

**Jemez Valley Public Schools**  
**GRADE 8 MATHEMATICS • CONTENT MAP**

Quadrant I	Quadrant II	Quadrant III	Quadrant IV
<b>Strand 1: Number and Operations</b>			
<b>Standard: Students will understand numerical concepts and mathematical operations</b>			
<p>Use real number properties (e.g., commutative, associative, distributive) to perform various computational procedures. (year long)</p> <p>Use symbols, variables, expressions, inequalities, equations, and simple systems of equations to represent problem situations that involve variables or unknown quantities</p> <p>Graph linear equations finding the slope.</p> <p>Approximate, mentally and with calculators, the value of irrational numbers as they arise from problem situations (year long).</p> <p>Use a variety of computational methods to estimate quantities involving real numbers (year long)</p> <p>Differentiate between rational and irrational numbers. (year long)</p> <p>Perform arithmetic operations and their inverses (e.g., add/subtract, multiplication/division, square roots of perfect squares, cube roots of perfect cubes) on real numbers. (year long)</p>	<p>Perform and explain computations with rational numbers, pi, and first-degree algebraic expressions in one variable in a variety of situations.</p> <p>Estimate answers and use formulas to solve application problems involving surface area and volume.</p> <p>Formulate algebraic expressions that include real numbers to describe and solve real-world problems.</p> <p>Select and use appropriate forms of rational numbers to solve real-world problems including those involving proportional relationships. (year long)</p>	<p>numbers by their properties (e.g., prime, composite, square, square root).</p> <p>Find roots of real numbers using calculators. (year long)</p> <p>Use a variety of computational methods to estimate quantities involving real numbers.</p> <p>Differentiate between rational and irrational numbers.</p> <p>Demonstrate the magnitude of rational numbers (e.g., trillions to millions).</p> <p>Express numbers in scientific notation (including negative exponents) in appropriate problem situations using a calculator.</p> <p>Describe how numbers can be classified by sets (e.g., natural, whole, integers, rationals, irrationals)</p>	<p>Identify the numerical value of an expression of one or more variables</p> <p>Explore strategies to simplify numerical expressions using order of operations, including exponents</p>
Quadrant I	Quadrant II	Quadrant III	Quadrant IV
<b>Strand 2: Algebra</b>			
<b>Standard II: Students will understand algebraic concepts and applications.</b>			
<p>Recognize the same general pattern of change presented in different representations</p> <p>Generate different representations to model a specific numerical relationship given one representation of data (e.g., a table, a graph, an equation, a verbal description).</p> <p>Move between numerical, tabular, and graphical representations of linear relationships</p> <p>Represent two numerical variables on a plot, describe how the data points are distributed, and identify relationships that exist between</p>	<p>Use symbols, variables, expressions, inequalities, equations, and simple systems of equations to represent problem situations that involve variables or unknown quantities.</p> <p>Use variables to generalize patterns and information presented in tables, charts, and graphs by; (a) graphing linear functions noting that the vertical change per unit of horizontal change (the slope of the graph) is always the same</p> <p>Recognize the same general pattern of change presented in different</p>	<p>Formulate and solve problems involving simple linear relationships, find percents of a given number, variable situations, and unknown quantities</p> <p>Use graphs, tables, and algebraic representations to make predictions and solve problems that involve change</p> <p>Estimate, find, and justify solutions to problems that involve change using tables, graphs, and algebraic expressions</p> <p>Solve multi-step problems that involve changes in rate, average speed, distance, and time.</p>	<p>Describe the relationship between two variables using a table with a finite set of values and graph the relationship</p> <p>Explore the solution to a system of equations in two variables from a given graph</p> <p>Describe strategies for solving problems that involve systems of equations</p>

<p>the two variables.</p> <p>Organize, analyze, and display appropriate quantitative and qualitative data to address specific questions including: (a) frequency distributions, (b) plots, (c) histograms, (d) bar, line and pie graphs, (e) diagrams and pictorial displays and charts and tables</p> <p>Generate, organize, and interpret real numbers in a variety of situations</p> <p>Demonstrate the difference between an equation and an expression.</p> <p>Simulate an event selecting and using different models.</p>	<p>representations</p> <p>Demonstrate understanding of the relationships between ratios, proportions, and percents and solve for a missing term in a proportion.</p> <p>Use variables to generalize patterns and information presented in tables, charts, and graphs by; (b) plotting the values of quantities whose ratios are always the same, fit a line to the plot, and understand the slope of the line equals the quantities</p> <p>Solve two-step linear equations and inequalities in one variable with rational solutions.</p> <p>Analyze problems that involve change by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing, and observing patterns</p>	<p>Graph solution sets of linear equations in two variables on the coordinate plane.</p> <p>Evaluate formulas using substitution.</p> <p>Use appropriate problem-solving strategies (e.g., drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table or graph, working a simpler problem, writing an algebraic expression or working backward) to solve problems that involve change.</p> <p>Generalize a pattern of change using algebra and show the relationship among the equation, graph, and table of values</p> <p>Represent a variety of relationships using written and verbal expressions, tables, equations, and graphs</p>	
<b>Quadrant I</b>	<b>Quadrant II</b>	<b>Quadrant III</b>	<b>Quadrant IV</b>

**Strand 3: Geometry**

**Standard: Students will understand geometric concepts and applications.**

	<p>Recognize, classify, and discuss properties of all geometric figures including point, line, and plane. (year long)</p> <p>Identify arc, chord, and semicircle and explain their attributes.</p> <p>Estimate answers and use formulas to solve application problems involving surface area and volume.</p> <p>Describe the symmetry of three-dimensional figures.</p> <p>Recognize and apply properties of corresponding parts of similar and congruent triangles and quadrilaterals.</p> <p>Develop and use formulas for area, perimeter, circumference, and volume.</p> <p>Represent and solve problems relating to size, shape, area, and volume using geometric models.</p>	<p>Construct two-dimensional patterns for three-dimensional models (e.g., cylinders, prisms, cones).</p> <p>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</p> <p>Use the Pythagorean theorem and its converse to find the missing side of a right triangle and the lengths of the other line segments.</p> <p>Describe and perform single and multiple transformations that include rotation, reflection, translation, and dilation (i.e., shrink or magnify) to two-dimensional figures</p> <p>Represent, formulate, and solve distance and geometry problems using the language and symbols of algebra and the coordinate plane and space (e.g., ordered triplets).</p> <p>Explore the characteristics and attributes of the coordinate plane including coordinate</p>	<p>Discuss the surface area and volume of three-dimensional objects and the formulas for finding these quantities</p> <p>Find the area and perimeter of a variety of geometric figures composed of a combination of two or more rectangles, triangles and/or semicircles with just edges in common</p>
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	Understand angle relationships formed by parallel lines cut by a transversal.	axes, four quadrants, and ordered pairs	
<b>Quadrant I</b>	<b>Quadrant II</b>	<b>Quadrant III</b>	<b>Quadrant IV</b>
<b>Strand 4: Measurement</b>			
<b>Standard: Students will understand measurement systems and applications.</b>			
	<p>Understand the concept of volume and use the appropriate units in common measuring systems (e.g., cubic centimeter, cubic inch, cubic yard) to compute the volume of rectangular solids.</p> <p>Use changes in measurement units (e.g., square inches, cubic feet) to perform conversions from one-, two-, and three-dimensional shapes.</p> <p>Apply strategies to determine the surface area and volume of prisms, pyramids, and cylinders</p> <p>Use estimation to solve problems</p>	<p>Perform conversions with multiple terms between metric and U.S. standard measurement systems</p> <p>Estimate volume in cubic units</p> <p>Use ratios and proportions to measure hard-to-measure objects</p> <p>Solve simple problems involving rates and derived measurements for such properties as velocity and density</p> <p>Use proportional relationships in similar shapes to find missing measurements</p>	
<b>Quadrant I</b>	<b>Quadrant II</b>	<b>Quadrant III</b>	<b>Quadrant IV</b>
<b>Strand 5: Data Analysis and Probability</b>			
<b>Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.</b>			
<p>Generate, organize, and interpret real numbers in a variety of situations</p> <p>Describe how changes in scale, intervals, or categories influence arguments for a particular interpretation of the data.</p> <p>Explain the relationship between probability and odds and calculate the odds of a desired outcome in a simple experiment.</p> <p>Use appropriate technology to display data as lists, tables, matrices, graphs, and plots and to analyze the relationships of variables in the data displayed</p> <p>Generate, organize, and interpret real number and other data in a variety of situations</p> <p>Interpret and analyze data from graphical representations and draw simple conclusions (e.g., line of best fit).</p>	<p>Represent two numerical variables on a plot, describe how the data points are distributed, and identify relationships that exist between the two variables.</p> <p>Select the appropriate measure of central tendency to describe a set of data for a particular problem situation.</p> <p>Design and use an appropriate simulation to estimate the probability of a real-world event (e.g., disk toss, cube toss).</p> <p>Conduct simple experiments and/or simulations, record results in charts, tables, or graphs, and use the results to draw conclusions and make predictions</p> <p>Select and use appropriate statistical methods to analyze data.</p> <p>Analyze data to make decisions and to</p>	<p>Simulate an event selecting and using different models.</p> <p>Understand that the probability of two unrelated events occurring is the sum of the two individual possibilities and that the probability of one event following another, in independent trials, is the product of the two probabilities.</p> <p>Use probability to generate convincing arguments, draw conclusions, and make decisions in a variety of situations.</p> <p>Use changes in scales, intervals, or categories to help support a particular interpretation of data</p> <p>Design and use an appropriate simulation to estimate the probability of a real-world event (e.g., disk toss, cube toss).</p> <p>Use theoretical or experimental probability to</p>	<p>Discuss sampling and the role of randomization in a well-designed survey or experiment</p> <p>Discuss the difference between independent and dependent events</p>

<p>Organize, analyze, and display appropriate quantitative and qualitative data to address specific questions including: (a) frequency distributions, (b) plots, (c) histograms, (d) bar, line, and pie graphs, (e) diagram and pictorial displays, and (f) charts and tables</p> <p>Identify simple graphic misrepresentations and distortions of sets of data (e.g., unequal interval sizes, omission of parts of axis range, scaling).</p> <p>Calculate the odds of a desired outcome in a simple experiment.</p>	<p>develop convincing arguments from data displayed in a variety of formats that include: plots, distributions, graphs, scatter plots, diagrams, pictorial displays, charts and tables, Venn diagrams. (Year long)</p> <p>Compare expected results with experimental results and information used in predictions and inferences.</p> <p>Use appropriate central tendency and spread as a means for effective decision-making in analyzing data and outliers.</p>	<p>make predictions about real-world events.</p> <p>Evaluate and defend the reasonableness of conclusions drawn from data analysis.</p> <p>Describe how reader bias, measurement errors, and display distortion can affect the interpretation of data, predictions, and inferences based on data.</p> <p>Develop an appropriate strategy using a variety of data from surveys, samplings, estimations, and inferences to address a specific problem</p> <p>Describe the differences between various methods of data collection</p> <p>Identify an appropriate strategy using a variety of data from surveys, samplings, estimations, and inferences to address a specific problem.</p>	
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