

**Jemez Valley Public Schools**  
**FOURTH GRADE 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>Exhibit an understanding of the place-value structure of the base-ten number system by reading, modeling, writing, and interpreting whole numbers up to 100,000; to compare and order the numbers by; (a) recognizing equivalent representations for the same number and generating them by decomposing and combining numbers and (b) identifying the numbers less than 0 by extending the number line and using negative numbers through familiar applications (e.g. temperatures below zero and owing money. (supplement)</p> <p>Recognize classes of numbers and apply these concepts in problem-solving situations. (year long)</p> <p>Select and use appropriate operations including addition and subtraction to solve problems. (year long)</p> <p>Demonstrate commutative (<math>37 \times 46 = 46 \times 37</math>), associative (<math>(6 \times 2) \times 5 = 6 \times (2 \times 5)</math>), identity (any number <math>\times 1 =</math> itself), and zero properties (any number <math>\times 0 = 0</math>) of operations on whole numbers (year long) (supplement associative property) Add and subtract up to two triple digits numbers accurately and efficiently. (year long).</p> <p>Demonstrate an understanding of and the ability to use: (a) standard algorithms for the addition and subtraction of multi-digit numbers. (year long)</p> <p>Use a variety of strategies (e.g., rounding and regrouping) to estimate the results of whole number computations and judge the reasonableness of the answers. (year long)</p> <p>Demonstrate an understanding of and the ability to use: (a) standard algorithms for the addition and subtraction of multi-digit numbers, and (b) standard algorithms for multiplication and division of multi-digit</p>	<p><i>Choose computational methods based on understanding the base-ten number system, properties of multiplication and division, and number relationships.</i></p>	<p>Extend the uses of whole numbers to the addition and subtraction of simple decimals (positive numbers to two places). Subtraction of (supplement subtraction of decimals)</p> <p>Use strategies to estimate computations involving fractions and decimals.</p> <p>Add and subtract fractions with common and uncommon denominators using a variety of strategies to (a) recognize and generate equivalent decimal forms of commonly used fractions (b) identify the numbers less than zero by extending the number line and using negative numbers through familiar applications (e.g. temperatures below zero and owing money. (supplement additional and subtractions of fractions)</p> <p>Use visual models and other strategies to recognize and generate equivalents of commonly used fractions and mixed numbers (halves, thirds, fourths, sixths, eighths, tenths</p> <p>Identify fractions as parts of unit wholes, as parts of groups, and as locations on number lines by; (a) using visual models and other strategies to compare and order commonly used fractions, (b) using models to show how whole numbers and decimals (to the hundredths place) relate to simple fractions, (c ) identifying different interpretations of fractions that include (i) division of whole numbers by whole numbers, (ii) ratio, (iii) equivalence, (iv) ordering of fractions, and (v) parts of a whole or parts of a set (year long).</p> <p>Extend the uses of whole numbers to the addition and subtraction of simple decimals (positive numbers to two places).</p> <p>Use strategies to estimate computations involving fractions and decimals.</p>	

<p>numbers by one-digit number (year long).</p> <p><i>Solve simple multiplication and division problem &amp; Identify and use the relationship between multiplication and division to solve problems.</i></p> <p><i>Demonstrate the concept of distributivity of multiplication over addition and subtraction (year long)</i></p> <p>Demonstrate multiplication combinations through 12 x 12 and related division facts, and use them to solve problems mentally and compute related problems. (year long)</p> <p><i>Use a variety of models to show an understanding of multiplication and division of whole numbers</i></p> <p><i>Choose computational methods based on understanding the base-ten number system, properties of multiplication and division, and number relationships.</i></p>			
<b>Quadrant I</b>	<b>Quadrant II</b>	<b>Quadrant III</b>	<b>Quadrant IV</b>
<b>Strand 2: Algebra</b> <b>Standard II: Students will understand algebraic concepts and applications.</b>			
<p>Use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences by (a) using letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate the concept of a variable), (b) interpreting and evaluating mathematical expressions using parentheses, and (c) using and interpreting formulas to answer questions about quantities and their relationships (year long).</p> <p>Explore the uses of properties (commutative, distributive, associative) in the computation of whole numbers.</p> <p>Identify symbols and letters that represent the concept of a variable as an unknown quantity</p> <p>Determine the value of variables in simple equations</p> <p>Express mathematical relationships using</p>	<p><i>Model problem situations with objects and use representation such as pictures, graphs, tables, and equations to draw conclusions.</i></p> <p><i>Represent simple functional relationships; (a) solve simple problems involving a functional relationship between two quantities, (b) extend and recognize a linear pattern by its rules (e.g., graphing). (introduce and supplement <math>y=x+3</math>)</i></p>		

<p>equations. (year long)</p> <p><i>Demonstrate how change in one variable can relate to change in a second variable (e.g., input-output machines, data tables). (introduce and supplement year long)</i></p> <p><i>Determine the value of variables in missing part problems</i></p> <p><i>Represent simple functional relationships by (a) solving simple problems involving a functional relationship between two quantities, and (b) extending and recognizing a linear pattern by its rules.</i></p> <p>Develop simple formulas in exploring quantities and their relationships (e.g., area = l X w).</p> <p>Use and interpret formulas (e.g., Area = Length X Width) to answer questions about quantities and their relationships</p> <p><i>Solve problems involving proportional relationships including unit pricing. (supplement e.g. 1 inch = 5 miles so 5 inches = 25 miles).</i></p> <p><i>Describe relationships of quantities in the form of mathematical expressions, equations, or inequalities.</i></p>			
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<b>Quadrant I</b>	<b>Quadrant II</b>	<b>Quadrant III</b>	<b>Quadrant IV</b>
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**Strand 3: Geometry**  
**Standard: Students will understand geometric concepts and applications.**

<p>Use geometric models, such as number lines, and computer simulations to investigate number relationships (e.g., patterns). (year long)</p> <p><i>Describe and compare the attributes of plane and solid geometric figures to show relationships and solve problems by (a) identifying, describing, and classifying polygons, (b) identifying lines of symmetry in two-dimensional shapes, (c) exploring attributes of quadrilaterals, (d) identifying right angles, and (e) identifying, describing, and classifying common three-dimensional geometric objects.</i></p> <p><i>Use ordered pairs to graph, locate specific</i></p>		<p>Classify two-dimensional shapes according to their properties and develop definitions of classes like triangles by; (a) visualizing, describing, and (b) interpreting two-dimensional representations of three-dimensional objects (year long)</p> <p>Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes by; (a) building, drawing, creating, and describing geometric objects, (b) identifying lines that are parallel or perpendicular, and (c) identifying and comparing congruent and similar figures.</p> <p>Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions</p>	<p><i>Identify, describe, and classify two-dimensional shapes and three-dimensional figures by their properties.</i></p> <p>Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes by; (a) building, drawing, creating, and describing geometric objects, (b) identifying lines that are parallel or perpendicular, and (c) identifying and comparing congruent and similar figures.</p> <p>Classify two- and three-dimensional shapes according to their properties and develop definitions of classes like</p>
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<p><i>points, create path, and measure distances within a coordinate grid system. (year long) (supplement).</i></p> <p>Use geometric models, such as number lines, arrays, and computer simulations to investigate number relationships (e.g., patterns). (year long)</p> <p><i>Use geometric models to solve problems in other areas of mathematics (e.g., using arrays as models of multiplication or area).</i></p>		<p>Describe location and movement using common language and geometric vocabulary.</p> <p>Use ordered pairs to graph, locate, identify points, and describe paths in the first quadrant of the coordinate plane (supplement)</p> <p>Use a variety of methods for measuring distances between locations on a grid. (supplement with mapping)</p> <p>Create and describe rotational designs using language of transformational symmetry.</p> <p>Describe a motion or set of motions that will show that two shapes are congruent.</p> <p>Develop and use mental images of geometric shapes to solve problems</p> <p><i>Describe location and movement using common language and geometric vocabulary</i></p> <p><i>Predict and describe the results of sliding, flipping, and turning two-dimensional shapes (supplement)</i></p> <p>Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes by: (a) building, drawing, creating, and describing geometric objects, (b) identifying lines that are parallel or perpendicular, and (c) identifying and comparing congruent and similar figures. (This must be supplemented)</p> <p>Explore relationships involving perimeter and area by: (a) measuring the area of rectangular shapes and using appropriate units, (b) recognizing that area can have the same perimeter but different areas and vice versa, and (c) using models and formulas to solve problems involving perimeter and area of rectangles and squares</p> <p><i>Describe location and movement using common language and geometric vocabulary</i></p>	<p>triangles and pyramids by; (a) visualizing, describing, and making models of geometric solids in terms of the number of faces, edges, and vertices, and (b) interpreting two-dimensional representations of three-dimensional objects (year long)</p>
<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><i>Use appropriate units and tools to estimate, measure, and solve problems (e.g., length, area, weight).</i></p> <p><i>Identify properties (e.g., length, area, weight, volume) and select the appropriate type of unit for measuring each property.</i></p>	<p><i>Demonstrate understanding that measurements are approximations, investigate differences in units and their effect on precision, and consider the degree of accuracy for different situations.</i></p>	<p><i>Find the area of rectangles using appropriate tools</i></p> <p>Select the appropriate type of unit for measuring perimeter and size of an angle.</p> <p>Understand the need for measuring with standard units and become familiar with</p>	<p>Develop formulas to determine the surface area and volume of rectangular solids.</p>

<p><i>Select and use appropriate measurement tools (ruler, yardstick, meter stick).</i></p> <p><i>Demonstrate understanding to the need for measuring with units and become familiar with standard units in the U.S. customary system.</i></p> <p>Develop formulas to determine the surface area of rectangular solids. (e.g., area = l X w )</p>		<p>the standard units in customary and metric system (year long)</p> <p>Identify the inverse relationship between the size of the units and the number of units.</p> <p>Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.</p> <p>Carry out simple conversions within a system of measurement</p> <p>Estimate perimeters, areas of rectangles, triangles, and irregular shapes</p> <p>Find the area of rectangles, related triangles and parallelograms.</p> <p>Estimate, measure, and solve problems involving length, area, mass, time, and temperature using appropriate standard units and tools. (supplement mass, temperature and time)</p> <p>Identify common measurements of turns (e.g., 360 degrees in one turn, 90 degrees in a quarter-turn).</p> <p>Use tools to measure angles (e.g., protractor, compass) (supplement)</p>	
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<b>Strand 5: Data Analysis and Probability</b> <b>Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.</b>			
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<p>Organize, represent, and interpret numerical and categorical data and clearly communicate findings by; (a) choosing and constructing representations that are appropriate for the data set, and (b) recognizing the differences in representing categorical and numerical data.</p> <p>Compare and describe related data sets. Use the concepts of median, mode, maximum, minimum, and range and draw conclusions about a data set. (supplement vocabulary)</p> <p>Describe events as “likely”, “unlikely”, or “impossible” and quantify simple probability situations by (a) representing all possible outcomes for a simple probability situation in an organized way and (b) expressing</p>	<p><i>Represent data using tables and graphs (e.g., line plots, bar graphs, and line graphs).</i></p> <p><i>Analyze data displayed in a variety of formats to make reasonable inferences and predictions, answer questions, and make decisions.(supplement e.g. Venn diagrams, pictographs, and tree diagrams)</i></p> <p>Design investigations and represent data using tables and graphs Use data analysis to make reasonable inferences/predictions and to develop convincing arguments from data described in a variety of formats</p>		<p>Organize, represent, and interpret numerical and categorical data and clearly communicate findings by; (a) choosing and constructing representations that are appropriate for the data set, and (b) recognizing the differences in representing categorical and numerical data.</p> <p>Compare and describe related data sets.</p> <p>Use the concepts of median, mode, maximum, minimum, and range and draw conclusions about a data set.</p> <p><i>Demonstrate how change in one variable can relate to change in a second variable (e.g., input-output</i></p>
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<p>outcomes of experimental probability situations verbally and numerically (e.g., three out of four, <math>\frac{3}{4}</math>).</p> <p>List all possible combinations of objects from three sets. (supplement).</p>	<p>Propose and justify conclusions and prediction based on data.</p> <p>Developing convincing arguments from data displayed in a variety of formats.</p>		<p><i>machines, data tables).</i></p>
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