USD 368
Curriculum Guide

▲KS Assessment

Grade/Course: Second
Curricular Area: Math
Standard 1: Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.
Benchmark 1: Number Sense – The student demonstrates number sense for whole numbers, fractions, and money using concrete objects in a variety of situations.

Knowledge Base Indicators

The student…
1. ▲*knows, explains, and represents whole numbers from 0 through 1,000 using concrete objects (2.4.K1a)* **$**.
2. compares and orders:
   a. whole numbers from 0 through 1,000 using concrete objects (2.4.K1a) **$**;
   b. fractions greater than or equal to zero with like denominators (halves, fourths, thirds, eighths) using concrete objects (2.4.K1a,c).
3. uses addition and subtraction to show equivalent representations for whole numbers from 0 through 100 (2.4.K1a-b), e.g., 8 – 5 = 2 + 1 or 20 + 40 = 70 – 10.
4. Identifies and uses ordinal positions from first (1^{st}) through twentieth (20^{th}) (2.4.K1a).
5. ▲identifies coins, states their values, and determines the total value to $1.00 of a mixed group of coins using pennies, nickels, dimes, quarters, and half-dollars (2.4.K1d) **$**.
6. Counts a like combination of currency ($1, $5, $10, $20) to $100 (2.4.K1d) **$**.

Application Indicators

The student...
1. solves real-world problems using equivalent representations and concrete objects to **$**:
   a. compare and order whole numbers from 0 through 1,000 (2.4.A1b), e.g., using base ten blocks, represent the students in each class in the school; represent the numbers using digits (24) and compare and order in different ways;
   b. add and subtract whole numbers from 0 through 100 (2.4.A1b), e.g., using base ten blocks, represent the number of students in each class in the school; find the total of all students in grades K, 1, and 2 and the total of all of the students in grades 3, 4, and 5 and then subtract to find the difference between the primary and intermediate grades;
   c. compare and order a mixed group of coins to $1.00 (2.4.A1c), e.g., use actual coins to show 2 different amounts; students write: 47¢ is more than 31¢;
   d. find equivalent values of coins to $1.00 without mixing coins (2.4.A1c), e.g., 50 pennies = 2 quarters, 5 dimes = 2 quarters, or 10 nickels = 2 quarters.
2. determines whether or not numerical values that involve whole numbers from 0 through 1,000 are reasonable (2.4.A1a-b) **$**, e.g., if there are 26 children, plus 10 more children, is it reasonable to say there are 50 children?

Standard 1: 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 whole numbers with a special emphasis on place value and recognizes, uses, and explains the concepts of properties as they relate to whole numbers in a variety of situations.

Knowledge Base Indicators

The student...

1. reads and writes $:
   a. whole numbers from 0 through 1,000 in numerical form, e.g., 942 is read as nine hundred forty-two and is written in numerical form as 942;
   b. whole numbers from 0 through 100 in words, e.g., 76 is read as seventy-six and is written in words as seventy-six.
   c. whole numbers from 0 through 1,000 in numerical form when presented in word form, e.g., nine hundred forty-six is read as nine hundred forty-six and is written as 946.
2. ▲represents whole numbers from 0 through 1,000 using various groupings and place value models emphasizing 1s, 10s, and 100s; explains the groups; and states the value of the digit in ones place, tens place, and hundreds place (2.4.K1b) $, e.g., in 385, the 3 represents 3 hundreds, 30 tens, or 300 ones; the 8 represents 8 tens or 80 ones; and the 5 represents 5 ones.
3. counts subsets of whole numbers from 0 through 1,000 forwards and backwards (2.4.K1a) $, e.g., 311, 312, …, 320; or 210, 209, …, 204.
4. ▲identifies the place value of the digits in whole numbers from 0 through 1,000 (2.4.K1b) $.
5. Identifies any whole number from 0 through 100 as even or odd (2.4.K1a).
6. **uses** the **concepts** of these properties with whole numbers from 0 through 100 and demonstrates their meaning including the use of concrete objects (2.4.K1a) $:
   a. Commutative property of addition, e.g., 5 + 6 = 6 + 5;
   b. zero property of addition (additive identity), e.g., 4 + 0 = 4;
   c. associative property of addition, e.g., (3 + 2) + 4 = 3 + (2 + 4);
   d. symmetric property of equality applied to basic addition and subtraction facts, e.g., 10 = 2 + 8 is the same as 2 + 8 = 10 or 7 = 10 – 3 is the same as 10 – 3 = 7.

Application Indications

The student...

1. solves real-world problems with whole numbers from 0 through 100 using place value models and the concepts of these properties to explain reasoning (2.4.A1a-b) $:
   a. commutative property of addition, e.g., group 17 students into a 9 and an 8, add to find the total, then reverse the students to show 8 + 9 still equals 17;
   b. zero property of addition, e.g., have students lay out 22 crayons, tell them to add zero (crayons). How many crayons? 22 + 0 = 22.
2. performs various computational procedures with whole numbers from 0 through 100 using these properties and explains how they were used (2.4.A1b):
   a. commutative property of addition (5 + 6 = 6 + 5), e.g., given 6 + 5, the student says: I know that the answer is 11 because 5 + 6 is 11 and the order you add them in does not matter;
   b. zero property of addition (17 + 0 = 0 + 17), e.g., given 17 + 0, the student says: I know that the answer is 17 because adding 0 does not change the answer (sum).

Standard 1: Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 3: Estimation – The student uses computational estimation with whole numbers and money in a variety of situations.

Knowledge Base Indicators

The student...

1. estimates whole number quantities from 0 through 1,000 and monetary amounts through $50 using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.Ka-b,d) $.
2. uses various estimation strategies to estimate whole number quantities from 0 through 1,000 (2.4.K1a) $.

Application Indicators

The student...

1. adjusts original whole number estimate of a real-world problem using numbers from 0 through 1,000 based on additional information (a frame of reference) (2.4.A1a) $, e.g., given a pint container and told the number of marbles it has in it, the student would estimate the number of marbles in a quart container.
2. estimates to check whether or not the result of a real-world problem using whole numbers from 0 through 1,000 and monetary amounts through $50 is reasonable and makes predictions based on the information (2.4.A1a-c) $, e.g., in the lunchroom, good behavior that day can earn the class an extra 5 minutes of recess. Is it reasonable to think you can earn an hour of extra recess in one week? After answering the first question, then ask: About how many days would it take?
3. selects a reasonable magnitude from three given quantities, a one-digit numeral, a two-digit numeral, and a three-digit numeral (5, 50, 500) based on a familiar problem situation and explains the reasonableness of the selection (2.4.A1a), e.g., could the basket of fruit on the kitchen table hold 7 apples, 70 apples, or 700 apples? The student chooses 7 apples because apples are about the size of baseballs and 7 will fit in a basket on the kitchen table.

Standard 1: Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 4: Computation – The student models, performs, and explains computation with whole numbers and money using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

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 20 and corresponding subtraction facts (2.4.K1a) $.
3. skip counts by 2s, 5s, and 10s through 100 and skip counts by 3s through 36 (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 (twenty or less) (2.4.K1a) $, e.g., five classes of 15 students visit the zoo; 15 + 15 + 15 + 15 + 15 = 75.
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 25 cookies. If each student gets 3 cookies, how many students get cookies? 25 – 3 – 3 – 3 – 3 – 3 – 3 – 3 – 3 or 25 minus 3 eight times means eight students get 3 cookies each and there is 1 cookie left over.
6. fair shares/measures out (divides) a total amount through 100 concrete objects into equal groups (2.4.K1a-b), e.g., fair sharing 48 eggs into four groups resulting in four groups of 12 eggs or measuring out 48 eggs with 12 eggs in each group resulting in four groups of 12 eggs.
7. ▲**N** performs and explains these computational procedures:
   a. adds and subtracts three-digit whole numbers with and without regrouping including the use of concrete objects (2.4.K1a-b),
   b. adds and subtracts monetary amounts through 99¢ using cent notation (25¢ + 52¢) and money models (2.4.K1a-b,d) $.

8. ▲**N** identifies basic addition and subtraction fact families (facts with sums from 0 through 20 and corresponding subtraction facts). (2.4.K1a).
9. reads and writes horizontally and vertically the same addition or subtraction expression e.g., 6 – 3 is the same as 6
   -3

Application Indicators

The student...

1. solves one-step real-world addition or subtraction problems with various groupings of **$**:
   a. two-digit whole numbers with regrouping (24A1a-b), e.g., for the food drive, the class collected 64 cans (cylinders) and 28 boxes (rectangular prisms). How many did they collect in all? This problem could be solved with base 10 models, or by saying 64 + 20 = 84 and 84 + 8 = 92 or 60 + 20 = 80 and 4 + 8 = 12 and 80 + 12 = 92 or with the traditional algorithm;
   b. monetary amounts to 99¢ with regrouping (2.4.A1a-c), e.g., an extra carton of milk costs 25¢. If three students want an extra carton, how much money should the teacher collect? The student could solve by using coins (q + q + q or d + d + n + d + d + n + d + d + n) or by counting by 25s or by drawing or using base 10 models or with the traditional algorithm.
2. generates a family of basic addition and subtraction facts given one fact/equation (2.4.A1a), e.g., given 9 + 8 = 17; the other facts are 8 + 9 = 17, 17 – 8 = 9, and 17 – 9 = 8.

Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 1: Patterns – The student recognizes, describes, extends, develops, and explains relationships in patterns using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. uses concrete objects, drawings, and other representations to work with **types** of patterns (2.4.K1a):
   a. repeating patterns, e.g., an AB pattern is like left-right, left-right, …; an ABC pattern is like dog-horse-pig, dog-horse-pig, …; an AAB pattern is like ↑↑→, ↑↑→, …;
   b. growing (extending) patterns, e.g., 7, 9, 11, … where the rule could be add 2 or the odd numbers beginning with 7.
2. uses the following **attributes** to generate patterns:
   a. counting numbers related to number theory (2.4.K1a), e.g., evens, odds, or skip counting by 3s, or 4s;
   b. whole numbers that increase or decrease (2.4.K1a) **$**, e.g., 11, 22, 33, ... or 98, 88, 78, …;
   c. geometric shapes (2.4.K1f), e.g., Δ-O-O, Δ-O-O, …;
   d. measurements (2.4.K1a), e.g., 1”, 3”, 5”, … or 5 lbs, 10 lbs, 15 lbs, …;
   e. the calendar (2.4.K1a), e.g., Sunday, Monday, Tuesday, …;
   f. money and time (2.4.K1a,d) **$**, e.g., $5, $10, $15, ... or 1:15, 1:30, 1:45, …;
   g. things related to daily life (2.4.K1a), e.g., seasons, temperature, or weather;
   h. things related to size, shape, color, texture, or movement (2.4.K1a), e.g., ◈◈,◈◈, ◈◈, … ; or snapping fingers, clapping hands, or stomping feet or over, under, or behind using a bean bag toss (kinesthetic patterns).
3. ▲identifies and continues a pattern presented in various formats including numeric (list or table), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written (2.4.K1a) **$**.
4. generates (2.4.K1a):
   a. repeating patterns, e.g., 1-2, 1-2, 1-2, … where the elements repeat;
   b. growing (extending) patterns, e.g., 1, 4, 7, …where the rule is add 3.

Application Indicators

The student...

1. generalizes these patterns using a written description:
   a. whole number patterns(2.4.A1a) $;
   b. patterns using geometric shapes (2.4.A1d);
   c. calendar patterns (2.4.A1a);
   d. money and time patterns (2.4.A1a,c) $;
   e. patterns using size, shape, color, texture, or movement (2.4.A1a);
2. recognizes multiple representations of the same pattern (2.4.A1a), e.g., the ABB pattern could be represented by clap, snap, snap, … or red, blue, blue, … or square, circle, circle, ….
3. uses concrete objects to model a whole number patterns (2.4.A1a), e.g.,
   counting by twos: ♦♦, ♦♦ ♦♦
   ♦♦, ♦♦
   ♦♦, …;
   counting by fives: xxxxx, xxxxx xxxxx
   xxxxx, xxxxx
   xxxxx, …;

   counting by tens:
   ■■■■■■■■■■, ■■■■■■■■■■ ■■■■■■■■■■
   ■■■■■■■■■■, ■■■■■■■■■■
   ■■■■■■■■■■,

   counting by twenty-fives:

…

Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 2: Variables, Equations, and Inequalities – The student uses symbols and whole numbers to solve addition and subtraction equations using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. explains and uses symbols to represent unknown whole number quantities from 0 through 100 (2.4.K1a).
2. finds the sum or difference in one-step equations with : $
   a. whole numbers from 0 through 99 (2.4.K1a-b), e.g., 32 + 19 = ☐ or ☐ = 79 – 46;
   b. up to two different coins (2.4.K1d), e.g., nickel + penny = ☐¢.
3. finds unknown addend or subtrahend using basic addition and subtraction facts (fact family) (2.4.K1a) $, e.g., 12 = ☐ + 7 or 12 – ☐ = 7.
4. describes and compares two whole numbers from 0 through 1,000 using the terms: is equal to, is less than, is greater than (2.4.K1a-b) $.

Application Indicators

The student...

1. represents real-world problems using symbols and whole numbers from 0 through 30 with one operation (addition, subtraction) and one unknown (2.4.A1a) $, e.g., when asked to give the total number of students in class today, the students write: 14 boys and 9 girls = □ students.

2. generates (2.4.A1a) $:
   a. addition or subtraction equations to match a given real-world problem with one operation and one unknown using whole numbers from 0 through 99, e.g., a boy has 45 stickers. How many more stickers does he need to have 80 stickers? This is represented by 45 + n = 80 or 80 – 45 = n.
   b. a real-world problem to match a given addition or subtraction equation with one operation using the basic facts, e.g., the student is given the addition equation, 9 + ν = 17 and writes this problem situation: You have 9¢ and a piece of candy costs 17¢. How much more money do you need to buy the candy?

Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 3: Functions – The student recognizes and describes whole number relationships using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. states mathematical relationships between whole numbers from 0 through 100 using various methods including mental math, paper and pencil, and concrete objects (2.4.K1a) $, e.g., every time a dog is added to the pack, 2 more ears are added to the total.
2. finds the values and determines the rule that involve addition or subtraction of whole numbers from 0 through 100 using a horizontal or vertical function table (input/output machine, T-table) (2.4.K1e), e.g., after looking at the function table, different students might respond that the rule is In + 2 equals Out, the rule is N + 2, or the rule is plus 2.

In	Out
9	11
2	4
13	15
42	44
57	59
6	?
72	?
N	?

3. generalizes numerical patterns using whole numbers from 0 through 100 with one operation (addition, subtraction) by stating the rule using words, e.g., if a set of numbers is 2, 4, 6, 8,10, …; the rule is add two.

Applicaton Indicators

The student...

1. represents and describes mathematical relationships between whole numbers from 0 through 100 using concrete objects, pictures, oral descriptions, and symbols (2.4.A1a) $.
2. finds the rule, states the rule, and extends numerical patterns with whole numbers from 0 through 100 (2.4.A1a), e.g., given 1, 3, 5, 7, 9 and continues with 11, 13, 15, 17, … recognizing that the pattern could be the odd numbers.

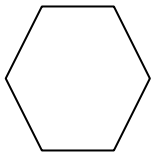
Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.

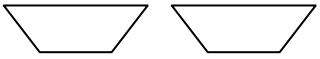
Benchmark 4: Models – The student uses mathematical models including concrete objects to represent, show, and communicate mathematical relationships in a variety of situations.

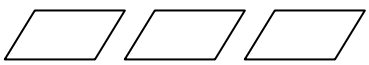
Knowledge Base Indicators

The student...

1. knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:
   a. process models (concrete objects, pictures, diagrams, number lines, unifix cubes, hundred charts, or measurement tools) 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.K5-6, 1.3.K1-2, 1.4.K1-8, 2.1.K1, 2.2K1, 2.1K1a-b, 2.1K1d-h, 2.1.K3-4, 2.2.K2a, 2.2.K3-4, 2.3.K1, 3.2.K1-5, 3.3.K1, 3.4.K1-3, 4.2.K3-5) **$**;
   b. place value models (place value mats, hundred charts, or base ten blocks) to compare, order, and represent numerical quantities and to model computational procedures (1.1.K3, 1.2.K2, 1.2.K4, 1.3.K1, 1.4.K6-7, 1.4.K7a, 2.2.K2a, 2.2.K4) **$**;
   c. fraction models (fraction strips or pattern blocks) to compare, order, and represent numerical quantities (1.1.K2b) **$**;
   d. money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.K5-6, 1.3.K1, 1.4.K7b, 2.1.K1f, 2.2.K2b) **$**.
   e. function tables (input/output machines, T-tables) to model numerical relationships (2.3.K2) **$**;
   f. two-dimensional geometric models (geoboards, dot paper, pattern blocks, tangrams, or attribute blocks) to model perimeter and properties of geometric shapes and three-dimensional geometric models (solids) and real-world objects to compare size and to model attributes of geometric shapes (2.1.K2c, 3.1.K1-6, 3.3.K2-3);
   g. two-dimensional geometric models (spinners), three-dimensional geometric models (number cubes), and process models (concrete objects) to model probability (4.1.K1-2) **$**;
   h. graphs using concrete objects, representational objects, or abstract representations, pictographs, frequency tables, horizontal and vertical bar graphs, Venn diagrams or other pictorial displays, and line plots to organize and display data (4.1.K2, 4.2.K1, 4.2.K2) **$**;
   i. Venn diagrams to sort data.
2. creates a mathematical model to show the relationship between two or more things, e.g., using pattern blocks, a whole (1) can be represented using

a  (1/1) or

two  (2/2) or

three  (3/3) or

six  (6/6).

Application Indicators

The student...

1. recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:
   a. process models (concrete objects, pictures, diagrams, number lines, unifix cubes, hundred charts, or measurement tools) to model computational procedures and mathematical relationships, to compare and order numerical quantities, and to model problem situations (1.1.A1a-b, 1.1.A2, 1.2.A1-2, 1.3.A1, 1.4.A1-2, 2.1.A1a, 2.1.A1c-e, 2.2.A1-2, 2.3.A1-2, , 3.2.A1-4, 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 (1.1.A1a-b, 1.1.A2, 1.2.A1-2, 1.3.A2, 1.4.A1a) $;
   c. money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.A1c-d, 1.3.A2, 1.4.A1b, 2.1.A1d) $.
   d. two-dimensional geometric models (geoboards, dot paper, pattern blocks, tangrams, or attribute blocks) to model perimeter and properties of geometric shapes and three-dimensional geometric models (solids) and real-world objects to compare size and to model attributes of geometric shapes (2.1.A1b, 3.1.A1-3);
   e. two-dimensional geometric models (spinners), three- dimensional geometric models (number cubes), and process models (concrete objects) to model probability (4.1.A1) $;
   f. graphs using concrete objects, representational objects, or abstract representations, pictographs, horizontal and vertical bar graphs (4.1.A1, 4.2.A1-4) $.
2. selects a mathematical model that is more useful than other mathematical models in a given situation.

Standard 3: Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 1: Geometric Figures and Their Properties – The student recognizes geometric shapes and describes their properties using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. recognizes and investigates properties of circles, squares, rectangles, triangles, and ellipses (ovals) (plane figures/two-dimensional shapes) using concrete objects, drawings, and appropriate technology (2.4.K1f).
2. ▲*recognizes, draws, and describes circles, squares, rectangles, triangles, ellipses (ovals) (plane figures) (2.4.K1f).*
3. recognizes cubes, rectangular prisms, cylinders, cones, and spheres (solids/three-dimensional figures) (2.4.K1f).
4. recognizes the square, triangle, rhombus, hexagon, parallelogram, and trapezoid from a pattern block set (2.4.K1f).
5. compares geometric shapes (circles, squares, rectangles, triangles, ellipses) to one another (2.4.K1f).
6. recognizes whether a shape has a line of symmetry (2.4.K1f).

Application Indicators

The student...

1. solves real-world problems by applying the properties of plane figures (circles, squares, rectangles, triangles, ellipses) (2.4.A1d), e.g., which shape could be used to completely cover the lid of a pencil box with no overlapping?

2. demonstrates how 2.4.A1d):
   a. ▲plane figures (circles, squares, rectangles, triangles, ellipses) can be combined or separated to make a new shape;
   b. solids (cubes, rectangular solids, cylinders, cones, spheres) can be combined or separated to make a new shape.
3. identifies the plane figures (circles, squares, rectangles, triangles, ellipses) used to form a composite figure (2.4.A1d).

Standard 3: Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 2: Measurement and Estimation – The student estimates and measures using standard and nonstandard units of measure with concrete objects in a variety of situations.

Knowledge Base Indicators

The student...
1. uses whole number approximations (estimations) for length, weight, and volume using standard and nonstandard units of measure (2.4.K1a) **$**, e.g., the height of the classroom door is 14 chalkboard erasers laid end to end or 7 feet high or an apple weighs about 42 unifix cubes.
2. ▲reads and tells time by five-minute intervals using analog and digital clocks (2.4.K1a).
3. selects and uses appropriate measurement tools and units of measure for length, weight, volume, and temperature for a given situation (2.4.K1a) **$**.
4. measures (2.4.K1a) **$**:
   a. ▲length to the nearest inch or foot and to the nearest whole unit of a nonstandard unit;
   b. weight to the nearest nonstandard unit;
   c. volume to the nearest cup, pint, quart, or gallon;
   d. temperature to the nearest degree.
5. states (2.4.K1a):
   a. the number of minutes in an hour,
   b. the number of days in each month.

Application Indicators

The student...
1. compares the weights of more than two concrete objects using a balance (2.4.A1a) **$**.
2. solves real-world problems by applying appropriate measurements (2.4.A1a):
   a. length to the nearest inch or foot, e.g., a cookie is almost how many inches wide?
   b. length to the nearest whole unit of a nonstandard unit, e.g., how many paper clips long is a candy bar?
3. estimates to check whether or not measurements or calculations for length in real-world problems are reasonable (2.4.A1a) **$**, e.g., is it reasonable to say that you measured your thumb and it is 2 feet long?
4. adjusts original measurement or estimation for length and weight in real-world problems based on additional information (a frame of reference) (2.4.A1a), e.g., I estimated that the stapler is 20 paperclips long. Then I lay out 4 paperclips next to the stapler. I realize that since I am half done, my estimate is too high; so I adjust my estimate to 8 paperclips.

Standard 3: Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 3: Transformational Geometry – The student recognizes and shows one transformation on simple shapes and concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. knows and uses the cardinal points (north, south, east, west) (2.4.K1a).
2. recognizes that changing an object's position or orientation including whether the object is nearer or farther away does not change the name, size, or shape of the object (2.4.K1f).
3. recognizes when a shape has undergone one transformation (flip/reflection, turn/rotation, slide/translation) (2.4.K1f).

Application Indicators

The student...

1. shows two concrete objects or shapes are congruent by physically fitting one shape or object on top of the other (2.4.A1a).
2. follows directions to move objects from one location to another using appropriate vocabulary and the cardinal points (north, south, east, west) (2.4.A1a).

Standard 3: 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.

Knowledge Base Indicators

The student...

1. locates and plots whole numbers from 0 through 1,000 on a segment of a number line (horizontal/vertical) (2.4.K1a), e.g., using a segment of a number line from 800 to 820 to locate the whole number 805.
2. represents the distance between two whole numbers from 0 through 1,000 on a segment of a number line (2.4.K1a).
3. uses a segment of a number line to model addition and subtraction using whole numbers from 0 through 1,000 (2.4.K1a), e.g.,
   333 + n = 349 or 333 + 16 = n or 400 – n = 352 or 400 – 48 = n.

Application Indicators

The student...

1. solves real-world problems involving counting, adding, and subtracting whole numbers from 0 through 1,000 using a segment of a number line (2.4.A1a) **s**, e.g., Adam had collected 894 marbles. He lost nine marbles. How many does he have now?
   Using the number line, Adam shows how he solved the problem.

Standard 4: Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 1: Probability – The student applies the concepts of probability using concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. recognizes any outcome of a simple event in an experiment or simulation as impossible, possible, certain, likely, or unlikely (2.4.K1g) $.
2. lists some of the possible outcomes of a simple event in an experiment or simulation including the use of concrete objects (2.4.K1g-h).

Application Indicators

The student...

1. makes a prediction about a simple event in an experiment or simulation; conducts the experiment or simulation including the use of concrete objects; records the results in a chart, table, or graph; and makes an accurate statement about the results (2.4.A1e-f).

Standard 4: Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 2: Statistics – The student collects, organizes, displays, and explains numerical (whole numbers) and non-numerical data sets including the use of concrete objects in a variety of situations.

Knowledge Base Indicators

The student...

1. organizes, displays, and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including a title, labels, categories, and whole number intervals using these **data displays** (2.4.K1h) $:
   a. ▲graphs using concrete objects;
   b. ▲pictographs with a whole symbol or picture representing one, two, or ten (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;
   f. line plots.
2. collects data using different techniques (observations, interviews, or surveys) and explains the results (2.4.K1h) $.
3. identifies the minimum (lowest) and maximum (highest) values in a whole number data set (2.4.K1a) $.
4. finds the range for a data set using two-digit whole numbers (2.4.K1a) $.
5. finds the mode (most) for a data set using concrete objects that include (2.4.K1a) $:
   a. quantitative/numerical data (whole numbers through 100);
   b. qualitative/non-numerical data (category that occurs most often).

Application Indicators

The student...

1. communicates the results of data collection and answers questions based on information from (2.4.A1f) $:
   a. graphs using concrete objects,
   b. pictographs with a whole symbol or picture representing one (no partial symbols or pictures),
   c. horizontal and vertical bar graphs.
2. determines categories from which data could be gathered (2.4.A1f) $, e.g., categories could include shoe size, height, favorite candy bar, or number of pockets in clothing.
3. recognizes that the same data set can be displayed in various formats including the use of concrete objects (2.4.A1f) $.
4. recognizes appropriate conclusions from data collected (2.4.A1f) $.