Jemez Valley Public Schools

SEVENTH GRADE MATHEMATICS • CONTENT MAP

Quadrant I	Quadrant II	Quadrant III	Quadrant IV
Strand 1: Number and Operations **Standard: Students will understand numerical concepts and mathematical operations**			
Use properties of the real number system to explain reasoning and to formulate and solve real-world problems. Add and subtract fractions with unlike denominators Add, subtract, multiply and divide rational numbers (e.g., integers, fractions, terminating decimals) and take positive rational numbers to whole-number powers. Use estimation to check reasonableness of results and use this information to make predictions in situations involving rational numbers, pi, and simple algebraic equations Illustrate the relationships among natural (i.e., counting) numbers, whole numbers, integers, rational and irrational numbers. Calculate given percentages of quantities and use them to solve problems (e.g., discounts of sales, interest earned, tips, mark-ups, commission, profit, simple interest) Calculate the percentage of increase and decrease of a quantity	Use properties of the real number system to explain reasoning and to formulate and solve real-world problems Convert terminating decimals into reduced fractions Convert fractions to decimals and percents and use these representations in estimations, computations, and applications Read, write and compare rational numbers in scientific notation (e.g., positive and negative powers of 10) with approximate numbers using scientific notation Determine the absolute value of rational numbers Simplify numerical expressions using order of operations Multiply, divide and simplify rational numbers by using exponent rules Understand the meaning of th absolute value of a number by; (a) interpreting the absolute value as the distance of the number from zero on a number line, and (b) determining the absolute value of real numbers Simplify and evaluate positive rational numbers raised to positive whole number powers Solve addition, subtraction, multiplication, and division problems that use positive and negative integers and combinations of these operations	Find square roots of perfect whole-number squares Use the inverse relationship between raising to a power and extracting the root of a perfect square integer Explain and use the Pythagorean Theorem Use properties of the real-number system to explain reasoning and to formulate and solve real-world problems Identify numbers by their properties (e.g, prime, composite square, square root)	Explore arithmetic operations an their inverses (e.g., addition/subtraction, multiplication/division, square roots of perfect squares, cube roots of perfect cubes) on real numbers Explore computations with rational numbers, pi, and first-degree algebraic expressions in one variable in a variety of situations Estimate answers and use formulas to solve application problems involving surface area and volume
Quadrant I	**Quadrant II**	**Quadrant III**	**Quadrant IV**
Strand 2: Algebra **Standard II: Students will understand algebraic concepts and applications.**			

Identify and continue patterns presented in a variety of formats Select and use an appropriate model for a particular situation Use variables and appropriate operations to write and expression, an equation, and/or an inequality that represents a verbal description involving change Use letters as variables in mathematical expressions to describe how one quantity changes when a related quantity changes Represent a variety of relationships using tables, graphs, verbal rules, and possible symbolic notation, and recognize the same general pattern presented in different representations Create scale models and use them for dimensional drawings Graph and interpret linear functions	Graph linear functions and identify slope as positive or negative Understand and use the coordinate plane to graph ordered pairs and linear equations Use the order of operations to evaluate algebraic expressions Graph and interpret linear functions as they are used to solve problems Simplify numerical expressions by applying properties of rational numbers and justify the process used Solve problems involving rate, average speed, distance, and time	Interpret and evaluate expressions involving integer powers and simple roots Write verbal expressions and sentences as algebraic expressions and equations to; (a) evaluate algebraic expressions, (b) solve simple linear equations, and (c) graph and interpret results Solve two-step equations and inequalities with one variable over the rational numbers, interpret the solution, or solutions, in the context from which they arose, and verify the reasonable ness of the results Interpret and evaluate expressions involving integer powers and simple roots as they relate to change. Identify variables that can be used to generalize a pattern and information presented in tables, charts, and graphs. Explore different representations to model a specific numerical relationship given one representation of data (e.g., a table, a graph, an equation, a verbal description)	Graph a linear function and describe how the slope of the line remains the same Use symbols, variables, expression, inequalities, equations and simple systems of equations to represent a variety of problem situations that involve variables and unknown quantities
Quadrant I	**Quadrant II**	**Quadrant III**	**Quadrant IV**
Strand 3: Geometry **Standard: Students will understand geometric concepts and applications.**			
Classify geometric figures as similar or congruent Identify and describe the properties of two-dimensional figures by; (a) identifying angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms			
Quadrant I	**Quadrant II**	**Quadrant III**	**Quadrant IV**
Strand 4: Measurement **Standard: Students will understand measurement systems and applications.**			
Select and use the appropriate size and type of unit for a given measurement situation Compare masses, weights, capacities, geometric measures, times, and	Choose appropriate units of measure and ratios to recognize new equivalences (e.g., 1 square yards equals 9 square feet) to solve problems Apply strategies and formulas to find	Solve problems involving scale factors, ratios, and proportions Select and use formulas to determine the circumference of circles and the area of triangles, parallelograms,	Use changes in measurement units (e.g. square inches, cubic feet) to perform conversions from one-. Two-, and three-dimensional shapes

temperatures within measurement systems	missing angle measurements in triangles and quadrilaterals Approximate the relationship between standard and metric measurement systems (e.g., inches and centimeters, pounds and kilograms, quarts and liters)	trapezoids, and circles Use measures expressed as rates and measures expressed as products to solve problems, check the units of the solutions and analyze the reasonableness of the answer Explore the concept of volume and use the appropriate units in common measuring systems	Use estimation to solve problems Identify proportional relationships in similar shapes to find missing measurements Identify derived measurements for such properties as velocity and density
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Strand 5: Data Analysis and Probability **Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.**			
Collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set Describe how data representations influence interpretation Use appropriate technology to gather and display data sets and identify the relationships that exist among variables within the data set Select and use appropriate representation for presenting collected data and justify the selection Use various scales and formats to display the same data set Use data samples of a population and describe the characteristics and limitations of the sample. Use measures of central tendency and spread to describe a set of data.	Know various ways to display data sets (e.g., stem and leaf plot, box and whisker plot, scatter plots) and use these forms to display a single set of data or to compare two sets of data. Identify and explain the effects of scale and/or interval changes on graphs of whole number data sets. Use and explain sampling techniques (e.g., observations, surveys, and random sampling) for gathering data Identify examples of events having the probability of one or zero. Choose between median and mode to describe a set of data and justify the choice for a particular situation Identify and explain the misleading representations of data. Identify data that represent sampling errors and explain why the sample and the display might be biased. Approximate a line of best fit for a data set in a scatter plot form and make predictions using the simple equation of that line. Identify ordered pairs of data from a graph and interpret the data in terms of the situation depicted by the graph. Describe the probability of events using fractions, decimals, and percents Express probability as a fraction, zero, or one	Determine the quartiles of a data set. Compute the minimum, lower quartile, median, upper quartile, and maximum of a data set Analyze data to make accurate inferences, predictions, and to develop convincing arguments from data displayed in a variety of forms Determine the probability of a simple event or a compound event composed of simple, independent events Choose and justify appropriate measures of central tendencies (e.g., mean, median, mode, range) to describe given or derived data. Formulate and justify mathematical conjectures based on data and a general description of the mathematical question or problem posed Use the analysis of data to make convincing arguments Identify claims based on statistical data and evaluate the validity of the claims Make predictions based on theoretical probabilities of compound events Use probability to generate convincing arguments, draw conclusions, and make decisions in a variety of situations Identify appropriate quantitative and qualitative data displays to address a variety of specific questions including frequency distributions, plots, histograms, bar, line and pie graphs, diagrams and pictorial displays, and charts and tables	Explore appropriate strategies using a variety of data from surveys, samplings, estimations, and inferences to address specific problems Identify appropriate central tendency and spread as a means for effective decision-making in analyzing data and outliers Conduct simple experiments and/or simulations, record results in charts. Tables, or graphs, and use the results to draw conclusions and make predictions.