Jemez Valley Public Schools

SIXTH 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**			
Explain and perform (a) addition and subtraction with integers. Compare and order rational numbers. Use appropriate representations of positive rational numbers in the context of real-life applications (year long) Calculate multiplication and division problems using contextual situations. (year long) Explain and perform (b) addition, subtraction, multiplication, and division with decimals Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (year long) Interpret and use ratios in different contexts. Identify and represent on a number line decimals, fractions, mixed numbers, and positive. Identify and represent on a number line decimals., fractions, mixed numbers and positive and negative integers	Explain and perform (c) addition, subtraction, and multiplication with fractions and mixed numerals. Use equivalent representations for rational numbers (e.g. decimals, fractions, percents, ratios, numbers with whole-number exponents) (year long) Demonstrate the relationship and equivalency among ratios and percents. (year long) Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line. Explain and perform (d) whole number division and express remainders as decimals or appropriately in the context of the problem Determine if a problem situation calls for an exact or approximate answer and perform the appropriate computation Use proportions to solve problems (year long)	Determine the least common multiple and the greatest common divisor of whole numbers and use them to solve problems with fractions Factor a whole number into a product of its primes. Estimate quantities involving rational numbers using various estimations Compute and perform multiplication and division of fractions and decimals and apply these procedures to solving problems. Identify greatest common factor and least common multiples for a set of whole numbers. Use estimates to check reasonableness of results and make predictions in situations involving rational numbers. Describe properties of the real-number system to explain reasoning and to formulate and solve real-world problems Describe how numerical expressions can be simplified using order of operations	Identify percentages and how they can be used to solve problems (e.g., discounts of sales, interest earned) Discuss the concept of absolute value Describe rational numbers in scientific notation Identify percentage of increase and decrease of a quantity
Quadrant I	**Quadrant II**	**Quadrant III**	**Quadrant IV**
Strand 2: Algebra **Standard II: Students will understand algebraic concepts and applications.**			
Make generalizations based on observed patterns and relationships Create, explain, and use mathematical models such as (a) Venn diagrams to show the relationships between the characteristics of two or more sets Use letters to represent an unknown in an equation.	Create, explain, and use mathematical models such as (c) equations and inequalities to model numerical relationships. Graphs, tables, and charts to interpret and analyze data. Demonstrate that a variable can represent a single quantity that changes.	Use ratios to predict changes in proportional situations. (year long) Make generalizations based on observed patterns and relationships. Solve problems that involve change using proportional relationships. (year long) Generate formulas to represent relationships	Graph simple linear functions and describe the resulting slope Graph a variety of ordered pairs and linear equations Discuss and interpret a variety of expressions that involve integer

Graph ordered pairs in the coordinate plane. (year long) Create, explain, and use mathematical models such as (b) three-dimensional geometric models Explain and use symbols to represent unknown quantities and variable relationships. Explain and use the relationships among ratios, proportions, and percents. (year long)	Solve problems involving proportional relationships. (year long) Develop and use mathematical models to represent and justify mathematical relationships found in a variety of situations. (year long) Represent and explain changes using one-step equations with one variable. Use tables and symbols to represent and describe proportional and other relationships involving conversions, sequences, and perimeter.	involving changes in perimeter. Solve one-step linear equations and inequalities in one variable with positive whole-number solutions Demonstrate how changes in one variable affect other variables. Explore writing verbal expressions and sentences as algebraic expressions and equations Use variables and appropriate operations to write simple expressions	powers and simple roots as they relate to change
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Strand 3: Geometry **Standard: Students will understand geometric concepts and applications.**			
Describe the properties of geometric figures that include regular polygons, and circles. Describe the relationship between radius, diameter, and circumference of a circle Use appropriate technology, manipulatives, constructions, or drawings to recognize or compare geometric figures. Identify, describe and classify the properties of, and the relationships between plane and solid geometric figures by (a) measuring, identifying, and drawing angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software). Describe the properties of geometry figures that include ellipses, cylinders, cones, spheres, and cubes.	Identify, describe and classify the properties of, and the relationships between plane and solid geometric figures by (a) measuring, identifying, and drawing angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software). Describe the properties of geometry figures that include ellipses, cylinders, cones, spheres, and cubes. Identify, describe, and classify the properties of, and the relationships between, plane and solid geometric figures by (c) visualizing and drawing two-dimensional views of three-dimensional objects made from rectangular solids. Classify angles as right, obtuse, or straight.	Identify angle, line, segment, and ray and use the symbols for each. Use coordinate geometry to describe location on a plane. Recognize skewed lines in space. Classify triangles as scalene, isosceles, or equilateral and by angles (i.e., right, acute, and obtuse). Identify line of symmetry with rotation and scaling. Describe how geometric figures can be similar or congruent Explore the properties of complementary and supplementary angles and how the sum of the angles of a triangle can be used to solve problems involving an unknown angle	Explore the concept of pi and how it relates to the diameter, area and circumference of a circle Explore perimeter and area and how these are affected by changes of scale

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Strand 4: Measurement **Standard: Students will understand measurement systems and applications.**			
Select and justify the selection of measurement tools, units of measure, and degrees of accuracy appropriate to the given situation (year long) 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 (year long)	Use standard units of linear measurement to the nearest sixteenth of an inch; metric measurements to the nearest millimeter. Select and use formulas for perimeters of squares and rectangles. 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.	Select and use strategies to estimate measurements including angle measure and capacity (year long) Estimate measurements in both U.S. customary and metric units. Perform multi step conversions of measurement units to equivalent units within a given system (e.g., 36 inches equals 3 feet or 1 yard). Discuss comparisons between masses, weights, capacities, geometric measures, times and temperatures within measurement systems	Describe measures expressed as rates and measures expressed as products and how these are used to solve problems Identify formulas that determine the circumference of circles and the area of triangles Use scale factors, ratios and proportions to solve simple problems
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Strand 5: Data Analysis and Probability **Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.**			
Choose an appropriate graphical format to organize and represent data Draw and compare different graphical representations of the same data. Sketch circle graphs to display data. Explain advantages and disadvantages of using various display formats for a specific data set Describe the effects of missing or incorrect data. Use mean, median, mode, and range to describe data. Conduct observations, surveys, experiments and/or simulations, record the results in charts, tables, or graphs, and use the results to draw conclusions and make predictions. Describe the difference between independent and dependent events and identify situations involving independent or dependent events. Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more	Use statistical representations to analyze data. Determine the median for a rational number data set containing an odd number of data points List all possible outcomes for a compound event composed of two independent events and recognize whether an outcome is “certain”, “impossible”, “likely”, or “unlikely”. Use data samples of a population and describe the characteristics and limitations of the sample. Compare different samples of a population with the entire population and determine the appropriateness of using a sample Formulate and solve problems by collecting, organizing, displaying, and interpreting data Calculate and explain the median for a whole number data set containing an even number of data points 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.	Determine and compare experimental (empirical) and mathematical (theoretical) probabilities (e.g., flipping two color counters). Use data to estimate the probability of future events (e.g., batting averages). Identify data that represent sampling errors and explain why the sample and the display might be biased. Determine theoretical and experimental probabilities and use them to make predictions about events. Compute and analyze statistical measurements for data sets by; (a) understanding how additional data added to data sets may affect the computations of central tendency, (b) understanding how the inclusion or exclusion of outliers affects measures of central tendency and, (c) knowing why a specific measure of central tendency provides the most useful information in a given context Identify claims based on statistical data and, in sample cases, evaluate the validity and usefulness of the claims Use measures of central tendency to describe a set of data Describe various ways to display data sets (e.g.,	Identify misleading representations of data Examine lines of best fit for a data set in a scatter plot and make a prediction using the simple equation of that line

representative for a population.	Conduct and explain sampling techniques such as observations, surveys, and random sampling for gathering data. Find all possible combinations in a given set (e.g., the number of ways a set of books can be arranged on a shelf) Compare expected results with actual results in a simple experiment	stem and leaf plots, box and whisker plots, scatter plots	