standards 1. Use appropriate technology, manipulatives, constructions, or drawings to recognize or compare geometric figures.</p>	

STRAND IV: MEASUREMENT

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

NM State Benchmarks Grades 5-8

RRPS Grade 6 Power Standard

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

NM State Benchmark IV-A: Grades 5-8

Understand measurable attributes of objects and the units, systems, and process of measurement.

Power Standard 15 (Benchmark IV-A)

Perform multi-step conversions of measurement units to equivalent units within a given system (e.g., 36 inches equals 3 feet or 1 yard).

NM Grade 6 Performance Standards

1. Perform multi-step conversions of measurement units to equivalent units within a given system (e.g., 36 inches equals 3 feet or 1 yard).
2. Estimate measurement in both U.S. customary and metric units.
3. Select and use units of appropriate size and type to measure angles (e.g., degrees, Radians), perimeter, area, and capacity in both U.S. customary and metric systems
4. Use standard units of measurement to the nearest sixteenth of an inch, metric measurements to the nearest millimeter.

Power Standard 16 (Benchmark IV-A)

Use standard units of measurement to the nearest sixteenth of an inch, metric measurements to the nearest millimeter.

NM State Benchmark IV-B: Grades 5-8

Apply appropriate techniques, tools, and formulas to determine measurements.

NM Grade 6 Performance Standards

1. Apply various measurement techniques and tools, units of measure, and degrees of accuracy to find accurate rational number representations for length, liquid, weight, perimeter, temperature, and time.
2. Select and use formulas for perimeters of squares and rectangles.
3. Select and use strategies to estimate measurements including angle measure and capacity.
4. Select and justify the selection of measurement tools, units of measure, and degrees of accuracy appropriate to the given situation.

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 5-8

RRPS Grade 6 Power Standards

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

NM State Benchmark V-A: Grades 5-8

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

Power Standard 17 (Benchmark V-A)

Use mean, median, mode, and range to describe data.

NM Grade 6 Performance Standards

1. Use statistical representations to analyze data.
2. Draw and compare different graphical representations of the same data.
3. Use mean, median, mode, and range to describe data.
4. Sketch circle graphs to display data.
5. Solve problems by collecting, organizing, displaying, and interpreting data.
6. Compare different samples of a population with the entire population and determine the appropriateness of using a sample.
7. Conduct and explain sampling techniques such as observations, surveys, and random sampling for gathering data.
8. Determine the median for a rational number data set containing an odd number of data points.
9. Calculate and explain the median for a whole number data set containing an even number of data points.
10. Explain advantages and disadvantages of using various display formats for a specific data set.
11. Formulate and solve problems by collecting, organizing, displaying, and interpreting data.

Power Standard 18 (Benchmark V-A)

Sketch circle graphs to display data.

Power Standard 19 (Benchmark V-A)

Formulate and solve problems by collecting, organizing, displaying, and interpreting data.

NM State Benchmark V-B: Grades 5-8

Select and use appropriate statistical methods to analyze data.

NM Grade 6 Performance Standards

1. Choose an appropriate graphical formula to organize and represent data.
2. Describe the effects of missing or incorrect data.
3. Compute and analyze statistical measurements for data sets:
 - understand how additional data added to data sets may affect the computations of central tendency
 - understand how the inclusion or exclusion of outliers affects measures of central tendency
 - know why a specific measure of central tendency provides the most useful information in a given context
4. Use data samples of a population and describe the characteristics and limitations of the sample.
5. Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.
6. Explain how the way a question is asked in a survey might influence the results obtained.
7. Identify data that represent sampling errors and explain why the sample and the display might be biased.
8. Identify claims based on statistical data and, in sample cases, evaluate the validity and usefulness of the claims.

STRAND V: DATA AND PROBABILITY

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

NM State Benchmarks Grade 5-8

RRPS Grade 6 Power Standards

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

NM State Benchmark V-C: Grade 5-8

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

Power Standard 20 (Benchmark V-C)

Find all possible combinations in a given set (e.g., the number of ways a set of a shelf).

NM Grade 6 Performance Standards

1. Identify claims based on statistical data and evaluate the validity of the claim.
2. Conduct observations, surveys, experiments and/or simulations, record the results in charts, tables, or the results to draw conclusions and make predictions.
3. Find all possible combinations in a given set (e.g., the number of ways a set of a shelf).
4. Compare expected results with actual results in a simple experiment.

Power Standard 21 (Benchmark V-D)

Determine and compare experimental (empirical) and mathematical (theoretical) probabilities (e.g., flipping two color counters).

NM State Benchmark V-D: Grade 5-8

Understand and apply basic concepts of probability.

Power Standard 22 (Benchmark V-D)

Describe the difference between independent and dependent events and identify situations involving independent or dependent events

NM Grade 6 Performance Standards

1. List all possible outcomes for a compound event composed of two independent events and recognize whether an outcome is certain, impossible, likely, or unlikely.
2. Determine and compare experimental (empirical) and mathematical (theoretical) probabilities (e.g., flipping two color counters).
3. Determine theoretical and experimental probabilities and use them to make predictions about events.
4. Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.
5. Use data to estimate the probability of future events (e.g., batting averages).
6. Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, 1-P is the probability of the event not occurring.
7. Describe the difference between independent and dependent events and identify situations involving independent or dependent events.