

KC⁴ Mathematics 2005 Scope and Sequence

Academic Standards for Grades K-5

	K	1	2	3	4	5
Number and Operations/Algebra	<p>K:1 TLW recognize, count, order, and compare numbers 0-30; display one-to-one correspondence within sets of 0-30 objects; write numerals to represent sets of 0-30 objects; and compare which is more than, less than, or the same when given two sets of up to 30 objects.</p> <p>K:2 TLW count to 100 by ones and tens, count to 30 by twos and fives, and demonstrate that numbers up to 30 can be placed into groups of tens and ones.</p> <p>K:3 TLW recognize different representations of the same number, compose and decompose numbers from 2 to 10, represent situations/stories involving putting together and taking apart for totals up to 10, and write simple addition and subtraction sentences.</p> <p>K:4 TLW describe, create, and extend simple number patterns and simple geometric patterns using attributes of color, shape, and size.</p>	<p>1:1 TLW count, read, and write numbers by ones, twos, fives, and tens to 110 and relate them to the quantities they represent; count backward by ones from any number between 0 and 110; count to 500 by tens and hundreds; and use ordinals to identify position in a sequence.</p> <p>1:2 TLW order and compare numbers to 110 and explore place value by composing and decomposing numbers to 30.</p> <p>1:3 TLW solve problems involving addition of two and three addends with sums up to 20 and related subtraction problems and write mathematical sentences using the symbols +, -, and =.</p> <p>1:4 TLW fluently recall addition facts to $10 + 10$ and related subtraction facts, recognizing the identity property of addition, and mentally calculate sums and differences up to two-digit numbers.</p> <p>1:5 TLW recognize fractions as being equal parts of a whole or set and use models to identify one-half, one-third, and one-fourth.</p>	<p>2:1 TLW count to 1000 by ones, tens, and hundreds starting with any number, read and write numbers to 1000 in numerals and words, and count by threes and fours starting with 0 and by twos and fives starting with any number.</p> <p>2:2 TLW order numbers to 1000 and compare using > and < symbols and express the place value of numbers to 1000, relating numbers to the quantities they represent.</p> <p>2:3 TLW decompose 100 into addition pairs, fluently solve addition and related subtraction problems using two two-digit numbers, find missing values in open addition and subtraction sentences, and find the distance between two numbers on a number line.</p> <p>2:4 TLW estimate and calculate the sum of two numbers with three digits that do not require regrouping and mentally calculate sums and differences involving three-digit numbers and ones, tens, and hundreds.</p>	<p>3:1 TLW read and write numbers to 10,000 in numerals and words and relate numbers to the quantities they represent, identify place value, use expanded notation, compare and order numbers, and differentiate numbers as odd or even.</p> <p>3:2 TLW add and subtract two numbers up to two digits with regrouping and up to four digits without regrouping and use mental strategies to add and subtract two-digit numbers.</p> <p>3:3 TLW estimate the sum and difference of two three-digit numbers using various strategies.</p> <p>3:4 TLW demonstrate the concepts of multiplication as repeated addition and multiplication and division as inverse operations, and recall multiplication facts through ten times ten.</p> <p>3:5 Given a contextual situation, TLW use multiplication or division (including remainders) to solve problems.</p>	<p>4:1 TLW read, write, order, and compare numbers through seven digits, relate numbers to the quantities they represent, and compose and decompose numbers using place value.</p> <p>4:2 TLW find all factors of a whole number up to 50, list the first ten multiples of a given one-digit whole number, and solve problems.</p> <p>4:3 TLW multiply fluently any whole number by a one-digit number, a three-digit number by a two-digit number, and solve applied problems.</p> <p>4:4 TLW divide numbers up to four digits by one-digit numbers and by ten, use the inverse operation (multiplication) to check solutions, find unknowns in division equations and solve applied problems.</p> <p>4:5 TLW read, write, interpret and compare decimals through hundredths, relate decimals to money and place value decomposition, identify decimal equivalents for halves and fourths, and solve problems.</p>	<p>5:1 TLW explain division of whole numbers with and without remainders, relate division to fractions and repeated subtraction, and write mathematical statements involving division for given situations.</p> <p>5:2 TLW multiply a multi-digit number by a two-digit number, divide fluently up to a four-digit number by a two-digit number, and solve applied problems involving multiplication and division of whole numbers.</p> <p>5:3 TLW find the prime factorization of numbers between 1 and 50, express numbers in exponential notation, and understand that every composite number can be expressed as a product of primes.</p> <p>5:4 TLW relate the relative magnitude of ones, tenths, and hundredths to place value, relate percentages to parts out of 100 and part of a whole as a percentage, express fractions and decimals as percentages and vice versa, and multiply whole numbers by decimals.</p> <p>5:5 TLW multiply and divide whole numbers by powers of ten.</p>

KC⁴ Mathematics 2005 Scope and Sequence
Academic Standards for Grades K-5 (continued)

	K	1	2	3	4	5
Number and Operations/Algebra (continued)			<p>2:5 TLW demonstrate the concepts of multiplication as repeated addition, division as repeated subtraction, and multiplication and division as inverse operations and recall multiplication facts through five times five using various strategies.</p> <p>2:6 TLW recognize, name, and represent commonly used fractions with denominators 12 or less, explain the inverse relationship between the size of a unit fraction and the size of the denominator, and recognize that fractions with the same numerator and denominator are equal to the whole.</p>	<p>3:6 TLW mentally calculate simple products and quotients up to a three-digit number involving multiples of 10 by a one-digit number.</p> <p>3:7 Given problems that use any one of the four operations with appropriate numbers, TLW represent the problem with objects, solve, write a mathematical statement, and use the terms sum, difference, product, or quotient to describe the answer.</p> <p>3:8 TLW explain that fractions may represent a portion of a whole unit; compare and order fractions with denominators 2, 4, and 8; use equivalent fractions with denominators 2, 4, and 8; and add and subtract fractions with like denominators.</p>	<p>4:6 TLW understand fractions as parts of a set of objects; explain why equivalent fractions are equal; locate, compare, and order fractions on a number line; understand relationships among fractions; and write improper fractions as mixed numbers.</p> <p>4:7 TLW solve problems involving the addition and subtraction of fractions with like denominators or where one denominator is a multiple of the other and solve for the unknown in addition and subtraction of fractions with numerators less than 1 and with like denominators.</p> <p>4:8 Using repeated addition and area or array models, TLW multiply fractions by whole numbers and solve applied problems.</p> <p>4:9 TLW add and subtract decimals, multiply and divide decimals by a one-digit whole number where the result is a terminating decimal, and solve applied problems.</p> <p>4:10 TLW solve problems using the four basic arithmetic operations fluently; estimate sums, differences, products, and quotients; know when an estimation or approximation is appropriate and reasonable; and make estimations and calculations fluently using mental math strategies.</p>	<p>5:6 TLW add and subtract fractions using the common denominator that is the product of the denominators of the two fractions.</p> <p>5:7 TLW multiply unit fractions and divide a whole number by a fraction and a fraction by a whole number.</p> <p>5:8 TLW solve applied problems involving fractions and decimals and solve for unknowns in equations such as $\frac{1}{4} + x = \frac{7}{12}$.</p> <p>5:9 Given applied situations, TLW express ratios in several ways, recognize and find equivalent ratios, and find the unknown in a proportion.</p>

KC⁴ Mathematics 2005 Scope and Sequence
Academic Standards for Grades K-5 (continued)

	K	1	2	3	4	5
Measurement	<p>K:5 TLW compare two or more objects by length, weight and capacity and identify common measurement tools to determine the purpose for their use.</p> <p>K:6 TLW read and record time to the hour using a digital clock and an analog clock, identify daily landmark times, and know and use common words for parts of the day and relative time.</p> <p>K:7 TLW recognize and state the value of pennies, nickels, dimes, and quarters.</p>	<p>1:6 TLW measure and compare lengths of objects in non-standard units, weigh common objects using a balance, determine capacity of containers, and solve simple word problems involving measurement.</p> <p>1:7 TLW read, record, and relate time to the hour and half-hour using a digital clock and an analog clock in real-life situations, use a calendar to name months of the year and days of the week, and solve one-step word problems involving time.</p> <p>1:8 TLW identify the different denominations of coins and bills, tell the total value of combinations of coins up to \$1 and the total value of combinations of bills up to \$100, represent equivalency of coins and bills, and solve simple word problems involving money.</p>	<p>2:7 TLW measure, compare, and add & subtract lengths of objects in meters, centimeters, yards, feet, and inches to solve problems.</p> <p>2:8 TLW compute the perimeter of polygons, measure area of polygons using non-standard units, find the area of rectangles by covering with unit squares and write as a product, and solve applied problems.</p> <p>2:9 TLW read and record time to five-minute intervals using a.m. and p.m. and find a time in the past or future (duration).</p> <p>2:10 TLW add and subtract money in mixed units and solve simple word problems involving money.</p> <p>2:11 TLW read and use the concept of temperature to solve real-life problems.</p>	<p>3:9 Using common units of measurement including mixed units, TLW measure length, weight, and capacity; explain the relationships between sizes of standard units; and solve addition and subtraction problems of like measures.</p> <p>3:10 Using common units of time, TLW measure in mixed units for hours and minutes, minutes and seconds, and years and months; add and subtract mixed units of time; and solve applied problems.</p> <p>3:11 TLW read thermometers and use the concept of temperature to compare to benchmark temperatures and to solve real-life problems.</p> <p>3:12 TLW solve applied problems involving dollars and cents.</p> <p>3:13 TLW distinguish between perimeter and area, estimate and calculate the perimeter of polygons and area of rectangles, use the appropriate unit of measure, and solve related contextual problems.</p>	<p>4:11 TLW measure to a reasonable degree of precision using common tools, select appropriate units of measure, and convert one unit of measure to a larger or smaller unit of measure using simple calculations.</p> <p>4:12 TLW use formulas to calculate perimeter and area of rectangles and combinations of rectangular shapes, measure surface area of cubes and rectangular prisms, and solve contextual problems.</p>	<p>5:10 Using models, manipulatives, or illustrations, TLW show the relationship between areas of rectangles, triangles, and parallelograms and develop and use area formulas.</p> <p>5:11 TLW find the volume of cubes and rectangular prisms and solve applied problems.</p> <p>5:12 TLW make conversions within customary or metric systems and apply the concepts of linear measurement, area, volume, weight/mass, and time to solve applied problems.</p>

KC⁴ Mathematics 2005 Scope and Sequence
Academic Standards for Grades K-5 (continued)

	K	1	2	3	4	5
Geometry	<p>K:8 TLW identify and name familiar two-dimensional and three-dimensional shapes, and relate geometric shapes to objects inside and outside the classroom.</p> <p>K:9 TLW use directional and positional words to describe the location of an object.</p>	<p>1:9 TLW differentiate among and create common two- and three-dimensional geometric shapes and describe their physical and geometric attributes.</p> <p>1:10 TLW describe, identify, extend, and create patterns using number, shape, and size.</p> <p>1:11 TLW describe relative position of objects on a plane and in space.</p>	<p>2:12 TLW identify, describe, compare, and classify two-dimensional and three-dimensional shapes; distinguish between curves and straight lines and curved surfaces and flat surfaces; and demonstrate slides, flips, and turns using manipulatives.</p> <p>2:13 TLW find and name locations using simple coordinate systems such as maps and first-quadrant grids.</p>	<p>3:14 TLW recognize the basic elements of geometric objects; identify, compare, classify, compose, and decompose two-dimensional shapes.</p> <p>3:15 TLW identify, describe, build and classify familiar three-dimensional solids based on their component parts (faces, parallel faces, surfaces, bases, edges, vertices).</p>	<p>4:13 TLW identify basic two-dimensional and three-dimensional geometric shapes and use their properties to solve problems.</p> <p>4:14 TLW recognize symmetry and transformations of two-dimensional shapes and objects.</p>	<p>5:13 TLW identify, measure, and classify angles; find unknown angles using the properties of triangles, parallelograms, and trapezoids; and solve problems.</p>
Data and Probability	<p>K:10 TLW construct real and picture graphs and verbally answer questions by comparing data.</p>	<p>1:12 TLW collect and organize data and create, read, and interpret real and picture graphs.</p>	<p>2:14 TLW make pictographs and interpret data given on a pictograph to solve problems.</p>	<p>3:16 TLW construct, read and interpret bar graphs and use information in bar graphs to solve problems.</p>	<p>4:15 TLW order a given set of data, find the median and specify the range of values, construct tables and bar graphs from given data, and solve problems using data represented in tables and bar graphs.</p>	<p>5:14 TLW construct line graphs from tables of data, read and interpret line graphs, and solve problems.</p> <p>5:15 TLW find and interpret mean and mode in a set of data and solve multi-step problems involving means.</p>

KC⁴ Mathematics 2006 Scope and Sequence
Academic Standards for Grades 6-8

	6	7	8
Number and Operations	<p>6:1 TLW demonstrate division of fractions as the inverse of multiplication, fluently multiply and divide any two fractions, write a mathematical statement to represent a situation involving division of fractions, and solve for the unknown.</p> <p>6:2 TLW order, add, subtract, multiply, and divide positive rational numbers and translate between rational forms (fractions and decimals).</p> <p>6:3 TLW estimate and calculate sums, differences, products, and quotients of positive rational numbers in applied situations.</p> <p>6:4 TLW explain the meaning of integers, absolute values, and fractions (including positive and negative fractions) and compute with integers to solve problems.</p> <p>6:5 TLW understand and use integer exponents and express numbers in scientific notation.</p> <p>6:6 TLW find equivalent ratios and percentages of numbers, and use rates, ratios, percentages, and proportions to solve real-life situations.</p>	<p>7:1 TLW apply ratios, rates, proportions, and percents in problem-solving situations.</p> <p>7:2 TLW solve problems involving derived quantities such as density, velocity, and weighted averages.</p> <p>7:3 TLW apply the concepts of square root and cube root, simplify expressions using order of operations, and estimate square roots and cube roots.</p> <p>7:4 TLW solve problems involving operations with integers and estimate and perform computations involving rational numbers.</p>	<p>8:1 TLW estimate square roots and cube roots, relate square roots to areas of squares and cube roots to volumes of cubes, and solve problems.</p> <p>8:2 TLW apply the concepts of zero and negative integer exponents, express rational numbers as terminating or repeating decimals, and approximate rational and irrational numbers on a number line.</p> <p>8:3 TLW solve problems in real-life situations involving percent increase or decrease, compound interest, and multiple discounts.</p> <p>8:4 TLW solve problems in real-life situations involving weighted averages and ratio units.</p>
Algebra	<p>6:7 TLW write an algebraic expression or equation related to a given situation, simplify expressions of the first degree, and evaluate expressions using specific values.</p> <p>6:8 TLW understand and use properties of equations to solve equations of the form $ax + b = c$ and solve contextual problems.</p> <p>6:9 TLW plot ordered pairs, use ordered pairs to graph linear equations, write equations for linear functions of the form $y = mx$, and represent simple relationships between quantities.</p>	<p>7:5 TLW understand and apply linear relationships of the form $y = mx + b$ and directly proportional relationships of the form $y = mx$, and solve applied problems.</p> <p>7:6 TLW calculate the slope from the graph of a linear function and explain that the solution to a linear equation corresponds to the point at which the graph of its related function crosses the x-axis.</p> <p>7:7 TLW recognize inversely proportional relationships in contextual situations, explain that the graph of $y = k/x$ never crosses the x- nor the y-axis, and solve simple problems.</p> <p>7:8 TLW use the associative, commutative, identity, inverse, zero, and distributive properties; simplify algebraic expressions of the first degree; and generate and solve linear equations of the form $ax + b = c$ and $ax + b = cx + d$.</p>	<p>8:5 TLW identify and represent linear functions, quadratic functions, and other simple functions using tables, graphs, and equations; describe how changes in one variable affect other variable(s); and solve problems.</p> <p>8:6 TLW find products of two simple binomials, recognize and apply common formulas, and factor simple quadratic expressions.</p> <p>8:7 TLW relate quadratic equations and functions to their graphs, graph quadratic functions and find roots of the related equation, solve factorable quadratic equations, and solve applied problems.</p> <p>8:8 TLW determine whether a given value(s) is a solution to an equation and graph and solve applied problems involving simultaneous linear equations and linear inequalities involving one and two variables.</p>

KC⁴ Mathematics 2006 Scope and Sequence
Academic Standards for Grades 6-8 (continued)

	6	7	8
Measurement	<p>6:10 TLW convert between basic units of measurement within the metric or customary systems.</p> <p>6:11 TLW construct circles with given diameters or radii, measure the diameter and radius of given circles, determine circumferences, and use a grid to determine areas.</p> <p>6:12 TLW construct nets for cubes and rectangular prisms and compute the surface area and volume of cubes and rectangular prisms using formulas.</p>		
Geometry	<p>6:13 TLW understand and apply basic properties of lines, angles, triangles, and congruence of polygons; use paper folding for geometric construction; and solve problems.</p> <p>6:14 TLW perform the basic rigid motions in the plane (transformations such as rotations, reflections, translations), relate them to congruence, and apply them to solve problems.</p>	<p>7:9 TLW use appropriate tools to perform basic geometric constructions.</p> <p>7:10 TLW use the concepts of similarity and congruence relating to angles and sides of polygons to solve problems, and understand that when two-dimensional shapes are similar with a scale factor of r, their areas are related by a factor of r^2.</p>	<p>8:9 TLW use the Pythagorean Theorem and distance formula to solve problems.</p> <p>8:10 TLW develop and use formulas for the circumference and area of a circle, find area and perimeter of complex figures by subdividing into basic shapes, and solve applied problems involving area and perimeter.</p> <p>8:11 TLW develop and use formulas for surface area and volume of common three-dimensional shapes.</p> <p>8:12 TLW use transformations (dilations, reflections, and rotations) to solve problems involving similar and congruent polygons.</p>
Data and Probability	<p>6:15 TLW read and interpret circle graphs, gather data, construct graphs and formulate sentences to state conclusions which will include the use of mean, median, mode, and range in real-life situations.</p> <p>6:16 TLW express probabilities as fractions, decimals, and percentages between 0 and 1, inclusive; determine probabilities empirically from simple experiments; and compute probabilities theoretically by listing all possibilities.</p>	<p>7:11 TLW calculate and interpret relative and cumulative frequencies, and create, represent, and interpret data in various graphs and plots.</p>	<p>8:13 TLW justify conclusions based on data, determine which measure of central tendency best represents a data set, and recognize potential bias in presenting or analyzing data.</p> <p>8:13 TLW compute relative frequency, explain the relationship of probability to relative frequency, and apply the Basic Counting Principle to find total number of possible outcomes for independent and dependent events.</p>