

USD #294
Math Curriculum

Standard 1: Number and Computation

Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 1: Number Sense – The student demonstrates an understanding of number sense in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none">1. knows, explains, and represents whole numbers from 0 through 100 using concrete objects (2.4.K1a) (\$).2. compares and orders (\$):<ol style="list-style-type: none">a. whole numbers from 0 through 100 using concrete objects (2.4.K1a),b. fractions with like denominators (halves, thirds, and fourths) using concrete objects (2.4.K1a,c).3. recognizes a whole, a half, a third, and a fourth and represents equal parts of a whole (halves, thirds, fourths) using concrete objects, pictures, diagrams, fraction strips, or pattern blocks (2.4.K1a,c) (\$).4. identifies and uses ordinal numbers first (1st) through tenth (10th) (2.4.K1a).5. identifies coins (pennies, nickels, dimes, quarters) and currency (\$1, \$5, \$10) and states the value of each coin and each type of currency using money models (2.4.K1d) (\$).6. recognizes and counts a like group of coins (pennies, nickels, dimes) (2.4.K1d) (\$).	<p>The student...</p> <ol style="list-style-type: none">1. solves real-world problems using equivalent representations and concrete objects to compare and order whole numbers from 0 through 50 (2.4.A1a) (\$).2. determines whether or not numerical values using whole numbers from 0 through 50 are reasonable (2.4.A1a) (\$), e.g., when asked if 40 dictionaries will fit inside the student's desk, the student answers no and explains why.3. demonstrates that smaller whole numbers are within larger whole numbers using whole numbers from 0 to 30 (2.4.A1a) (\$), e.g., if there are five pigs in a pen, there are also three pigs in the pen.

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Standard 1: Numbers and Computation

Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 2: Number Systems and Their Properties – The student demonstrates an understanding of number systems in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. reads and writes whole numbers from 0 through 100 in numerical form (\$). 2. represents whole numbers from 0 through 100 using various groupings and place value models (place value mats, hundred charts, or base ten blocks) emphasizing ones, tens, and hundreds (2.4.K1b) (\$), e.g., how many groups of tens are there in 32 <i>or</i> how many groups of tens and ones are there in 62? 3. counts subsets of whole numbers from 0 through 100 both forwards and backwards (2.4.K1a) (\$). 4. writes in words whole numbers from 0 through 10. 5. identifies the place value of the digits in whole numbers from 0 through 100 (2.4.K1b) (\$). 6. identifies any whole number from 0 through 30 as even or odd (2.4.K1a). 7. uses the concepts of these properties with whole numbers from 0 through 100 and demonstrates their meaning using concrete objects (2.4.K1a) (\$): <ol style="list-style-type: none"> a. commutative property of addition, e.g., $3 + 2 = 2 + 3$, b. zero property of addition (additive identity), e.g., $4 + 0 = 4$. 	<p>The student...</p> <ol style="list-style-type: none"> 1. solves real-world problems with whole numbers from 0 through 50 using place value models (place value mats, hundred charts, or base ten blocks) and the concepts of these properties to explain reasoning (2.4.A1a-b) (\$): <ol style="list-style-type: none"> a. commutative property of addition, e.g., group 5 students into a group of 3 and a group of 2, add to find the total; then reverse the order of the students to show that $2 + 3$ still equals 5; b. zero property of addition, e.g., have students lay out 11 crayons, tell them to add zero (crayons). Then ask: How many crayons are there?

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Standard 1: Numbers and Computation

Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 3: Estimation – The student demonstrates an understanding of numerical estimation in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
The student... 1. estimates whole number quantities from 0 through 100 using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a) (\$). 2. estimates to check whether or not results of whole number quantities from 0 through 100 are reasonable (2.4.K1a) (\$).	The student... 1. adjusts original whole number estimate of a real-world problem using whole numbers from 0 through 50 based on additional information (a frame of reference) (2.4.A1a) (\$), e.g., an estimate is made about the number of tennis balls in a shoebox; about half of the tennis balls are removed from the box and counted. With this additional information, an adjustment of the original estimate is made.

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Standard 1: Number and Computation

Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 4: Computation – The student demonstrates an understanding of computation in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a) (\$). 2. N states and uses with efficiency and accuracy basic addition facts with sums from 0 through 10 and corresponding subtraction facts (\$). 3. skip counts by 2s, 5s, and 10s through 100 (2.4.K1a). 4. uses repeated addition (multiplication) with whole numbers to find the sum when given the number of groups (ten or less) and given the same number of concrete objects in each group (ten or less) (2.4.K1a), e.g., three plates of cookies with 10 cookies on each plate means $10 + 10 + 10 = 30$ cookies. 5. uses repeated subtraction (division) with whole numbers when given the total number of concrete objects in each group to find the number of groups (2.4.K1a), e.g., there are 9 pencils. If each student gets 2 pencils, how many students get pencils? $9 - 2 - 2 - 2 - 2$ or 9 minus 2 four times means four students get 2 pencils each and there is 1 pencil left over. <i>or</i> There are 30 pieces of candy to put equally into five bowls, how many pieces of candy will be in each bowl? $30 - 5 - 5 - 5 - 5 - 5 - 5$ means there are six in each bowl. 6. performs and explains these computational procedures (2.4.K1a-b): <ol style="list-style-type: none"> a. adds whole numbers with sums through 99 without regrouping using concrete objects, e.g., 42 straws (bundled in 10s) + 21 straws (bundled in 10s) = 63 straws (bundled in 10s); b. subtracts two-digit whole numbers without regrouping using concrete objects, e.g., 63 cubes – 21 cubes = 42 cubes. 7. shows that addition and subtraction are inverse operations using concrete objects (2.4.K1a) (\$). 8. reads and writes horizontally and vertically the same addition expression, e.g., $5 + 4$ is the same as $4 + 5$. 	<p>The student...</p> <ol style="list-style-type: none"> 1. solves one-step real-world addition or subtraction problems with various groupings of two-digit whole numbers without regrouping (2.4.A1a-b) (\$), e.g., Jo has 48 crayons and 16 markers in her desk. How many more crayons does she have than markers? This problem could be solved using base 10 models or a number line or by saying $48 - 10 = 38$ and $38 - 6 = 32$.

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Standard 2: Algebra

Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 2: Variables, Equations, and Inequalities – The student demonstrates an understanding of variables, equations, and inequalities in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> explains and uses symbols to represent unknown whole number quantities from 0 through 20 (2.4.K1a). finds the unknown sum or difference of the basic facts using concrete objects (2.4.K1a) (\$), e.g., 12 dominoes – 5 dominoes = Δ dominoes or Δ cubes = 2 cubes + 4 cubes. describes and compares two whole numbers from 0 through 100 using the terms: is equal to, is less than, is greater than (2.4.K1a-b) (\$). 	<p>The student...</p> <ol style="list-style-type: none"> represents real-world problems using concrete objects, pictures, oral descriptions, and symbols and the basic addition and subtraction facts with one operation and one unknown (2.4.A1a) (\$), e.g., given some marbles, Sue says: 3 red marbles and 3 blue marbles equal 6 marbles. Sue also shows and writes the problem and solution: $3 + 3 = \square$ or $RRR + BBB = \square$, $3 + 3 = 6$. generates and solves problem situations using the basic facts to find the unknown sum or difference with concrete objects (2.4.A1a), e.g., a student generates this problem: I have 6 marbles. My sister has 4. How many do we have altogether? The student shows $6 + 4 = \square$, and $6 + 4 = 10$.

Standard 2: Algebra

Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 3: Functions – The student demonstrates an understanding of functions in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators														
<p>The student...</p> <ol style="list-style-type: none"> plots whole numbers from 0 through 100 on segments of a number line (2.4.K1a). states mathematical relationships between whole numbers from 0 through 50 using various methods including mental math, paper and pencil, and concrete objects (2.4.K1a) (\$), e.g., every time a hand is added to the set, five more fingers are added to the total. states numerical relationships for whole numbers from 0 through 50 in a horizontal or vertical function table (input/output machine, T-table) (2.4.K1e) (\$), e.g., <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Number of bicycles</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">...</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Total number of wheels</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">...</td> </tr> </table> <p>The student states: For every bicycle added, you add two more wheels.</p>	Number of bicycles	1	2	3	4	5	...	Total number of wheels	2	4	6	8	10	...	<p>The student...</p> <ol style="list-style-type: none"> represents and describes mathematical relationships for whole numbers from 0 through 50 using concrete objects, pictures, oral descriptions, and symbols (2.4.A1a) (\$). recognizes numerical patterns (counting by 2s, 5s, and 10s) through 50 using a hundred chart (2.4.A1a).
Number of bicycles	1	2	3	4	5	...									
Total number of wheels	2	4	6	8	10	...									

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Math Curriculum

Standard 2: Algebra

Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 4: Models – The student demonstrates the use of models to show relationships in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include: <ol style="list-style-type: none"> a. process models (concrete objects, pictures, diagrams, number lines, unifix cubes, hundred charts, measurement tools, or calendars) to model computational procedures and mathematical relationships, to compare and order numerical quantities, and to represent fractional parts (1.1.K1-4, 1.2.K3, 1.2.K6-7, 1.3.K1-2, 1.4.K1, 1.4.K2-7, 2.1.K1, 2.1.K1d-h, 2.1.K2a-b, 2.2.K3-4, 2.3.K1-2, 3.2.K1-6, 3.3.K1-3, 3.4.K1-3 4.2.K3-4) (\$); b. place value models (place value mats, hundred charts, or base ten blocks) to compare, order, and represent numerical quantities and to model computational procedures (1.2.K2, 1.2.K5, 1.4.K6, 2.2.K3) (\$); c. fraction models (fraction strips or pattern blocks) to compare, order, and represent numerical quantities (1.1.K2-3) (\$); d. money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.K5-6, 2.1.K2f) (\$); e. function tables (input/output machines, T-tables) to model numerical relationships (2.3.K3) (\$); f. two-dimensional geometric models (geoboards, dot paper, pattern blocks, tangrams, or attribute blocks), three-dimensional geometric models (solids), and real-world objects to compare size and to model attributes of geometric shapes (2.1.K1c, 3.1.K1-3); g. two-dimensional geometric models (spinners), three-dimensional geometric models (number cubes), and concrete objects to model probability (4.1.K1-2) (\$); h. graphs using concrete objects, pictographs, frequency tables, horizontal and vertical bar graphs, and Venn diagrams or other pictorial displays to organize, display, and explain data (4.1.A1, 4.2.A1-2) (\$); i. Venn diagrams to sort data (4.2.K4). 2. uses concrete objects, pictures, diagrams, drawings, or dramatizations to show the relationship between two or more things (\$). 	<p>The student...</p> <ol style="list-style-type: none"> 1. recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include: <ol style="list-style-type: none"> a. process models (concrete objects, pictures, diagrams, number lines, unifix cubes, hundreds charts, measurement tools, or calendars) to model computational procedures and mathematical relationships, to compare and order numerical quantities, and to model problem situations (1.1.A1-3, 1.2.A1, 1.3.A1, 1.4.A1, 2.1.A1a, 2.1.A1c-d, 2.1.A2-3, 2.2.A1-2, 2.3.A1-2, 3.2.A1-3, 3.3.A1-2, 3.4.A1, 4.2.A2) (\$); b. place value models (place value mats, hundred charts, or base ten blocks) to compare, order, and represent numerical quantities and to model computational procedures (1.2.A1, 1.4.A1) (\$); c. two-dimensional geometric models (geoboards, dot paper, pattern blocks, tangrams, or attribute blocks), three-dimensional geometric models (solids), and real-world objects to compare size and to model attributes of geometric shapes (2.1.A1b, 3.1.A1-2); d. two-dimensional geometric models (spinners), three-dimensional geometric models (number cubes), and concrete objects to model probability (4.1.A1) (\$); e. graphs using concrete objects, pictographs, frequency tables, and horizontal and vertical bar graphs to organize, display, and explain data (4.1.A1, 4.2.A1) (\$).

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Standard 3: Geometry

Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 1: Geometric Figures and Their Properties – The student demonstrates an understanding of geometric shapes and their attributes.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. recognizes and draws circles, squares, rectangles, triangles, and ellipses (ovals) (plane figures/two-dimensional figures) (2.4.K1f). 2. recognizes and investigates attributes of circles, squares, rectangles, triangles, and ellipses (plane figures) using concrete objects, drawings, and appropriate technology (2.4.K1f). 3. recognizes cubes, rectangular prisms, cylinders, cones, and spheres (solids/three-dimensional figures) (2.4.K1f). 	<p>The student...</p> <ol style="list-style-type: none"> 1. demonstrates how (2.4.A1c): <ol style="list-style-type: none"> a. a geometric shape made of several plane figures (circles, squares, rectangles, triangles, ellipses) can be separated to make two or more different plane figures; b. several plane figures (circles, squares, rectangles, triangles, ellipses) can be combined to make a new geometric shape; c. several solids (cubes, rectangular prisms, cylinders, cones, spheres) can be combined to make a new geometric shape. 2. sorts plane figures and solids (circles, squares, rectangles, triangles, ellipses, cubes, rectangular prisms, cylinders, cones, spheres) by a given attribute (2.4.A1c).

Standard 3: Geometry

Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 2: Measurement and Estimation – The student demonstrates an understanding of estimation and measurement using standard and non-standard units of measure in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. uses whole number approximations (estimations) for length and weight using nonstandard units of measure (2.4.K1a) (\$), e.g., the width of the chalkboard is about 10 erasers long or the weight of one encyclopedia is about five picture books. 2. compares two measurements using these attributes (2.4.K1a) (\$): <ol style="list-style-type: none"> a. longer, shorter (length); b. taller, shorter (height); c. heavier, lighter (weight); d. hotter, colder (temperature). 3. reads and tells time at the hour and half-hour using analog and digital clocks (2.4.K1a). 4. selects appropriate measuring tools for length, weight, volume, and temperature for a given situation (2.4.K1a) (\$). 5. measures length and weight to the nearest whole unit using nonstandard units (2.4.K1a) (\$). 6. states the number of days in a week and months in a year (2.4.K1a). 	<p>The student...</p> <ol style="list-style-type: none"> 1. compares and orders concrete objects by length or weight (2.4.A1a) (\$). 2. compares the weight of two concrete objects using a balance (2.4.A1a). 3. locates and names concrete objects that are about the same length, weight, or volume as a given concrete object (2.4.A1a) (\$).

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Standard 3 – Geometry

Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 3: Transformational Geometry – The student demonstrates an understanding of spatial sense and relationships in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
The student... <ol style="list-style-type: none">describes the spatial relationship between two concrete objects using appropriate vocabulary (2.4.K1a), e.g., behind, above, below, on, under, beside, or in front of.recognizes that changing an object's position or orientation does not change the name, size, or shape of the object (2.4.K1a).describes movement of concrete objects using appropriate vocabulary (2.4.K1a), e.g., right, left, up, or down.	The student... <ol style="list-style-type: none">shows two concrete objects or shapes are congruent by physically fitting one object or shape on top of the other (2.4.A1a).gives and follows directions to move concrete objects from one location to another using appropriate vocabulary (2.4.A1a), e.g., right, left, up, down, behind, or above.

Standard 3: Geometry

Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 4: Geometry From An Algebraic Perspective – The student identifies one or more points on a number line in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
The student... <ol style="list-style-type: none">locates and plots whole numbers from 0 through 100 on a segment of a number line (horizontal/vertical) (2.4.K1a), e.g., using a segment of a number line from 45 to 60 to locate the whole number 50.describes a given whole number from 0 to 100 as coming before or after another number on a number line (2.4.K1a).uses a number line to model addition and counting using whole numbers from 0 to 100 (2.4.K1a).	The student... <ol style="list-style-type: none">solves real-world problems involving counting and adding whole numbers from 0 to 50 using a number line (2.4.A1a) (\$), e.g., Nancy has 23¢. She finds 18¢ more in her pocket. How much money does she now have?

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Standard 4: Data

Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 1: Probability – The student demonstrates an understanding of the concepts of probability in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. recognizes whether an outcome of a simple event in an experiment or simulation is impossible, possible, or certain (2.4.K1g) (§). 2. recognizes and states whether a simple event in an experiment or simulation including the use of concrete objects can have more than one outcome (2.4.K1g). 	<p>The student...</p> <ol style="list-style-type: none"> 1. makes a prediction about a simple event in an experiment or simulation, conducts the experiment or simulation, and records the results in a graph using concrete objects, a pictograph with a symbol or picture representing only one, or a bar graph (2.4.A1d-e).

Standard 4: Data

Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 2: Statistics – The student demonstrates an understanding of data sets in a variety of situations.

First Grade Knowledge Base Indicators	First Grade Application Indicators
<p>The student...</p> <ol style="list-style-type: none"> 1. displays and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including a title, labels, and whole number intervals using these data displays (2.4.K1h) (§): <ol style="list-style-type: none"> a. graphs using concrete objects, b. pictographs with a whole symbol or picture representing one (no partial symbols or pictures), c. frequency tables (tally marks), d. horizontal and vertical bar graphs, e. Venn diagrams or other pictorial displays, e.g., glyphs. 2. collects data using different techniques (observations or interviews) and explains the results (2.4.K1h) (§). 3. identifies the minimum (lowest) and maximum (highest) values in a data set (2.4.K1a) (§). 4. determines the mode (most) after sorting by one attribute (2.4.K1a,i) (§). 5. sorts and records qualitative (non-numerical, categorical) data sets using one attribute (2.4.K1a) (§), e.g., color, shape, or size. 	<p>The student...</p> <ol style="list-style-type: none"> 1. communicates the results of data collection and answers questions (identifying more, less, fewer, greater than, or less than) based on information from (2.4.A1e) (§): <ol style="list-style-type: none"> a. graphs using concrete objects, b. a pictograph with a whole symbol or picture representing only one (no partial symbols or pictures), c. frequency tables (tally marks) d. a horizontal or vertical bar graph. 2. determines categories from which data could be gathered (2.4.A1a) (§), e.g., categories could include shoe size, height, favorite candy bar, or number of pockets in clothing.